Creekside Assisted Living

Technical Appendices

Appendix K

Traffic Memorandum

URBAN SYSTEMS ASSOCIATES, INC.
PLANNING & TRAFFIC ENGINEERING, MARKETING & PROJECT SUPPORT
CONSULTANTS TO INDUSTRY AND GOVERNMENT

MEMO

ATTN:	***Greg Scaduto*** ***Lanikai Management Corp***		***E-Mail: lmc@lanikaimanagement.com***
FROM:	***Justin P. Schlaefli, PE, TE, PTOE***		***TOTAL PAGES (Including Cover): 8 + Attachments and Appendices***
DATE:	***April 24, 2018***	***TIME: 10:21:17 PM***	***JOB NUMBER:*** 001718
SUBJECT:	***Traffic Impact Analysis – Richmar Connection***		

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This memo is provided to provide a Traffic Impact Analysis to evaluate the effects of the removal of the Richmar connection which will result in the re-routing of traffic.

Project Land-Use Description:

The proposed project will be located on the northwest corner at the intersection of Woodward Street and Mission Road on undeveloped land. The proposed project is an age-restricted senior living housing. Additionally, the removal of the Richmar connection will be factored into whether the re-routing of future traffic will cause a significant impact to a street segment or intersection due to the addition of the proposed project.

Methodology:

A past project conducted by Urban Systems Associates, Inc. involving the removal of the Richmar Ave. Bridge for a "With and Without" Comparison study was referenced to determine the re-routing of traffic. The SANDAG TFIC Series 13, Year 2035 was referenced to determine the amount of average daily trips (ADT) would be re-routed. As shown in **Attachment B**, the TFIC shows that the Richmar connection will have an ADT of 6,000 in the year 2035.

DRAFT

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Trip Generation:

Based on the *SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates (2002)* were used to establish a trip generation estimate. As shown in **Table 1,** the proposed project is expected to generate a total ADT of generate **460** average daily trips (ADT) with **23** (**9** in / **14** out) AM peak hour trips and **32** (**19** in / **13** out) PM peak hour trips.

Trip Generation Table

Land Use	Intensity	Rate*	ADT	AM						PM					
				Peak%*	Vol.	In %	Out%	In	Out	Peak%*	Vol.	In %	Out%	In	Out
Retirement Community	115 units	4 /unit	460	5%	23	40% :	60%	9	14	7%	32	60% :	40%	19	13
Total			460		23			9	14		32			19	13

Source:

*Rates are used taken from SANDAG "(Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region", April 2002.

Note:

ADT= Average Daily Trips

Unit = Dwelling Unit

Studied Street Segments:

The following street segments were analyzed in the Existing, Year 2035 With Connection, Year 2035 With Connection Plus Project, Year 2035 Without Connection, Year 2035 Without Connection Plus Project scenarios:

- Twin Oaks Valley Road – between Borden Road and Richmar Avenue
- Twin Oaks Valley Road – between Richmar Avenue to San Marcos Boulevard
- San Marcos Boulevard – between Twin Oaks Valley Road to East Mission Road
- Woodward Street – between East Mission Road to Vineyard Road
- Woodward Street – between Vineyard Road to Borden Road
- Borden Road – between Twin Oaks Valley Road to Woodward Street

The listed street segments were analyzed for Average Daily Traffic Volumes following the SANTEC/ITE Guidelines for roadway classifications

Traffic Count volumes were obtained on January 25, 2018

Studied Intersections:

The following listed intersections were analyzed in the Existing, Year 2035 With Connection, Year 2035 With Connection Plus Project, Year 2035 Without Connection, Year 2035 Without Connection Plus Project scenarios

using Synchro 10 which utilizes the Highway Capacity Manual (HCM), HCM 2000, and HCM 6th edition methodologies for calculating the delay per vehicle (sec) for each intersection.

Turning Movement Counts were obtained on January 25, 2018.

- Twin Oaks Valley Road at Borden Road
- Woodward Street at Borden Road
- Woodward Street at Vineyard Road
- Twin Oaks Valley Road at Richmar Avenue
- Woodward Street at East Mission Road
- Twin Oaks Valley Road at San Marcos Boulevard

Street segments capacities that are within the study area will be analyzed based on the table provided below from the SANTEC/ITE Guidelines.

ROADWAY CLASSIFICATIONS, LEVELS OF SERVICE (LOS) AND AVERAGE DAILY TRAFFIC (ADT)

			LEVEL OF SERVICE W/ADT**				
STREET CLASSIFICATION	LANES	CROSS SECTIONS* (APPROX.)	A	B	C	D	E
Expressway	6 lanes	102-160/122-200	30,000	42,000	60,000	70,000	80,000
Prime Arterial	6 lanes	102-108/122-128	25,000	35,000	50,000	55,000	60,000
Major Arterial	6 lanes	102/122	20,000	28,000	40,000	45,000	50,000
Major Arterial	4 lanes	78-82/98-102	15,000	21,000	30,000	35,000	40,000
Secondary Arterial/ Collector	4 lanes	64-72/84-92	10,000	14,000	20,000	25,000	30,000
Collector (no center lane) (continuous left-turn lane)	4 lanes 2 lanes	64/84 50/70	5,000	7,000	10,000	13,000	15,000
Collector (no fronting property)	2 lanes	40/60	4,000	5,500	7,500	9,000	10,000
Collector (commercial-industrial fronting)	2 lanes	50/70	2,500	3,500	5,000	6,500	8,000
Collector (multi-family)	2 lanes	40/60	2,500	3,500	5,000	6,500	8,000
Sub-Collector (single-family)	2 lanes	36/56	---	---	2,200	---	---

LEGEND:

* Curb to curb width (feet)/right of way width (feet): based upon the City of San Diego Street Design Manual and other jurisdictions within the San Diego region.
** Approximate recommended ADT based upon the City of San Diego Street Design Manual.

NOTES:

1. The volumes and the average daily level of service listed above are only intended as a general planning guideline.
2. Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

Intersections that are within the study area will be analyzed based on the table provided below from the Highway Capacity Manual.

Level of Service Criteria for Signalized Intersection

Level of Service	Traffic Signal Control Delay per vehicle (sec)
A	≤ 10
B	> 10 - 20
C	> 20 - 35
D	> 35 - 55
E	> 55 - 80
F	> 80

Source: HCM 6th Edition

The studied street segments and intersections will be evaluated in the plus project traffic conditions to determine if the proposed project causes a direct or cumulative impact. The criteria for determining significant impacts is shown below and is provided by SANTEC/ITE Guidelines. Any impacts that will occur must be mitigated by the project applicant to return the transportation facility back to acceptable Levels of Service.

MEASURE OF SIGNIFICANT PROJECT TRAFFIC IMPACTS

Level of Service with Project*	Allowable Change due to Project Impact**					
	Freeways		Roadway Segments		Intersections	Ramp*** Metering
	V/C	Speed (mph)	V/C	Speed (mph)	Delay (sec.)	Delay(min.)
D, E, & F (or ramp meter delays above 15 min.)	0.01	1	0.02	1	2	2

NOTES:

* All level of service measurements are based upon HCM procedures for peak-hour conditions. However, V/C ratios for Roadway Segments may be estimated on an ADT/24-hour traffic volume basis (using Table 2 or a similar LOS chart for each jurisdiction). The acceptable LOS for freeways, roadways, and intersections is generally "D" ("C" for undeveloped or not densely developed locations per jurisdiction definitions). For metered freeway ramps, LOS does not apply. However, ramp meter delays above 15 minutes are considered excessive.

** If a proposed project's traffic causes the values shown in the table to be exceeded, the impacts are determined to be significant. These impact changes may be measured from appropriate computer programs or expanded manual spreadsheets. The project applicant shall then identify feasible mitigation (within the Traffic Impact Study [TIS] report) that will maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see above * note), or if the project adds a significant amount of peak-hour trips to cause any traffic queues to exceed on- or off-ramp storage capacities, the project applicant shall be responsible for mitigating significant impact changes.

*** See Attachment B for ramp metering analysis.

KEY: V/C = Volume to Capacity ratio
Speed = Speed measured in miles per hour
Delay = Average stopped delay per vehicle measured in seconds for intersections, or minutes for ramp meters
LOS = Level of Service

Existing Conditions

The following table displays the Existing level of service and the Existing Plus Project level of service comparison for street segments to determine if the proposed project will cause a direct impact.

Road	Segment	# of Lanes	LOS "E" Capacity	Class.	Existing			Existing + Project			ΔV/C	Is this impact Significant?
					LOS	Volume	V/C	LOS	Volume	V/C		
Twin Oaks Valley Road	Borden Road to Richmar Avenue	4	40,000	4-M	C	28,115	0.70	C	28,129	0.70	0.000	***NO***
	Richmar Avenue to San Marcos Boulevard	4	40,000	4-M	C	27,109	0.68	C	27,132	0.68	0.001	***NO***
San Marcos Boulevard	Twin Oaks Valley Road East Mission Road	4	40,000	4-M	B	16,882	0.42	B	16,974	0.42	0.002	***NO***
Woodward Street	East Mission Road to Vineyard Road	4	30,000	4-C	A	7,816	0.26	A	8,046	0.27	0.008	***NO***
	Vineyard Road to Borden Road	2	15,000	2-Ca	A	3,781	0.25	A	3,827	0.26	0.003	***NO***
Borden Road	Twin Oaks Valley Road to Woodward Street	4	30,000	4-C	B	10,325	0.34	B	10,362	0.35	0.001	***NO***

Legend:

LOS= Level of Service
V/C= Volume to Capacity Ratio
ΔV/C= Change in V/C ratio
2-Ca = 2 Lane Collector (w/continuous left-turn lane)
4-C = 4 Lane Collector
4-M = 4 Lane Major Arterial

No direct impact is expected to occur to any street segment in the Existing conditions.

The following table displays the Existing level of service and the Existing Plus Project level of service comparison for intersections to determine if the proposed project will cause a direct impact.

#	Intersection	Existing				Existing + Project (Buildout)							
		AM Peak Hour		PM Peak Hour		AM Peak Hour		Δ	S ?	PM Peak Hour		Δ	S ?
		D	LOS	D	LOS	D	LOS			D	LOS		
1	Twin Oaks Valley Road at Borden Road	43.1	D	37.7	D	43.1	D	0.0	No	37.8	D	0.1	No
2	Woodward Street at Borden Road	29.2	C	40.4	D	29.3	C	0.1	No	40.4	D	0.0	No
3	Woodward Street at Vineyard Road	16.1	B	9.2	A	16.1	B	0.0	No	9.3	A	0.1	No
4	Twin Oaks Valley Road at Richmar Avenue	20	B	30.1	C	20.0	B	0.0	No	30.1	C	0.0	No
5	Woodward Street at East Mission Road	46.1	D	50.1	D	46.1	D	0.0	No	50.1	D	0.0	No
6	Twin Oaks Valley Road at San Marcos Boulevard	55.5	E	66.6	E	55.5	E	0.0	No	66.6	E	0.0	No

Notes:

LOS = Level of Service
Δ = Change
S = Significant
D= Delay

No direct impact is expected to occur to any intersection in the Existing conditions

The Existing Conditions Synchro worksheets for intersection analysis is provided in **Appendix A.**

Year 2035 With Connection

Due to the Existing obtained volumes being higher than what is provided in the SANDAG TFIC Series 13, Year 2035, a 1% growth factor per year from 2018 to 2035 was applied as a conservative approach.

The following table displays the Year 2035 level of service and the Year 2035 Plus Project level of service comparison for street segments to determine if the proposed project will cause a cumulative impact.

Road	Segment	# of Lanes	LOS "E" Capacity	Class.	Year 2035			Year 2035 + Project			ΔV/C	Is this impact Significant?
					LOS	Volume	V/C	LOS	Volume	V/C		
Twin Oaks Valley Road	Borden Road to Richmar Avenue	4	40,000	4-M	D	32,895	0.82	D	32,909	0.82	0.000	***NO***
	Richmar Avenue to San Marcos Boulevard	4	40,000	4-M	D	31,718	0.79	D	31,741	0.79	0.001	***NO***
San Marcos Boulevard	Twin Oaks Valley Road East Mission Road	4	40,000	4-M	B	19,752	0.49	B	19,844	0.50	0.002	***NO***
Woodward Street	East Mission Road to Vineyard Road	4	30,000	4-C	A	9,145	0.30	A	9,375	0.31	0.008	***NO***
	Vineyard Road to Borden Road	2	15,000	2-Ca	A	4,424	0.29	A	4,470	0.30	0.003	***NO***
Borden Road	Twin Oaks Valley Road to Woodward Street	4	30,000	4-C	B	12,080	0.40	B	12,117	0.40	0.001	***NO***

Legend:

LOS= Level of Service
V/C= Volume to Capacity Ratio
ΔV/C= Change in V/C ratio
2-Ca = 2 Lane Collector (w/continuous left-turn lane)
4-C = 4 Lane Collector
4-M = 4 Lane Major Arterial

No cumulative impact is expected to occur to any street segment in the Year 2035 With Connection conditions.

The following table displays the Year 2035 level of service and the Year 2035 Plus Project level of service comparison for intersections to determine if the proposed project will cause a direct impact.

#	Intersection	Year 2035				Year 2035 + Project							
		AM Peak Hour		PM Peak Hour		AM Peak Hour		Δ	S ?	PM Peak Hour		Δ	S ?
		D	LOS	D	LOS	D	LOS			D	LOS		
1	Twin Oaks Valley Road at Borden Road	66.6	E	51.2	D	66.6	E	0.0	No	51.2	D	0.0	No
2	Woodward Street at Borden Road	30.2	C	49.6	D	30.3	C	0.1	No	49.6	D	0.0	No
3	Woodward Street at Vineyard Road	17.6	B	9.8	A	17.6	B	0.0	No	9.9	A	0.1	No
4	Twin Oaks Valley Road at Richmar Avenue	25.2	C	38.5	D	25.2	C	0.0	No	38.5	D	0.0	No
5	Woodward Street at East Mission Road	66.3	E	65.7	E	66.6	E	0.3	No	65.8	E	0.1	No
6	Twin Oaks Valley Road at San Marcos Boulevard	81.9	F	88.4	F	82.0	F	0.1	No	88.5	F	0.1	No

Notes:

DNE = Does Not Exist
LOS = Level of Service
Δ = Change
S = Significant
D= Delay

No direct impact is expected to occur to any intersection in the Existing conditions

The Year 2035 With Connection Conditions Synchro worksheets for intersection analysis is provided in **Appendix B.**

Year 2035 Without Connection

As shown in **Attachment 3**, it is estimated that the deletion of the Richmar bridge will re-route the traffic to the surrounding street segments. The addition of the ADT from the Richmar bridge removal was added to the Year 2035 baseline volumes to analyze the effect of the bridge removal.

The following table displays the Year 2035 volumes due to the removal of the bridge.

Road	Segment	Standard	# of Ln.	Class.	Cap.	Volume	V/C	LOS
Twin Oaks Valley Road	Borden Road to Richmar Avenue	SANTEC/ITE	4	4-M	40,000	33,375	0.83	D
	Richmar Avenue to San Marcos Boulevard	SANTEC/ITE	4	4-M	40,000	32,063	0.80	D
San Marcos Boulevard	Twin Oaks Valley Road East Mission Road	SANTEC/ITE	4	4-M	40,000	21,912	0.55	C
Woodward Street	East Mission Road to Vineyard Road	SANTEC/ITE	4	4-C	30,000	11,305	0.38	B
	Vineyard Road to Boreden Road	SANTEC/ITE	2	2-Ca	15,000	5,024	0.33	A
Borden Road	Twin Oaks Valley Road to Woodward Street	SANTEC/ITE	4	4-C	30,000	15,920	0.53	C

Legend:

Class. = Functional Class
Cap. = Capacity
LOS = Level of Service
4-S = 4 Lane Secondary Arterial, LOS "E" Capacity 30,000
4-M = 4 Lane Major Arterial, LOS "E" Capacity 40,000

Notes:

1% growth factor per year applied to existing volumes

The following table displays the Year 2035 volumes due to the removal of the bridge as well as the addition of the proposed project.

Road	Segment	# of Lanes	LOS "E" Capacity	Class.	Year 2035 without Bridge Connection			Year 2035 Without Bridge Connection + Project			ΔV/C	Is this impact Significant?
					LOS	Volume	V/C	LOS	Volume	V/C		
Twin Oaks Valley Road	Borden Road to Richmar Avenue	4	40,000	4-M	D	33,375	0.83	D	33,389	0.83	0.000	***NO***
	Richmar Avenue to San Marcos Boulevard	4	40,000	4-M	D	32,063	0.80	D	32,086	0.80	0.001	***NO***
San Marcos Boulevard	Twin Oaks Valley Road East Mission Road	4	40,000	4-M	C	21,912	0.55	C	22,004	0.55	0.002	***NO***
Woodward Street	East Mission Road to Vineyard Road	4	30,000	4-C	B	11,305	0.38	B	11,535	0.38	0.008	***NO***
	Vineyard Road to Borden Road	2	15,000	2-Ca	A	5,024	0.33	A	5,070	0.34	0.003	***NO***
Borden Road	Twin Oaks Valley Road to Woodward Street	4	30,000	4-C	C	15,920	0.53	C	15,957	0.53	0.001	***NO***

Legend:

LOS= Level of Service
V/C= Volume to Capacity Ratio
ΔV/C= Change in V/C ratio
2-Ca = 2 Lane Collector (w/continuous left-turn lane)
4-C = 4 Lane Collector
4-M = 4 Lane Major Arterial

No cumulative impact is expected to occur to any street segment in the Year 2035 Without Connection conditions.

As shown in **Attachment 4** and **Attachment 5**, the re-routing of AM and PM peak hour turning movement counts are added or subtracted to or from Year 2035 peak hour volumes to produce the Year 2035 without connection peak hour volumes.

The following table displays the Year 2035 without the connection level of service and the Year 2035 without connection Plus Project level of service comparison for intersections to determine if the proposed project will cause a direct impact.

#	Intersection	Year 2035 without Connection				Year 2035 without Connection + Project							
		AM Peak Hour		PM Peak Hour		AM Peak Hour		Δ	S ?	PM Peak Hour		Δ	S ?
		D	LOS	D	LOS	D	LOS			D	LOS		
1	Twin Oaks Valley Road at Borden Road	73.5	E	51.8	D	73.5	E	0.0	No	51.9	D	0.1	No
2	Woodward Street at Borden Road	33.4	C	56.9	E	33.5	C	0.1	No	56.9	E	0.0	No
3	Woodward Street at Vineyard Road	13.2	B	3.2	A	13.3	B	0.1	No	3.2	A	0.0	No
4	Twin Oaks Valley Road at Richmar Avenue	26.3	C	23.2	C	26.3	C	0.0	No	23.2	C	0.0	No
5	Woodward Street at East Mission Road	53.6	D	62.8	E	53.6	D	0.0	No	63.1	E	0.3	No
6	Twin Oaks Valley Road at San Marcos Boulevard	79.4	E	71.7	E	79.5	E	0.1	No	71.8	E	0.1	No

Notes:

DNE = Does Not Exist

LOS = Level of Service

Δ = Change

S = Significant

D= Delay

No cumulative impact is expected to occur to any intersection in the Year 2035 Without Connection conditions.

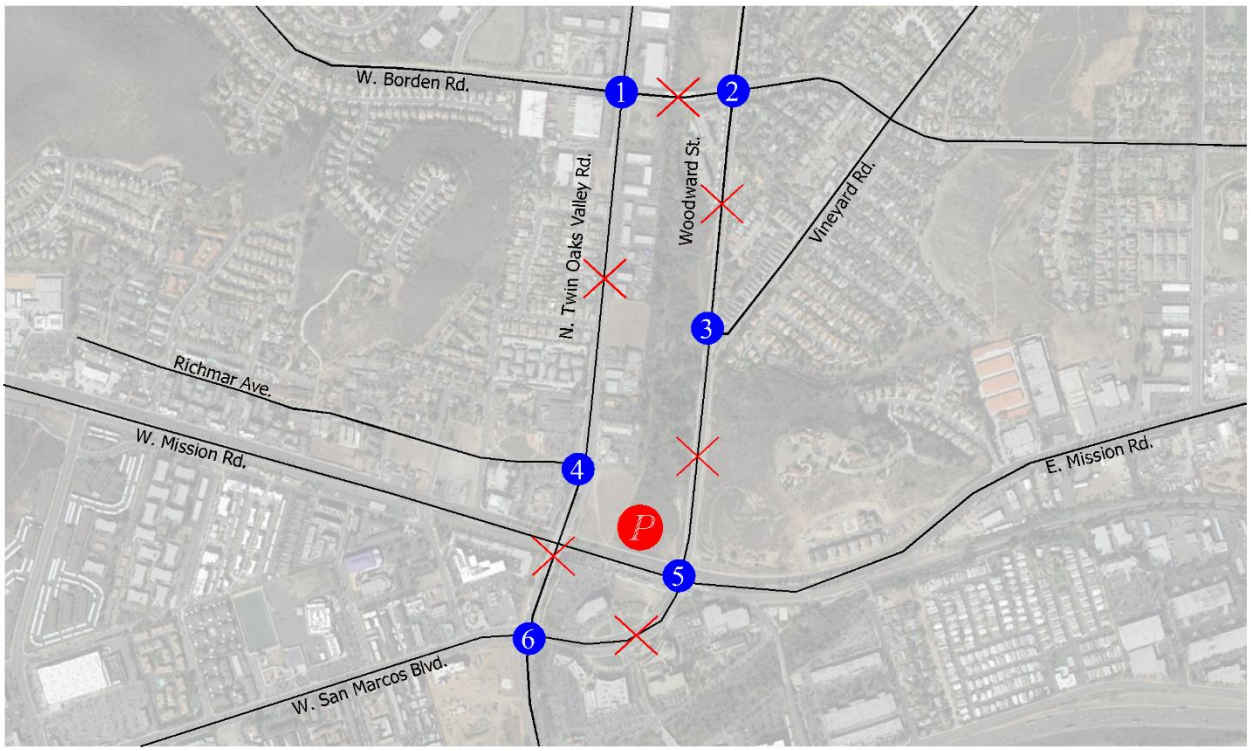
The Year 2035 Without Connection Conditions Synchro worksheets for intersection analysis is provided in **Appendix C.**

Conclusion

As a result of the study, it can be concluded that no project impacts will occur with the bridge connection or without the bridge connection to the surround street segments and intersections.

