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February 15, 2013

VIA EMAIL

Ms. Felicia Miller, Siting Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Re: Huntington Beach Energy Project (12-AFC-02)
Applicant's Supplemental Responses to Data Requests, Set 2 (Water Resources #80-83 and Traffic and Transportation #92-94)

Dear Ms. Miller:

On behalf of Applicant AES Southland Development, LLC, please find enclosed herewith Applicant's responses to Staff's Data Requests, Set 2. Specifically, these responses related solely to data requests regarding Water Resources and Traffic and Transportation (#80-83 and #92-94, respectively).

Should you have any questions regarding these responses, please contact Robert Mason or me directly.

Respectfully submitted,

Melissa A. Foster

MAF:jmw
Enclosure
cc: Proof of Service

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION FOR THE HUNTINGTON BEACH ENERGY PROJECT

Docket No. 12-AFC-02

PROOF OF SERVICE
(Revised 02/11/2013)

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OTHER ENERGY COMMISSION PARTICIPANTS (LISTED FOR CONVENIENCE ONLY):

After docketing, the Docket Unit will provide a copy to the persons listed below. Do not send copies of documents to these persons unless specifically directed to do so.

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Adviser to Commissioner McAllister

Patrick Saxton
Adviser to Commissioner McAllister

Galen Lemei
Adviser to Commissioner Douglas

Jennifer Nelson
Adviser to Commissioner Douglas

Eileen Allen
Commissioners' Technical
Adviser for Facility Siting

DECLARATION OF SERVICE

I, Judith M. Warmuth, declare that on February 15, 2013, I served and filed copies of the attached Applicant's Supplemental Responses to Data Requests, Set 2 (Water Resources #80-83 and Traffic and Transportation #92-94) dated February 15, 2013. This document is accompanied by the most recent Proof of Service, which I copied from the web page for this project at:
http://www.energy.ca.gov/sitingcases/huntington_beach_energy/index.html.

The document has been sent to the other parties on the Service List above in the following manner:

(C*heck one*)

For service to all other parties and filing with the Docket Unit at the Energy Commission:

_X_ I e-mailed the document to all e-mail addresses on the Service List above and personally delivered it or deposited it in the US mail with first class postage to those parties noted above as "hard copy required"; **OR**

____ Instead of e-mailing the document, I personally delivered it or deposited it in the US mail with first class postage to all of the persons on the Service List for whom a mailing address is given.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that I am over the age of 18 years.

Dated: February 15, 2013

Judith M. Warmuth

Huntington Beach Energy Project

(12-AFC-02)

Data Responses, Set 2

(80–83; 92–94)

Submitted to

California Energy Commission

Prepared by

AES Southland Development, LLC

With Assistance from

CH2MHILL®

2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

February 15, 2013

Contents

Tables

Attachment

Introduction

Attached are AES Southland Development, LLC's (AES or the Applicant) responses to the California Energy Commission (CEC) Data Request, Set 2 (Water Resources DRs 80 to 83 and Traffic and Transportation 92 to 94). The Applicant previously submitted data responses to the remaining Data Requests in the CEC Data Requests, Set 2, on January 22, 2013.

The responses are grouped by individual discipline or topic area. Within each discipline area, the responses are presented in the same order as the CEC presented them and are keyed to the Data Request numbers (Water Resources Data Requests 80 to 83, and Traffic and Transportation Data Requests 92 to 94).

New or revised graphics or tables are numbered in reference to the Data Request number. For example, the first table used in response to Data Request 80 would be numbered Table DR80-1. The first figure used in response to Data Request 82 would be Figure DR82-1, and so on. Figures or tables from the HBEP AFC that have been revised have "R1" following the original number, indicating revision 1.

Additional tables, figures, or documents submitted in response to a data request (for example, supporting data, stand-alone documents such as plans, folding graphics, etc.) are found at the end of each discipline-specific section and are not sequentially page-numbered consistently with the remainder of the document, though they may have their own internal page numbering system.

Soil and Water Resources (80–83)

BACKGROUND

Section 5.14.1.2.2 states that "wastewater generated during HBEP construction will include…water from excavation dewatering during construction (if dewatering is required). Depending on the chemical quality of these wastewaters, they could be classified as hazardous or nonhazardous."

The Phase I ESA states that "Groundwater underlying the site is known to be impacted by metals, VOCs and 1,4-dioxane. Groundwater is monitored as part of on-going subsurface investigations regarding former Southern California Edison operations at the site including former operation of waste-water retention basins. These investigations are currently overseen by the Department of Toxic Substances Control. The presence of groundwater contamination represents a *Recognized Environmental Condition* in connection with the site."

Staff is concerned that pumping of contaminated groundwater could result in significant impacts to on and offsite water resources or sensitive environmental receptors. The applicant did not provide a discussion of how contaminated groundwater would be discharged, what volumes may be expected, and how hazardous it could be to the environment.

DATA REQUEST

80. Please provide an estimate of the range of dewatering volumes necessary during demolition or construction of the proposed HBEP.

Response: To provide a meaningful estimate of the range of dewatering volume that could potentially be generated, if any, during demolition of the existing Huntington Beach Generating Station facilities and during construction of HBEP requires detailed site-specific geotechnical information, detailed engineering and design, and specific details of construction methods. Such detailed analyses will be developed by the selected Engineering, Procurement and Construction (EPC) firm for HBEP that the Applicant will select post-licensing. Therefore, it is not feasible at this time to provide an estimated range of dewater volume, if any, that could potentially be generated by the project.

Based on the geotechnical analysis, the EPC will determine site-specific construction techniques and, as applicable/necessary, the EPC would develop a demolition and construction dewatering plan for HBEP. The dewatering plan will include appropriate best management practices (BMPs) for the management of water generated during dewatering. As noted in response to BIO-32 docketed on November 2, 2012, if dewatering is determined to be required, a dewatering plan would be prepared, and, if requested, would be submitted to the CEC Construction Compliance Manager (CPM).

DATA REQUEST

81. Please provide information showing what the estimated hazardous chemical concentrations would be in the groundwater generated from dewatering.

Response: As discussed in response to DR 80, the potential for dewatering during demolition and construction of HBEP has not been determined at this stage of the project. If dewatering is required, an evaluation of the potential, if any, for groundwater to contain contaminants would be included in a dewatering plan prepared by the EPC, and appropriate BMPs of such water would be included in the plan, and, if requested, would be submitted to the CEC CPM. See also responses to DR 84 through DR 86 provided on January 22, 2013.

DATA REQUEST

82. Please discuss whether the groundwater dewatering could result in movement of contaminated groundwater offsite and impact groundwater quality or other sensitive receptors such as salt marsh habitat.

Response: As discussed in response to DR 32 (HBEP Data Response Set 1A, November 2, 2012), because of the relatively small excavation areas and the short amount of time when some of the excavated area may require dewatering, it is unlikely that dewatering, if required, would generate either a large quantity of water or a high rate of water withdrawals. For this reason, dewatering is not expected to result in any drawdown of the groundwater table other than immediately adjacent to the excavation sites. Ocean water enters the marsh directly through the Talbert Channel Outlet, and fresh water enters the marsh from the Huntington Beach Channel. Groundwater (or "base flow") is a likely third source of water; however, the interplay between these three sources and the exact hydrodynamic qualities of the marsh areas is unknown. As stated above, if any dewatering is required as part of demolition or construction of the project, it is highly unlikely that the cone of depression created by any such dewatering would extend far beyond the excavation site. In the unlikely case dewatering resulted in reduced base flow of groundwater into the marshes, any losses are likely to be offset by additional inflow from the Talbert Channel Outfall and the Huntington Beach Channel. However, as noted previously, if dewatering is required, the EPC would develop a demolition and construction dewatering plan for HBEP that would address any such issues.

Also, see responses to DR 80 and DR 81, above.

DATA REQUEST

83. Please discuss whether dewatering could further degrade groundwater quality on-site.

Response: As discussed in responses to DRs 85 and 86 (HBEP Data Response Set 2, January 22, 2013), if dewatering is required during demolition or construction of HBEP, the management of any discharge associated with dewatering would be permitted by the Santa Ana Regional Water Quality Control Board under the regional general permit for low-threat discharges (Order No. 2003-0061/NPDES No. CAG998001). If water from HBEP construction activities is determined to exceed the pollutant thresholds for the regional general permit for low-threat discharges, then the permit could not be used and an alternative disposal method would be developed. In this event, the Applicant anticipates that water would be stored onsite (e.g., in Baker tanks), and the Applicant or its representative would contract with a State of California licensed waste hauler to remove the contaminated water. Such information would be addressed in a demolition and construction dewatering plan prepared by the EPC if dewatering is required.

Also see Responses to DR 80 and DR 81, above.

Traffic and Transportation (92–94)

Existing Conditions at Intersections

BACKGROUND

The AFC Traffic and Transportation analysis studied the following intersections in the project area to determine existing PM peak hour conditions (AFC, Section 5.12.1.3.2):

- Beach Boulevard and Pacific Coast Highway (PCH) (signalized)
- Newland Street and PCH (signalized)
- Newland Street and Hamilton Avenue (signalized)
- Brookhurst Street and PCH (signalized)

The Highway Capacity Manual (HCM) was used to determine the intersection Level of Service (LOS) and is summarized in Table 5.12-5.

The City of Huntington Beach recent traffic study indicates the AM peak hour is a critical period of traffic at the studied intersections. The City requests the traffic AM peak hour should be included as part of the analysis (City of Huntington Beach- Beach Boulevard and Edinger Avenue Corridor Specific Plan – Traffic Study, August 2009) (City of Huntington Beach Letter, 12-6-2012, Comment #7, TN #68804).

The City submitted a letter to Energy Commission staff requesting that the intersection analysis should include Magnolia Street and PCH (City of Huntington Beach Letter, 12-6-2012, Comment #8, TN #68804). Energy Commission staff agrees that the Magnolia/PCH intersection should be included as part of the analysis. The City of Huntington Beach Circulation Element in the General Plan identifies Magnolia Street as a Primary Arterial and one of the primary north/south streets from the San Diego (I-405) Freeway which provides regional access to the City of Huntington Beach.

The City conducted an LOS Analysis and determined the PM peak hour average control delay at Beach Boulevard/PCH, Newland Street/PCH, and Brookhurst Street/PCH are 25.5, 16.9, and 31.2 seconds, respectively (City of Huntington Beach- Beach Boulevard and Edinger Avenue Corridor Specific Plan – Traffic Study, August 2009) (City of Huntington Beach Letter, 12-6-2012, Comment #9, TN #68804).

DATA REQUEST

92. Please include the AM peak hour in the intersection analysis and amend the Existing Intersection LOS Summary Table 5.12-5 and the Construction Intersection LOS Summary Table 5.12-8.

Response:

Revised intersection LOS summary tables are provided below. Table 5.12-5R1 includes new columns for the AM peak hour, and a new row for the Magnolia Street/PCH intersection (see DR 93). Slight differences from the data provided in the AFC are shown as underlined text, due to changes in rounding. None of these changes are significant or alter the conclusions reached in the AFC.

Table DR92-1 is a summary of the changes in LOS for the AM peak period. It is a companion to Table 5.12-8R1, which adds a row for the PM peak period hour analysis for the Magnolia Street/PCH intersection. As shown in the tables, the study intersections will continue to operate within the City's acceptable LOS threshold with the project-added traffic during the AM peak hour. As such, the project would not result in a significant impact during the AM peak hour.

TABLE 5.12-5R1
Existing Intersection LOS Summary

Intersection	Traffic Control Type	AM Peak Hour		PM Peak Hour	
		Delay (seconds)	LOS	Delay (seconds)	LOS
Beach Boulevard and PCH	Signalized	40	D	**57**	**E**
Newland Street and PCH	Signalized	9	A	7	A
Newland Street and Hamilton Avenue	Signalized	10	A	14	B
Brookhurst Street and PCH	Signalized	37	D	**121**	**F**
Magnolia Street and PCH	Signalized	13	B	15	B

Bold = Does not meet City of Huntington Beach LOS criteria

TABLE DR92-1
Construction Intersection LOS Summary

Intersection	AM Peak Hour			
	With Project		Existing	
	Delay (seconds)	LOS	Delay (seconds)	LOS
Beach Boulevard and PCH	45	D	40	D
Newland Street and PCH	16	B	9	A
Newland Street and Hamilton Avenue	11	B	10	A
Brookhurst Street and PCH	37	D	37	D
Magnolia Street and PCH	13	B	13	B

TABLE 5.12-8R1
Construction Intersection LOS Summary

Intersection	PM Peak Hour			
	With Project		Existing	
	Delay (seconds)	LOS	Delay (seconds)	LOS
Beach Boulevard and PCH	**61**	**E**	**57**	**E**
Newland Street and PCH	8	A	7	A
Newland Street and Hamilton Avenue	22	C	14	B
Brookhurst Street and PCH	**122**	**F**	**121**	**F**
Magnolia Street and PCH	15	B	15	B

Bold = Does not meet City of Huntington Beach LOS criteria

DATA REQUEST

93. Please include PCH and Magnolia Street in the intersection analysis and amend Table 5.12-5 as reflected in the City of Huntington Beach LOS analysis.

Response:

See the revised tables in the response to DR 92 for data on the Magnolia Street/PCH intersection.

The intersection at Magnolia Street/PCH will continue to operate at LOS B during both peak AM and PM hours with the project-added traffic. The project impacts would be less than significant.

DATA REQUEST

94. Please provide data worksheets and calculations for the existing intersection conditions analysis and clarification of the discrepancy between the PM Peak Hour Delays of the studied intersections in Table 5.12-5 of the AFC and the PM Peak Hour Delay in the Huntington Beach Traffic study.