Attachment 1

Study Area



Legend

= Studied Intersection Location

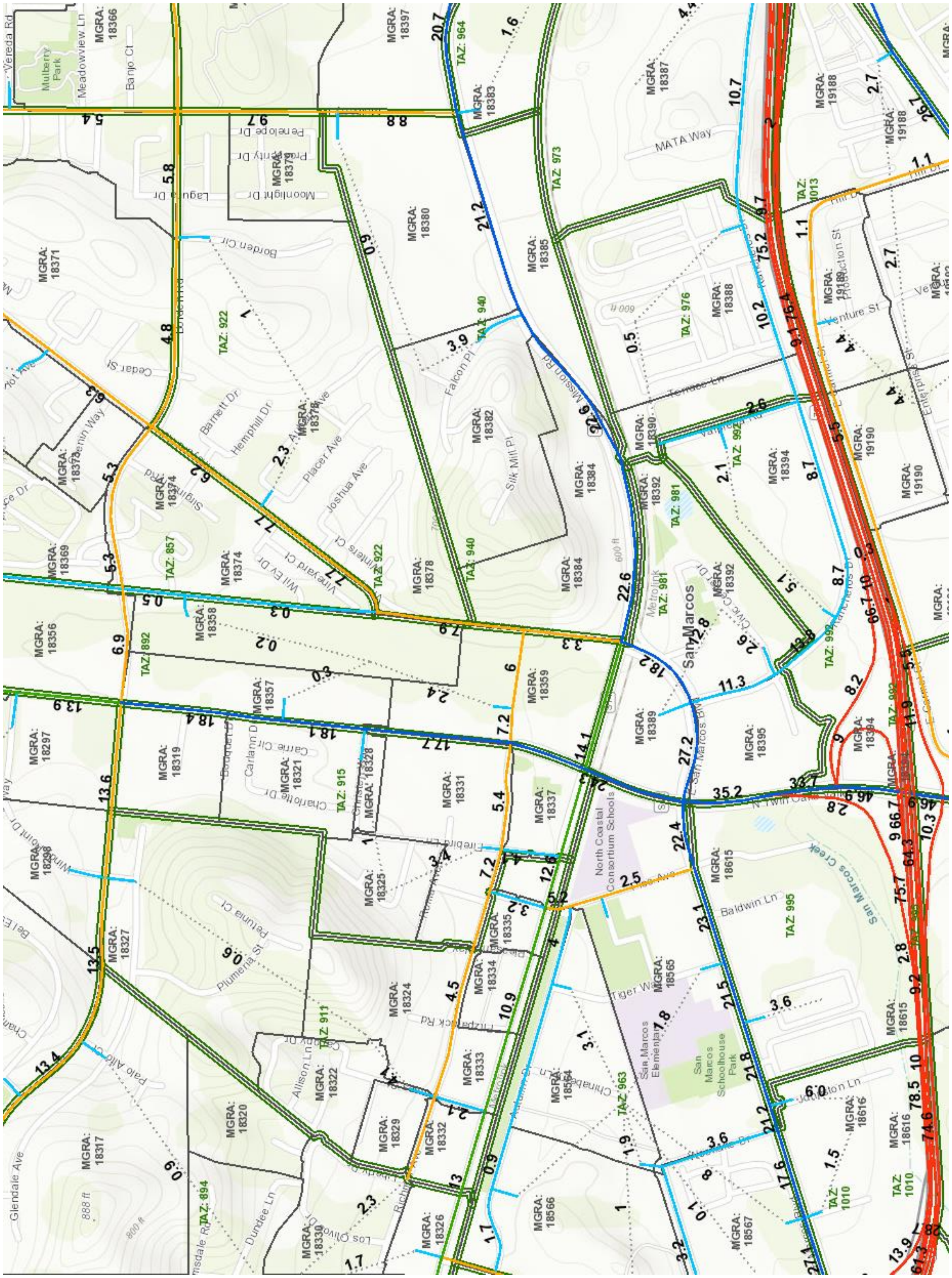
= Street Segment Location

P = Project Location

N
NO SCALE

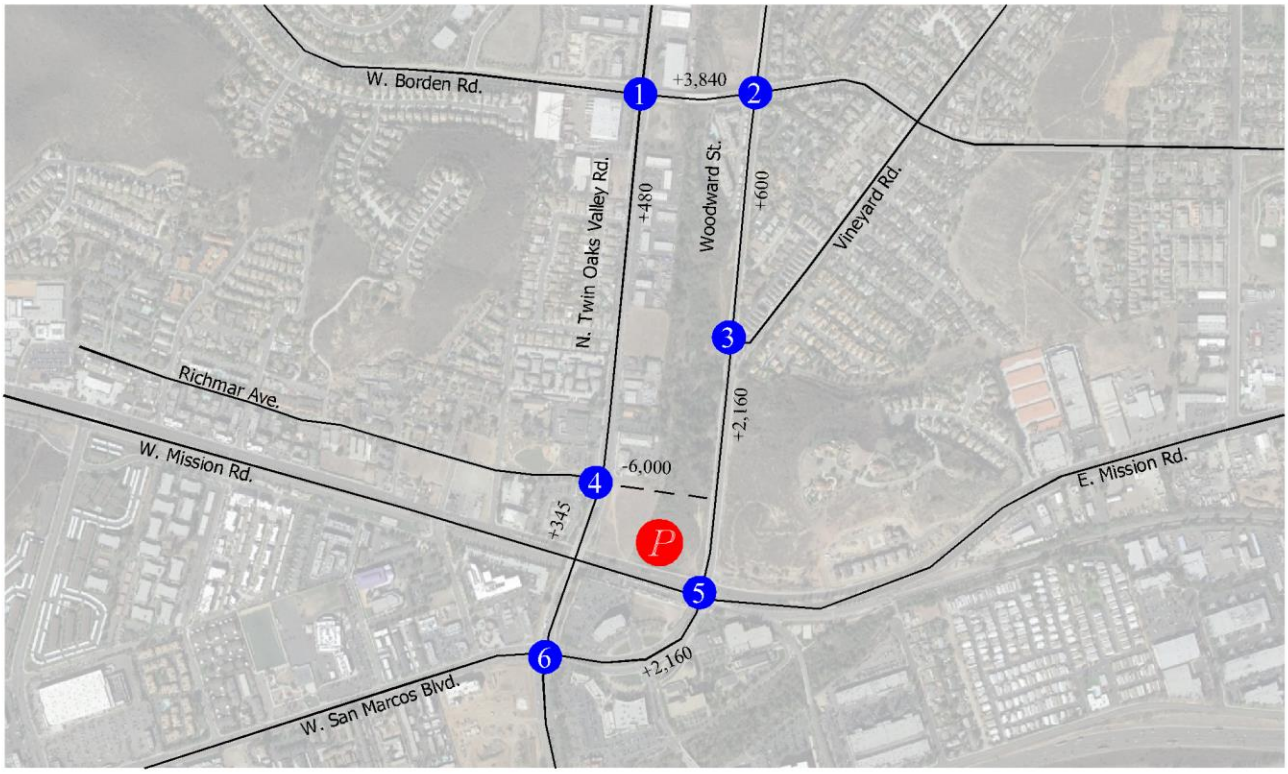
Attachment 2

SANDAG TFIC Series 13 Year 2035



Attachment 3

Removal of Richmar Bridge and Re-Routing of Traffic for Street Segments



Legend

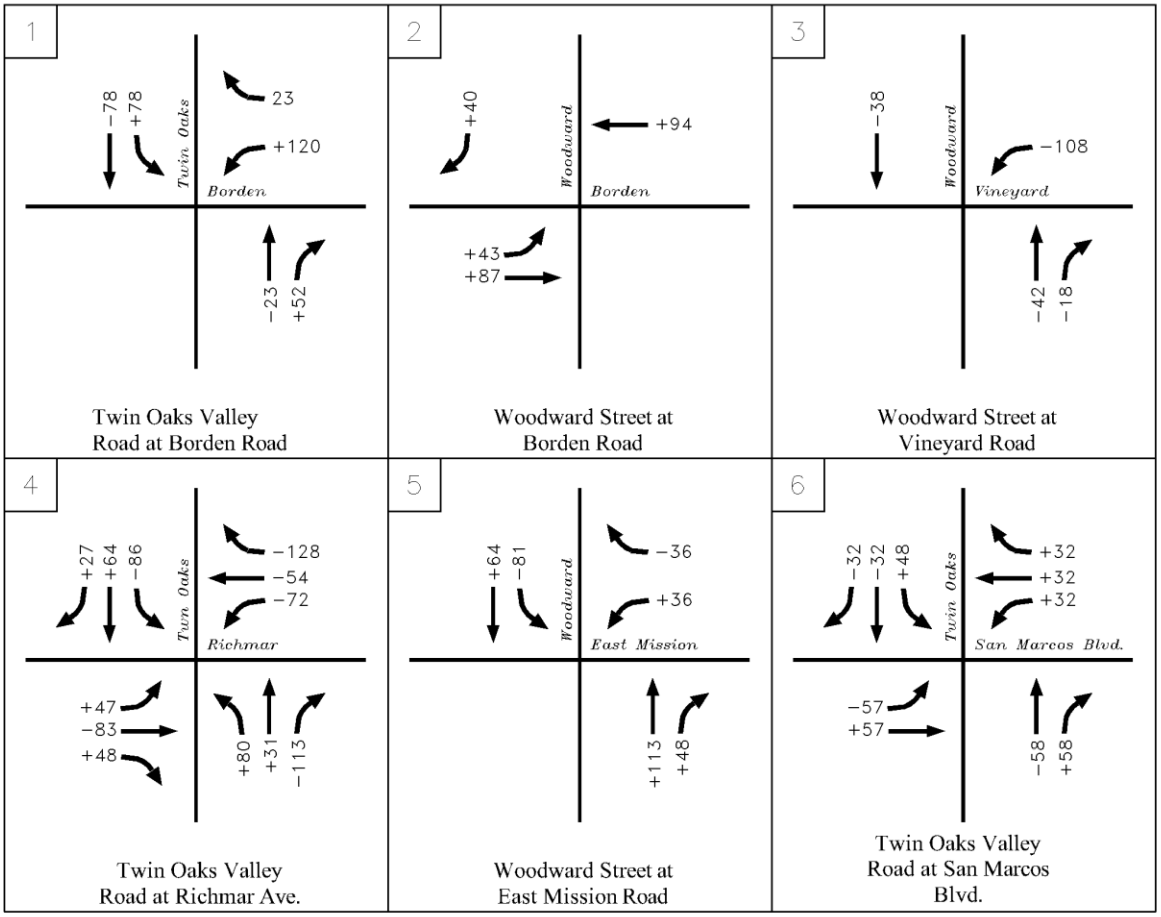
P = Project Location

+/- XX,XXX = Re-Routed ADT

N
NO SCALE

Attachment 4

Removal of Richmar Bridge and Re-Routing of Traffic for Intersections AM Peak

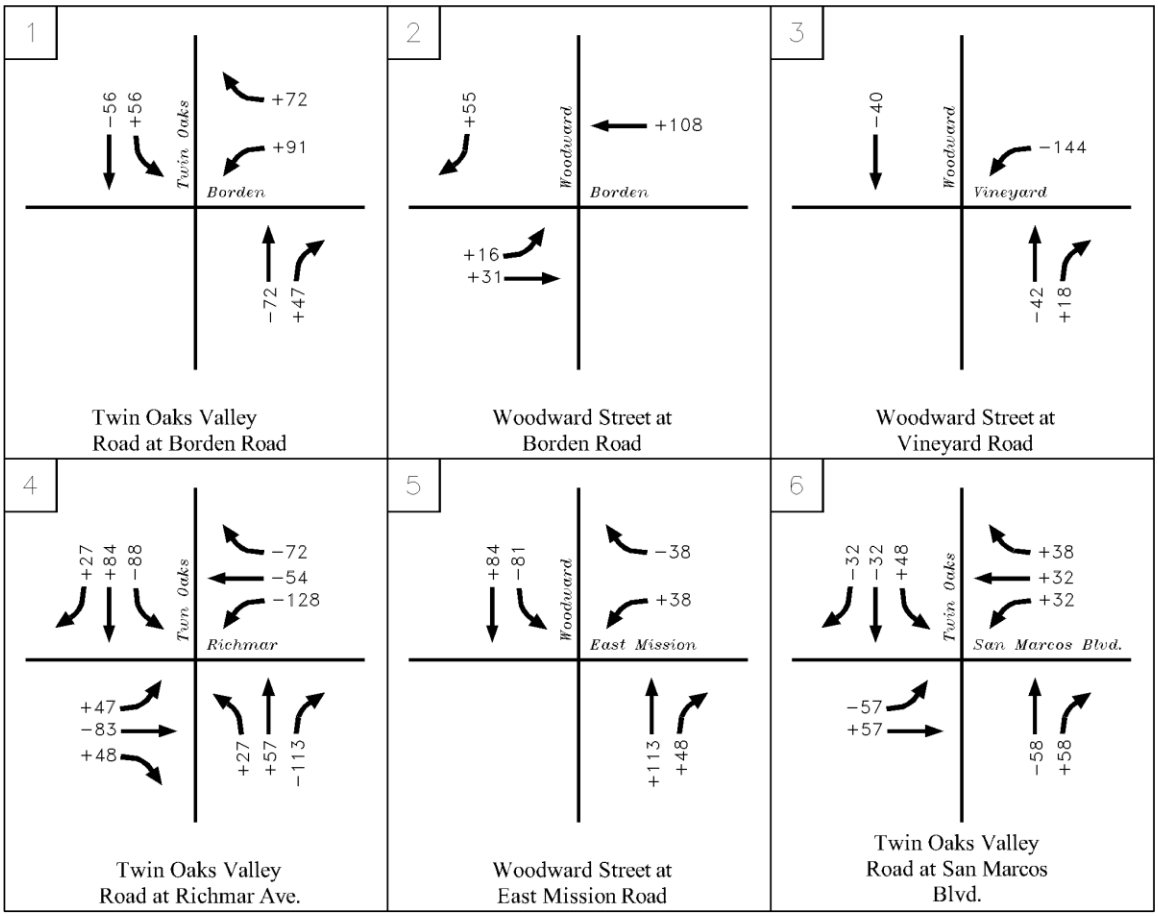


Legend

+/− XX = Re−Routed Turning Movement Count

Attachment 5

Removal of Richmar Bridge and Re-Routing of Traffic for Intersections PM Peak



Legend

+/- XX = Re-Routed Turning Movement Count

Appendix A

HCM 6th Signalized Intersection Summary
1: Twin Oaks Valley Rd. & Borden Rd.

Existing AM
04/24/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	228	236	262	406	98	181	407	86	55	868	96
Future Volume (veh/h)	55	228	236	262	406	98	181	407	86	55	868	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	60	248	257	285	441	107	197	442	93	60	943	104
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	78	356	317	314	946	228	227	1334	875	78	1036	462
Arrive On Green	0.04	0.20	0.20	0.18	0.33	0.33	0.13	0.38	0.38	0.04	0.29	0.29
Sat Flow, veh/h	1781	1777	1585	1781	2840	684	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	60	248	257	285	275	273	197	442	93	60	943	104
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1747	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.5	13.4	16.0	16.3	12.6	12.8	11.2	9.2	2.9	3.5	26.5	5.2
Cycle Q Clear(g_c), s	3.5	13.4	16.0	16.3	12.6	12.8	11.2	9.2	2.9	3.5	26.5	5.2
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	78	356	317	314	592	582	227	1334	875	78	1036	462
V/C Ratio(X)	0.77	0.70	0.81	0.91	0.46	0.47	0.87	0.33	0.11	0.77	0.91	0.23
Avail Cap(c_a), veh/h	162	549	489	320	703	691	227	1334	875	162	1036	462
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.1	38.5	39.6	41.8	27.3	27.3	44.4	23.1	11.1	49.1	35.4	27.8
Incr Delay (d2), s/veh	15.0	2.5	5.8	27.8	0.6	0.6	28.1	0.7	0.2	15.0	13.3	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	6.0	6.7	9.5	5.4	5.4	6.7	3.9	1.0	1.9	13.2	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.0	41.0	45.3	69.6	27.8	27.9	72.5	23.8	11.3	64.0	48.7	29.0
LnGrp LOS	E	D	D	E	C	C	E	C	B	E	D	C
Approach Vol, veh/h		565			833			732			1107	
Approach Delay, s/veh		45.4			42.2			35.3			47.7	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	44.5	22.8	27.3	17.7	35.8	9.0	41.1
Change Period (Y+Rc), s	4.5	* 5.6	4.5	* 6.6	4.5	* 5.6	4.5	* 6.6
Max Green Setting (Gmax), s	9.4	* 34	18.6	* 32	13.2	* 30	9.4	* 41
Max Q Clear Time (g_c+I1), s	5.5	11.2	18.3	18.0	13.2	28.5	5.5	14.8
Green Ext Time (p_c), s	0.0	3.3	0.0	2.7	0.0	1.1	0.0	3.5

Intersection Summary	
HCM 6th Ctrl Delay	43.1
HCM 6th LOS	D

Notes

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

HCM 6th Signalized Intersection Summary
2: Woodward St. & Borden Rd.

Existing AM
04/24/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	314	80	26	486	20	83	31	14	38	155	133
Future Volume (veh/h)	38	314	80	26	486	20	83	31	14	38	155	133
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	41	341	87	28	528	22	90	34	15	41	168	145
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	67	606	152	52	719	30	116	542	239	67	772	654
Arrive On Green	0.04	0.22	0.22	0.03	0.21	0.21	0.07	0.44	0.44	0.04	0.41	0.41
Sat Flow, veh/h	1781	2812	708	1781	3477	145	1781	1230	543	1781	1870	1585
Grp Volume(v), veh/h	41	214	214	28	270	280	90	0	49	41	168	145
Grp Sat Flow(s),veh/h/ln	1781	1777	1743	1781	1777	1844	1781	0	1773	1781	1870	1585
Q Serve(g_s), s	1.8	8.5	8.7	1.2	11.2	11.3	3.9	0.0	1.3	1.8	4.6	4.7
Cycle Q Clear(g_c), s	1.8	8.5	8.7	1.2	11.2	11.3	3.9	0.0	1.3	1.8	4.6	4.7
Prop In Lane	1.00		0.41	1.00		0.08	1.00		0.31	1.00		1.00
Lane Grp Cap(c), veh/h	67	383	375	52	368	382	116	0	781	67	772	654
V/C Ratio(X)	0.61	0.56	0.57	0.54	0.73	0.74	0.77	0.00	0.06	0.61	0.22	0.22
Avail Cap(c_a), veh/h	124	691	678	133	695	722	236	0	781	148	772	654
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.6	27.7	27.8	37.9	29.4	29.4	36.4	0.0	12.8	37.6	15.0	15.0
Incr Delay (d2), s/veh	8.8	1.3	1.4	8.5	2.8	2.8	10.3	0.0	0.2	8.8	0.6	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	3.6	3.7	0.6	4.9	5.1	2.0	0.0	0.5	0.9	2.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.4	29.0	29.2	46.5	32.2	32.2	46.8	0.0	12.9	46.4	15.7	15.8
LnGrp LOS	D	C	C	D	C	C	D	A	B	D	B	B
Approach Vol, veh/h		469			578			139			354	
Approach Delay, s/veh		30.6			32.9			34.8			19.3	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.5	41.7	6.8	23.3	9.7	39.5	7.5	22.6
Change Period (Y+Rc), s	4.5	* 6.8	4.5	* 6.2	4.5	* 6.8	4.5	* 6.2
Max Green Setting (Gmax), s	6.6	* 35	5.9	* 31	10.5	* 31	5.5	* 31
Max Q Clear Time (g_c+I1), s	3.8	3.3	3.2	10.7	5.9	6.7	3.8	13.3
Green Ext Time (p_c), s	0.0	0.2	0.0	2.5	0.1	1.4	0.0	3.1

Intersection Summary	
HCM 6th Ctrl Delay	29.2
HCM 6th LOS	C

Notes

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

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	259	4	122	64	1	299
Future Volume (vph)	259	4	122	64	1	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
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)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	282	4	133	70	1	325
RTOR Reduction (vph)	0	3	0	33	0	0
Lane Group Flow (vph)	282	1	133	37	1	325
Turn Type	Perm	Perm	NA	Perm	Prot	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2		
Actuated Green, G (s)	15.8	15.8	38.0	38.0	0.9	43.8
Effective Green, g (s)	15.8	15.8	38.0	38.0	0.9	43.8
Actuated g/C Ratio	0.22	0.22	0.53	0.53	0.01	0.62
Clearance Time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	392	351	994	844	22	1146
v/s Ratio Prot			0.07		0.00	c0.17
v/s Ratio Perm	c0.16	0.00		0.02		
v/c Ratio	0.72	0.00	0.13	0.04	0.05	0.28
Uniform Delay, d1	25.6	21.6	8.3	7.9	34.7	6.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.2	0.0	0.3	0.1	0.9	0.6
Delay (s)	31.9	21.6	8.6	8.0	35.6	7.0
Level of Service	C	C	A	A	D	A
Approach Delay (s)	31.7		8.4			7.1
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	71.2	Sum of lost time (s)	16.5
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	6	74	13	3	5	47	534	32	34	1153	160
Future Volume (veh/h)	135	6	74	13	3	5	47	534	32	34	1153	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	147	7	80	14	3	5	51	580	35	37	1253	174
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	193	14	160	42	15	25	71	1979	119	59	1802	249
Arrive On Green	0.11	0.11	0.11	0.02	0.02	0.02	0.04	0.58	0.58	0.03	0.57	0.57
Sat Flow, veh/h	1781	129	1476	1781	630	1051	1781	3405	205	1781	3136	433
Grp Volume(v), veh/h	147	0	87	14	0	8	51	302	313	37	707	720
Grp Sat Flow(s),veh/h/ln	1781	0	1605	1781	0	1681	1781	1777	1833	1781	1777	1792
Q Serve(g_s), s	7.3	0.0	4.7	0.7	0.0	0.4	2.6	7.8	7.8	1.9	25.6	26.0
Cycle Q Clear(g_c), s	7.3	0.0	4.7	0.7	0.0	0.4	2.6	7.8	7.8	1.9	25.6	26.0
Prop In Lane	1.00		0.92	1.00		0.63	1.00		0.11	1.00		0.24
Lane Grp Cap(c), veh/h	193	0	174	42	0	39	71	1032	1065	59	1021	1030
V/C Ratio(X)	0.76	0.00	0.50	0.34	0.00	0.20	0.72	0.29	0.29	0.62	0.69	0.70
Avail Cap(c_a), veh/h	358	0	323	705	0	665	104	1032	1065	139	1021	1030
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.4	0.0	38.3	43.7	0.0	43.6	43.2	9.6	9.6	43.4	13.7	13.8
Incr Delay (d2), s/veh	6.1	0.0	2.2	4.6	0.0	2.5	12.8	0.7	0.7	10.2	3.9	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	1.9	0.4	0.0	0.2	1.4	3.0	3.1	1.0	10.3	10.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.5	0.0	40.5	48.4	0.0	46.1	56.0	10.3	10.3	53.6	17.5	17.7
LnGrp LOS	D	A	D	D	A	D	E	B	B	D	B	B
Approach Vol, veh/h		234			22			666			1464	
Approach Delay, s/veh		43.7			47.5			13.8			18.5	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	58.3		16.5	8.1	57.7		8.7
Change Period (Y+Rc), s	4.5	* 5.4		* 6.6	4.5	* 5.4		6.6
Max Green Setting (Gmax), s	7.1	* 51		* 18	5.3	* 52		36.0
Max Q Clear Time (g_c+I1), s	3.9	9.8		9.3	4.6	28.0		2.7
Green Ext Time (p_c), s	0.0	4.3		0.6	0.0	11.7		0.0

Intersection Summary	
HCM 6th Ctrl Delay	20.0
HCM 6th LOS	B

Notes

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

HCM 6th Signalized Intersection Summary
5: E. San Marcos Blvd./Woodward St. & E. Mission Rd.

Existing AM
04/24/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	478	50	636	798	105	12	54	430	89	366	75
Future Volume (veh/h)	36	478	50	636	798	105	12	54	430	89	366	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	39	520	54	691	867	114	13	59	0	97	398	82
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	56	669	298	701	1278	570	27	1192		104	1115	228
Arrive On Green	0.03	0.19	0.19	0.20	0.36	0.36	0.01	0.34	0.00	0.06	0.38	0.38
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	2939	600
Grp Volume(v), veh/h	39	520	54	691	867	114	13	59	0	97	239	241
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1762
Q Serve(g_s), s	2.4	15.4	3.2	22.1	22.9	5.5	0.8	1.2	0.0	6.0	10.7	10.9
Cycle Q Clear(g_c), s	2.4	15.4	3.2	22.1	22.9	5.5	0.8	1.2	0.0	6.0	10.7	10.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	56	669	298	701	1278	570	27	1192		104	674	668
V/C Ratio(X)	0.69	0.78	0.18	0.99	0.68	0.20	0.49	0.05		0.93	0.35	0.36
Avail Cap(c_a), veh/h	112	1122	500	701	1625	725	80	1192		104	674	668
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.2	42.8	37.8	44.0	30.1	24.5	54.2	24.9	0.0	52.0	24.7	24.7
Incr Delay (d2), s/veh	14.3	2.0	0.3	30.2	0.8	0.2	13.3	0.1	0.0	65.6	1.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	6.9	1.3	12.3	9.8	2.1	0.5	0.5	0.0	4.6	4.8	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.4	44.8	38.1	74.2	30.9	24.7	67.5	25.0	0.0	117.5	26.1	26.2
LnGrp LOS	E	D	D	E	C	C	E	C		F	C	C
Approach Vol, veh/h		613			1672			72	A		577	
Approach Delay, s/veh		45.6			48.4			32.7			41.5	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	45.2	27.0	27.7	6.1	50.1	8.0	46.7
Change Period (Y+Rc), s	4.5	8.0	4.5	* 6.8	4.5	* 8	4.5	* 6.8
Max Green Setting (Gmax), s	6.5	37.2	22.5	* 35	5.0	* 39	7.0	* 51
Max Q Clear Time (g_c+I1), s	8.0	3.2	24.1	17.4	2.8	12.9	4.4	24.9
Green Ext Time (p_c), s	0.0	0.3	0.0	3.4	0.0	3.0	0.0	7.2

Intersection Summary	
HCM 6th Ctrl Delay	46.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
6: Twin Oaks Valley Rd. & E. San Marcos Blvd.

Existing AM
04/24/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	177	499	284	444	532	28	203	383	372	92	883	249
Future Volume (veh/h)	177	499	284	444	532	28	203	383	372	92	883	249
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	192	542	309	483	578	30	221	416	404	100	960	271
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	244	813	363	526	1068	55	257	1452	889	146	1031	290
Arrive On Green	0.07	0.23	0.23	0.15	0.31	0.31	0.07	0.41	0.41	0.04	0.38	0.38
Sat Flow, veh/h	3456	3554	1585	3456	3437	178	3456	3554	1585	3456	2738	770
Grp Volume(v), veh/h	192	542	309	483	298	310	221	416	404	100	622	609
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1838	1728	1777	1585	1728	1777	1732
Q Serve(g_s), s	7.7	19.6	26.3	19.4	19.6	19.7	8.9	11.1	21.2	4.0	47.4	47.7
Cycle Q Clear(g_c), s	7.7	19.6	26.3	19.4	19.6	19.7	8.9	11.1	21.2	4.0	47.4	47.7
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	244	813	363	526	552	571	257	1452	889	146	669	652
V/C Ratio(X)	0.79	0.67	0.85	0.92	0.54	0.54	0.86	0.29	0.45	0.68	0.93	0.93
Avail Cap(c_a), veh/h	345	1033	461	532	612	633	257	1452	889	213	669	652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.5	49.5	52.1	58.9	40.3	40.3	64.5	27.9	18.2	66.6	42.2	42.3
Incr Delay (d2), s/veh	7.7	1.1	11.8	20.8	0.8	0.8	24.1	0.5	1.7	5.6	21.3	22.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	8.9	11.7	10.0	8.8	9.1	4.8	4.9	8.2	1.9	24.6	24.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.3	50.6	63.9	79.8	41.1	41.1	88.6	28.4	19.9	72.2	63.5	64.7
LnGrp LOS	E	D	E	E	D	D	F	C	B	E	E	E
Approach Vol, veh/h		1043			1091			1041			1331	
Approach Delay, s/veh		58.5			58.2			37.9			64.7	
Approach LOS		E			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	65.1	26.0	39.5	15.0	60.6	14.4	51.0
Change Period (Y+Rc), s	4.5	7.5	4.5	7.2	4.5	7.5	4.5	7.2
Max Green Setting (Gmax), s	8.7	54.9	21.7	41.0	10.5	53.1	14.1	48.6
Max Q Clear Time (g_c+I1), s	6.0	23.2	21.4	28.3	10.9	49.7	9.7	21.7
Green Ext Time (p_c), s	0.1	4.7	0.1	3.9	0.0	2.3	0.2	4.0

Intersection Summary	
HCM 6th Ctrl Delay	55.5
HCM 6th LOS	E

HCM 6th Signalized Intersection Summary
1: Twin Oaks Valley Rd. & Borden Rd.

Existing PM
04/24/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	287	200	157	249	59	210	660	250	90	657	71
Future Volume (veh/h)	157	287	200	157	249	59	210	660	250	90	657	71
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	171	312	217	171	271	64	228	717	272	98	714	77
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	177	409	278	207	628	146	248	1378	799	125	1132	505
Arrive On Green	0.10	0.20	0.20	0.12	0.22	0.22	0.14	0.39	0.39	0.07	0.32	0.32
Sat Flow, veh/h	1781	2025	1375	1781	2863	665	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	171	273	256	171	166	169	228	717	272	98	714	77
Grp Sat Flow(s),veh/h/ln	1781	1777	1623	1781	1777	1751	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	9.1	13.7	14.2	8.9	7.6	7.9	12.0	14.7	9.7	5.1	16.2	3.3
Cycle Q Clear(g_c), s	9.1	13.7	14.2	8.9	7.6	7.9	12.0	14.7	9.7	5.1	16.2	3.3
Prop In Lane	1.00		0.85	1.00		0.38	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	177	359	328	207	390	384	248	1378	799	125	1132	505
V/C Ratio(X)	0.97	0.76	0.78	0.82	0.43	0.44	0.92	0.52	0.34	0.79	0.63	0.15
Avail Cap(c_a), veh/h	177	600	548	350	769	757	248	1378	799	177	1132	505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	35.6	35.8	40.9	31.9	32.0	40.3	22.2	14.1	43.4	27.5	23.1
Incr Delay (d2), s/veh	58.1	3.3	4.1	8.0	0.7	0.8	36.1	1.4	1.2	14.0	2.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	6.2	5.9	4.3	3.3	3.4	7.7	6.2	3.6	2.7	7.1	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	100.7	39.0	39.9	49.0	32.6	32.8	76.4	23.7	15.2	57.4	30.2	23.8
LnGrp LOS	F	D	D	D	C	C	E	C	B	E	C	C
Approach Vol, veh/h		700			506			1217			889	
Approach Delay, s/veh		54.4			38.2			31.7			32.7	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.1	42.4	15.5	25.8	17.7	35.8	13.9	27.4
Change Period (Y+Rc), s	4.5	* 5.6	4.5	* 6.6	4.5	* 5.6	4.5	* 6.6
Max Green Setting (Gmax), s	9.4	* 34	18.6	* 32	13.2	* 30	9.4	* 41
Max Q Clear Time (g_c+I1), s	7.1	16.7	10.9	16.2	14.0	18.2	11.1	9.9
Green Ext Time (p_c), s	0.0	5.6	0.3	3.0	0.0	4.1	0.0	2.1

Intersection Summary	
HCM 6th Ctrl Delay	37.7
HCM 6th LOS	D

Notes

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

HCM 6th Signalized Intersection Summary
2: Woodward St. & Borden Rd.

Existing PM
04/24/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	439	56	11	312	30	70	92	17	26	76	78
Future Volume (veh/h)	131	439	56	11	312	30	70	92	17	26	76	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	142	477	61	12	339	33	76	100	18	28	83	85
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	128	666	85	26	500	48	98	706	127	52	807	684
Arrive On Green	0.07	0.21	0.21	0.01	0.15	0.15	0.06	0.46	0.46	0.03	0.43	0.43
Sat Flow, veh/h	1781	3171	404	1781	3274	317	1781	1543	278	1781	1870	1585
Grp Volume(v), veh/h	142	266	272	12	183	189	76	0	118	28	83	85
Grp Sat Flow(s),veh/h/ln	1781	1777	1798	1781	1777	1813	1781	0	1820	1781	1870	1585
Q Serve(g_s), s	5.5	10.6	10.7	0.5	7.4	7.5	3.2	0.0	2.9	1.2	2.0	2.5
Cycle Q Clear(g_c), s	5.5	10.6	10.7	0.5	7.4	7.5	3.2	0.0	2.9	1.2	2.0	2.5
Prop In Lane	1.00		0.22	1.00		0.17	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	128	373	378	26	271	277	98	0	833	52	807	684
V/C Ratio(X)	1.11	0.71	0.72	0.46	0.67	0.68	0.77	0.00	0.14	0.54	0.10	0.12
Avail Cap(c_a), veh/h	128	717	726	138	722	737	245	0	833	154	807	684
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	28.0	28.0	37.3	30.5	30.6	35.6	0.0	12.0	36.5	12.9	13.0
Incr Delay (d2), s/veh	110.6	2.5	2.6	11.9	2.9	3.0	12.0	0.0	0.4	8.3	0.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	4.6	4.7	0.3	3.3	3.4	1.7	0.0	1.2	0.6	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	146.0	30.5	30.6	49.2	33.4	33.5	47.5	0.0	12.4	44.8	13.2	13.4
LnGrp LOS	F	C	C	D	C	C	D	A	B	D	B	B
Approach Vol, veh/h		680			384			194			196	
Approach Delay, s/veh		54.7			34.0			26.1			17.8	
Approach LOS		D			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.7	41.7	5.6	22.2	8.7	39.7	10.0	17.8
Change Period (Y+Rc), s	4.5	* 6.8	4.5	* 6.2	4.5	* 6.8	4.5	* 6.2
Max Green Setting (Gmax), s	6.6	* 35	5.9	* 31	10.5	* 31	5.5	* 31
Max Q Clear Time (g_c+I1), s	3.2	4.9	2.5	12.7	5.2	4.5	7.5	9.5
Green Ext Time (p_c), s	0.0	0.6	0.0	3.1	0.1	0.7	0.0	2.1

Intersection Summary	
HCM 6th Ctrl Delay	40.4
HCM 6th LOS	D

Notes

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

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	107	1	216	256	5	146
Future Volume (vph)	107	1	216	256	5	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
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)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	116	1	235	278	5	159
RTOR Reduction (vph)	0	1	0	107	0	0
Lane Group Flow (vph)	116	0	235	171	5	159
Turn Type	Perm	Perm	NA	Perm	Prot	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2		
Actuated Green, G (s)	8.0	8.0	40.8	40.8	1.0	46.7
Effective Green, g (s)	8.0	8.0	40.8	40.8	1.0	46.7
Actuated g/C Ratio	0.12	0.12	0.62	0.62	0.02	0.70
Clearance Time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	213	191	1146	974	26	1312
v/s Ratio Prot			c0.13		0.00	c0.09
v/s Ratio Perm	c0.07	0.00		0.11		
v/c Ratio	0.54	0.00	0.21	0.18	0.19	0.12
Uniform Delay, d1	27.4	25.6	5.6	5.5	32.3	3.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.8	0.0	0.4	0.4	3.6	0.2
Delay (s)	30.3	25.6	6.0	5.9	35.8	3.4
Level of Service	C	C	A	A	D	A
Approach Delay (s)	30.2		5.9			4.3
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	66.3	Sum of lost time (s)	16.5
Intersection Capacity Utilization	29.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	189	7	68	20	5	0	113	991	26	37	888	153
Future Volume (veh/h)	189	7	68	20	5	0	113	991	26	37	888	153
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	205	8	74	22	5	0	123	1077	28	40	965	166
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	246	22	200	48	50	0	98	1989	52	61	1641	282
Arrive On Green	0.14	0.14	0.14	0.03	0.03	0.00	0.05	0.56	0.56	0.03	0.54	0.54
Sat Flow, veh/h	1781	157	1452	1781	1870	0	1781	3539	92	1781	3032	521
Grp Volume(v), veh/h	205	0	82	22	5	0	123	541	564	40	565	566
Grp Sat Flow(s),veh/h/ln	1781	0	1609	1781	1870	0	1781	1777	1854	1781	1777	1777
Q Serve(g_s), s	10.8	0.0	4.5	1.2	0.3	0.0	5.3	18.5	18.5	2.1	20.7	20.7
Cycle Q Clear(g_c), s	10.8	0.0	4.5	1.2	0.3	0.0	5.3	18.5	18.5	2.1	20.7	20.7
Prop In Lane	1.00		0.90	1.00		0.00	1.00		0.05	1.00		0.29
Lane Grp Cap(c), veh/h	246	0	222	48	50	0	98	999	1042	61	962	962
V/C Ratio(X)	0.83	0.00	0.37	0.46	0.10	0.00	1.26	0.54	0.54	0.66	0.59	0.59
Avail Cap(c_a), veh/h	337	0	305	664	697	0	98	999	1042	131	962	962
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.6	0.0	37.8	46.3	45.9	0.0	45.7	13.3	13.3	46.1	14.9	14.9
Incr Delay (d2), s/veh	12.2	0.0	1.0	6.9	0.9	0.0	175.8	2.1	2.0	11.5	2.6	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	1.8	0.6	0.1	0.0	7.1	7.5	7.8	1.1	8.5	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.7	0.0	38.8	53.2	46.8	0.0	221.4	15.4	15.3	57.6	17.5	17.5
LnGrp LOS	D	A	D	D	D	A	F	B	B	E	B	B
Approach Vol, veh/h		287			27			1228			1171	
Approach Delay, s/veh		48.7			52.0			36.0			18.9	
Approach LOS		D			D			D			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.8	59.7		19.9	9.8	57.7		9.2
Change Period (Y+Rc), s	4.5	* 5.4		* 6.6	4.5	* 5.4		6.6
Max Green Setting (Gmax), s	7.1	* 51		* 18	5.3	* 52		36.0
Max Q Clear Time (g_c+I1), s	4.1	20.5		12.8	7.3	22.7		3.2
Green Ext Time (p_c), s	0.0	8.8		0.5	0.0	9.2		0.1

Intersection Summary	
HCM 6th Ctrl Delay	30.1
HCM 6th LOS	C

Notes

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

HCM 6th Signalized Intersection Summary
5: E. San Marcos Blvd./Woodward St. & E. Mission Rd.

Existing PM
04/24/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	809	79	375	645	103	59	237	708	47	166	50
Future Volume (veh/h)	121	809	79	375	645	103	59	237	708	47	166	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	132	879	86	408	701	112	64	258	0	51	180	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	989	441	483	1274	568	76	1212		66	909	265
Arrive On Green	0.06	0.28	0.28	0.14	0.36	0.36	0.04	0.34	0.00	0.04	0.33	0.33
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	2714	791
Grp Volume(v), veh/h	132	879	86	408	701	112	64	258	0	51	116	118
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1728
Q Serve(g_s), s	7.0	27.7	4.8	13.4	18.4	5.7	4.2	6.0	0.0	3.3	5.4	5.7
Cycle Q Clear(g_c), s	7.0	27.7	4.8	13.4	18.4	5.7	4.2	6.0	0.0	3.3	5.4	5.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.46
Lane Grp Cap(c), veh/h	107	989	441	483	1274	568	76	1212		66	595	579
V/C Ratio(X)	1.24	0.89	0.19	0.84	0.55	0.20	0.84	0.21		0.78	0.19	0.20
Avail Cap(c_a), veh/h	107	1065	475	666	1543	688	76	1212		99	595	579
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.9	40.4	32.1	49.0	29.9	25.9	55.5	27.3	0.0	55.7	27.6	27.7
Incr Delay (d2), s/veh	163.4	8.9	0.2	7.2	0.4	0.2	53.0	0.4	0.0	19.1	0.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	13.2	1.9	6.3	7.9	2.2	3.0	2.6	0.0	1.8	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	218.3	49.3	32.3	56.1	30.3	26.0	108.5	27.7	0.0	74.8	28.3	28.5
LnGrp LOS	F	D	C	E	C	C	F	C		E	C	C
Approach Vol, veh/h		1097			1221			322	A		285	
Approach Delay, s/veh		68.3			38.5			43.8			36.7	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	47.8	20.8	39.3	9.5	47.1	11.5	48.6
Change Period (Y+Rc), s	4.5	8.0	4.5	* 6.8	4.5	* 8	4.5	* 6.8
Max Green Setting (Gmax), s	6.5	37.2	22.5	* 35	5.0	* 39	7.0	* 51
Max Q Clear Time (g_c+I1), s	5.3	8.0	15.4	29.7	6.2	7.7	9.0	20.4
Green Ext Time (p_c), s	0.0	1.7	0.9	2.8	0.0	1.4	0.0	5.9

Intersection Summary	
HCM 6th Ctrl Delay	50.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
6: Twin Oaks Valley Rd. & E. San Marcos Blvd.

Existing PM
04/24/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	272	677	327	387	548	103	324	730	308	100	590	262
Future Volume (veh/h)	272	677	327	387	548	103	324	730	308	100	590	262
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	296	736	355	421	596	112	352	793	335	109	641	285
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	339	910	406	472	880	165	252	1413	847	155	884	393
Arrive On Green	0.10	0.26	0.26	0.14	0.29	0.29	0.07	0.40	0.40	0.04	0.37	0.37
Sat Flow, veh/h	3456	3554	1585	3456	2987	560	3456	3554	1585	3456	2392	1063
Grp Volume(v), veh/h	296	736	355	421	354	354	352	793	335	109	476	450
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1770	1728	1777	1585	1728	1777	1679
Q Serve(g_s), s	12.1	27.9	30.9	17.2	25.2	25.4	10.5	24.9	17.9	4.5	33.2	33.2
Cycle Q Clear(g_c), s	12.1	27.9	30.9	17.2	25.2	25.4	10.5	24.9	17.9	4.5	33.2	33.2
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		0.63
Lane Grp Cap(c), veh/h	339	910	406	472	523	521	252	1413	847	155	656	620
V/C Ratio(X)	0.87	0.81	0.87	0.89	0.68	0.68	1.39	0.56	0.40	0.70	0.73	0.73
Avail Cap(c_a), veh/h	339	1014	452	522	601	598	252	1413	847	209	656	620
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.9	50.2	51.3	61.0	44.7	44.7	66.6	33.6	19.8	67.7	39.0	39.0
Incr Delay (d2), s/veh	21.3	4.5	16.0	16.4	2.5	2.6	199.8	1.6	1.4	6.6	6.9	7.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	13.0	14.1	8.6	11.5	11.6	11.7	11.1	7.0	2.1	15.7	14.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.3	54.7	67.3	77.4	47.2	47.3	266.5	35.2	21.1	74.3	45.9	46.3
LnGrp LOS	F	D	E	E	D	D	F	D	C	E	D	D
Approach Vol, veh/h		1387			1129			1480			1035	
Approach Delay, s/veh		64.4			58.5			87.0			49.0	
Approach LOS		E			E			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	64.7	24.1	44.0	15.0	60.6	18.6	49.5
Change Period (Y+Rc), s	4.5	7.5	4.5	7.2	4.5	7.5	4.5	7.2
Max Green Setting (Gmax), s	8.7	54.9	21.7	41.0	10.5	53.1	14.1	48.6
Max Q Clear Time (g_c+I1), s	6.5	26.9	19.2	32.9	12.5	35.2	14.1	27.4
Green Ext Time (p_c), s	0.1	7.7	0.4	3.9	0.0	6.0	0.0	4.5

Intersection Summary	
HCM 6th Ctrl Delay	66.6
HCM 6th LOS	E

HCM 6th Signalized Intersection Summary
1: Twin Oaks Valley Rd. & Borden Rd.

Existing + Project AM
04/24/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	228	236	262	407	99	181	407	86	55	868	96
Future Volume (veh/h)	55	228	236	262	407	99	181	407	86	55	868	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	60	248	257	285	442	108	197	442	93	60	943	104
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	78	356	317	314	945	229	227	1334	875	78	1036	462
Arrive On Green	0.04	0.20	0.20	0.18	0.33	0.33	0.13	0.38	0.38	0.04	0.29	0.29
Sat Flow, veh/h	1781	1777	1585	1781	2836	688	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	60	248	257	285	276	274	197	442	93	60	943	104
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1747	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.5	13.4	16.0	16.3	12.7	12.9	11.2	9.2	2.9	3.5	26.5	5.2
Cycle Q Clear(g_c), s	3.5	13.4	16.0	16.3	12.7	12.9	11.2	9.2	2.9	3.5	26.5	5.2
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	78	356	317	314	592	582	227	1334	875	78	1036	462
V/C Ratio(X)	0.77	0.70	0.81	0.91	0.47	0.47	0.87	0.33	0.11	0.77	0.91	0.23
Avail Cap(c_a), veh/h	162	549	489	320	703	691	227	1334	875	162	1036	462
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.1	38.5	39.6	41.8	27.3	27.3	44.4	23.1	11.1	49.1	35.4	27.8
Incr Delay (d2), s/veh	15.0	2.5	5.8	27.8	0.6	0.6	28.1	0.7	0.2	15.0	13.3	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	6.0	6.7	9.5	5.4	5.4	6.7	3.9	1.0	1.9	13.2	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.0	41.0	45.3	69.6	27.8	27.9	72.5	23.8	11.3	64.0	48.7	29.0
LnGrp LOS	E	D	D	E	C	C	E	C	B	E	D	C
Approach Vol, veh/h		565			835			732			1107	
Approach Delay, s/veh		45.4			42.1			35.3			47.7	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	44.5	22.8	27.3	17.7	35.8	9.0	41.1
Change Period (Y+Rc), s	4.5	* 5.6	4.5	* 6.6	4.5	* 5.6	4.5	* 6.6
Max Green Setting (Gmax), s	9.4	* 34	18.6	* 32	13.2	* 30	9.4	* 41
Max Q Clear Time (g_c+I1), s	5.5	11.2	18.3	18.0	13.2	28.5	5.5	14.9
Green Ext Time (p_c), s	0.0	3.3	0.0	2.7	0.0	1.1	0.0	3.6

Intersection Summary	
HCM 6th Ctrl Delay	43.1
HCM 6th LOS	D

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	314	81	26	486	20	84	31	14	38	155	133
Future Volume (veh/h)	38	314	81	26	486	20	84	31	14	38	155	133
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	41	341	88	28	528	22	91	34	15	41	168	145
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	67	604	154	52	719	30	118	542	239	67	770	653
Arrive On Green	0.04	0.22	0.22	0.03	0.21	0.21	0.07	0.44	0.44	0.04	0.41	0.41
Sat Flow, veh/h	1781	2805	714	1781	3477	145	1781	1230	543	1781	1870	1585
Grp Volume(v), veh/h	41	214	215	28	270	280	91	0	49	41	168	145
Grp Sat Flow(s),veh/h/ln	1781	1777	1742	1781	1777	1844	1781	0	1773	1781	1870	1585
Q Serve(g_s), s	1.8	8.5	8.7	1.2	11.2	11.3	4.0	0.0	1.3	1.8	4.6	4.7
Cycle Q Clear(g_c), s	1.8	8.5	8.7	1.2	11.2	11.3	4.0	0.0	1.3	1.8	4.6	4.7
Prop In Lane	1.00		0.41	1.00		0.08	1.00		0.31	1.00		1.00
Lane Grp Cap(c), veh/h	67	383	375	52	368	382	118	0	781	67	770	653
V/C Ratio(X)	0.61	0.56	0.57	0.54	0.73	0.74	0.77	0.00	0.06	0.61	0.22	0.22
Avail Cap(c_a), veh/h	124	691	677	133	695	722	236	0	781	148	770	653
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.6	27.7	27.8	37.9	29.4	29.4	36.4	0.0	12.8	37.6	15.1	15.1
Incr Delay (d2), s/veh	8.8	1.3	1.4	8.5	2.8	2.8	10.2	0.0	0.2	8.8	0.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	3.6	3.7	0.6	4.9	5.1	2.0	0.0	0.5	0.9	2.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.4	29.0	29.2	46.5	32.2	32.2	46.7	0.0	12.9	46.4	15.7	15.9
LnGrp LOS	D	C	C	D	C	C	D	A	B	D	B	B
Approach Vol, veh/h		470			578			140			354	
Approach Delay, s/veh		30.6			32.9			34.8			19.3	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.5	41.7	6.8	23.3	9.7	39.4	7.5	22.6
Change Period (Y+Rc), s	4.5	* 6.8	4.5	* 6.2	4.5	* 6.8	4.5	* 6.2
Max Green Setting (Gmax), s	6.6	* 35	5.9	* 31	10.5	* 31	5.5	* 31
Max Q Clear Time (g_c+I1), s	3.8	3.3	3.2	10.7	6.0	6.7	3.8	13.3
Green Ext Time (p_c), s	0.0	0.2	0.0	2.5	0.1	1.4	0.0	3.1