Response:

As noted in the Data Request, there are differences between the intersection LOS analysis results contained in the AFC and those in the Beach Boulevard and Edinger Avenue Corridor Specific Plan. A number of factors affect how LOS is calculated, particularly when using a computerized analysis program, such as Synchro. The differences in the results may be attributable to variations in the peak hour factor, right-turn-on-red reduction, pedestrian and bicycle conflicts, and general differences in the signal timing parameters used. The latter is probably the biggest factor. Also, the delay/LOS in the AFC was calculated using Synchro 7 software and the delay/ICU/LOS in the Beach Boulevard and Edinger Avenue Corridor Specific Plan was calculated using Synchro 6 software.

With the exception of the Newland Street/PCH intersection analysis, the AFC provides a more conservative estimate of the existing intersection LOS for both the AM and PM peak hour. Both studies found that the Newland Street/PCH intersection is operating at an acceptable LOS during both peak hours.

Table DR94-1 is a comparison of the LOS results with the two analyses. The intersections where the LOS changes occurred are in underlined text. The LOS calculation worksheets for the existing and existing plus project conditions are provided as Attachment DR94-1.

TABLE DR94-1
Intersection LOS Comparison

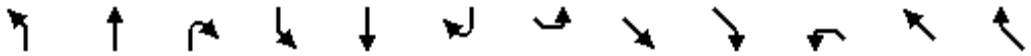
	AM Peak Hour				PM Peak Hour			
	HBEP AFC		Beach Blvd. SP		HBEP AFC		Beach Blvd. SP	
Intersection/Number[a]	Delay/ ICU[b]	LOS	Delay/ ICU[b]	LOS	Delay/ ICU[b]	LOS	Delay/ ICU[b]	LOS
Beach Boulevard/PCH (135)	40	D	31	C	57	E	26	C
Newland Street/PCH (136)	9	A	23	C	7	A	17	B
Newland Street/Hamilton Avenue (115)	10	A	0.41	A	14	B	0.56	A
Brookhurst Street/PCH (138)	37	D	31	C	121	F	31	C
Magnolia Street/PCH (137)	13	B	0.64	B	15	B	0.66	B

[a]Intersection number from Beach Boulevard Specific Plan

[b]Delay reported in seconds for HBEP AFC. For the Beach Boulevard Specific Plan (SP), the LOS is determined based on delay (for intersections 135, 136, and 138) or Intersection Capacity Utilization (ICU)

Attachment DR94-1
LOS Calculation Worksheets for Existing and Existing-plus-project Conditions

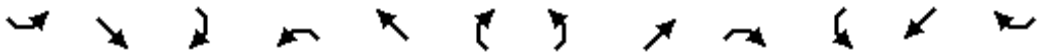
AM PEAK HOUR EXISTING CONDITIONS



Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	20	20	10	520	40	170	100	1980	10	20	770	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	0.97	0.91		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.87	1.00	1.00	0.87	1.00	1.00		1.00	1.00	0.87
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1372	3433	1863	1372	3433	5076		1770	3539	1372
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1372	3433	1863	1372	3433	5076		1770	3539	1372
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	22	11	565	43	185	109	2152	11	22	837	283
RTOR Reduction (vph)	0	0	9	0	0	126	0	1	0	0	0	152
Lane Group Flow (vph)	22	22	2	565	43	59	109	2162	0	22	837	131
Confl. Peds. (#/hr)			100			100			100			100
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6						8
Actuated Green, G (s)	2.4	23.2	23.2	17.4	38.2	38.2	7.7	59.8		3.6	55.7	55.7
Effective Green, g (s)	2.4	23.2	23.2	17.4	38.2	38.2	7.7	59.8		3.6	55.7	55.7
Actuated g/C Ratio	0.02	0.19	0.19	0.14	0.32	0.32	0.06	0.50		0.03	0.46	0.46
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	35	684	265	497	593	436	220	2529		53	1642	636
v/s Ratio Prot	0.01	0.01		c0.16	0.02		0.03	c0.43		0.01	c0.24	
v/s Ratio Perm			0.00			c0.04						0.10
v/c Ratio	0.63	0.03	0.01	1.14	0.07	0.14	0.50	0.86		0.42	0.51	0.21
Uniform Delay, d1	58.4	39.3	39.1	51.3	28.5	29.1	54.3	26.3		57.2	22.6	19.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.78	0.37	0.64
Incremental Delay, d2	30.3	0.0	0.0	83.7	0.2	0.6	1.8	4.0		5.0	1.1	0.7
Delay (s)	88.7	39.3	39.1	135.0	28.8	29.8	56.0	30.3		49.4	9.6	12.8
Level of Service	F	D	D	F	C	C	E	C		D	A	B
Approach Delay (s)		59.0			104.7			31.5			11.1	
Approach LOS		E			F			C			B	

Intersection Summary			
HCM 2000 Control Delay	40.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	80	2440	10	10	880	40	10	20	10	190	10	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.61	1.00	1.00	0.61	1.00	0.96		1.00	0.88	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	0.90	1.00		0.88	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5085	970	1754	5085	970	1592	1691		1560	1414	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.62	1.00		0.74	1.00	
Satd. Flow (perm)	1770	5085	970	1754	5085	970	1041	1691		1208	1414	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	2652	11	11	957	43	11	22	11	207	11	109
RTOR Reduction (vph)	0	0	4	0	0	18	0	8	0	0	83	0
Lane Group Flow (vph)	87	2652	7	11	957	25	11	25	0	207	37	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Turn Type	Prot	NA	Perm	Prot	NA	custom	Perm	NA		Perm	NA	
Protected Phases	7	4		3				2			6	
Permitted Phases			4		8	8	2			6		
Actuated Green, G (s)	9.9	78.2	78.2	0.8	69.1	69.1	29.0	29.0		29.0	29.0	
Effective Green, g (s)	9.9	78.2	78.2	0.8	69.1	69.1	29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.08	0.65	0.65	0.01	0.58	0.58	0.24	0.24		0.24	0.24	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	146	3313	632	11	2928	558	251	408		291	341	
v/s Ratio Prot	0.05	c0.52		0.01				0.01			0.03	
v/s Ratio Perm			0.01		c0.19	0.03	0.01			c0.17		
v/c Ratio	0.60	0.80	0.01	1.00	0.33	0.04	0.04	0.06		0.71	0.11	
Uniform Delay, d1	53.1	15.2	7.3	59.6	13.3	11.1	34.9	35.0		41.7	35.4	
Progression Factor	1.25	0.13	1.00	0.80	0.12	0.01	1.00	1.00		0.96	1.02	
Incremental Delay, d2	2.9	1.0	0.0	265.4	0.3	0.1	0.3	0.3		13.6	0.6	
Delay (s)	69.2	3.0	7.3	312.8	1.9	0.2	35.2	35.3		53.5	36.7	
Level of Service	E	A	A	F	A	A	D	D		D	D	
Approach Delay (s)		5.1			5.2			35.3			47.3	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	100	160	160	80	350	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.80	0.93		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		0.93	1.00
Frt	1.00	0.85	0.95		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1261	1658		1647	1863
Flt Permitted	0.95	1.00	1.00		0.57	1.00
Satd. Flow (perm)	1770	1261	1658		996	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	174	174	87	380	304
RTOR Reduction (vph)	0	139	24	0	0	0
Lane Group Flow (vph)	109	35	237	0	380	304
Confl. Peds. (#/hr)	100	100		100	100	
Turn Type	NA	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	12.2	12.2	28.8		39.8	39.8
Effective Green, g (s)	12.2	12.2	28.8		39.8	39.8
Actuated g/C Ratio	0.20	0.20	0.48		0.66	0.66
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	359	256	795		736	1235
v/s Ratio Prot	c0.06		0.14		c0.06	0.16
v/s Ratio Perm		0.03			c0.28	
v/c Ratio	0.30	0.14	0.30		0.52	0.25
Uniform Delay, d1	20.3	19.6	9.5		6.1	4.1
Progression Factor	1.00	1.00	0.70		1.00	1.00
Incremental Delay, d2	0.5	0.2	0.9		0.6	0.5
Delay (s)	20.8	19.8	7.6		6.7	4.5
Level of Service	C	B	A		A	A
Approach Delay (s)	20.2		7.6			5.7
Approach LOS	C		A			A