Intersection Summary	
HCM 6th Ctrl Delay	29.3
HCM 6th LOS	C

Notes

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

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	260	4	123	65	1	300
Future Volume (vph)	260	4	123	65	1	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
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)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	283	4	134	71	1	326
RTOR Reduction (vph)	0	3	0	33	0	0
Lane Group Flow (vph)	283	1	134	38	1	326
Turn Type	Perm	Perm	NA	Perm	Prot	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2		
Actuated Green, G (s)	15.8	15.8	38.0	38.0	0.9	43.8
Effective Green, g (s)	15.8	15.8	38.0	38.0	0.9	43.8
Actuated g/C Ratio	0.22	0.22	0.53	0.53	0.01	0.62
Clearance Time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	392	351	994	844	22	1146
v/s Ratio Prot			0.07		0.00	c0.18
v/s Ratio Perm	c0.16	0.00		0.02		
v/c Ratio	0.72	0.00	0.13	0.04	0.05	0.28
Uniform Delay, d1	25.7	21.6	8.3	7.9	34.7	6.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.4	0.0	0.3	0.1	0.9	0.6
Delay (s)	32.1	21.6	8.6	8.0	35.6	7.0
Level of Service	C	C	A	A	D	A
Approach Delay (s)	32.0		8.4			7.1
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	71.2	Sum of lost time (s)	16.5
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	6	74	13	3	5	47	534	32	34	1153	160
Future Volume (veh/h)	135	6	74	13	3	5	47	534	32	34	1153	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	147	7	80	14	3	5	51	580	35	37	1253	174
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	193	14	160	42	15	25	71	1979	119	59	1802	249
Arrive On Green	0.11	0.11	0.11	0.02	0.02	0.02	0.04	0.58	0.58	0.03	0.57	0.57
Sat Flow, veh/h	1781	129	1476	1781	630	1051	1781	3405	205	1781	3136	433
Grp Volume(v), veh/h	147	0	87	14	0	8	51	302	313	37	707	720
Grp Sat Flow(s),veh/h/ln	1781	0	1605	1781	0	1681	1781	1777	1833	1781	1777	1792
Q Serve(g_s), s	7.3	0.0	4.7	0.7	0.0	0.4	2.6	7.8	7.8	1.9	25.6	26.0
Cycle Q Clear(g_c), s	7.3	0.0	4.7	0.7	0.0	0.4	2.6	7.8	7.8	1.9	25.6	26.0
Prop In Lane	1.00		0.92	1.00		0.63	1.00		0.11	1.00		0.24
Lane Grp Cap(c), veh/h	193	0	174	42	0	39	71	1032	1065	59	1021	1030
V/C Ratio(X)	0.76	0.00	0.50	0.34	0.00	0.20	0.72	0.29	0.29	0.62	0.69	0.70
Avail Cap(c_a), veh/h	358	0	323	705	0	665	104	1032	1065	139	1021	1030
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.4	0.0	38.3	43.7	0.0	43.6	43.2	9.6	9.6	43.4	13.7	13.8
Incr Delay (d2), s/veh	6.1	0.0	2.2	4.6	0.0	2.5	12.8	0.7	0.7	10.2	3.9	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	1.9	0.4	0.0	0.2	1.4	3.0	3.1	1.0	10.3	10.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.5	0.0	40.5	48.4	0.0	46.1	56.0	10.3	10.3	53.6	17.5	17.7
LnGrp LOS	D	A	D	D	A	D	E	B	B	D	B	B
Approach Vol, veh/h		234			22			666			1464	
Approach Delay, s/veh		43.7			47.5			13.8			18.5	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	58.3		16.5	8.1	57.7		8.7
Change Period (Y+Rc), s	4.5	* 5.4		* 6.6	4.5	* 5.4		6.6
Max Green Setting (Gmax), s	7.1	* 51		* 18	5.3	* 52		36.0
Max Q Clear Time (g_c+I1), s	3.9	9.8		9.3	4.6	28.0		2.7
Green Ext Time (p_c), s	0.0	4.3		0.6	0.0	11.7		0.0

Intersection Summary	
HCM 6th Ctrl Delay	20.0
HCM 6th LOS	B

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	478	50	636	798	106	12	56	430	90	369	75
Future Volume (veh/h)	36	478	50	636	798	106	12	56	430	90	369	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	39	520	54	691	867	115	13	61	0	98	401	82
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	56	669	298	701	1278	570	27	1192		104	1116	226
Arrive On Green	0.03	0.19	0.19	0.20	0.36	0.36	0.01	0.34	0.00	0.06	0.38	0.38
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	2943	597
Grp Volume(v), veh/h	39	520	54	691	867	115	13	61	0	98	241	242
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1763
Q Serve(g_s), s	2.4	15.4	3.2	22.1	22.9	5.6	0.8	1.3	0.0	6.1	10.8	11.0
Cycle Q Clear(g_c), s	2.4	15.4	3.2	22.1	22.9	5.6	0.8	1.3	0.0	6.1	10.8	11.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	56	669	298	701	1278	570	27	1192		104	674	669
V/C Ratio(X)	0.69	0.78	0.18	0.99	0.68	0.20	0.49	0.05		0.94	0.36	0.36
Avail Cap(c_a), veh/h	112	1122	500	701	1625	725	80	1192		104	674	669
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.2	42.8	37.8	44.0	30.1	24.5	54.2	24.9	0.0	52.0	24.7	24.8
Incr Delay (d2), s/veh	14.3	2.0	0.3	30.2	0.8	0.2	13.3	0.1	0.0	68.4	1.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	6.9	1.3	12.3	9.8	2.1	0.5	0.6	0.0	4.7	4.8	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.4	44.8	38.1	74.2	30.9	24.7	67.5	25.0	0.0	120.4	26.2	26.3
LnGrp LOS	E	D	D	E	C	C	E	C		F	C	C
Approach Vol, veh/h		613			1673			74	A		581	
Approach Delay, s/veh		45.6			48.3			32.5			42.1	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	45.2	27.0	27.7	6.1	50.1	8.0	46.7
Change Period (Y+Rc), s	4.5	8.0	4.5	* 6.8	4.5	* 8	4.5	* 6.8
Max Green Setting (Gmax), s	6.5	37.2	22.5	* 35	5.0	* 39	7.0	* 51
Max Q Clear Time (g_c+I1), s	8.1	3.3	24.1	17.4	2.8	13.0	4.4	24.9
Green Ext Time (p_c), s	0.0	0.3	0.0	3.4	0.0	3.1	0.0	7.2

Intersection Summary	
HCM 6th Ctrl Delay	46.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	177	499	284	445	533	29	203	383	373	92	883	249
Future Volume (veh/h)	177	499	284	445	533	29	203	383	373	92	883	249
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	192	542	309	484	579	32	221	416	405	100	960	271
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	244	813	363	527	1064	59	257	1452	889	146	1030	290
Arrive On Green	0.07	0.23	0.23	0.15	0.31	0.31	0.07	0.41	0.41	0.04	0.38	0.38
Sat Flow, veh/h	3456	3554	1585	3456	3424	189	3456	3554	1585	3456	2738	770
Grp Volume(v), veh/h	192	542	309	484	300	311	221	416	405	100	622	609
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1836	1728	1777	1585	1728	1777	1732
Q Serve(g_s), s	7.7	19.6	26.4	19.5	19.8	19.8	8.9	11.1	21.3	4.0	47.4	47.8
Cycle Q Clear(g_c), s	7.7	19.6	26.4	19.5	19.8	19.8	8.9	11.1	21.3	4.0	47.4	47.8
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	244	813	363	527	552	571	257	1452	889	146	669	652
V/C Ratio(X)	0.79	0.67	0.85	0.92	0.54	0.54	0.86	0.29	0.46	0.68	0.93	0.93
Avail Cap(c_a), veh/h	345	1033	461	531	612	632	257	1452	889	213	669	652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.5	49.5	52.1	58.9	40.3	40.3	64.6	28.0	18.3	66.6	42.2	42.3
Incr Delay (d2), s/veh	7.7	1.1	11.8	21.0	0.8	0.8	24.1	0.5	1.7	5.6	21.3	22.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	8.9	11.7	10.1	8.8	9.2	4.8	4.9	8.2	1.9	24.6	24.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.3	50.6	63.9	79.9	41.2	41.2	88.7	28.5	19.9	72.2	63.5	64.8
LnGrp LOS	E	D	E	E	D	D	F	C	B	E	E	E
Approach Vol, veh/h		1043			1095			1042			1331	
Approach Delay, s/veh		58.6			58.3			37.9			64.8	
Approach LOS		E			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	65.1	26.0	39.5	15.0	60.6	14.4	51.1
Change Period (Y+Rc), s	4.5	7.5	4.5	7.2	4.5	7.5	4.5	7.2
Max Green Setting (Gmax), s	8.7	54.9	21.7	41.0	10.5	53.1	14.1	48.6
Max Q Clear Time (g_c+I1), s	6.0	23.3	21.5	28.4	10.9	49.8	9.7	21.8
Green Ext Time (p_c), s	0.1	4.7	0.1	3.9	0.0	2.3	0.2	4.0

Intersection Summary	
HCM 6th Ctrl Delay	55.5
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	288	200	157	250	60	210	660	251	91	657	71
Future Volume (veh/h)	157	288	200	157	250	60	210	660	251	91	657	71
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	171	313	217	171	272	65	228	717	273	99	714	77
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	177	410	278	207	627	147	248	1376	798	126	1132	505
Arrive On Green	0.10	0.20	0.20	0.12	0.22	0.22	0.14	0.39	0.39	0.07	0.32	0.32
Sat Flow, veh/h	1781	2028	1372	1781	2856	671	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	171	273	257	171	167	170	228	717	273	99	714	77
Grp Sat Flow(s),veh/h/ln	1781	1777	1623	1781	1777	1750	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	9.1	13.7	14.2	8.9	7.7	7.9	12.0	14.7	9.8	5.2	16.2	3.3
Cycle Q Clear(g_c), s	9.1	13.7	14.2	8.9	7.7	7.9	12.0	14.7	9.8	5.2	16.2	3.3
Prop In Lane	1.00		0.85	1.00		0.38	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	177	360	329	207	390	384	248	1376	798	126	1132	505
V/C Ratio(X)	0.97	0.76	0.78	0.82	0.43	0.44	0.92	0.52	0.34	0.79	0.63	0.15
Avail Cap(c_a), veh/h	177	600	548	349	768	756	248	1376	798	177	1132	505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.6	35.6	35.8	41.0	31.9	32.0	40.3	22.3	14.1	43.4	27.6	23.1
Incr Delay (d2), s/veh	58.3	3.3	4.1	8.0	0.7	0.8	36.2	1.4	1.2	14.3	2.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	6.2	5.9	4.3	3.3	3.4	7.7	6.2	3.6	2.8	7.2	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	100.8	39.0	39.9	49.0	32.6	32.8	76.5	23.7	15.3	57.7	30.2	23.8
LnGrp LOS	F	D	D	D	C	C	E	C	B	E	C	C
Approach Vol, veh/h		701			508			1218			890	
Approach Delay, s/veh		54.4			38.2			31.7			32.7	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	42.3	15.5	25.8	17.7	35.8	13.9	27.4
Change Period (Y+Rc), s	4.5	* 5.6	4.5	* 6.6	4.5	* 5.6	4.5	* 6.6
Max Green Setting (Gmax), s	9.4	* 34	18.6	* 32	13.2	* 30	9.4	* 41
Max Q Clear Time (g_c+I1), s	7.2	16.7	10.9	16.2	14.0	18.2	11.1	9.9
Green Ext Time (p_c), s	0.0	5.6	0.3	3.0	0.0	4.1	0.0	2.1

Intersection Summary	
HCM 6th Ctrl Delay	37.8
HCM 6th LOS	D

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	439	58	11	312	30	71	92	17	26	76	78
Future Volume (veh/h)	131	439	58	11	312	30	71	92	17	26	76	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	142	477	63	12	339	33	77	100	18	28	83	85
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	128	663	87	26	500	48	100	706	127	52	806	683
Arrive On Green	0.07	0.21	0.21	0.01	0.15	0.15	0.06	0.46	0.46	0.03	0.43	0.43
Sat Flow, veh/h	1781	3157	415	1781	3274	317	1781	1543	278	1781	1870	1585
Grp Volume(v), veh/h	142	268	272	12	183	189	77	0	118	28	83	85
Grp Sat Flow(s),veh/h/ln	1781	1777	1796	1781	1777	1813	1781	0	1820	1781	1870	1585
Q Serve(g_s), s	5.5	10.7	10.8	0.5	7.4	7.5	3.3	0.0	2.9	1.2	2.0	2.5
Cycle Q Clear(g_c), s	5.5	10.7	10.8	0.5	7.4	7.5	3.3	0.0	2.9	1.2	2.0	2.5
Prop In Lane	1.00		0.23	1.00		0.17	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	128	373	377	26	271	277	100	0	833	52	806	683
V/C Ratio(X)	1.11	0.72	0.72	0.46	0.67	0.68	0.77	0.00	0.14	0.54	0.10	0.12
Avail Cap(c_a), veh/h	128	717	725	138	722	737	245	0	833	154	806	683
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	28.0	28.1	37.3	30.5	30.6	35.5	0.0	12.0	36.5	12.9	13.1
Incr Delay (d2), s/veh	110.6	2.6	2.6	11.9	2.9	3.0	11.8	0.0	0.4	8.3	0.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	4.6	4.7	0.3	3.3	3.4	1.7	0.0	1.2	0.6	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	146.0	30.6	30.7	49.2	33.4	33.5	47.3	0.0	12.4	44.8	13.2	13.4
LnGrp LOS	F	C	C	D	C	C	D	A	B	D	B	B
Approach Vol, veh/h		682			384			195			196	
Approach Delay, s/veh		54.7			34.0			26.2			17.8	
Approach LOS		D			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.7	41.7	5.6	22.2	8.8	39.7	10.0	17.8
Change Period (Y+Rc), s	4.5	* 6.8	4.5	* 6.2	4.5	* 6.8	4.5	* 6.2
Max Green Setting (Gmax), s	6.6	* 35	5.9	* 31	10.5	* 31	5.5	* 31
Max Q Clear Time (g_c+I1), s	3.2	4.9	2.5	12.8	5.3	4.5	7.5	9.5
Green Ext Time (p_c), s	0.0	0.6	0.0	3.1	0.1	0.7	0.0	2.1

Intersection Summary	
HCM 6th Ctrl Delay	40.4
HCM 6th LOS	D

Notes

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

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	109	1	217	257	5	148
Future Volume (vph)	109	1	217	257	5	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
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)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	118	1	236	279	5	161
RTOR Reduction (vph)	0	1	0	108	0	0
Lane Group Flow (vph)	118	0	236	171	5	161
Turn Type	Perm	Perm	NA	Perm	Prot	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2		
Actuated Green, G (s)	8.1	8.1	40.8	40.8	1.0	46.7
Effective Green, g (s)	8.1	8.1	40.8	40.8	1.0	46.7
Actuated g/C Ratio	0.12	0.12	0.61	0.61	0.02	0.70
Clearance Time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	215	193	1144	972	26	1310
v/s Ratio Prot			c0.13		0.00	c0.09
v/s Ratio Perm	c0.07	0.00		0.11		
v/c Ratio	0.55	0.00	0.21	0.18	0.19	0.12
Uniform Delay, d1	27.4	25.6	5.7	5.5	32.3	3.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	0.0	0.4	0.4	3.6	0.2
Delay (s)	30.3	25.6	6.1	5.9	35.9	3.4
Level of Service	C	C	A	A	D	A
Approach Delay (s)	30.2		6.0			4.4
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	66.4	Sum of lost time (s)	16.5
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	189	7	68	20	5	0	113	991	26	37	889	153
Future Volume (veh/h)	189	7	68	20	5	0	113	991	26	37	889	153
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	205	8	74	22	5	0	123	1077	28	40	966	166
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	246	22	200	48	50	0	98	1989	52	61	1642	282
Arrive On Green	0.14	0.14	0.14	0.03	0.03	0.00	0.05	0.56	0.56	0.03	0.54	0.54
Sat Flow, veh/h	1781	157	1452	1781	1870	0	1781	3539	92	1781	3033	521
Grp Volume(v), veh/h	205	0	82	22	5	0	123	541	564	40	566	566
Grp Sat Flow(s),veh/h/ln	1781	0	1609	1781	1870	0	1781	1777	1854	1781	1777	1777
Q Serve(g_s), s	10.8	0.0	4.5	1.2	0.3	0.0	5.3	18.5	18.5	2.1	20.7	20.7
Cycle Q Clear(g_c), s	10.8	0.0	4.5	1.2	0.3	0.0	5.3	18.5	18.5	2.1	20.7	20.7
Prop In Lane	1.00		0.90	1.00		0.00	1.00		0.05	1.00		0.29
Lane Grp Cap(c), veh/h	246	0	222	48	50	0	98	999	1042	61	962	962
V/C Ratio(X)	0.83	0.00	0.37	0.46	0.10	0.00	1.26	0.54	0.54	0.66	0.59	0.59
Avail Cap(c_a), veh/h	337	0	305	664	697	0	98	999	1042	131	962	962
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.6	0.0	37.8	46.3	45.9	0.0	45.7	13.3	13.3	46.1	14.9	14.9
Incr Delay (d2), s/veh	12.2	0.0	1.0	6.9	0.9	0.0	175.8	2.1	2.0	11.5	2.6	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	1.8	0.6	0.1	0.0	7.1	7.5	7.8	1.1	8.5	8.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.7	0.0	38.8	53.2	46.8	0.0	221.4	15.4	15.3	57.6	17.5	17.6
LnGrp LOS	D	A	D	D	D	A	F	B	B	E	B	B
Approach Vol, veh/h		287			27			1228			1172	
Approach Delay, s/veh		48.7			52.0			36.0			18.9	
Approach LOS		D			D			D			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.8	59.7		19.9	9.8	57.7		9.2
Change Period (Y+Rc), s	4.5	* 5.4		* 6.6	4.5	* 5.4		6.6
Max Green Setting (Gmax), s	7.1	* 51		* 18	5.3	* 52		36.0
Max Q Clear Time (g_c+I1), s	4.1	20.5		12.8	7.3	22.7		3.2
Green Ext Time (p_c), s	0.0	8.8		0.5	0.0	9.2		0.1

Intersection Summary	
HCM 6th Ctrl Delay	30.1
HCM 6th LOS	C

Notes

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

HCM 6th Signalized Intersection Summary
5: E. San Marcos Blvd./Woodward St. & E. Mission Rd.

Existing + Project PM
04/24/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	809	79	375	645	105	59	241	708	48	169	50
Future Volume (veh/h)	121	809	79	375	645	105	59	241	708	48	169	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	132	879	86	408	701	114	64	262	0	52	184	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	989	441	483	1274	568	76	1209		67	914	261
Arrive On Green	0.06	0.28	0.28	0.14	0.36	0.36	0.04	0.34	0.00	0.04	0.33	0.33
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	2729	778
Grp Volume(v), veh/h	132	879	86	408	701	114	64	262	0	52	118	120
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1730
Q Serve(g_s), s	7.0	27.7	4.8	13.4	18.4	5.8	4.2	6.1	0.0	3.4	5.5	5.8
Cycle Q Clear(g_c), s	7.0	27.7	4.8	13.4	18.4	5.8	4.2	6.1	0.0	3.4	5.5	5.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.45
Lane Grp Cap(c), veh/h	107	989	441	483	1274	568	76	1209		67	595	580
V/C Ratio(X)	1.24	0.89	0.19	0.84	0.55	0.20	0.84	0.22		0.78	0.20	0.21
Avail Cap(c_a), veh/h	107	1065	475	666	1543	688	76	1209		99	595	580
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.9	40.4	32.1	49.0	29.9	25.9	55.5	27.4	0.0	55.7	27.7	27.7
Incr Delay (d2), s/veh	163.4	8.9	0.2	7.2	0.4	0.2	53.0	0.4	0.0	19.8	0.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	13.2	1.9	6.3	7.9	2.2	3.0	2.7	0.0	1.9	2.5	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	218.3	49.3	32.3	56.1	30.3	26.1	108.5	27.8	0.0	75.5	28.4	28.5
LnGrp LOS	F	D	C	E	C	C	F	C		E	C	C
Approach Vol, veh/h		1097			1223			326	A		290	
Approach Delay, s/veh		68.3			38.5			43.7			36.9	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	47.7	20.8	39.3	9.5	47.1	11.5	48.6
Change Period (Y+Rc), s	4.5	8.0	4.5	* 6.8	4.5	* 8	4.5	* 6.8
Max Green Setting (Gmax), s	6.5	37.2	22.5	* 35	5.0	* 39	7.0	* 51
Max Q Clear Time (g_c+I1), s	5.4	8.1	15.4	29.7	6.2	7.8	9.0	20.4
Green Ext Time (p_c), s	0.0	1.7	0.9	2.8	0.0	1.4	0.0	5.9

Intersection Summary	
HCM 6th Ctrl Delay	50.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
6: Twin Oaks Valley Rd. & E. San Marcos Blvd.

Existing + Project PM
04/24/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	272	678	327	388	549	104	324	730	310	101	590	262
Future Volume (veh/h)	272	678	327	388	549	104	324	730	310	101	590	262
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	296	737	355	422	597	113	352	793	337	110	641	285
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	339	910	406	473	879	166	252	1412	847	156	883	393
Arrive On Green	0.10	0.26	0.26	0.14	0.29	0.29	0.07	0.40	0.40	0.05	0.37	0.37
Sat Flow, veh/h	3456	3554	1585	3456	2983	563	3456	3554	1585	3456	2392	1063
Grp Volume(v), veh/h	296	737	355	422	355	355	352	793	337	110	476	450
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1769	1728	1777	1585	1728	1777	1679
Q Serve(g_s), s	12.1	28.0	30.9	17.3	25.3	25.5	10.5	24.9	18.1	4.5	33.2	33.2
Cycle Q Clear(g_c), s	12.1	28.0	30.9	17.3	25.3	25.5	10.5	24.9	18.1	4.5	33.2	33.2
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		0.63
Lane Grp Cap(c), veh/h	339	910	406	473	524	521	252	1412	847	156	656	620
V/C Ratio(X)	0.87	0.81	0.87	0.89	0.68	0.68	1.39	0.56	0.40	0.71	0.73	0.73
Avail Cap(c_a), veh/h	339	1013	452	522	601	598	252	1412	847	209	656	620
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.0	50.2	51.3	61.0	44.7	44.7	66.6	33.6	19.8	67.7	39.1	39.1
Incr Delay (d2), s/veh	21.4	4.6	16.0	16.5	2.6	2.6	200.1	1.6	1.4	6.8	6.9	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	13.0	14.1	8.7	11.6	11.6	11.7	11.1	7.0	2.1	15.7	14.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.3	54.8	67.3	77.5	47.2	47.3	266.7	35.2	21.2	74.5	45.9	46.3
LnGrp LOS	F	D	E	E	D	D	F	D	C	E	D	D
Approach Vol, veh/h		1388			1132			1482			1036	
Approach Delay, s/veh		64.5			58.6			87.0			49.1	
Approach LOS		E			E			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	64.6	24.2	44.0	15.0	60.6	18.6	49.6
Change Period (Y+Rc), s	4.5	7.5	4.5	7.2	4.5	7.5	4.5	7.2
Max Green Setting (Gmax), s	8.7	54.9	21.7	41.0	10.5	53.1	14.1	48.6
Max Q Clear Time (g_c+I1), s	6.5	26.9	19.3	32.9	12.5	35.2	14.1	27.5
Green Ext Time (p_c), s	0.1	7.7	0.4	3.9	0.0	6.0	0.0	4.5

Intersection Summary	
HCM 6th Ctrl Delay	66.6
HCM 6th LOS	E

Appendix B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	267	276	307	475	115	212	476	101	64	1016	112
Future Volume (veh/h)	64	267	276	307	475	115	212	476	101	64	1016	112
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	70	290	300	334	516	125	230	517	110	70	1104	122
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	90	400	357	308	988	238	219	1256	835	90	999	446
Arrive On Green	0.05	0.23	0.23	0.17	0.35	0.35	0.12	0.35	0.35	0.05	0.28	0.28
Sat Flow, veh/h	1781	1777	1585	1781	2839	685	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	70	290	300	334	322	319	230	517	110	70	1104	122
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1747	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.2	16.2	19.4	18.6	15.5	15.6	13.2	11.8	3.8	4.2	30.2	6.4
Cycle Q Clear(g_c), s	4.2	16.2	19.4	18.6	15.5	15.6	13.2	11.8	3.8	4.2	30.2	6.4
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	90	400	357	308	618	608	219	1256	835	90	999	446
V/C Ratio(X)	0.78	0.72	0.84	1.08	0.52	0.52	1.05	0.41	0.13	0.78	1.10	0.27
Avail Cap(c_a), veh/h	156	529	472	308	678	667	219	1256	835	156	999	446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.4	38.5	39.7	44.4	27.9	27.9	47.1	26.3	12.9	50.4	38.6	30.1
Incr Delay (d2), s/veh	13.2	3.3	9.9	75.1	0.7	0.7	74.8	1.0	0.3	13.2	61.7	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	7.4	8.5	14.6	6.6	6.6	10.4	5.1	1.4	2.2	21.5	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.6	41.9	49.7	119.5	28.6	28.6	121.9	27.3	13.3	63.6	100.3	31.6
LnGrp LOS	E	D	D	F	C	C	F	C	B	E	F	C
Approach Vol, veh/h		660			975			857			1296	
Approach Delay, s/veh		47.7			59.7			50.9			91.9	
Approach LOS		D			E			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	43.6	23.1	30.8	17.7	35.8	9.9	44.0
Change Period (Y+Rc), s	4.5	* 5.6	4.5	* 6.6	4.5	* 5.6	4.5	* 6.6
Max Green Setting (Gmax), s	9.4	* 34	18.6	* 32	13.2	* 30	9.4	* 41
Max Q Clear Time (g_c+I1), s	6.2	13.8	20.6	21.4	15.2	32.2	6.2	17.6
Green Ext Time (p_c), s	0.0	3.8	0.0	2.8	0.0	0.0	0.0	4.2

Intersection Summary	
HCM 6th Ctrl Delay	66.6
HCM 6th LOS	E

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	367	94	30	569	23	97	36	16	44	181	156
Future Volume (veh/h)	44	367	94	30	569	23	97	36	16	44	181	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	48	399	102	33	618	25	105	39	17	48	197	170
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	72	676	171	57	809	33	134	520	227	72	722	612
Arrive On Green	0.04	0.24	0.24	0.03	0.23	0.23	0.08	0.42	0.42	0.04	0.39	0.39
Sat Flow, veh/h	1781	2809	711	1781	3481	141	1781	1235	538	1781	1870	1585
Grp Volume(v), veh/h	48	251	250	33	315	328	105	0	56	48	197	170
Grp Sat Flow(s),veh/h/ln	1781	1777	1742	1781	1777	1845	1781	0	1773	1781	1870	1585
Q Serve(g_s), s	2.2	10.3	10.5	1.5	13.7	13.7	4.8	0.0	1.6	2.2	6.0	6.1
Cycle Q Clear(g_c), s	2.2	10.3	10.5	1.5	13.7	13.7	4.8	0.0	1.6	2.2	6.0	6.1
Prop In Lane	1.00		0.41	1.00		0.08	1.00		0.30	1.00		1.00
Lane Grp Cap(c), veh/h	72	428	419	57	413	429	134	0	747	72	722	612
V/C Ratio(X)	0.67	0.59	0.60	0.58	0.76	0.76	0.78	0.00	0.07	0.67	0.27	0.28
Avail Cap(c_a), veh/h	118	661	648	127	665	690	226	0	747	142	722	612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	27.8	27.9	39.5	29.7	29.7	37.6	0.0	14.3	39.2	17.4	17.5
Incr Delay (d2), s/veh	10.2	1.3	1.4	8.9	3.0	2.9	9.4	0.0	0.2	10.2	0.9	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	4.4	4.4	0.8	6.0	6.2	2.4	0.0	0.6	1.1	2.7	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.4	29.1	29.2	48.4	32.6	32.5	47.0	0.0	14.5	49.4	18.4	18.6
LnGrp LOS	D	C	C	D	C	C	D	A	B	D	B	B
Approach Vol, veh/h		549			676			161			415	
Approach Delay, s/veh		30.9			33.4			35.7			22.1	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	41.7	7.2	26.1	10.8	38.8	7.8	25.5
Change Period (Y+Rc), s	4.5	* 6.8	4.5	* 6.2	4.5	* 6.8	4.5	* 6.2
Max Green Setting (Gmax), s	6.6	* 35	5.9	* 31	10.5	* 31	5.5	* 31
Max Q Clear Time (g_c+I1), s	4.2	3.6	3.5	12.5	6.8	8.1	4.2	15.7
Green Ext Time (p_c), s	0.0	0.3	0.0	2.9	0.1	1.7	0.0	3.5

Intersection Summary	
HCM 6th Ctrl Delay	30.2
HCM 6th LOS	C

Notes

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

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	303	5	143	75	1	350
Future Volume (vph)	303	5	143	75	1	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
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)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	329	5	155	82	1	380
RTOR Reduction (vph)	0	4	0	39	0	0
Lane Group Flow (vph)	329	1	155	43	1	380
Turn Type	Perm	Perm	NA	Perm	Prot	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2		
Actuated Green, G (s)	17.4	17.4	38.0	38.0	0.9	43.8
Effective Green, g (s)	17.4	17.4	38.0	38.0	0.9	43.8
Actuated g/C Ratio	0.24	0.24	0.52	0.52	0.01	0.60
Clearance Time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	423	378	972	826	21	1120
v/s Ratio Prot			0.08		0.00	c0.20
v/s Ratio Perm	c0.19	0.00		0.03		
v/c Ratio	0.78	0.00	0.16	0.05	0.05	0.34
Uniform Delay, d1	25.9	21.1	9.1	8.5	35.5	7.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.7	0.0	0.4	0.1	0.9	0.8
Delay (s)	34.6	21.1	9.4	8.7	36.5	8.1
Level of Service	C	C	A	A	D	A
Approach Delay (s)	34.4		9.2			8.2
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	72.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Signalized Intersection Summary
4: Twin Oaks Valley Rd. & Richmar Ave.

Year 2035 AM
04/24/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	7	87	15	4	6	55	625	37	40	1349	187
Future Volume (veh/h)	158	7	87	15	4	6	55	625	37	40	1349	187
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	172	8	95	16	4	7	60	679	40	43	1466	203
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	217	15	181	48	16	29	77	1935	114	64	1759	241
Arrive On Green	0.12	0.12	0.12	0.03	0.03	0.03	0.04	0.57	0.57	0.04	0.56	0.56
Sat Flow, veh/h	1781	125	1479	1781	610	1068	1781	3410	201	1781	3140	430
Grp Volume(v), veh/h	172	0	103	16	0	11	60	354	365	43	822	847
Grp Sat Flow(s),veh/h/ln	1781	0	1604	1781	0	1678	1781	1777	1834	1781	1777	1793
Q Serve(g_s), s	8.8	0.0	5.6	0.8	0.0	0.6	3.1	10.0	10.0	2.2	35.3	36.8
Cycle Q Clear(g_c), s	8.8	0.0	5.6	0.8	0.0	0.6	3.1	10.0	10.0	2.2	35.3	36.8
Prop In Lane	1.00		0.92	1.00		0.64	1.00		0.11	1.00		0.24
Lane Grp Cap(c), veh/h	217	0	196	48	0	45	77	1008	1041	64	996	1005
V/C Ratio(X)	0.79	0.00	0.53	0.33	0.00	0.24	0.78	0.35	0.35	0.67	0.83	0.84
Avail Cap(c_a), veh/h	349	0	314	687	0	647	101	1008	1041	135	996	1005
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.8	0.0	38.4	44.6	0.0	44.5	44.2	10.9	10.9	44.4	16.8	17.1
Incr Delay (d2), s/veh	6.3	0.0	2.2	4.0	0.0	2.7	24.1	1.0	0.9	11.5	7.8	8.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.0	2.3	0.4	0.0	0.3	1.9	3.9	4.1	1.2	15.2	16.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.2	0.0	40.6	48.6	0.0	47.2	68.3	11.9	11.8	55.9	24.6	25.7
LnGrp LOS	D	A	D	D	A	D	E	B	B	E	C	C
Approach Vol, veh/h		275			27			779			1712	
Approach Delay, s/veh		44.1			48.0			16.2			25.9	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.9	58.4		18.0	8.5	57.7		9.1
Change Period (Y+Rc), s	4.5	* 5.4		* 6.6	4.5	* 5.4		6.6
Max Green Setting (Gmax), s	7.1	* 51		* 18	5.3	* 52		36.0
Max Q Clear Time (g_c+I1), s	4.2	12.0		10.8	5.1	38.8		2.8
Green Ext Time (p_c), s	0.0	5.2		0.6	0.0	9.5		0.1

Intersection Summary	
HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	559	59	744	934	123	14	63	503	104	428	88
Future Volume (veh/h)	42	559	59	744	934	123	14	63	503	104	428	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	46	608	64	809	1015	134	15	68	0	113	465	96
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	60	757	337	680	1336	596	30	1156		101	1074	220
Arrive On Green	0.03	0.21	0.21	0.20	0.38	0.38	0.02	0.33	0.00	0.06	0.37	0.37
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	2936	602
Grp Volume(v), veh/h	46	608	64	809	1015	134	15	68	0	113	280	281
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1762
Q Serve(g_s), s	2.9	18.6	3.8	22.5	28.5	6.6	1.0	1.5	0.0	6.5	13.6	13.8
Cycle Q Clear(g_c), s	2.9	18.6	3.8	22.5	28.5	6.6	1.0	1.5	0.0	6.5	13.6	13.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	60	757	337	680	1336	596	30	1156		101	650	644
V/C Ratio(X)	0.77	0.80	0.19	1.19	0.76	0.22	0.51	0.06		1.12	0.43	0.44
Avail Cap(c_a), veh/h	109	1088	485	680	1576	703	78	1156		101	650	644
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.8	42.7	36.9	45.9	31.2	24.3	55.8	26.5	0.0	53.9	27.3	27.4
Incr Delay (d2), s/veh	18.4	2.9	0.3	99.6	1.8	0.2	12.9	0.1	0.0	124.1	2.1	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	8.4	1.5	19.0	12.4	2.5	0.5	0.7	0.0	6.4	6.1	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.2	45.6	37.2	145.5	33.0	24.5	68.6	26.6	0.0	178.0	29.4	29.5
LnGrp LOS	E	D	D	F	C	C	E	C		F	C	C
Approach Vol, veh/h		718			1958			83	A		674	
Approach Delay, s/veh		46.7			78.9			34.2			54.4	
Approach LOS		D			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	45.2	27.0	31.1	6.4	49.8	8.3	49.8
Change Period (Y+Rc), s	4.5	8.0	4.5	* 6.8	4.5	* 8	4.5	* 6.8
Max Green Setting (Gmax), s	6.5	37.2	22.5	* 35	5.0	* 39	7.0	* 51
Max Q Clear Time (g_c+I1), s	8.5	3.5	24.5	20.6	3.0	15.8	4.9	30.5
Green Ext Time (p_c), s	0.0	0.4	0.0	3.8	0.0	3.5	0.0	8.0

Intersection Summary	
HCM 6th Ctrl Delay	66.3
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	207	584	332	519	622	33	238	448	435	108	1033	291
Future Volume (veh/h)	207	584	332	519	622	33	238	448	435	108	1033	291
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	225	635	361	564	676	36	259	487	473	117	1123	316
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	273	906	404	513	1112	59	248	1378	850	162	997	277
Arrive On Green	0.08	0.25	0.25	0.15	0.32	0.32	0.07	0.39	0.39	0.05	0.36	0.36
Sat Flow, veh/h	3456	3554	1585	3456	3432	183	3456	3554	1585	3456	2746	764
Grp Volume(v), veh/h	225	635	361	564	350	362	259	487	473	117	722	717
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1837	1728	1777	1585	1728	1777	1733
Q Serve(g_s), s	9.4	23.7	32.1	21.7	24.2	24.3	10.5	14.2	28.9	4.9	53.1	53.1
Cycle Q Clear(g_c), s	9.4	23.7	32.1	21.7	24.2	24.3	10.5	14.2	28.9	4.9	53.1	53.1
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	273	906	404	513	576	596	248	1378	850	162	645	629
V/C Ratio(X)	0.82	0.70	0.89	1.10	0.61	0.61	1.04	0.35	0.56	0.72	1.12	1.14
Avail Cap(c_a), veh/h	333	996	444	513	590	610	248	1378	850	206	645	629
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	66.3	49.4	52.6	62.3	41.6	41.6	67.9	31.8	22.4	68.8	46.6	46.6
Incr Delay (d2), s/veh	12.9	2.0	18.9	70.0	1.7	1.7	69.2	0.7	2.6	8.7	73.2	80.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	10.8	14.9	14.5	11.0	11.4	7.0	6.3	11.4	2.4	36.4	36.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.3	51.4	71.5	132.3	43.3	43.3	137.1	32.5	25.1	77.4	119.8	127.4
LnGrp LOS	E	D	E	F	D	D	F	C	C	E	F	F
Approach Vol, veh/h		1221			1276			1219			1556	
Approach Delay, s/veh		62.5			82.6			51.8			120.1	
Approach LOS		E			F			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	64.2	26.2	44.5	15.0	60.6	16.1	54.6
Change Period (Y+Rc), s	4.5	7.5	4.5	7.2	4.5	7.5	4.5	7.2
Max Green Setting (Gmax), s	8.7	54.9	21.7	41.0	10.5	53.1	14.1	48.6
Max Q Clear Time (g_c+I1), s	6.9	30.9	23.7	34.1	12.5	55.1	11.4	26.3
Green Ext Time (p_c), s	0.1	5.4	0.0	3.1	0.0	0.0	0.2	4.6

Intersection Summary	
HCM 6th Ctrl Delay	81.9
HCM 6th LOS	F

HCM 6th Signalized Intersection Summary
1: Twin Oaks Valley Rd. & Borden Rd.

Year 2035 PM
04/24/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	336	234	184	291	69	246	772	293	105	769	83
Future Volume (veh/h)	184	336	234	184	291	69	246	772	293	105	769	83
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	200	365	254	200	316	75	267	839	318	114	836	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	166	456	312	235	755	177	234	1251	767	142	1067	476
Arrive On Green	0.09	0.23	0.23	0.13	0.26	0.26	0.13	0.35	0.35	0.08	0.30	0.30
Sat Flow, veh/h	1781	2017	1382	1781	2858	669	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	200	321	298	200	195	196	267	839	318	114	836	90
Grp Sat Flow(s),veh/h/ln	1781	1777	1622	1781	1777	1750	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	9.4	17.2	17.5	11.0	9.1	9.3	13.2	20.1	13.0	6.3	21.6	4.2
Cycle Q Clear(g_c), s	9.4	17.2	17.5	11.0	9.1	9.3	13.2	20.1	13.0	6.3	21.6	4.2
Prop In Lane	1.00		0.85	1.00		0.38	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	166	401	366	235	469	462	234	1251	767	142	1067	476
V/C Ratio(X)	1.20	0.80	0.81	0.85	0.41	0.42	1.14	0.67	0.41	0.80	0.78	0.19
Avail Cap(c_a), veh/h	166	565	516	329	724	713	234	1251	767	166	1067	476
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.6	36.8	36.9	42.7	30.6	30.7	43.7	27.7	16.8	45.5	32.2	26.1
Incr Delay (d2), s/veh	134.2	5.4	6.7	14.0	0.6	0.6	102.5	2.9	1.7	21.2	5.8	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.3	7.9	7.5	5.7	3.9	4.0	12.4	8.9	4.9	3.6	10.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	179.7	42.2	43.6	56.7	31.2	31.3	146.2	30.5	18.4	66.7	38.0	27.0
LnGrp LOS	F	D	D	E	C	C	F	C	B	E	D	C
Approach Vol, veh/h		819			591			1424			1040	
Approach Delay, s/veh		76.3			39.9			49.5			40.2	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.5	41.0	17.8	29.3	17.7	35.8	13.9	33.2
Change Period (Y+Rc), s	4.5	* 5.6	4.5	* 6.6	4.5	* 5.6	4.5	* 6.6
Max Green Setting (Gmax), s	9.4	* 34	18.6	* 32	13.2	* 30	9.4	* 41
Max Q Clear Time (g_c+I1), s	8.3	22.1	13.0	19.5	15.2	23.6	11.4	11.3
Green Ext Time (p_c), s	0.0	5.5	0.3	3.2	0.0	3.2	0.0	2.5

Intersection Summary	
HCM 6th Ctrl Delay	51.2
HCM 6th LOS	D

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	153	514	66	13	365	35	82	108	20	30	89	91
Future Volume (veh/h)	153	514	66	13	365	35	82	108	20	30	89	91
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	166	559	72	14	397	38	89	117	22	33	97	99
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	123	742	95	30	596	57	115	673	126	58	762	646
Arrive On Green	0.07	0.23	0.23	0.02	0.18	0.18	0.06	0.44	0.44	0.03	0.41	0.41
Sat Flow, veh/h	1781	3167	407	1781	3279	312	1781	1531	288	1781	1870	1585
Grp Volume(v), veh/h	166	313	318	14	214	221	89	0	139	33	97	99
Grp Sat Flow(s),veh/h/ln	1781	1777	1797	1781	1777	1814	1781	0	1819	1781	1870	1585
Q Serve(g_s), s	5.5	13.0	13.1	0.6	8.9	9.0	3.9	0.0	3.7	1.5	2.6	3.1
Cycle Q Clear(g_c), s	5.5	13.0	13.1	0.6	8.9	9.0	3.9	0.0	3.7	1.5	2.6	3.1
Prop In Lane	1.00		0.23	1.00		0.17	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	123	416	421	30	323	330	115	0	799	58	762	646
V/C Ratio(X)	1.35	0.75	0.76	0.47	0.66	0.67	0.77	0.00	0.17	0.57	0.13	0.15
Avail Cap(c_a), veh/h	123	689	697	132	694	708	236	0	799	148	762	646
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.0	28.3	28.3	38.7	30.2	30.3	36.6	0.0	13.5	37.9	14.7	14.9
Incr Delay (d2), s/veh	199.7	2.8	2.8	11.1	2.3	2.4	10.4	0.0	0.5	8.5	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	5.6	5.7	0.4	3.9	4.0	2.0	0.0	1.5	0.8	1.1	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	236.7	31.0	31.1	49.7	32.6	32.6	47.0	0.0	14.0	46.3	15.0	15.4
LnGrp LOS	F	C	C	D	C	C	D	A	B	D	B	B
Approach Vol, veh/h		797			449			228			229	
Approach Delay, s/veh		73.9			33.1			26.9			19.7	
Approach LOS		E			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	41.7	5.8	24.8	9.6	39.2	10.0	20.6
Change Period (Y+Rc), s	4.5	* 6.8	4.5	* 6.2	4.5	* 6.8	4.5	* 6.2
Max Green Setting (Gmax), s	6.6	* 35	5.9	* 31	10.5	* 31	5.5	* 31
Max Q Clear Time (g_c+I1), s	3.5	5.7	2.6	15.1	5.9	5.1	7.5	11.0
Green Ext Time (p_c), s	0.0	0.8	0.0	3.5	0.1	0.8	0.0	2.5

Intersection Summary	
HCM 6th Ctrl Delay	49.6
HCM 6th LOS	D

Notes

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

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	125	1	253	300	6	171
Future Volume (vph)	125	1	253	300	6	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
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)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	136	1	275	326	7	186
RTOR Reduction (vph)	0	1	0	127	0	0
Lane Group Flow (vph)	136	0	275	199	7	186
Turn Type	Perm	Perm	NA	Perm	Prot	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2		
Actuated Green, G (s)	8.7	8.7	40.9	40.9	1.0	46.8
Effective Green, g (s)	8.7	8.7	40.9	40.9	1.0	46.8
Actuated g/C Ratio	0.13	0.13	0.61	0.61	0.01	0.70
Clearance Time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	229	205	1135	964	26	1299
v/s Ratio Prot			c0.15		0.00	c0.10
v/s Ratio Perm	c0.08	0.00		0.13		
v/c Ratio	0.59	0.00	0.24	0.21	0.27	0.14
Uniform Delay, d1	27.5	25.4	6.0	5.9	32.7	3.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.1	0.0	0.5	0.5	5.5	0.2
Delay (s)	31.6	25.4	6.5	6.3	38.2	3.6
Level of Service	C	C	A	A	D	A
Approach Delay (s)	31.6		6.4			4.9
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	67.1	Sum of lost time (s)	16.5
Intersection Capacity Utilization	31.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	221	8	80	23	6	0	132	1159	30	43	1039	179
Future Volume (veh/h)	221	8	80	23	6	0	132	1159	30	43	1039	179
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	240	9	87	25	7	0	143	1260	33	47	1129	195
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	278	23	227	53	55	0	95	1927	50	65	1600	275
Arrive On Green	0.16	0.16	0.16	0.03	0.03	0.00	0.05	0.54	0.54	0.04	0.53	0.53
Sat Flow, veh/h	1781	151	1457	1781	1870	0	1781	3538	93	1781	3032	522
Grp Volume(v), veh/h	240	0	96	25	7	0	143	633	660	47	660	664
Grp Sat Flow(s),veh/h/ln	1781	0	1608	1781	1870	0	1781	1777	1854	1781	1777	1776
Q Serve(g_s), s	13.0	0.0	5.3	1.4	0.4	0.0	5.3	24.9	25.0	2.6	27.6	27.9
Cycle Q Clear(g_c), s	13.0	0.0	5.3	1.4	0.4	0.0	5.3	24.9	25.0	2.6	27.6	27.9
Prop In Lane	1.00		0.91	1.00		0.00	1.00		0.05	1.00		0.29
Lane Grp Cap(c), veh/h	278	0	251	53	55	0	95	968	1010	65	938	938
V/C Ratio(X)	0.86	0.00	0.38	0.47	0.13	0.00	1.50	0.65	0.65	0.72	0.70	0.71
Avail Cap(c_a), veh/h	329	0	297	647	680	0	95	968	1010	128	938	938
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.8	0.0	37.5	47.3	46.8	0.0	46.9	15.9	15.9	47.2	17.6	17.6
Incr Delay (d2), s/veh	18.3	0.0	1.0	6.5	1.0	0.0	272.1	3.4	3.3	13.8	4.4	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	0.0	2.1	0.7	0.2	0.0	9.5	10.4	10.8	1.4	11.8	11.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.1	0.0	38.5	53.8	47.8	0.0	319.0	19.4	19.2	61.1	22.0	22.1
LnGrp LOS	E	A	D	D	D	A	F	B	B	E	C	C
Approach Vol, veh/h		336			32			1436			1371	
Approach Delay, s/veh		53.2			52.5			49.2			23.4	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.1	59.4		22.0	9.8	57.7		9.5
Change Period (Y+Rc), s	4.5	* 5.4		* 6.6	4.5	* 5.4		6.6
Max Green Setting (Gmax), s	7.1	* 51		* 18	5.3	* 52		36.0
Max Q Clear Time (g_c+I1), s	4.6	27.0		15.0	7.3	29.9		3.4
Green Ext Time (p_c), s	0.0	10.1		0.4	0.0	10.2		0.1

Intersection Summary			
HCM 6th Ctrl Delay			38.5
HCM 6th LOS			D

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	947	92	439	755	121	69	277	828	55	194	59
Future Volume (veh/h)	142	947	92	439	755	121	69	277	828	55	194	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	154	1029	100	477	821	132	75	301	0	60	211	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	102	1019	454	544	1374	613	73	1130		77	866	256
Arrive On Green	0.06	0.29	0.29	0.16	0.39	0.39	0.04	0.32	0.00	0.04	0.32	0.32
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	2704	799
Grp Volume(v), veh/h	154	1029	100	477	821	132	75	301	0	60	137	138
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1727
Q Serve(g_s), s	7.0	35.0	5.9	16.5	22.5	6.8	5.0	7.7	0.0	4.1	6.9	7.2
Cycle Q Clear(g_c), s	7.0	35.0	5.9	16.5	22.5	6.8	5.0	7.7	0.0	4.1	6.9	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.46
Lane Grp Cap(c), veh/h	102	1019	454	544	1374	613	73	1130		77	569	553
V/C Ratio(X)	1.51	1.01	0.22	0.88	0.60	0.22	1.03	0.27		0.78	0.24	0.25
Avail Cap(c_a), veh/h	102	1019	454	637	1476	658	73	1130		95	569	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.6	43.6	33.2	50.3	29.9	25.1	58.6	31.0	0.0	57.8	30.6	30.7
Incr Delay (d2), s/veh	272.5	30.7	0.2	11.9	0.6	0.2	113.4	0.6	0.0	27.4	1.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.9	19.6	2.3	8.0	9.7	2.6	4.6	3.4	0.0	2.4	3.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	330.1	74.3	33.4	62.2	30.5	25.2	172.0	31.6	0.0	85.2	31.6	31.8
LnGrp LOS	F	F	C	E	C	C	F	C		F	C	C
Approach Vol, veh/h		1283			1430			376	A		335	
Approach Delay, s/veh		101.8			40.6			59.6			41.2	
Approach LOS		F			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.8	46.8	23.7	41.8	9.5	47.1	11.5	54.0
Change Period (Y+Rc), s	4.5	8.0	4.5	* 6.8	4.5	* 8	4.5	* 6.8
Max Green Setting (Gmax), s	6.5	37.2	22.5	* 35	5.0	* 39	7.0	* 51
Max Q Clear Time (g_c+I1), s	6.1	9.7	18.5	37.0	7.0	9.2	9.0	24.5
Green Ext Time (p_c), s	0.0	2.0	0.7	0.0	0.0	1.7	0.0	6.9