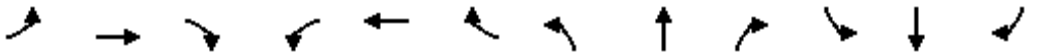
Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	240	2290	10	10	840	270	10	10	10	510	10	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.61	1.00	1.00	0.61	1.00	0.94		1.00	1.00	0.87
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.92	1.00		0.93	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	970	1770	5085	970	1620	1615		3190	1863	1384
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00		0.68	1.00	1.00
Satd. Flow (perm)	1770	5085	970	1770	5085	970	1280	1615		2281	1863	1384
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	2489	11	11	913	293	11	11	11	554	11	109
RTOR Reduction (vph)	0	0	5	0	0	162	0	8	0	0	0	75
Lane Group Flow (vph)	261	2489	6	11	913	131	11	14	0	554	11	34
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2			6		6
Actuated Green, G (s)	12.2	64.8	64.8	1.0	53.6	53.6	35.0	34.2		41.4	37.4	37.4
Effective Green, g (s)	12.2	64.8	64.8	1.0	53.6	53.6	35.0	34.2		41.4	37.4	37.4
Actuated g/C Ratio	0.10	0.54	0.54	0.01	0.45	0.45	0.29	0.29		0.34	0.31	0.31
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	179	2745	523	14	2271	433	375	460		817	580	431
v/s Ratio Prot	c0.15	c0.49		0.01	c0.18		0.00	0.01		c0.02	0.01	
v/s Ratio Perm			0.01			0.13	0.01			c0.21		0.02
v/c Ratio	1.46	0.91	0.01	0.79	0.40	0.30	0.03	0.03		0.68	0.02	0.08
Uniform Delay, d1	53.9	24.9	12.8	59.4	22.4	21.2	30.3	30.9		34.4	28.6	29.1
Progression Factor	0.78	0.62	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	224.5	3.7	0.0	130.6	0.5	1.8	0.0	0.1		2.2	0.1	0.4
Delay (s)	266.6	19.0	12.8	190.0	22.9	23.0	30.3	31.1		36.6	28.7	29.5
Level of Service	F	B	B	F	C	C	C	C		D	C	C
Approach Delay (s)		42.4			24.5			30.8			35.3	
Approach LOS		D			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	36.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

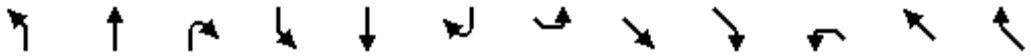


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	2520	40	30	850	60	10	30	10	160	50	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1793		1681	1723	1583
Flt Permitted	0.28	1.00	1.00	0.11	1.00	1.00	0.68	1.00		0.73	0.84	1.00
Satd. Flow (perm)	529	5085	1583	207	5085	1583	1263	1793		1289	1485	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	2739	43	33	924	65	11	33	11	174	54	120
RTOR Reduction (vph)	0	0	17	0	0	26	0	1	0	0	0	88
Lane Group Flow (vph)	98	2739	26	33	924	39	11	43	0	111	117	32
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	36.0	36.0	36.0	36.0	36.0	36.0	16.0	16.0		16.0	16.0	16.0
Effective Green, g (s)	36.0	36.0	36.0	36.0	36.0	36.0	16.0	16.0		16.0	16.0	16.0
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.60	0.60	0.27	0.27		0.27	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	317	3051	949	124	3051	949	336	478		343	396	422
v/s Ratio Prot		c0.54			0.18			0.02				
v/s Ratio Perm	0.19		0.02	0.16		0.02	0.01			c0.09	0.08	0.02
v/c Ratio	0.31	0.90	0.03	0.27	0.30	0.04	0.03	0.09		0.32	0.30	0.08
Uniform Delay, d1	5.9	10.4	4.9	5.7	5.9	4.9	16.3	16.5		17.7	17.5	16.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.5	4.7	0.1	5.2	0.3	0.1	0.2	0.4		2.5	1.9	0.3
Delay (s)	8.4	15.1	4.9	10.9	6.1	5.0	16.5	16.9		20.1	19.4	16.8
Level of Service	A	B	A	B	A	A	B	B		C	B	B
Approach Delay (s)		14.7			6.2			16.8			18.8	
Approach LOS		B			A			B			B	

Intersection Summary					
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.72				
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0		
Intersection Capacity Utilization	74.4%	ICU Level of Service	D		
Analysis Period (min)	15				

c Critical Lane Group

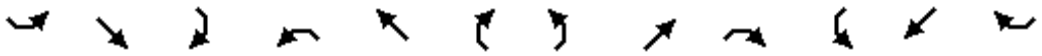
PM PEAK HOUR EXISTING CONDITIONS



Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	10	50	20	300	40	200	230	1100	10	30	1690	770
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	0.97	0.91		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.87	1.00	1.00	0.87	1.00	1.00		1.00	1.00	0.87
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1372	3433	1863	1372	3433	5068		1770	3539	1372
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1372	3433	1863	1372	3433	5068		1770	3539	1372
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	54	22	326	43	217	250	1196	11	33	1837	837
RTOR Reduction (vph)	0	0	18	0	0	121	0	1	0	0	0	188
Lane Group Flow (vph)	11	54	4	326	43	96	250	1206	0	33	1837	649
Confl. Peds. (#/hr)			100			100			100			100
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6						8
Actuated Green, G (s)	0.8	23.2	23.2	17.4	39.8	39.8	9.6	59.8		3.6	53.8	53.8
Effective Green, g (s)	0.8	23.2	23.2	17.4	39.8	39.8	9.6	59.8		3.6	53.8	53.8
Actuated g/C Ratio	0.01	0.19	0.19	0.14	0.33	0.33	0.08	0.50		0.03	0.45	0.45
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	11	684	265	497	617	455	274	2525		53	1586	615
v/s Ratio Prot	0.01	0.02		c0.09	0.02		c0.07	0.24		0.02	c0.52	
v/s Ratio Perm			0.00			c0.07						0.47
v/c Ratio	1.00	0.08	0.02	0.66	0.07	0.21	0.91	0.48		0.62	1.16	1.06
Uniform Delay, d1	59.6	39.6	39.2	48.5	27.4	28.8	54.8	19.8		57.5	33.1	33.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.57	0.18	0.46
Incremental Delay, d2	271.4	0.0	0.0	3.1	0.2	1.1	32.2	0.6		10.7	75.1	41.4
Delay (s)	331.0	39.7	39.2	51.6	27.7	29.9	87.0	20.5		43.7	81.2	56.7
Level of Service	F	D	D	D	C	C	F	C		D	F	E
Approach Delay (s)		76.4			41.8			31.9			73.2	
Approach LOS		E			D			C			E	