Intersection Summary	
HCM 6th Ctrl Delay	65.7
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	318	792	383	453	641	121	379	854	360	117	690	307
Future Volume (veh/h)	318	792	383	453	641	121	379	854	360	117	690	307
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	346	861	416	492	697	132	412	928	391	127	750	334
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	325	970	433	500	965	183	242	1331	823	171	847	377
Arrive On Green	0.09	0.27	0.27	0.14	0.32	0.32	0.07	0.37	0.37	0.05	0.35	0.35
Sat Flow, veh/h	3456	3554	1585	3456	2981	564	3456	3554	1585	3456	2392	1064
Grp Volume(v), veh/h	346	861	416	492	415	414	412	928	391	127	557	527
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1769	1728	1777	1585	1728	1777	1679
Q Serve(g_s), s	14.1	34.9	38.8	21.3	30.9	31.0	10.5	33.1	23.6	5.4	44.2	44.3
Cycle Q Clear(g_c), s	14.1	34.9	38.8	21.3	30.9	31.0	10.5	33.1	23.6	5.4	44.2	44.3
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		0.63
Lane Grp Cap(c), veh/h	325	970	433	500	575	573	242	1331	823	171	629	595
V/C Ratio(X)	1.06	0.89	0.96	0.98	0.72	0.72	1.70	0.70	0.48	0.74	0.89	0.89
Avail Cap(c_a), veh/h	325	972	433	500	576	573	242	1331	823	201	629	595
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.9	52.3	53.7	63.9	44.7	44.8	69.7	39.7	23.0	70.3	45.6	45.6
Incr Delay (d2), s/veh	68.1	10.0	33.2	35.9	4.4	4.5	333.2	3.0	2.0	11.6	16.7	17.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.3	16.9	19.4	11.9	14.4	14.4	15.9	15.1	9.3	2.7	22.4	21.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	136.0	62.3	87.0	99.9	49.2	49.2	403.0	42.7	25.0	81.9	62.2	63.2
LnGrp LOS	F	E	F	F	D	D	F	D	C	F	E	E
Approach Vol, veh/h		1623			1321			1731			1211	
Approach Delay, s/veh		84.3			68.1			124.5			64.7	
Approach LOS		F			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.9	63.7	26.2	48.1	15.0	60.6	18.6	55.7
Change Period (Y+Rc), s	4.5	7.5	4.5	7.2	4.5	7.5	4.5	7.2
Max Green Setting (Gmax), s	8.7	54.9	21.7	41.0	10.5	53.1	14.1	48.6
Max Q Clear Time (g_c+I1), s	7.4	35.1	23.3	40.8	12.5	46.3	16.1	33.0
Green Ext Time (p_c), s	0.0	8.2	0.0	0.2	0.0	3.8	0.0	4.8

Intersection Summary	
HCM 6th Ctrl Delay	88.4
HCM 6th LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	267	276	307	476	116	212	476	101	64	1016	112
Future Volume (veh/h)	64	267	276	307	476	116	212	476	101	64	1016	112
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	70	290	300	334	517	126	230	517	110	70	1104	122
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	90	400	357	308	987	239	219	1256	835	90	999	446
Arrive On Green	0.05	0.23	0.23	0.17	0.35	0.35	0.12	0.35	0.35	0.05	0.28	0.28
Sat Flow, veh/h	1781	1777	1585	1781	2836	688	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	70	290	300	334	323	320	230	517	110	70	1104	122
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1747	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.2	16.2	19.4	18.6	15.6	15.7	13.2	11.8	3.8	4.2	30.2	6.4
Cycle Q Clear(g_c), s	4.2	16.2	19.4	18.6	15.6	15.7	13.2	11.8	3.8	4.2	30.2	6.4
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	90	400	357	308	618	608	219	1256	835	90	999	446
V/C Ratio(X)	0.78	0.72	0.84	1.08	0.52	0.53	1.05	0.41	0.13	0.78	1.10	0.27
Avail Cap(c_a), veh/h	156	529	472	308	678	667	219	1256	835	156	999	446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.4	38.5	39.7	44.4	27.9	28.0	47.1	26.3	12.9	50.4	38.6	30.1
Incr Delay (d2), s/veh	13.2	3.3	9.9	75.1	0.7	0.7	74.8	1.0	0.3	13.2	61.7	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	7.4	8.5	14.6	6.7	6.6	10.4	5.1	1.4	2.2	21.5	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.6	41.9	49.7	119.5	28.6	28.7	121.9	27.3	13.3	63.6	100.3	31.6
LnGrp LOS	E	D	D	F	C	C	F	C	B	E	F	C
Approach Vol, veh/h		660			977			857			1296	
Approach Delay, s/veh		47.7			59.7			50.9			91.9	
Approach LOS		D			E			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	43.6	23.1	30.8	17.7	35.8	9.9	44.0
Change Period (Y+Rc), s	4.5	* 5.6	4.5	* 6.6	4.5	* 5.6	4.5	* 6.6
Max Green Setting (Gmax), s	9.4	* 34	18.6	* 32	13.2	* 30	9.4	* 41
Max Q Clear Time (g_c+I1), s	6.2	13.8	20.6	21.4	15.2	32.2	6.2	17.7
Green Ext Time (p_c), s	0.0	3.8	0.0	2.8	0.0	0.0	0.0	4.2

Intersection Summary	
HCM 6th Ctrl Delay	66.6
HCM 6th LOS	E

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	367	95	30	569	23	98	36	16	44	181	156
Future Volume (veh/h)	44	367	95	30	569	23	98	36	16	44	181	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	48	399	103	33	618	25	107	39	17	48	197	170
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	72	674	172	57	809	33	137	520	227	72	720	610
Arrive On Green	0.04	0.24	0.24	0.03	0.23	0.23	0.08	0.42	0.42	0.04	0.38	0.38
Sat Flow, veh/h	1781	2802	716	1781	3481	141	1781	1235	538	1781	1870	1585
Grp Volume(v), veh/h	48	251	251	33	315	328	107	0	56	48	197	170
Grp Sat Flow(s),veh/h/ln	1781	1777	1741	1781	1777	1845	1781	0	1773	1781	1870	1585
Q Serve(g_s), s	2.2	10.4	10.6	1.5	13.7	13.7	4.9	0.0	1.6	2.2	6.0	6.1
Cycle Q Clear(g_c), s	2.2	10.4	10.6	1.5	13.7	13.7	4.9	0.0	1.6	2.2	6.0	6.1
Prop In Lane	1.00		0.41	1.00		0.08	1.00		0.30	1.00		1.00
Lane Grp Cap(c), veh/h	72	428	419	57	413	429	137	0	747	72	720	610
V/C Ratio(X)	0.67	0.59	0.60	0.58	0.76	0.76	0.78	0.00	0.07	0.67	0.27	0.28
Avail Cap(c_a), veh/h	118	661	647	127	665	690	226	0	747	142	720	610
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	27.8	27.9	39.5	29.7	29.7	37.6	0.0	14.3	39.2	17.5	17.6
Incr Delay (d2), s/veh	10.2	1.3	1.4	8.9	3.0	2.9	9.3	0.0	0.2	10.2	0.9	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	4.4	4.4	0.8	6.0	6.2	2.4	0.0	0.6	1.1	2.7	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.4	29.1	29.3	48.4	32.6	32.5	46.9	0.0	14.5	49.4	18.5	18.7
LnGrp LOS	D	C	C	D	C	C	D	A	B	D	B	B
Approach Vol, veh/h		550			676			163			415	
Approach Delay, s/veh		30.9			33.4			35.7			22.1	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	41.7	7.2	26.1	10.9	38.7	7.8	25.5
Change Period (Y+Rc), s	4.5	* 6.8	4.5	* 6.2	4.5	* 6.8	4.5	* 6.2
Max Green Setting (Gmax), s	6.6	* 35	5.9	* 31	10.5	* 31	5.5	* 31
Max Q Clear Time (g_c+I1), s	4.2	3.6	3.5	12.6	6.9	8.1	4.2	15.7
Green Ext Time (p_c), s	0.0	0.3	0.0	2.9	0.1	1.7	0.0	3.5

Intersection Summary	
HCM 6th Ctrl Delay	30.3
HCM 6th LOS	C

Notes

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

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	304	5	144	76	1	351
Future Volume (vph)	304	5	144	76	1	351
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
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)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	330	5	157	83	1	382
RTOR Reduction (vph)	0	4	0	40	0	0
Lane Group Flow (vph)	330	1	157	43	1	382
Turn Type	Perm	Perm	NA	Perm	Prot	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2		
Actuated Green, G (s)	17.5	17.5	38.0	38.0	0.9	43.8
Effective Green, g (s)	17.5	17.5	38.0	38.0	0.9	43.8
Actuated g/C Ratio	0.24	0.24	0.52	0.52	0.01	0.60
Clearance Time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	424	380	971	825	21	1119
v/s Ratio Prot			0.08		0.00	c0.21
v/s Ratio Perm	c0.19	0.00		0.03		
v/c Ratio	0.78	0.00	0.16	0.05	0.05	0.34
Uniform Delay, d1	25.9	21.1	9.1	8.6	35.6	7.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.7	0.0	0.4	0.1	0.9	0.8
Delay (s)	34.6	21.1	9.5	8.7	36.5	8.1
Level of Service	C	C	A	A	D	A
Approach Delay (s)	34.4		9.2			8.2
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	72.9	Sum of lost time (s)	16.5
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	7	87	15	4	6	55	625	37	40	1349	187
Future Volume (veh/h)	158	7	87	15	4	6	55	625	37	40	1349	187
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	172	8	95	16	4	7	60	679	40	43	1466	203
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	217	15	181	48	16	29	77	1935	114	64	1759	241
Arrive On Green	0.12	0.12	0.12	0.03	0.03	0.03	0.04	0.57	0.57	0.04	0.56	0.56
Sat Flow, veh/h	1781	125	1479	1781	610	1068	1781	3410	201	1781	3140	430
Grp Volume(v), veh/h	172	0	103	16	0	11	60	354	365	43	822	847
Grp Sat Flow(s),veh/h/ln	1781	0	1604	1781	0	1678	1781	1777	1834	1781	1777	1793
Q Serve(g_s), s	8.8	0.0	5.6	0.8	0.0	0.6	3.1	10.0	10.0	2.2	35.3	36.8
Cycle Q Clear(g_c), s	8.8	0.0	5.6	0.8	0.0	0.6	3.1	10.0	10.0	2.2	35.3	36.8
Prop In Lane	1.00		0.92	1.00		0.64	1.00		0.11	1.00		0.24
Lane Grp Cap(c), veh/h	217	0	196	48	0	45	77	1008	1041	64	996	1005
V/C Ratio(X)	0.79	0.00	0.53	0.33	0.00	0.24	0.78	0.35	0.35	0.67	0.83	0.84
Avail Cap(c_a), veh/h	349	0	314	687	0	647	101	1008	1041	135	996	1005
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.8	0.0	38.4	44.6	0.0	44.5	44.2	10.9	10.9	44.4	16.8	17.1
Incr Delay (d2), s/veh	6.3	0.0	2.2	4.0	0.0	2.7	24.1	1.0	0.9	11.5	7.8	8.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.0	2.3	0.4	0.0	0.3	1.9	3.9	4.1	1.2	15.2	16.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.2	0.0	40.6	48.6	0.0	47.2	68.3	11.9	11.8	55.9	24.6	25.7
LnGrp LOS	D	A	D	D	A	D	E	B	B	E	C	C
Approach Vol, veh/h		275			27			779			1712	
Approach Delay, s/veh		44.1			48.0			16.2			25.9	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.9	58.4		18.0	8.5	57.7		9.1
Change Period (Y+Rc), s	4.5	* 5.4		* 6.6	4.5	* 5.4		6.6
Max Green Setting (Gmax), s	7.1	* 51		* 18	5.3	* 52		36.0
Max Q Clear Time (g_c+I1), s	4.2	12.0		10.8	5.1	38.8		2.8
Green Ext Time (p_c), s	0.0	5.2		0.6	0.0	9.5		0.1

Intersection Summary			
HCM 6th Ctrl Delay			25.2
HCM 6th LOS			C

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	559	59	744	934	124	14	65	503	105	431	88
Future Volume (veh/h)	42	559	59	744	934	124	14	65	503	105	431	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	46	608	64	809	1015	135	15	71	0	114	468	96
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	60	757	337	680	1336	596	30	1156		101	1075	219
Arrive On Green	0.03	0.21	0.21	0.20	0.38	0.38	0.02	0.33	0.00	0.06	0.37	0.37
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	2940	599
Grp Volume(v), veh/h	46	608	64	809	1015	135	15	71	0	114	282	282
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1762
Q Serve(g_s), s	2.9	18.6	3.8	22.5	28.5	6.6	1.0	1.6	0.0	6.5	13.7	13.8
Cycle Q Clear(g_c), s	2.9	18.6	3.8	22.5	28.5	6.6	1.0	1.6	0.0	6.5	13.7	13.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	60	757	337	680	1336	596	30	1156		101	650	644
V/C Ratio(X)	0.77	0.80	0.19	1.19	0.76	0.23	0.51	0.06		1.13	0.43	0.44
Avail Cap(c_a), veh/h	109	1088	485	680	1576	703	78	1156		101	650	644
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.8	42.7	36.9	45.9	31.2	24.3	55.8	26.6	0.0	53.9	27.3	27.4
Incr Delay (d2), s/veh	18.4	2.9	0.3	99.6	1.8	0.2	12.9	0.1	0.0	127.3	2.1	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	8.4	1.5	19.0	12.4	2.5	0.5	0.7	0.0	6.5	6.2	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.2	45.6	37.2	145.5	33.0	24.5	68.6	26.7	0.0	181.3	29.4	29.6
LnGrp LOS	E	D	D	F	C	C	E	C		F	C	C
Approach Vol, veh/h		718			1959			86	A		678	
Approach Delay, s/veh		46.7			78.9			34.0			55.0	
Approach LOS		D			E			C			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	45.2	27.0	31.1	6.4	49.8	8.3	49.8
Change Period (Y+Rc), s	4.5	8.0	4.5	* 6.8	4.5	* 8	4.5	* 6.8
Max Green Setting (Gmax), s	6.5	37.2	22.5	* 35	5.0	* 39	7.0	* 51
Max Q Clear Time (g_c+I1), s	8.5	3.6	24.5	20.6	3.0	15.8	4.9	30.5
Green Ext Time (p_c), s	0.0	0.4	0.0	3.8	0.0	3.6	0.0	8.0

Intersection Summary	
HCM 6th Ctrl Delay	66.3
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	207	584	332	520	623	34	238	448	436	108	1033	291
Future Volume (veh/h)	207	584	332	520	623	34	238	448	436	108	1033	291
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	225	635	361	565	677	37	259	487	474	117	1123	316
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	273	906	404	513	1111	61	248	1378	850	162	997	277
Arrive On Green	0.08	0.25	0.25	0.15	0.32	0.32	0.07	0.39	0.39	0.05	0.36	0.36
Sat Flow, veh/h	3456	3554	1585	3456	3426	187	3456	3554	1585	3456	2746	764
Grp Volume(v), veh/h	225	635	361	565	351	363	259	487	474	117	722	717
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1837	1728	1777	1585	1728	1777	1733
Q Serve(g_s), s	9.4	23.7	32.1	21.7	24.3	24.4	10.5	14.2	29.0	4.9	53.1	53.1
Cycle Q Clear(g_c), s	9.4	23.7	32.1	21.7	24.3	24.4	10.5	14.2	29.0	4.9	53.1	53.1
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	273	906	404	513	576	595	248	1378	850	162	645	629
V/C Ratio(X)	0.82	0.70	0.89	1.10	0.61	0.61	1.04	0.35	0.56	0.72	1.12	1.14
Avail Cap(c_a), veh/h	333	996	444	513	590	610	248	1378	850	206	645	629
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	66.3	49.4	52.6	62.3	41.6	41.6	67.9	31.8	22.5	68.8	46.6	46.6
Incr Delay (d2), s/veh	12.9	2.0	18.9	70.6	1.8	1.7	69.2	0.7	2.6	8.7	73.2	80.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	10.8	14.9	14.6	11.0	11.4	7.0	6.3	11.4	2.4	36.4	36.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.3	51.4	71.5	132.9	43.4	43.4	137.1	32.5	25.1	77.4	119.8	127.4
LnGrp LOS	E	D	E	F	D	D	F	C	C	E	F	F
Approach Vol, veh/h		1221			1279			1220			1556	
Approach Delay, s/veh		62.5			82.9			51.8			120.1	
Approach LOS		E			F			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	64.2	26.2	44.5	15.0	60.6	16.1	54.6
Change Period (Y+Rc), s	4.5	7.5	4.5	7.2	4.5	7.5	4.5	7.2
Max Green Setting (Gmax), s	8.7	54.9	21.7	41.0	10.5	53.1	14.1	48.6
Max Q Clear Time (g_c+I1), s	6.9	31.0	23.7	34.1	12.5	55.1	11.4	26.4
Green Ext Time (p_c), s	0.1	5.4	0.0	3.1	0.0	0.0	0.2	4.6

Intersection Summary	
HCM 6th Ctrl Delay	82.0
HCM 6th LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	337	234	184	292	70	246	772	294	106	769	83
Future Volume (veh/h)	184	337	234	184	292	70	246	772	294	106	769	83
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	200	366	254	200	317	76	267	839	320	115	836	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	166	457	312	235	754	178	234	1248	765	143	1067	476
Arrive On Green	0.09	0.23	0.23	0.13	0.26	0.26	0.13	0.35	0.35	0.08	0.30	0.30
Sat Flow, veh/h	1781	2019	1380	1781	2852	674	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	200	321	299	200	196	197	267	839	320	115	836	90
Grp Sat Flow(s),veh/h/ln	1781	1777	1622	1781	1777	1749	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	9.4	17.2	17.6	11.0	9.2	9.4	13.2	20.2	13.2	6.4	21.7	4.2
Cycle Q Clear(g_c), s	9.4	17.2	17.6	11.0	9.2	9.4	13.2	20.2	13.2	6.4	21.7	4.2
Prop In Lane	1.00		0.85	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	166	402	367	235	470	463	234	1248	765	143	1067	476
V/C Ratio(X)	1.20	0.80	0.81	0.85	0.42	0.43	1.14	0.67	0.42	0.80	0.78	0.19
Avail Cap(c_a), veh/h	166	565	516	329	724	713	234	1248	765	166	1067	476
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.6	36.8	36.9	42.7	30.6	30.7	43.7	27.7	16.9	45.5	32.2	26.1
Incr Delay (d2), s/veh	134.3	5.5	6.7	14.0	0.6	0.6	102.7	2.9	1.7	21.5	5.8	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.3	8.0	7.5	5.7	4.0	4.0	12.4	8.9	5.0	3.7	10.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	179.9	42.2	43.7	56.8	31.2	31.3	146.4	30.6	18.5	67.0	38.0	27.0
LnGrp LOS	F	D	D	E	C	C	F	C	B	E	D	C
Approach Vol, veh/h		820			593			1426			1041	
Approach Delay, s/veh		76.3			39.8			49.6			40.2	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.6	40.9	17.8	29.4	17.7	35.8	13.9	33.2
Change Period (Y+Rc), s	4.5	* 5.6	4.5	* 6.6	4.5	* 5.6	4.5	* 6.6
Max Green Setting (Gmax), s	9.4	* 34	18.6	* 32	13.2	* 30	9.4	* 41
Max Q Clear Time (g_c+I1), s	8.4	22.2	13.0	19.6	15.2	23.7	11.4	11.4
Green Ext Time (p_c), s	0.0	5.5	0.3	3.2	0.0	3.2	0.0	2.5

Intersection Summary	
HCM 6th Ctrl Delay	51.2
HCM 6th LOS	D

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	153	514	68	13	365	35	83	108	20	30	89	91
Future Volume (veh/h)	153	514	68	13	365	35	83	108	20	30	89	91
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	166	559	74	14	397	38	90	117	22	33	97	99
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	123	741	98	30	598	57	116	672	126	58	760	644
Arrive On Green	0.07	0.23	0.23	0.02	0.18	0.18	0.07	0.44	0.44	0.03	0.41	0.41
Sat Flow, veh/h	1781	3156	417	1781	3279	312	1781	1531	288	1781	1870	1585
Grp Volume(v), veh/h	166	314	319	14	214	221	90	0	139	33	97	99
Grp Sat Flow(s),veh/h/ln	1781	1777	1795	1781	1777	1814	1781	0	1819	1781	1870	1585
Q Serve(g_s), s	5.5	13.1	13.1	0.6	8.9	9.0	4.0	0.0	3.7	1.5	2.6	3.1
Cycle Q Clear(g_c), s	5.5	13.1	13.1	0.6	8.9	9.0	4.0	0.0	3.7	1.5	2.6	3.1
Prop In Lane	1.00		0.23	1.00		0.17	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	123	417	422	30	324	331	116	0	799	58	760	644
V/C Ratio(X)	1.35	0.75	0.76	0.47	0.66	0.67	0.77	0.00	0.17	0.57	0.13	0.15
Avail Cap(c_a), veh/h	123	689	696	132	693	708	235	0	799	148	760	644
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.0	28.3	28.3	38.7	30.2	30.2	36.6	0.0	13.5	37.9	14.8	14.9
Incr Delay (d2), s/veh	200.2	2.8	2.8	11.1	2.3	2.3	10.3	0.0	0.5	8.5	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	5.7	5.8	0.4	3.9	4.0	2.0	0.0	1.5	0.8	1.1	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	237.2	31.0	31.1	49.8	32.5	32.6	46.9	0.0	14.0	46.4	15.1	15.4
LnGrp LOS	F	C	C	D	C	C	D	A	B	D	B	B
Approach Vol, veh/h		799			449			229			229	
Approach Delay, s/veh		73.9			33.1			26.9			19.8	
Approach LOS		E			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	41.7	5.8	24.9	9.7	39.1	10.0	20.7
Change Period (Y+Rc), s	4.5	* 6.8	4.5	* 6.2	4.5	* 6.8	4.5	* 6.2
Max Green Setting (Gmax), s	6.6	* 35	5.9	* 31	10.5	* 31	5.5	* 31
Max Q Clear Time (g_c+I1), s	3.5	5.7	2.6	15.1	6.0	5.1	7.5	11.0
Green Ext Time (p_c), s	0.0	0.8	0.0	3.5	0.1	0.8	0.0	2.5

Intersection Summary	
HCM 6th Ctrl Delay	49.6
HCM 6th LOS	D

Notes

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

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	127	1	254	301	6	173
Future Volume (vph)	127	1	254	301	6	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
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)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	1	276	327	7	188
RTOR Reduction (vph)	0	1	0	127	0	0
Lane Group Flow (vph)	138	0	276	200	7	188
Turn Type	Perm	Perm	NA	Perm	Prot	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2		
Actuated Green, G (s)	8.7	8.7	40.9	40.9	0.9	46.7
Effective Green, g (s)	8.7	8.7	40.9	40.9	0.9	46.7
Actuated g/C Ratio	0.13	0.13	0.61	0.61	0.01	0.70
Clearance Time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	229	205	1137	966	23	1298
v/s Ratio Prot			c0.15		0.00	c0.10
v/s Ratio Perm	c0.08	0.00		0.13		
v/c Ratio	0.60	0.00	0.24	0.21	0.30	0.14
Uniform Delay, d1	27.5	25.4	6.0	5.8	32.7	3.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	0.0	0.5	0.5	7.4	0.2
Delay (s)	31.9	25.4	6.5	6.3	40.1	3.7
Level of Service	C	C	A	A	D	A
Approach Delay (s)	31.9		6.4			5.0
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	67.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	221	8	80	23	6	0	132	1159	30	43	1040	179
Future Volume (veh/h)	221	8	80	23	6	0	132	1159	30	43	1040	179
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	240	9	87	25	7	0	143	1260	33	47	1130	195
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	278	23	227	53	55	0	95	1927	50	65	1601	275
Arrive On Green	0.16	0.16	0.16	0.03	0.03	0.00	0.05	0.54	0.54	0.04	0.53	0.53
Sat Flow, veh/h	1781	151	1457	1781	1870	0	1781	3538	93	1781	3032	521
Grp Volume(v), veh/h	240	0	96	25	7	0	143	633	660	47	660	665
Grp Sat Flow(s),veh/h/ln	1781	0	1608	1781	1870	0	1781	1777	1854	1781	1777	1777
Q Serve(g_s), s	13.0	0.0	5.3	1.4	0.4	0.0	5.3	24.9	25.0	2.6	27.7	28.0
Cycle Q Clear(g_c), s	13.0	0.0	5.3	1.4	0.4	0.0	5.3	24.9	25.0	2.6	27.7	28.0
Prop In Lane	1.00		0.91	1.00		0.00	1.00		0.05	1.00		0.29
Lane Grp Cap(c), veh/h	278	0	251	53	55	0	95	968	1010	65	938	938
V/C Ratio(X)	0.86	0.00	0.38	0.47	0.13	0.00	1.50	0.65	0.65	0.72	0.70	0.71
Avail Cap(c_a), veh/h	329	0	297	647	680	0	95	968	1010	128	938	938
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.8	0.0	37.5	47.3	46.8	0.0	46.9	15.9	15.9	47.2	17.6	17.6
Incr Delay (d2), s/veh	18.3	0.0	1.0	6.5	1.0	0.0	272.1	3.4	3.3	13.8	4.4	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	0.0	2.1	0.7	0.2	0.0	9.5	10.4	10.8	1.4	11.8	11.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.1	0.0	38.5	53.8	47.8	0.0	319.0	19.4	19.2	61.1	22.0	22.2
LnGrp LOS	E	A	D	D	D	A	F	B	B	E	C	C
Approach Vol, veh/h		336			32			1436			1372	
Approach Delay, s/veh		53.2			52.5			49.2			23.4	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.1	59.4		22.0	9.8	57.7		9.5
Change Period (Y+Rc), s	4.5	* 5.4		* 6.6	4.5	* 5.4		6.6
Max Green Setting (Gmax), s	7.1	* 51		* 18	5.3	* 52		36.0
Max Q Clear Time (g_c+I1), s	4.6	27.0		15.0	7.3	30.0		3.4
Green Ext Time (p_c), s	0.0	10.1		0.4	0.0	10.2		0.1