Intersection Summary			
HCM 2000 Control Delay	57.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	110	1290	10	10	2360	200	10	10	10	70	0	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.61	1.00	1.00	0.61	1.00	0.93		1.00	0.87	
Flpb, ped/bikes	1.00	1.00	1.00	0.95	1.00	1.00	0.90	1.00		0.88	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5085	970	1680	5085	970	1596	1608		1557	1372	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.60	1.00		0.74	1.00	
Satd. Flow (perm)	1770	5085	970	1680	5085	970	1012	1608		1217	1372	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	1402	11	11	2565	217	11	11	11	76	0	130
RTOR Reduction (vph)	0	0	4	0	0	89	0	8	0	0	99	0
Lane Group Flow (vph)	120	1402	7	11	2565	128	11	14	0	76	31	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Turn Type	Prot	NA	Perm	Prot	NA	custom	Perm	NA		Perm	NA	
Protected Phases	7	4		3				2			6	
Permitted Phases			4		8	8	2			6		
Actuated Green, G (s)	10.6	78.2	78.2	0.8	68.4	68.4	29.0	29.0		29.0	29.0	
Effective Green, g (s)	10.6	78.2	78.2	0.8	68.4	68.4	29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.09	0.65	0.65	0.01	0.57	0.57	0.24	0.24		0.24	0.24	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	156	3313	632	11	2898	552	244	388		294	331	
v/s Ratio Prot	c0.07	0.28		0.01				0.01			0.02	
v/s Ratio Perm			0.01		c0.50	0.13	0.01			c0.06		
v/c Ratio	0.77	0.42	0.01	1.00	0.89	0.23	0.05	0.04		0.26	0.09	
Uniform Delay, d1	53.5	10.1	7.3	59.6	22.4	12.8	34.9	34.8		36.8	35.3	
Progression Factor	1.33	0.14	1.00	0.57	0.09	0.00	1.00	1.00		0.95	1.74	
Incremental Delay, d2	17.9	0.3	0.0	81.4	0.4	0.1	0.3	0.2		2.1	0.6	
Delay (s)	88.8	1.7	7.4	115.5	2.4	0.1	35.2	35.0		37.1	62.0	
Level of Service	F	A	A	F	A	A	D	C		D	E	
Approach Delay (s)		8.6			2.7			35.1			52.8	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	100	420	340	60	220	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.80	0.97		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		0.97	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1261	1770		1714	1863
Flt Permitted	0.95	1.00	1.00		0.41	1.00
Satd. Flow (perm)	1770	1261	1770		739	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	457	370	65	239	239
RTOR Reduction (vph)	0	287	9	0	0	0
Lane Group Flow (vph)	109	170	426	0	239	239
Confl. Peds. (#/hr)	100	100		100	100	
Turn Type	NA	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	13.2	13.2	27.8		38.8	38.8
Effective Green, g (s)	13.2	13.2	27.8		38.8	38.8
Actuated g/C Ratio	0.22	0.22	0.46		0.65	0.65
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	389	277	820		591	1204
v/s Ratio Prot	0.06		c0.24		c0.05	0.13
v/s Ratio Perm		c0.13			0.21	
v/c Ratio	0.28	0.61	0.52		0.40	0.20
Uniform Delay, d1	19.5	21.1	11.4		8.5	4.3
Progression Factor	1.00	1.00	0.70		1.00	1.00
Incremental Delay, d2	0.4	4.0	2.2		0.5	0.4
Delay (s)	19.8	25.1	10.2		8.9	4.7
Level of Service	B	C	B		A	A
Approach Delay (s)	24.1		10.2			6.8
Approach LOS	C		B			A

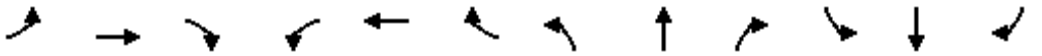
Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	160	1020	10	20	2740	730	10	10	10	250	20	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.61	1.00	1.00	0.61	1.00	0.94		1.00	1.00	0.87
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.92	1.00		0.93	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	970	1770	5085	970	1624	1615		3190	1863	1384
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00		0.68	1.00	1.00
Satd. Flow (perm)	1770	5085	970	1770	5085	970	1270	1615		2281	1863	1384
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	174	1109	11	22	2978	793	11	11	11	272	22	185
RTOR Reduction (vph)	0	0	5	0	0	203	0	8	0	0	0	127
Lane Group Flow (vph)	174	1109	6	22	2978	590	11	14	0	272	22	58
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2			6		6
Actuated Green, G (s)	10.6	62.8	62.8	3.0	55.2	55.2	35.0	34.2		41.4	37.4	37.4
Effective Green, g (s)	10.6	62.8	62.8	3.0	55.2	55.2	35.0	34.2		41.4	37.4	37.4
Actuated g/C Ratio	0.09	0.52	0.52	0.02	0.46	0.46	0.29	0.29		0.34	0.31	0.31
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	156	2661	507	44	2339	446	372	460		817	580	431
v/s Ratio Prot	c0.10	0.22		0.01	0.59		0.00	0.01		c0.01	0.01	
v/s Ratio Perm			0.01			c0.61	0.01			c0.10		0.04
v/c Ratio	1.12	0.42	0.01	0.50	1.27	1.32	0.03	0.03		0.33	0.04	0.13
Uniform Delay, d1	54.7	17.4	13.7	57.8	32.4	32.4	30.3	30.9		29.4	28.8	29.7
Progression Factor	0.72	0.50	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	104.0	0.5	0.0	8.7	126.4	160.2	0.0	0.1		0.2	0.1	0.6
Delay (s)	143.6	9.1	13.8	66.4	158.8	192.6	30.3	31.1		29.7	28.9	30.3
Level of Service	F	A	B	E	F	F	C	C		C	C	C
Approach Delay (s)		27.2			165.4			30.8			29.9	
Approach LOS		C			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	121.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	1240	10	20	2490	200	10	20	10	80	30	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1770		1681	1730	1583
Flt Permitted	0.11	1.00	1.00	0.16	1.00	1.00	0.72	1.00		0.74	0.89	1.00
Satd. Flow (perm)	207	5085	1583	305	5085	1583	1332	1770		1302	1578	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	1348	11	22	2707	217	11	22	11	87	33	109
RTOR Reduction (vph)	0	0	4	0	0	87	0	8	0	0	0	13
Lane Group Flow (vph)	130	1348	7	22	2707	130	11	25	0	59	61	96
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	36.0	36.0	36.0	36.0	36.0	36.0	16.0	16.0		16.0	16.0	16.0
Effective Green, g (s)	36.0	36.0	36.0	36.0	36.0	36.0	16.0	16.0		16.0	16.0	16.0
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.60	0.60	0.27	0.27		0.27	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	124	3051	949	183	3051	949	355	472		347	420	422
v/s Ratio Prot		0.27			0.53			0.01				
v/s Ratio Perm	c0.63		0.00	0.07		0.08	0.01			0.05	0.04	c0.06
v/c Ratio	1.05	0.44	0.01	0.12	0.89	0.14	0.03	0.05		0.17	0.15	0.23
Uniform Delay, d1	12.0	6.5	4.8	5.2	10.3	5.2	16.3	16.4		16.9	16.8	17.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	94.4	0.5	0.0	1.3	4.3	0.3	0.2	0.2		1.1	0.7	1.2
Delay (s)	106.4	7.0	4.8	6.5	14.5	5.5	16.4	16.6		18.0	17.5	18.4
Level of Service	F	A	A	A	B	A	B	B		B	B	B
Approach Delay (s)		15.7			13.8			16.5			18.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		