Intersection Summary		
HCM 6th Ctrl Delay		38.5
HCM 6th LOS		D

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	947	92	439	755	123	69	281	828	56	197	59
Future Volume (veh/h)	142	947	92	439	755	123	69	281	828	56	197	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	154	1029	100	477	821	134	75	305	0	61	214	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	102	1019	454	544	1374	613	73	1127		78	869	253
Arrive On Green	0.06	0.29	0.29	0.16	0.39	0.39	0.04	0.32	0.00	0.04	0.32	0.32
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	2714	791
Grp Volume(v), veh/h	154	1029	100	477	821	134	75	305	0	61	138	140
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1728
Q Serve(g_s), s	7.0	35.0	5.9	16.5	22.5	6.9	5.0	7.8	0.0	4.1	7.0	7.3
Cycle Q Clear(g_c), s	7.0	35.0	5.9	16.5	22.5	6.9	5.0	7.8	0.0	4.1	7.0	7.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.46
Lane Grp Cap(c), veh/h	102	1019	454	544	1374	613	73	1127		78	569	553
V/C Ratio(X)	1.51	1.01	0.22	0.88	0.60	0.22	1.03	0.27		0.78	0.24	0.25
Avail Cap(c_a), veh/h	102	1019	454	637	1476	658	73	1127		80	569	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.6	43.6	33.2	50.3	29.9	25.1	58.6	31.1	0.0	57.8	30.6	30.7
Incr Delay (d2), s/veh	272.5	30.7	0.2	11.9	0.6	0.2	113.4	0.6	0.0	37.0	1.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.9	19.6	2.3	8.0	9.7	2.7	4.6	3.5	0.0	2.7	3.2	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	330.1	74.3	33.4	62.2	30.5	25.3	172.0	31.7	0.0	94.8	31.6	31.8
LnGrp LOS	F	F	C	E	C	C	F	C		F	C	C
Approach Vol, veh/h		1283			1432			380	A		339	
Approach Delay, s/veh		101.8			40.5			59.4			43.0	
Approach LOS		F			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	46.7	23.7	41.8	9.5	47.1	11.5	54.0
Change Period (Y+Rc), s	4.5	8.0	4.5	* 6.8	4.5	* 8	4.5	* 6.8
Max Green Setting (Gmax), s	5.5	38.2	22.5	* 35	5.0	* 39	7.0	* 51
Max Q Clear Time (g_c+I1), s	6.1	9.8	18.5	37.0	7.0	9.3	9.0	24.5
Green Ext Time (p_c), s	0.0	2.1	0.7	0.0	0.0	1.7	0.0	6.9

Intersection Summary	
HCM 6th Ctrl Delay	65.8
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	318	793	383	454	642	122	379	854	362	118	690	307
Future Volume (veh/h)	318	793	383	454	642	122	379	854	362	118	690	307
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	346	862	416	493	698	133	412	928	393	128	750	334
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	325	970	433	500	964	184	242	1330	823	172	847	377
Arrive On Green	0.09	0.27	0.27	0.14	0.32	0.32	0.07	0.37	0.37	0.05	0.35	0.35
Sat Flow, veh/h	3456	3554	1585	3456	2978	567	3456	3554	1585	3456	2392	1064
Grp Volume(v), veh/h	346	862	416	493	416	415	412	928	393	128	557	527
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1768	1728	1777	1585	1728	1777	1679
Q Serve(g_s), s	14.1	34.9	38.8	21.3	31.0	31.1	10.5	33.2	23.8	5.5	44.2	44.3
Cycle Q Clear(g_c), s	14.1	34.9	38.8	21.3	31.0	31.1	10.5	33.2	23.8	5.5	44.2	44.3
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		0.63
Lane Grp Cap(c), veh/h	325	970	433	500	575	572	242	1330	823	172	629	595
V/C Ratio(X)	1.06	0.89	0.96	0.99	0.72	0.72	1.70	0.70	0.48	0.74	0.89	0.89
Avail Cap(c_a), veh/h	325	972	433	500	576	573	242	1330	823	201	629	595
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.9	52.3	53.7	64.0	44.8	44.8	69.7	39.7	23.1	70.3	45.6	45.6
Incr Delay (d2), s/veh	68.1	10.1	33.2	36.4	4.5	4.5	333.2	3.1	2.0	11.8	16.7	17.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.3	16.9	19.4	11.9	14.5	14.4	15.9	15.1	9.4	2.7	22.4	21.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	136.0	62.4	87.0	100.4	49.2	49.3	403.0	42.8	25.1	82.1	62.2	63.2
LnGrp LOS	F	E	F	F	D	D	F	D	C	F	E	E
Approach Vol, veh/h		1624			1324			1733			1212	
Approach Delay, s/veh		84.4			68.3			124.4			64.7	
Approach LOS		F			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	63.6	26.2	48.1	15.0	60.6	18.6	55.7
Change Period (Y+Rc), s	4.5	7.5	4.5	7.2	4.5	7.5	4.5	7.2
Max Green Setting (Gmax), s	8.7	54.9	21.7	41.0	10.5	53.1	14.1	48.6
Max Q Clear Time (g_c+I1), s	7.5	35.2	23.3	40.8	12.5	46.3	16.1	33.1
Green Ext Time (p_c), s	0.0	8.2	0.0	0.2	0.0	3.8	0.0	4.8

Intersection Summary	
HCM 6th Ctrl Delay	88.5
HCM 6th LOS	F

Appendix C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	336	234	275	291	141	246	700	340	161	713	83
Future Volume (veh/h)	184	336	234	275	291	141	246	700	340	161	713	83
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	200	365	254	299	316	153	267	761	370	175	775	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	448	307	275	577	273	258	1101	736	206	997	445
Arrive On Green	0.13	0.22	0.22	0.15	0.25	0.25	0.14	0.31	0.31	0.12	0.28	0.28
Sat Flow, veh/h	1781	2017	1382	1781	2340	1108	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	200	321	298	299	238	231	267	761	370	175	775	90
Grp Sat Flow(s),veh/h/ln	1781	1777	1622	1781	1777	1671	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	11.8	18.3	18.7	16.5	12.5	12.9	15.5	20.1	17.5	10.3	21.5	4.6
Cycle Q Clear(g_c), s	11.8	18.3	18.7	16.5	12.5	12.9	15.5	20.1	17.5	10.3	21.5	4.6
Prop In Lane	1.00		0.85	1.00		0.66	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	231	395	360	275	438	412	258	1101	736	206	997	445
V/C Ratio(X)	0.86	0.81	0.83	1.09	0.54	0.56	1.03	0.69	0.50	0.85	0.78	0.20
Avail Cap(c_a), veh/h	281	532	485	275	522	491	258	1101	736	255	997	445
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.6	39.5	39.6	45.2	35.1	35.2	45.7	32.4	20.0	46.4	35.4	29.4
Incr Delay (d2), s/veh	20.3	6.9	8.5	79.8	1.1	1.2	65.2	3.6	2.4	19.5	6.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	8.7	8.2	13.3	5.5	5.4	11.5	9.1	6.8	5.7	10.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.9	46.4	48.2	125.0	36.1	36.4	110.9	36.0	22.5	65.9	41.4	30.4
LnGrp LOS	E	D	D	F	D	D	F	D	C	E	D	C
Approach Vol, veh/h		819			768			1398			1040	
Approach Delay, s/veh		51.8			70.8			46.7			44.5	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.9	38.7	21.0	30.4	20.0	35.6	18.4	33.0
Change Period (Y+Rc), s	4.5	* 5.6	4.5	* 6.6	4.5	* 5.6	4.5	* 6.6
Max Green Setting (Gmax), s	15.3	* 30	16.5	* 32	15.5	* 30	16.9	* 31
Max Q Clear Time (g_c+I1), s	12.3	22.1	18.5	20.7	17.5	23.5	13.8	14.9
Green Ext Time (p_c), s	0.1	4.0	0.0	3.0	0.0	3.0	0.2	2.6

Intersection Summary	
HCM 6th Ctrl Delay	51.8
HCM 6th LOS	D

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	545	66	13	473	35	82	108	20	30	89	146
Future Volume (veh/h)	169	545	66	13	473	35	82	108	20	30	89	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	184	592	72	14	514	38	89	117	22	33	97	159
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	819	99	30	692	51	115	652	123	57	736	624
Arrive On Green	0.07	0.26	0.26	0.02	0.21	0.21	0.06	0.43	0.43	0.03	0.39	0.39
Sat Flow, veh/h	1781	3190	387	1781	3355	247	1781	1531	288	1781	1870	1585
Grp Volume(v), veh/h	184	329	335	14	272	280	89	0	139	33	97	159
Grp Sat Flow(s),veh/h/ln	1781	1777	1801	1781	1777	1826	1781	0	1819	1781	1870	1585
Q Serve(g_s), s	5.5	13.8	13.9	0.6	11.7	11.8	4.0	0.0	3.9	1.5	2.7	5.5
Cycle Q Clear(g_c), s	5.5	13.8	13.9	0.6	11.7	11.8	4.0	0.0	3.9	1.5	2.7	5.5
Prop In Lane	1.00		0.22	1.00		0.14	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	120	456	462	30	367	377	115	0	774	57	736	624
V/C Ratio(X)	1.54	0.72	0.72	0.47	0.74	0.74	0.77	0.00	0.18	0.57	0.13	0.25
Avail Cap(c_a), veh/h	120	668	677	128	672	691	228	0	774	143	736	624
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.2	27.8	27.8	39.9	30.5	30.5	37.7	0.0	14.6	39.1	15.9	16.8
Incr Delay (d2), s/veh	279.8	2.2	2.2	11.2	3.0	2.9	10.5	0.0	0.5	8.8	0.4	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.6	6.0	6.1	0.4	5.2	5.3	2.1	0.0	1.6	0.8	1.2	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	318.1	29.9	30.0	51.1	33.4	33.4	48.2	0.0	15.1	47.9	16.3	17.7
LnGrp LOS	F	C	C	D	C	C	D	A	B	D	B	B
Approach Vol, veh/h		848			566			228			289	
Approach Delay, s/veh		92.5			33.9			28.0			20.7	
Approach LOS		F			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	41.7	5.9	27.2	9.8	39.0	10.0	23.1
Change Period (Y+Rc), s	4.5	* 6.8	4.5	* 6.2	4.5	* 6.8	4.5	* 6.2
Max Green Setting (Gmax), s	6.6	* 35	5.9	* 31	10.5	* 31	5.5	* 31
Max Q Clear Time (g_c+I1), s	3.5	5.9	2.6	15.9	6.0	7.5	7.5	13.8
Green Ext Time (p_c), s	0.0	0.8	0.0	3.6	0.1	1.0	0.0	3.1

Intersection Summary	
HCM 6th Ctrl Delay	56.9
HCM 6th LOS	E

Notes

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

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	1	211	318	6	131
Future Volume (vph)	0	1	211	318	6	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6	6.4	6.4	4.5	6.0
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1583	1863	1583	1770	1863
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1583	1863	1583	1770	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1	229	346	7	142
RTOR Reduction (vph)	0	1	0	88	0	0
Lane Group Flow (vph)	0	0	229	258	7	142
Turn Type	Perm	Perm	NA	Perm	Prot	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2		
Actuated Green, G (s)		1.0	53.6	53.6	0.9	59.4
Effective Green, g (s)		1.0	53.6	53.6	0.9	59.4
Actuated g/C Ratio		0.01	0.74	0.74	0.01	0.82
Clearance Time (s)		5.6	6.4	6.4	4.5	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		21	1386	1178	22	1536
v/s Ratio Prot			0.12		c0.00	0.08
v/s Ratio Perm		c0.00		c0.16		
v/c Ratio		0.00	0.17	0.22	0.32	0.09
Uniform Delay, d1		35.0	2.7	2.8	35.2	1.2
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.0	0.3	0.4	8.2	0.1
Delay (s)		35.0	2.9	3.2	43.4	1.3
Level of Service		D	A	A	D	A
Approach Delay (s)	35.0		3.1			3.3
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	3.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	32.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	268	0	128	0	0	0	159	1216	0	0	1123	206
Future Volume (veh/h)	268	0	128	0	0	0	159	1216	0	0	1123	206
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	291	0	139	0	0	0	173	1322	0	0	1221	224
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	334	0	297	2	2	0	206	2412	0	2	1540	280
Arrive On Green	0.19	0.00	0.19	0.00	0.00	0.00	0.12	0.68	0.00	0.00	0.51	0.51
Sat Flow, veh/h	1781	0	1585	1781	1870	0	1781	3647	0	1781	3002	547
Grp Volume(v), veh/h	291	0	139	0	0	0	173	1322	0	0	719	726
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1781	1870	0	1781	1777	0	1781	1777	1772
Q Serve(g_s), s	14.2	0.0	7.0	0.0	0.0	0.0	8.5	17.1	0.0	0.0	29.7	30.3
Cycle Q Clear(g_c), s	14.2	0.0	7.0	0.0	0.0	0.0	8.5	17.1	0.0	0.0	29.7	30.3
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	1.00		0.31
Lane Grp Cap(c), veh/h	334	0	297	2	2	0	206	2412	0	2	911	909
V/C Ratio(X)	0.87	0.00	0.47	0.00	0.00	0.00	0.84	0.55	0.00	0.00	0.79	0.80
Avail Cap(c_a), veh/h	385	0	343	715	751	0	209	2412	0	99	911	909
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	0.0	32.5	0.0	0.0	0.0	38.8	7.4	0.0	0.0	17.9	18.0
Incr Delay (d2), s/veh	17.4	0.0	1.1	0.0	0.0	0.0	24.8	0.9	0.0	0.0	6.9	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	0.0	2.7	0.0	0.0	0.0	5.1	5.7	0.0	0.0	12.9	13.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.8	0.0	33.6	0.0	0.0	0.0	63.6	8.3	0.0	0.0	24.8	25.3
LnGrp LOS	D	A	C	A	A	A	E	A	A	A	C	C
Approach Vol, veh/h		430			0			1495			1445	
Approach Delay, s/veh		46.6			0.0			14.7			25.0	
Approach LOS		D						B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	66.3		23.4	14.9	51.4		0.0
Change Period (Y+Rc), s	4.5	* 5.4		* 6.6	4.5	* 5.4		6.6
Max Green Setting (Gmax), s	5.0	* 52		* 19	10.5	* 46		36.0
Max Q Clear Time (g_c+I1), s	0.0	19.1		16.2	10.5	32.3		0.0
Green Ext Time (p_c), s	0.0	12.9		0.6	0.0	8.4		0.0

Intersection Summary	
HCM 6th Ctrl Delay	23.2
HCM 6th LOS	C

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	947	92	477	755	83	69	390	876	0	278	59
Future Volume (veh/h)	142	947	92	477	755	83	69	390	876	0	278	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	154	1029	100	518	821	90	75	424	0	0	302	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	181	1033	461	445	1129	504	96	1493		1	962	201
Arrive On Green	0.10	0.29	0.29	0.13	0.32	0.32	0.05	0.42	0.00	0.00	0.33	0.33
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	2926	611
Grp Volume(v), veh/h	154	1029	100	518	821	90	75	424	0	0	182	184
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1760
Q Serve(g_s), s	10.2	34.8	5.7	15.5	24.7	4.9	5.0	9.5	0.0	0.0	9.2	9.4
Cycle Q Clear(g_c), s	10.2	34.8	5.7	15.5	24.7	4.9	5.0	9.5	0.0	0.0	9.2	9.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	181	1033	461	445	1129	504	96	1493		1	585	579
V/C Ratio(X)	0.85	1.00	0.22	1.16	0.73	0.18	0.78	0.28		0.00	0.31	0.32
Avail Cap(c_a), veh/h	216	1033	461	445	1129	504	170	1493		74	585	579
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	53.2	42.6	32.3	52.4	36.4	29.7	56.3	23.0	0.0	0.0	30.2	30.3
Incr Delay (d2), s/veh	23.0	27.0	0.2	96.0	2.4	0.2	12.9	0.5	0.0	0.0	1.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	18.9	2.3	12.6	11.0	1.9	2.6	4.1	0.0	0.0	4.2	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.2	69.6	32.6	148.4	38.8	29.9	69.1	23.5	0.0	0.0	31.6	31.7
LnGrp LOS	E	E	C	F	D	C	E	C		A	C	C
Approach Vol, veh/h		1283			1429			499	A		366	
Approach Delay, s/veh		67.5			78.0			30.3			31.6	
Approach LOS		E			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	0.0	58.6	20.0	41.8	11.0	47.6	16.7	45.1
Change Period (Y+Rc), s	4.5	8.0	4.5	* 6.8	4.5	* 8	4.5	* 6.8
Max Green Setting (Gmax), s	5.0	45.7	15.5	* 35	11.5	* 40	14.6	* 36
Max Q Clear Time (g_c+I1), s	0.0	11.5	17.5	36.8	7.0	11.4	12.2	26.7
Green Ext Time (p_c), s	0.0	3.1	0.0	0.0	0.0	2.3	0.1	4.1

Intersection Summary	
HCM 6th Ctrl Delay	62.8
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	261	849	383	485	673	159	379	796	418	165	658	275
Future Volume (veh/h)	261	849	383	485	673	159	379	796	418	165	658	275
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	284	923	416	527	732	173	412	865	454	179	715	299
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	330	970	433	532	946	223	419	1242	798	226	717	300
Arrive On Green	0.10	0.27	0.27	0.15	0.33	0.33	0.12	0.35	0.35	0.07	0.29	0.29
Sat Flow, veh/h	3456	3554	1585	3456	2852	674	3456	3554	1585	3456	2442	1021
Grp Volume(v), veh/h	284	923	416	527	456	449	412	865	454	179	520	494
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1749	1728	1777	1585	1728	1777	1687
Q Serve(g_s), s	12.1	38.2	38.8	22.8	34.6	34.6	17.8	31.4	29.9	7.7	43.9	43.9
Cycle Q Clear(g_c), s	12.1	38.2	38.8	22.8	34.6	34.6	17.8	31.4	29.9	7.7	43.9	43.9
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	330	970	433	532	589	580	419	1242	798	226	521	495
V/C Ratio(X)	0.86	0.95	0.96	0.99	0.77	0.77	0.98	0.70	0.57	0.79	1.00	1.00
Avail Cap(c_a), veh/h	366	972	433	532	589	580	419	1242	798	283	521	495
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	66.8	53.5	53.7	63.3	45.1	45.1	65.7	41.9	25.9	69.1	52.9	52.9
Incr Delay (d2), s/veh	17.1	18.2	33.2	36.3	6.4	6.5	39.1	3.2	2.9	11.5	38.8	39.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	19.5	19.4	12.7	16.4	16.1	10.2	14.4	12.0	3.8	25.1	24.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.9	71.7	86.9	99.6	51.4	51.5	104.9	45.2	28.8	80.6	91.8	92.9
LnGrp LOS	F	E	F	F	D	D	F	D	C	F	F	F
Approach Vol, veh/h		1623			1432			1731			1193	
Approach Delay, s/veh		77.7			69.2			55.1			90.5	
Approach LOS		E			E			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.3	59.9	27.6	48.1	22.7	51.5	18.8	56.9
Change Period (Y+Rc), s	4.5	7.5	4.5	7.2	4.5	7.5	4.5	7.2
Max Green Setting (Gmax), s	12.3	49.9	23.1	41.0	18.2	44.0	15.9	48.2
Max Q Clear Time (g_c+I1), s	9.7	33.4	24.8	40.8	19.8	45.9	14.1	36.6
Green Ext Time (p_c), s	0.1	7.3	0.0	0.2	0.0	0.0	0.2	4.6

Intersection Summary	
HCM 6th Ctrl Delay	71.7
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	267	276	427	476	139	212	453	153	142	938	112
Future Volume (veh/h)	64	267	276	427	476	139	212	453	153	142	938	112
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	70	290	300	464	517	151	230	492	166	154	1020	122
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	89	369	329	439	1098	319	224	1056	861	179	965	430
Arrive On Green	0.05	0.21	0.21	0.25	0.40	0.40	0.13	0.30	0.30	0.10	0.27	0.27
Sat Flow, veh/h	1781	1777	1585	1781	2716	789	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	70	290	300	464	337	331	230	492	166	154	1020	122
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1728	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	5.6	22.1	26.4	35.2	20.0	20.1	18.0	16.1	7.6	12.2	38.8	8.7
Cycle Q Clear(g_c), s	5.6	22.1	26.4	35.2	20.0	20.1	18.0	16.1	7.6	12.2	38.8	8.7
Prop In Lane	1.00		1.00	1.00		0.46	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	89	369	329	439	718	699	224	1056	861	179	965	430
V/C Ratio(X)	0.79	0.79	0.91	1.06	0.47	0.47	1.02	0.47	0.19	0.86	1.06	0.28
Avail Cap(c_a), veh/h	153	398	355	439	718	699	224	1056	861	267	965	430
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.1	53.6	55.3	53.8	31.3	31.4	62.4	41.0	16.6	63.3	52.0	41.1
Incr Delay (d2), s/veh	14.2	9.4	25.8	58.9	0.5	0.5	66.7	1.5	0.5	16.6	45.3	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	10.9	12.9	22.9	8.7	8.6	12.3	7.4	2.9	6.4	23.3	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.3	62.9	81.1	112.8	31.8	31.9	129.2	42.4	17.1	79.9	97.3	42.7
LnGrp LOS	F	E	F	F	C	C	F	D	B	E	F	D
Approach Vol, veh/h		660			1132			888			1296	
Approach Delay, s/veh		73.1			65.0			60.2			90.1	
Approach LOS		E			E			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.8	48.1	39.7	36.3	22.5	44.4	11.6	64.4
Change Period (Y+Rc), s	4.5	* 5.6	4.5	* 6.6	4.5	* 5.6	4.5	* 6.6
Max Green Setting (Gmax), s	21.4	* 35	35.2	* 32	18.0	* 39	12.3	* 55
Max Q Clear Time (g_c+I1), s	14.2	18.1	37.2	28.4	20.0	40.8	7.6	22.1
Green Ext Time (p_c), s	0.2	3.6	0.0	1.3	0.0	0.0	0.0	4.7

Intersection Summary	
HCM 6th Ctrl Delay	73.5
HCM 6th LOS	E

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	454	95	30	663	23	98	36	16	44	181	196
Future Volume (veh/h)	87	454	95	30	663	23	98	36	16	44	181	196
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	95	493	103	33	721	25	107	39	17	48	197	213
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	121	859	179	56	899	31	135	480	209	70	658	557
Arrive On Green	0.07	0.29	0.29	0.03	0.26	0.26	0.08	0.39	0.39	0.04	0.35	0.35
Sat Flow, veh/h	1781	2929	609	1781	3504	121	1781	1235	538	1781	1870	1585
Grp Volume(v), veh/h	95	298	298	33	366	380	107	0	56	48	197	213
Grp Sat Flow(s),veh/h/ln	1781	1777	1761	1781	1777	1848	1781	0	1773	1781	1870	1585
Q Serve(g_s), s	4.7	12.6	12.8	1.6	17.1	17.1	5.2	0.0	1.8	2.4	6.8	8.9
Cycle Q Clear(g_c), s	4.7	12.6	12.8	1.6	17.1	17.1	5.2	0.0	1.8	2.4	6.8	8.9
Prop In Lane	1.00		0.35	1.00		0.07	1.00		0.30	1.00		1.00
Lane Grp Cap(c), veh/h	121	521	516	56	456	474	135	0	689	70	658	557
V/C Ratio(X)	0.78	0.57	0.58	0.59	0.80	0.80	0.79	0.00	0.08	0.69	0.30	0.38
Avail Cap(c_a), veh/h	150	652	646	122	620	645	171	0	689	100	658	557
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.7	26.6	26.7	42.4	30.9	30.9	40.3	0.0	17.1	42.1	20.9	21.6
Incr Delay (d2), s/veh	19.1	1.0	1.0	9.6	5.4	5.2	17.5	0.0	0.2	11.5	1.2	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	5.4	5.4	0.9	7.8	8.1	2.9	0.0	0.7	1.2	3.1	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.8	27.6	27.7	52.0	36.2	36.1	57.9	0.0	17.4	53.6	22.0	23.5
LnGrp LOS	E	C	C	D	D	D	E	A	B	D	C	C
Approach Vol, veh/h		691			779			163			458	
Approach Delay, s/veh		32.1			36.8			44.0			26.0	
Approach LOS		C			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	41.3	7.3	32.2	11.3	38.0	10.5	29.0
Change Period (Y+Rc), s	4.5	* 6.8	4.5	* 6.2	4.5	* 6.8	4.5	* 6.2
Max Green Setting (Gmax), s	5.0	* 35	6.1	* 33	8.5	* 31	7.5	* 31
Max Q Clear Time (g_c+I1), s	4.4	3.8	3.6	14.8	7.2	10.9	6.7	19.1
Green Ext Time (p_c), s	0.0	0.3	0.0	3.5	0.0	1.8	0.0	3.7