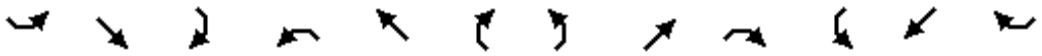
c Critical Lane Group

AM PEAK HOUR EXISTING + PROJECT CONDITIONS

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	20	20	10	555	40	170	100	1980	10	20	770	262
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	0.97	0.91		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.87	1.00	1.00	0.87	1.00	1.00		1.00	1.00	0.87
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1372	3433	1863	1372	3433	5076		1770	3539	1372
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1372	3433	1863	1372	3433	5076		1770	3539	1372
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	22	11	603	43	185	109	2152	11	22	837	285
RTOR Reduction (vph)	0	0	9	0	0	126	0	1	0	0	0	153
Lane Group Flow (vph)	22	22	2	603	43	59	109	2162	0	22	837	132
Confl. Peds. (#/hr)			100			100			100			100
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6						8
Actuated Green, G (s)	2.4	23.2	23.2	17.4	38.2	38.2	7.7	59.8		3.6	55.7	55.7
Effective Green, g (s)	2.4	23.2	23.2	17.4	38.2	38.2	7.7	59.8		3.6	55.7	55.7
Actuated g/C Ratio	0.02	0.19	0.19	0.14	0.32	0.32	0.06	0.50		0.03	0.46	0.46
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	35	684	265	497	593	436	220	2529		53	1642	636
v/s Ratio Prot	0.01	0.01		c0.18	0.02		0.03	c0.43		0.01	c0.24	
v/s Ratio Perm			0.00			c0.04						0.10
v/c Ratio	0.63	0.03	0.01	1.21	0.07	0.14	0.50	0.86		0.42	0.51	0.21
Uniform Delay, d1	58.4	39.3	39.1	51.3	28.5	29.1	54.3	26.3		57.2	22.6	19.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.77	0.37	0.56
Incremental Delay, d2	30.3	0.0	0.0	113.4	0.2	0.6	1.8	4.0		5.0	1.1	0.7
Delay (s)	88.7	39.3	39.1	164.7	28.8	29.8	56.0	30.3		48.9	9.3	11.3
Level of Service	F	D	D	F	C	C	E	C		D	A	B
Approach Delay (s)		59.0			127.6			31.5			10.6	
Approach LOS		E			F			C			B	

Intersection Summary			
HCM 2000 Control Delay	44.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	181	2440	10	10	880	43	10	20	10	193	10	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.61	1.00	1.00	0.61	1.00	0.96		1.00	0.88	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	0.90	1.00		0.88	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5085	970	1754	5085	970	1593	1691		1560	1413	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.62	1.00		0.74	1.00	
Satd. Flow (perm)	1770	5085	970	1754	5085	970	1035	1691		1208	1413	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	197	2652	11	11	957	47	11	22	11	210	11	111
RTOR Reduction (vph)	0	0	4	0	0	20	0	8	0	0	84	0
Lane Group Flow (vph)	197	2652	7	11	957	27	11	25	0	210	38	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Turn Type	Prot	NA	Perm	Prot	NA	custom	Perm	NA		Perm	NA	
Protected Phases	7	4		3				2			6	
Permitted Phases			4		8	8	2			6		
Actuated Green, G (s)	11.0	78.2	78.2	0.8	68.0	68.0	29.0	29.0		29.0	29.0	
Effective Green, g (s)	11.0	78.2	78.2	0.8	68.0	68.0	29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.09	0.65	0.65	0.01	0.57	0.57	0.24	0.24		0.24	0.24	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	162	3313	632	11	2881	549	250	408		291	341	
v/s Ratio Prot	c0.11	c0.52		0.01				0.01			0.03	
v/s Ratio Perm			0.01		c0.19	0.03	0.01			c0.17		
v/c Ratio	1.22	0.80	0.01	1.00	0.33	0.05	0.04	0.06		0.72	0.11	
Uniform Delay, d1	54.5	15.2	7.3	59.6	13.9	11.6	34.9	35.0		41.8	35.5	
Progression Factor	1.24	0.18	1.00	0.79	0.12	0.01	1.00	1.00		0.95	1.00	
Incremental Delay, d2	120.1	1.0	0.0	264.3	0.3	0.2	0.3	0.3		13.7	0.6	
Delay (s)	187.5	3.6	7.3	311.4	2.0	0.3	35.2	35.3		53.2	35.9	
Level of Service	F	A	A	F	A	A	D	D		D	D	
Approach Delay (s)		16.3			5.2			35.3			46.9	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	200	160	160	80	350	413
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.80	0.93		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		0.93	1.00
Frt	1.00	0.85	0.95		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1261	1658		1649	1863
Flt Permitted	0.95	1.00	1.00		0.57	1.00
Satd. Flow (perm)	1770	1261	1658		988	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	174	174	87	380	449
RTOR Reduction (vph)	0	135	25	0	0	0
Lane Group Flow (vph)	217	39	236	0	380	449
Confl. Peds. (#/hr)	100	100		100	100	
Turn Type	NA	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	13.5	13.5	27.5		38.5	38.5
Effective Green, g (s)	13.5	13.5	27.5		38.5	38.5
Actuated g/C Ratio	0.22	0.22	0.46		0.64	0.64
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	398	283	759		711	1195
v/s Ratio Prot	c0.12		0.14		c0.06	0.24
v/s Ratio Perm		0.03			c0.28	
v/c Ratio	0.55	0.14	0.31		0.53	0.38
Uniform Delay, d1	20.5	18.6	10.3		7.0	5.1
Progression Factor	1.00	1.00	0.92		1.00	1.00
Incremental Delay, d2	1.5	0.2	0.4		0.8	0.9
Delay (s)	22.1	18.8	9.8		7.7	6.0
Level of Service	C	B	A		A	A
Approach Delay (s)	20.6		9.8			6.8
Approach LOS	C		A			A

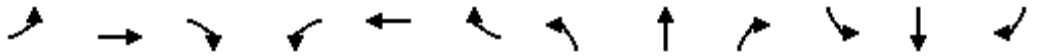
Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	241	2292	10	10	892	270	10	10	10	510	10	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.61	1.00	1.00	0.61	1.00	0.94		1.00	1.00	0.87
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.92	1.00		0.93	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	970	1770	5085	970	1620	1615		3190	1863	1384
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00		0.68	1.00	1.00
Satd. Flow (perm)	1770	5085	970	1770	5085	970	1280	1615		2281	1863	1384
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	262	2491	11	11	970	293	11	11	11	554	11	127
RTOR Reduction (vph)	0	0	5	0	0	162	0	8	0	0	0	87
Lane Group Flow (vph)	262	2491	6	11	970	131	11	14	0	554	11	40
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2			6		6
Actuated Green, G (s)	12.2	64.8	64.8	1.0	53.6	53.6	35.0	34.2		41.4	37.4	37.4
Effective Green, g (s)	12.2	64.8	64.8	1.0	53.6	53.6	35.0	34.2		41.4	37.4	37.4
Actuated g/C Ratio	0.10	0.54	0.54	0.01	0.45	0.45	0.29	0.29		0.34	0.31	0.31
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	179	2745	523	14	2271	433	375	460		817	580	431
v/s Ratio Prot	c0.15	c0.49		0.01	c0.19		0.00	0.01		c0.02	0.01	
v/s Ratio Perm			0.01			0.13	0.01			c0.21		0.03
v/c Ratio	1.46	0.91	0.01	0.79	0.43	0.30	0.03	0.03		0.68	0.02	0.09
Uniform Delay, d1	53.9	24.9	12.8	59.4	22.7	21.2	30.3	30.9		34.4	28.6	29.3
Progression Factor	0.78	0.61	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	226.9	3.7	0.0	130.6	0.6	1.8	0.0	0.1		2.2	0.1	0.4
Delay (s)	268.9	18.9	12.8	190.0	23.3	23.0	30.3	31.1		36.6	28.7	29.7
Level of Service	F	B	B	F	C	C	C	C		D	C	C
Approach Delay (s)		42.6			24.7			30.8			35.2	
Approach LOS		D			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	36.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	2523	40	30	919	60	10	30	10	160	50	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1793		1681	1723	1583
Flt Permitted	0.26	1.00	1.00	0.11	1.00	1.00	0.68	1.00		0.73	0.84	1.00
Satd. Flow (perm)	481	5085	1583	207	5085	1583	1263	1793		1289	1485	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	2742	43	33	999	65	11	33	11	174	54	120
RTOR Reduction (vph)	0	0	17	0	0	26	0	1	0	0	0	88
Lane Group Flow (vph)	98	2742	26	33	999	39	11	43	0	111	117	32
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	36.0	36.0	36.0	36.0	36.0	36.0	16.0	16.0		16.0	16.0	16.0
Effective Green, g (s)	36.0	36.0	36.0	36.0	36.0	36.0	16.0	16.0		16.0	16.0	16.0
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.60	0.60	0.27	0.27		0.27	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	288	3051	949	124	3051	949	336	478		343	396	422
v/s Ratio Prot		c0.54			0.20			0.02				
v/s Ratio Perm	0.20		0.02	0.16		0.02	0.01			c0.09	0.08	0.02
v/c Ratio	0.34	0.90	0.03	0.27	0.33	0.04	0.03	0.09		0.32	0.30	0.08
Uniform Delay, d1	6.0	10.4	4.9	5.7	6.0	4.9	16.3	16.5		17.7	17.5	16.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.2	4.7	0.1	5.2	0.3	0.1	0.2	0.4		2.5	1.9	0.3
Delay (s)	9.2	15.2	4.9	10.9	6.3	5.0	16.5	16.9		20.1	19.4	16.8
Level of Service	A	B	A	B	A	A	B	B		C	B	B
Approach Delay (s)		14.8			6.3			16.8			18.8	
Approach LOS		B			A			B			B	

Intersection Summary				
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	74.5%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

PM PEAK HOUR EXISTING + PROJECT CONDITIONS

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	10	50	20	302	40	200	230	1100	10	30	1690	805
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	0.97	0.91		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.87	1.00	1.00	0.87	1.00	1.00		1.00	1.00	0.87
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1372	3433	1863	1372	3433	5068		1770	3539	1372
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1372	3433	1863	1372	3433	5068		1770	3539	1372
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	54	22	328	43	217	250	1196	11	33	1837	875
RTOR Reduction (vph)	0	0	18	0	0	121	0	1	0	0	0	188
Lane Group Flow (vph)	11	54	4	328	43	96	250	1206	0	33	1837	687
Confl. Peds. (#/hr)			100			100			100			100
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6						8
Actuated Green, G (s)	0.8	23.2	23.2	17.4	39.8	39.8	9.6	59.8		3.6	53.8	53.8
Effective Green, g (s)	0.8	23.2	23.2	17.4	39.8	39.8	9.6	59.8		3.6	53.8	53.8
Actuated g/C Ratio	0.01	0.19	0.19	0.14	0.33	0.33	0.08	0.50		0.03	0.45	0.45
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	11	684	265	497	617	455	274	2525		53	1586	615
v/s Ratio Prot	0.01	0.02		c0.10	0.02		c0.07	0.24		0.02	c0.52	
v/s Ratio Perm			0.00			c0.07						0.50
v/c Ratio	1.00	0.08	0.02	0.66	0.07	0.21	0.91	0.48		0.62	1.16	1.12
Uniform Delay, d1	59.6	39.6	39.2	48.5	27.4	28.8	54.8	19.8		57.5	33.1	33.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.59	0.20	0.45
Incremental Delay, d2	271.4	0.0	0.0	3.2	0.2	1.1	32.2	0.6		10.8	75.1	64.0
Delay (s)	331.0	39.7	39.2	51.7	27.7	29.9	87.0	20.5		44.5	81.9	79.1
Level of Service	F	D	D	D	C	C	F	C		D	F	E
Approach Delay (s)		76.4			41.9			31.9			80.6	
Approach LOS		E			D			C			F	