Intersection Summary	
HCM 6th Ctrl Delay	33.5
HCM 6th LOS	C

Notes

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

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	196	5	102	58	1	313
Future Volume (vph)	196	5	102	58	1	313
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
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)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	213	5	111	63	1	340
RTOR Reduction (vph)	0	4	0	28	0	0
Lane Group Flow (vph)	213	1	111	35	1	340
Turn Type	Perm	Perm	NA	Perm	Prot	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2		
Actuated Green, G (s)	12.9	12.9	38.0	38.0	0.9	43.8
Effective Green, g (s)	12.9	12.9	38.0	38.0	0.9	43.8
Actuated g/C Ratio	0.19	0.19	0.56	0.56	0.01	0.64
Clearance Time (s)	5.6	5.6	6.4	6.4	4.5	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	334	298	1036	880	23	1194
v/s Ratio Prot			0.06		0.00	c0.18
v/s Ratio Perm	c0.12	0.00		0.02		
v/c Ratio	0.64	0.00	0.11	0.04	0.04	0.28
Uniform Delay, d1	25.5	22.5	7.1	6.9	33.3	5.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.0	0.0	0.2	0.1	0.8	0.6
Delay (s)	29.5	22.5	7.4	7.0	34.1	6.0
Level of Service	C	C	A	A	C	A
Approach Delay (s)	29.3		7.2			6.1
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	68.3	Sum of lost time (s)	16.5
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	0	135	0	0	0	135	656	0	0	1413	214
Future Volume (veh/h)	205	0	135	0	0	0	135	656	0	0	1413	214
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	223	0	147	0	0	0	147	713	0	0	1536	233
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	272	0	242	2	2	0	172	2526	0	2	1745	260
Arrive On Green	0.15	0.00	0.15	0.00	0.00	0.00	0.10	0.71	0.00	0.00	0.56	0.56
Sat Flow, veh/h	1781	0	1585	1781	1870	0	1781	3647	0	1781	3102	462
Grp Volume(v), veh/h	223	0	147	0	0	0	147	713	0	0	869	900
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1781	1870	0	1781	1777	0	1781	1777	1787
Q Serve(g_s), s	10.6	0.0	7.6	0.0	0.0	0.0	7.1	6.4	0.0	0.0	36.7	39.0
Cycle Q Clear(g_c), s	10.6	0.0	7.6	0.0	0.0	0.0	7.1	6.4	0.0	0.0	36.7	39.0
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	1.00		0.26
Lane Grp Cap(c), veh/h	272	0	242	2	2	0	172	2526	0	2	1000	1006
V/C Ratio(X)	0.82	0.00	0.61	0.00	0.00	0.00	0.85	0.28	0.00	0.00	0.87	0.90
Avail Cap(c_a), veh/h	365	0	325	730	767	0	172	2526	0	101	1000	1006
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	36.0	0.0	34.7	0.0	0.0	0.0	39.0	4.6	0.0	0.0	16.4	16.9
Incr Delay (d2), s/veh	10.4	0.0	2.5	0.0	0.0	0.0	31.4	0.3	0.0	0.0	10.2	12.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.0	3.0	0.0	0.0	0.0	4.6	2.0	0.0	0.0	16.1	17.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.5	0.0	37.2	0.0	0.0	0.0	70.5	4.9	0.0	0.0	26.6	29.1
LnGrp LOS	D	A	D	A	A	A	E	A	A	A	C	C
Approach Vol, veh/h		370			0			860			1769	
Approach Delay, s/veh		42.8			0.0			16.1			27.9	
Approach LOS		D						B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	67.8		20.0	13.0	54.8		0.0
Change Period (Y+Rc), s	4.5	* 5.4		* 6.6	4.5	* 5.4		6.6
Max Green Setting (Gmax), s	5.0	* 54		* 18	8.5	* 49		36.0
Max Q Clear Time (g_c+I1), s	0.0	8.4		12.6	9.1	41.0		0.0
Green Ext Time (p_c), s	0.0	5.9		0.8	0.0	6.7		0.0

Intersection Summary	
HCM 6th Ctrl Delay	26.3
HCM 6th LOS	C

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	559	59	780	934	88	14	178	551	24	495	88
Future Volume (veh/h)	42	559	59	780	934	88	14	178	551	24	495	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	46	608	64	848	1015	96	15	193	0	26	538	96
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	61	762	340	758	1420	633	30	1168		44	1015	180
Arrive On Green	0.03	0.21	0.21	0.22	0.40	0.40	0.02	0.33	0.00	0.02	0.34	0.34
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	3015	536
Grp Volume(v), veh/h	46	608	64	848	1015	96	15	193	0	26	316	318
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1774
Q Serve(g_s), s	2.9	18.1	3.7	24.5	26.8	4.3	0.9	4.3	0.0	1.6	16.0	16.2
Cycle Q Clear(g_c), s	2.9	18.1	3.7	24.5	26.8	4.3	0.9	4.3	0.0	1.6	16.0	16.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.30
Lane Grp Cap(c), veh/h	61	762	340	758	1420	633	30	1168		44	598	597
V/C Ratio(X)	0.76	0.80	0.19	1.12	0.71	0.15	0.51	0.17		0.59	0.53	0.53
Avail Cap(c_a), veh/h	140	1113	497	758	1619	722	80	1168		80	598	597
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.5	41.6	35.9	43.6	28.2	21.4	54.5	26.6	0.0	53.9	29.9	29.9
Incr Delay (d2), s/veh	17.4	2.6	0.3	70.5	1.3	0.1	12.7	0.3	0.0	11.9	3.3	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	8.2	1.5	17.8	11.4	1.6	0.5	1.9	0.0	0.9	7.4	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.9	44.2	36.2	114.1	29.5	21.5	67.1	26.9	0.0	65.8	33.2	33.3
LnGrp LOS	E	D	D	F	C	C	E	C		E	C	C
Approach Vol, veh/h		718			1959			208	A		660	
Approach Delay, s/veh		45.2			65.7			29.8			34.5	
Approach LOS		D			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.3	44.7	29.0	30.7	6.4	45.6	8.3	51.4
Change Period (Y+Rc), s	4.5	8.0	4.5	* 6.8	4.5	* 8	4.5	* 6.8
Max Green Setting (Gmax), s	5.0	36.7	24.5	* 35	5.0	* 37	8.8	* 51
Max Q Clear Time (g_c+I1), s	3.6	6.3	26.5	20.1	2.9	18.2	4.9	28.8
Green Ext Time (p_c), s	0.0	1.2	0.0	3.8	0.0	3.8	0.0	8.1

Intersection Summary	
HCM 6th Ctrl Delay	53.6
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	641	332	552	655	66	238	390	494	156	1001	259
Future Volume (veh/h)	150	641	332	552	655	66	238	390	494	156	1001	259
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	163	697	361	600	712	72	259	424	537	170	1088	282
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	211	910	406	507	1113	112	248	1323	823	218	1018	262
Arrive On Green	0.06	0.26	0.26	0.15	0.34	0.34	0.07	0.37	0.37	0.06	0.36	0.36
Sat Flow, veh/h	3456	3554	1585	3456	3259	329	3456	3554	1585	3456	2798	720
Grp Volume(v), veh/h	163	697	361	600	388	396	259	424	537	170	688	682
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1811	1728	1777	1585	1728	1777	1741
Q Serve(g_s), s	6.8	26.6	32.1	21.5	26.9	27.0	10.5	12.5	36.1	7.1	53.3	53.3
Cycle Q Clear(g_c), s	6.8	26.6	32.1	21.5	26.9	27.0	10.5	12.5	36.1	7.1	53.3	53.3
Prop In Lane	1.00		1.00	1.00		0.18	1.00		1.00	1.00		0.41
Lane Grp Cap(c), veh/h	211	910	406	507	607	619	248	1323	823	218	646	633
V/C Ratio(X)	0.77	0.77	0.89	1.18	0.64	0.64	1.05	0.32	0.65	0.78	1.06	1.08
Avail Cap(c_a), veh/h	295	995	444	507	607	619	248	1323	823	300	646	633
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.8	50.4	52.5	62.5	40.6	40.6	68.0	32.8	25.6	67.6	46.6	46.6
Incr Delay (d2), s/veh	8.0	3.3	18.5	101.1	2.3	2.2	69.7	0.6	4.0	8.6	53.8	58.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	12.3	14.9	16.6	12.2	12.5	7.1	5.6	14.5	3.4	33.1	33.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.7	53.8	71.0	163.6	42.9	42.9	137.7	33.4	29.6	76.2	100.4	104.8
LnGrp LOS	E	D	E	F	D	D	F	C	C	E	F	F
Approach Vol, veh/h		1221			1384			1220			1540	
Approach Delay, s/veh		61.8			95.2			53.9			99.7	
Approach LOS		E			F			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.8	62.0	26.0	44.7	15.0	60.8	13.5	57.2
Change Period (Y+Rc), s	4.5	7.5	4.5	7.2	4.5	7.5	4.5	7.2
Max Green Setting (Gmax), s	12.7	51.1	21.5	41.0	10.5	53.3	12.5	50.0
Max Q Clear Time (g_c+I1), s	9.1	38.1	23.5	34.1	12.5	55.3	8.8	29.0
Green Ext Time (p_c), s	0.2	4.2	0.0	3.4	0.0	0.0	0.2	5.1

Intersection Summary	
HCM 6th Ctrl Delay	79.5
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	337	234	275	292	142	246	700	341	162	713	83
Future Volume (veh/h)	184	337	234	275	292	142	246	700	341	162	713	83
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	200	366	254	299	317	154	267	761	371	176	775	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	449	307	275	576	274	258	1099	734	207	996	444
Arrive On Green	0.13	0.22	0.22	0.15	0.25	0.25	0.14	0.31	0.31	0.12	0.28	0.28
Sat Flow, veh/h	1781	2019	1380	1781	2337	1111	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	200	321	299	299	239	232	267	761	371	176	775	90
Grp Sat Flow(s),veh/h/ln	1781	1777	1622	1781	1777	1670	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	11.8	18.4	18.8	16.5	12.5	13.0	15.5	20.1	17.5	10.4	21.5	4.6
Cycle Q Clear(g_c), s	11.8	18.4	18.8	16.5	12.5	13.0	15.5	20.1	17.5	10.4	21.5	4.6
Prop In Lane	1.00		0.85	1.00		0.66	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	231	395	361	275	438	412	258	1099	734	207	996	444
V/C Ratio(X)	0.86	0.81	0.83	1.09	0.55	0.56	1.03	0.69	0.51	0.85	0.78	0.20
Avail Cap(c_a), veh/h	281	531	485	275	521	490	258	1099	734	255	996	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.6	39.5	39.6	45.2	35.1	35.2	45.7	32.5	20.1	46.4	35.4	29.4
Incr Delay (d2), s/veh	20.3	7.0	8.6	79.9	1.1	1.2	65.3	3.6	2.5	19.7	6.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	8.7	8.3	13.3	5.5	5.4	11.5	9.1	6.8	5.7	10.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.9	46.5	48.2	125.2	36.1	36.5	111.1	36.1	22.6	66.1	41.4	30.4
LnGrp LOS	E	D	D	F	D	D	F	D	C	E	D	C
Approach Vol, veh/h		820			770			1399			1041	
Approach Delay, s/veh		51.9			70.8			46.8			44.6	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.9	38.7	21.0	30.4	20.0	35.6	18.4	33.0
Change Period (Y+Rc), s	4.5	* 5.6	4.5	* 6.6	4.5	* 5.6	4.5	* 6.6
Max Green Setting (Gmax), s	15.3	* 30	16.5	* 32	15.5	* 30	16.9	* 31
Max Q Clear Time (g_c+I1), s	12.4	22.1	18.5	20.8	17.5	23.5	13.8	15.0
Green Ext Time (p_c), s	0.1	4.0	0.0	3.0	0.0	3.0	0.2	2.6

Intersection Summary	
HCM 6th Ctrl Delay	51.9
HCM 6th LOS	D

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	545	68	13	473	35	83	108	20	30	89	146
Future Volume (veh/h)	169	545	68	13	473	35	83	108	20	30	89	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	184	592	74	14	514	38	90	117	22	33	97	159
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	816	102	30	692	51	116	652	123	57	735	623
Arrive On Green	0.07	0.26	0.26	0.02	0.21	0.21	0.07	0.43	0.43	0.03	0.39	0.39
Sat Flow, veh/h	1781	3179	397	1781	3355	247	1781	1531	288	1781	1870	1585
Grp Volume(v), veh/h	184	330	336	14	272	280	90	0	139	33	97	159
Grp Sat Flow(s),veh/h/ln	1781	1777	1799	1781	1777	1826	1781	0	1819	1781	1870	1585
Q Serve(g_s), s	5.5	13.9	14.0	0.6	11.7	11.8	4.1	0.0	3.9	1.5	2.7	5.5
Cycle Q Clear(g_c), s	5.5	13.9	14.0	0.6	11.7	11.8	4.1	0.0	3.9	1.5	2.7	5.5
Prop In Lane	1.00		0.22	1.00		0.14	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	120	456	462	30	367	377	116	0	774	57	735	623
V/C Ratio(X)	1.54	0.72	0.73	0.47	0.74	0.74	0.77	0.00	0.18	0.57	0.13	0.26
Avail Cap(c_a), veh/h	120	668	676	128	672	691	228	0	774	143	735	623
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.2	27.8	27.8	39.9	30.5	30.5	37.7	0.0	14.6	39.1	15.9	16.8
Incr Delay (d2), s/veh	279.8	2.2	2.2	11.2	3.0	2.9	10.4	0.0	0.5	8.8	0.4	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.6	6.0	6.1	0.4	5.2	5.3	2.1	0.0	1.6	0.8	1.2	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	318.1	30.0	30.0	51.1	33.4	33.4	48.1	0.0	15.1	47.9	16.3	17.8
LnGrp LOS	F	C	C	D	C	C	D	A	B	D	B	B
Approach Vol, veh/h		850			566			229			289	
Approach Delay, s/veh		92.4			33.9			28.1			20.7	
Approach LOS		F			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	41.7	5.9	27.2	9.8	39.0	10.0	23.1
Change Period (Y+Rc), s	4.5	* 6.8	4.5	* 6.2	4.5	* 6.8	4.5	* 6.2
Max Green Setting (Gmax), s	6.6	* 35	5.9	* 31	10.5	* 31	5.5	* 31
Max Q Clear Time (g_c+I1), s	3.5	5.9	2.6	16.0	6.1	7.5	7.5	13.8
Green Ext Time (p_c), s	0.0	0.8	0.0	3.6	0.1	1.0	0.0	3.1

Intersection Summary	
HCM 6th Ctrl Delay	56.9
HCM 6th LOS	E

Notes

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

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	1	212	319	6	133
Future Volume (vph)	0	1	212	319	6	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6	6.4	6.4	4.5	6.0
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1583	1863	1583	1770	1863
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1583	1863	1583	1770	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1	230	347	7	145
RTOR Reduction (vph)	0	1	0	89	0	0
Lane Group Flow (vph)	0	0	230	258	7	145
Turn Type	Perm	Perm	NA	Perm	Prot	NA
Protected Phases			2		1	6
Permitted Phases	8	8		2		
Actuated Green, G (s)		1.0	53.6	53.6	0.9	59.4
Effective Green, g (s)		1.0	53.6	53.6	0.9	59.4
Actuated g/C Ratio		0.01	0.74	0.74	0.01	0.82
Clearance Time (s)		5.6	6.4	6.4	4.5	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		21	1386	1178	22	1536
v/s Ratio Prot			0.12		c0.00	0.08
v/s Ratio Perm		c0.00		c0.16		
v/c Ratio		0.00	0.17	0.22	0.32	0.09
Uniform Delay, d1		35.0	2.7	2.8	35.2	1.2
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.0	0.3	0.4	8.2	0.1
Delay (s)		35.0	2.9	3.2	43.4	1.3
Level of Service		D	A	A	D	A
Approach Delay (s)	35.0		3.1			3.3
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	3.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	268	0	128	0	0	0	159	1216	0	0	1124	206
Future Volume (veh/h)	268	0	128	0	0	0	159	1216	0	0	1124	206
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	291	0	139	0	0	0	173	1322	0	0	1222	224
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	334	0	297	2	2	0	206	2412	0	2	1540	280
Arrive On Green	0.19	0.00	0.19	0.00	0.00	0.00	0.12	0.68	0.00	0.00	0.51	0.51
Sat Flow, veh/h	1781	0	1585	1781	1870	0	1781	3647	0	1781	3003	546
Grp Volume(v), veh/h	291	0	139	0	0	0	173	1322	0	0	719	727
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1781	1870	0	1781	1777	0	1781	1777	1772
Q Serve(g_s), s	14.2	0.0	7.0	0.0	0.0	0.0	8.5	17.1	0.0	0.0	29.7	30.4
Cycle Q Clear(g_c), s	14.2	0.0	7.0	0.0	0.0	0.0	8.5	17.1	0.0	0.0	29.7	30.4
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	1.00		0.31
Lane Grp Cap(c), veh/h	334	0	297	2	2	0	206	2412	0	2	911	909
V/C Ratio(X)	0.87	0.00	0.47	0.00	0.00	0.00	0.84	0.55	0.00	0.00	0.79	0.80
Avail Cap(c_a), veh/h	385	0	343	715	751	0	209	2412	0	99	911	909
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	0.0	32.5	0.0	0.0	0.0	38.8	7.4	0.0	0.0	17.9	18.0
Incr Delay (d2), s/veh	17.4	0.0	1.1	0.0	0.0	0.0	24.8	0.9	0.0	0.0	6.9	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	0.0	2.7	0.0	0.0	0.0	5.1	5.7	0.0	0.0	13.0	13.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.8	0.0	33.6	0.0	0.0	0.0	63.6	8.3	0.0	0.0	24.8	25.3
LnGrp LOS	D	A	C	A	A	A	E	A	A	A	C	C
Approach Vol, veh/h		430			0			1495			1446	
Approach Delay, s/veh		46.6			0.0			14.7			25.1	
Approach LOS		D						B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	66.3		23.4	14.9	51.4		0.0
Change Period (Y+Rc), s	4.5	* 5.4		* 6.6	4.5	* 5.4		6.6
Max Green Setting (Gmax), s	5.0	* 52		* 19	10.5	* 46		36.0
Max Q Clear Time (g_c+I1), s	0.0	19.1		16.2	10.5	32.4		0.0
Green Ext Time (p_c), s	0.0	12.9		0.6	0.0	8.3		0.0

Intersection Summary		
HCM 6th Ctrl Delay		23.2
HCM 6th LOS		C

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	947	92	477	755	85	69	394	876	0	281	59
Future Volume (veh/h)	142	947	92	477	755	85	69	394	876	0	281	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	154	1029	100	518	821	92	75	428	0	0	305	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	181	1039	463	439	1129	504	96	1493		1	964	200
Arrive On Green	0.10	0.29	0.29	0.13	0.32	0.32	0.05	0.42	0.00	0.00	0.33	0.33
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	2931	607
Grp Volume(v), veh/h	154	1029	100	518	821	92	75	428	0	0	183	186
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1761
Q Serve(g_s), s	10.2	34.7	5.7	15.3	24.7	5.1	5.0	9.6	0.0	0.0	9.3	9.5
Cycle Q Clear(g_c), s	10.2	34.7	5.7	15.3	24.7	5.1	5.0	9.6	0.0	0.0	9.3	9.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	181	1039	463	439	1129	504	96	1493		1	585	579
V/C Ratio(X)	0.85	0.99	0.22	1.18	0.73	0.18	0.78	0.29		0.00	0.31	0.32
Avail Cap(c_a), veh/h	216	1039	463	439	1129	504	170	1493		74	585	579
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	53.2	42.4	32.2	52.5	36.4	29.7	56.3	23.0	0.0	0.0	30.2	30.3
Incr Delay (d2), s/veh	23.0	25.5	0.2	102.0	2.4	0.2	12.9	0.5	0.0	0.0	1.4	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	18.7	2.2	12.8	11.0	2.0	2.6	4.1	0.0	0.0	4.2	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.2	67.9	32.4	154.6	38.8	29.9	69.1	23.5	0.0	0.0	31.6	31.8
LnGrp LOS	E	E	C	F	D	C	E	C		A	C	C
Approach Vol, veh/h		1283			1431			503	A		369	
Approach Delay, s/veh		66.1			80.1			30.3			31.7	
Approach LOS		E			F			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	0.0	58.6	19.8	42.0	11.0	47.6	16.7	45.1
Change Period (Y+Rc), s	4.5	8.0	4.5	* 6.8	4.5	* 8	4.5	* 6.8
Max Green Setting (Gmax), s	5.0	45.7	15.3	* 35	11.5	* 40	14.6	* 36
Max Q Clear Time (g_c+I1), s	0.0	11.6	17.3	36.7	7.0	11.5	12.2	26.7
Green Ext Time (p_c), s	0.0	3.1	0.0	0.0	0.0	2.3	0.1	4.1

Intersection Summary	
HCM 6th Ctrl Delay	63.1
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	261	850	383	486	674	160	379	796	420	166	658	275
Future Volume (veh/h)	261	850	383	486	674	160	379	796	420	166	658	275
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	284	924	416	528	733	174	412	865	457	180	715	299
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	330	970	433	532	945	224	419	1241	798	227	717	300
Arrive On Green	0.10	0.27	0.27	0.15	0.33	0.33	0.12	0.35	0.35	0.07	0.29	0.29
Sat Flow, veh/h	3456	3554	1585	3456	2849	676	3456	3554	1585	3456	2442	1021
Grp Volume(v), veh/h	284	924	416	528	457	450	412	865	457	180	520	494
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1749	1728	1777	1585	1728	1777	1687
Q Serve(g_s), s	12.1	38.3	38.8	22.9	34.7	34.7	17.8	31.4	30.2	7.7	43.9	43.9
Cycle Q Clear(g_c), s	12.1	38.3	38.8	22.9	34.7	34.7	17.8	31.4	30.2	7.7	43.9	43.9
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	330	970	433	532	589	580	419	1241	798	227	521	495
V/C Ratio(X)	0.86	0.95	0.96	0.99	0.78	0.78	0.98	0.70	0.57	0.79	1.00	1.00
Avail Cap(c_a), veh/h	366	972	433	532	589	580	419	1241	798	283	521	495
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	66.8	53.5	53.7	63.3	45.1	45.1	65.7	42.0	26.0	69.1	52.9	52.9
Incr Delay (d2), s/veh	17.1	18.4	33.2	36.8	6.4	6.6	39.1	3.3	3.0	11.7	38.8	39.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	19.6	19.4	12.8	16.4	16.2	10.2	14.4	12.1	3.8	25.1	24.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.9	71.9	86.9	100.1	51.5	51.7	104.9	45.2	29.0	80.7	91.8	92.9
LnGrp LOS	F	E	F	F	D	D	F	D	C	F	F	F
Approach Vol, veh/h		1624			1435			1734			1194	
Approach Delay, s/veh		77.9			69.5			55.1			90.6	
Approach LOS		E			E			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.3	59.9	27.6	48.1	22.7	51.5	18.8	56.9
Change Period (Y+Rc), s	4.5	7.5	4.5	7.2	4.5	7.5	4.5	7.2
Max Green Setting (Gmax), s	12.3	49.9	23.1	41.0	18.2	44.0	15.9	48.2
Max Q Clear Time (g_c+I1), s	9.7	33.4	24.9	40.8	19.8	45.9	14.1	36.7
Green Ext Time (p_c), s	0.1	7.3	0.0	0.2	0.0	0.0	0.2	4.6

Intersection Summary	
HCM 6th Ctrl Delay	71.8
HCM 6th LOS	E