Intersection Summary			
HCM 2000 Control Delay	61.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	112	1290	10	10	2360	203	10	10	10	139	0	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.61	1.00	1.00	0.61	1.00	0.93		1.00	0.87	
Flpb, ped/bikes	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00		0.88	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5085	970	1680	5085	970	1612	1608		1557	1372	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.53	1.00		0.74	1.00	
Satd. Flow (perm)	1770	5085	970	1680	5085	970	900	1608		1217	1372	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	122	1402	11	11	2565	221	11	11	11	151	0	168
RTOR Reduction (vph)	0	0	4	0	0	91	0	8	0	0	122	0
Lane Group Flow (vph)	122	1402	7	11	2565	130	11	14	0	151	46	0
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Turn Type	Prot	NA	Perm	Prot	NA	custom	Perm	NA		Perm	NA	
Protected Phases	7	4		3				2			6	
Permitted Phases			4		8	8	2			6		
Actuated Green, G (s)	10.6	78.2	78.2	0.8	68.4	68.4	29.0	29.0		29.0	29.0	
Effective Green, g (s)	10.6	78.2	78.2	0.8	68.4	68.4	29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.09	0.65	0.65	0.01	0.57	0.57	0.24	0.24		0.24	0.24	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	156	3313	632	11	2898	552	217	388		294	331	
v/s Ratio Prot	c0.07	0.28		0.01				0.01			0.03	
v/s Ratio Perm			0.01		c0.50	0.13	0.01			c0.12		
v/c Ratio	0.78	0.42	0.01	1.00	0.89	0.24	0.05	0.04		0.51	0.14	
Uniform Delay, d1	53.6	10.1	7.3	59.6	22.4	12.8	34.9	34.8		39.4	35.7	
Progression Factor	1.32	0.14	1.00	0.57	0.09	0.00	1.00	1.00		0.95	1.14	
Incremental Delay, d2	19.7	0.3	0.0	81.4	0.4	0.1	0.4	0.2		6.2	0.9	
Delay (s)	90.6	1.7	7.4	115.5	2.4	0.1	35.4	35.0		43.5	41.7	
Level of Service	F	A	A	F	A	A	D	C		D	D	
Approach Delay (s)		8.8			2.7			35.1			42.6	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	100	420	473	160	220	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.80	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.97		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1261	1706		1770	1863
Flt Permitted	0.95	1.00	1.00		0.19	1.00
Satd. Flow (perm)	1770	1261	1706		353	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	457	514	174	239	239
RTOR Reduction (vph)	0	250	17	0	0	0
Lane Group Flow (vph)	109	207	671	0	239	239
Confl. Peds. (#/hr)	100	100		100	100	
Turn Type	NA	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	14.0	14.0	27.0		38.0	38.0
Effective Green, g (s)	14.0	14.0	27.0		38.0	38.0
Actuated g/C Ratio	0.23	0.23	0.45		0.63	0.63
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	413	294	767		388	1179
v/s Ratio Prot	0.06		c0.39		c0.07	0.13
v/s Ratio Perm		c0.16			0.32	
v/c Ratio	0.26	0.70	0.87		0.62	0.20
Uniform Delay, d1	18.8	21.1	15.0		17.2	4.6
Progression Factor	1.00	1.00	0.82		1.00	1.00
Incremental Delay, d2	0.3	7.5	13.1		2.9	0.4
Delay (s)	19.1	28.6	25.4		20.1	5.0
Level of Service	B	C	C		C	A
Approach Delay (s)	26.7		25.4			12.5
Approach LOS	C		C			B

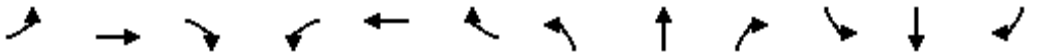
Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	177	1072	10	20	2742	730	10	10	10	250	20	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.61	1.00	1.00	0.61	1.00	0.94		1.00	1.00	0.87
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.92	1.00		0.93	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	970	1770	5085	970	1624	1615		3190	1863	1384
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00		0.68	1.00	1.00
Satd. Flow (perm)	1770	5085	970	1770	5085	970	1270	1615		2281	1863	1384
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	192	1165	11	22	2980	793	11	11	11	272	22	186
RTOR Reduction (vph)	0	0	5	0	0	201	0	8	0	0	0	128
Lane Group Flow (vph)	192	1165	6	22	2980	592	11	14	0	272	22	58
Confl. Peds. (#/hr)	100		100	100		100	100		100	100		100
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2			6		6
Actuated Green, G (s)	10.6	62.8	62.8	3.0	55.2	55.2	35.0	34.2		41.4	37.4	37.4
Effective Green, g (s)	10.6	62.8	62.8	3.0	55.2	55.2	35.0	34.2		41.4	37.4	37.4
Actuated g/C Ratio	0.09	0.52	0.52	0.02	0.46	0.46	0.29	0.29		0.34	0.31	0.31
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	156	2661	507	44	2339	446	372	460		817	580	431
v/s Ratio Prot	c0.11	0.23		0.01	0.59		0.00	0.01		c0.01	0.01	
v/s Ratio Perm			0.01			c0.61	0.01			c0.10		0.04
v/c Ratio	1.23	0.44	0.01	0.50	1.27	1.33	0.03	0.03		0.33	0.04	0.13
Uniform Delay, d1	54.7	17.7	13.7	57.8	32.4	32.4	30.3	30.9		29.4	28.8	29.7
Progression Factor	0.75	0.50	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	144.8	0.5	0.0	8.7	126.8	161.8	0.0	0.1		0.2	0.1	0.6
Delay (s)	185.7	9.3	13.8	66.4	159.2	194.2	30.3	31.1		29.7	28.9	30.3
Level of Service	F	A	B	E	F	F	C	C		C	C	C
Approach Delay (s)		34.1			166.0			30.8			29.9	
Approach LOS		C			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	121.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	98.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	1309	10	20	2493	200	10	20	10	80	30	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1770		1681	1730	1583
Flt Permitted	0.11	1.00	1.00	0.15	1.00	1.00	0.72	1.00		0.74	0.89	1.00
Satd. Flow (perm)	207	5085	1583	275	5085	1583	1332	1770		1302	1578	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	1423	11	22	2710	217	11	22	11	87	33	109
RTOR Reduction (vph)	0	0	4	0	0	87	0	8	0	0	0	13
Lane Group Flow (vph)	130	1423	7	22	2710	130	11	25	0	59	61	96
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	36.0	36.0	36.0	36.0	36.0	36.0	16.0	16.0		16.0	16.0	16.0
Effective Green, g (s)	36.0	36.0	36.0	36.0	36.0	36.0	16.0	16.0		16.0	16.0	16.0
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.60	0.60	0.27	0.27		0.27	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	124	3051	949	165	3051	949	355	472		347	420	422
v/s Ratio Prot		0.28			0.53			0.01				
v/s Ratio Perm	c0.63		0.00	0.08		0.08	0.01			0.05	0.04	c0.06
v/c Ratio	1.05	0.47	0.01	0.13	0.89	0.14	0.03	0.05		0.17	0.15	0.23
Uniform Delay, d1	12.0	6.7	4.8	5.2	10.3	5.2	16.3	16.4		16.9	16.8	17.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	94.4	0.5	0.0	1.7	4.3	0.3	0.2	0.2		1.1	0.7	1.2
Delay (s)	106.4	7.2	4.8	6.9	14.6	5.5	16.4	16.6		18.0	17.5	18.4
Level of Service	F	A	A	A	B	A	B	B		B	B	B
Approach Delay (s)		15.4			13.9			16.5			18.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group