APPENDIX H

TRAFFIC IMPACT ANALYSIS
EDEN LANDING PHASE 2 EIR

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DRAFT

Traffic Impact Analysis

Eden Landing Phase 2 EIS/R

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October 6, 2016

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APPENDIX

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I PROJECT DESCRIPTION

The purpose of this traffic analysis is to evaluate the potential traffic impacts resulting from the truck trips required for bringing fill to the project areas shown in Figure 1.

There are three project alternatives, each with a different fill quantity, as well as the no-build scenario. For the purposes of this study, a conservative approach was adopted by assigning outbound trips from the project site equal to the inbound trips to the project site during AM and PM peak hours. As this project is a restoration project, the only project traffic would be generated during the construction period.

II TRAFFIC IMPACT STUDY AREA

The project site is bounded by Union City Boulevard to the west, SR 92 to the north and Alameda Creek to the south. There are two access points to the site, to be used by trucks carrying fill material. The fill material will be transported to the site from I-880 via Whipple Road to Union City Boulevard before accessing the site from Horner Street (North Entrance) and Westport Way (South Entrance). Figure 2 presents the truck route for transporting material.

The study will analyze six study intersections that are also presented in Figure 2:

1. I-880 NB Ramps / Whipple Road / Industrial Parkway (Caltrans, in Hayward)
2. I-880 SB Ramps / Whipple Road / Dyer Street (Caltrans, in Union City)
3. Union City Boulevard / Whipple Road (Union City)
4. Union City Boulevard / Horner Street (Union City)
5. Union City Boulevard / Alvarado Boulevard (Union City)
6. Union City Boulevard / Dyer Street (Union City)

Intersection turning movement volumes were collected in June 2016 during the following time periods:

- 7:00 a.m. to 9:00 a.m. for the AM peak hour
- 4:00 p.m. to 6:00 p.m. for the PM peak hour

Traffic volumes were projected and impacts were assessed for the following conditions during the AM and PM peak hours:

1. Existing Conditions – Traffic conditions were evaluated based on existing lane geometries, traffic controls and traffic volumes; and
2. Existing plus Project Conditions – Traffic conditions were evaluated with proposed project trips added to existing traffic volumes.

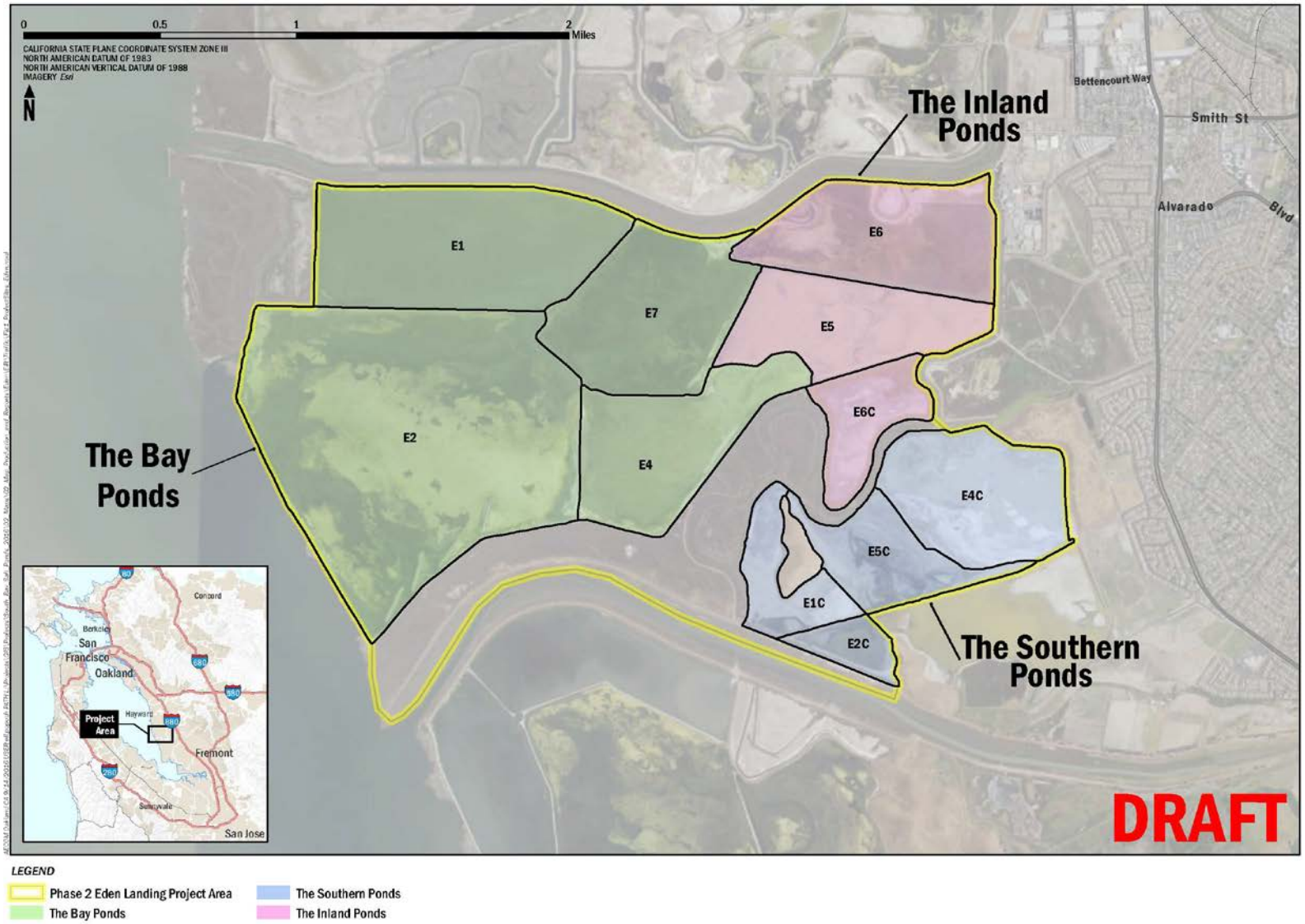


Figure 1 – Project Area Boundary

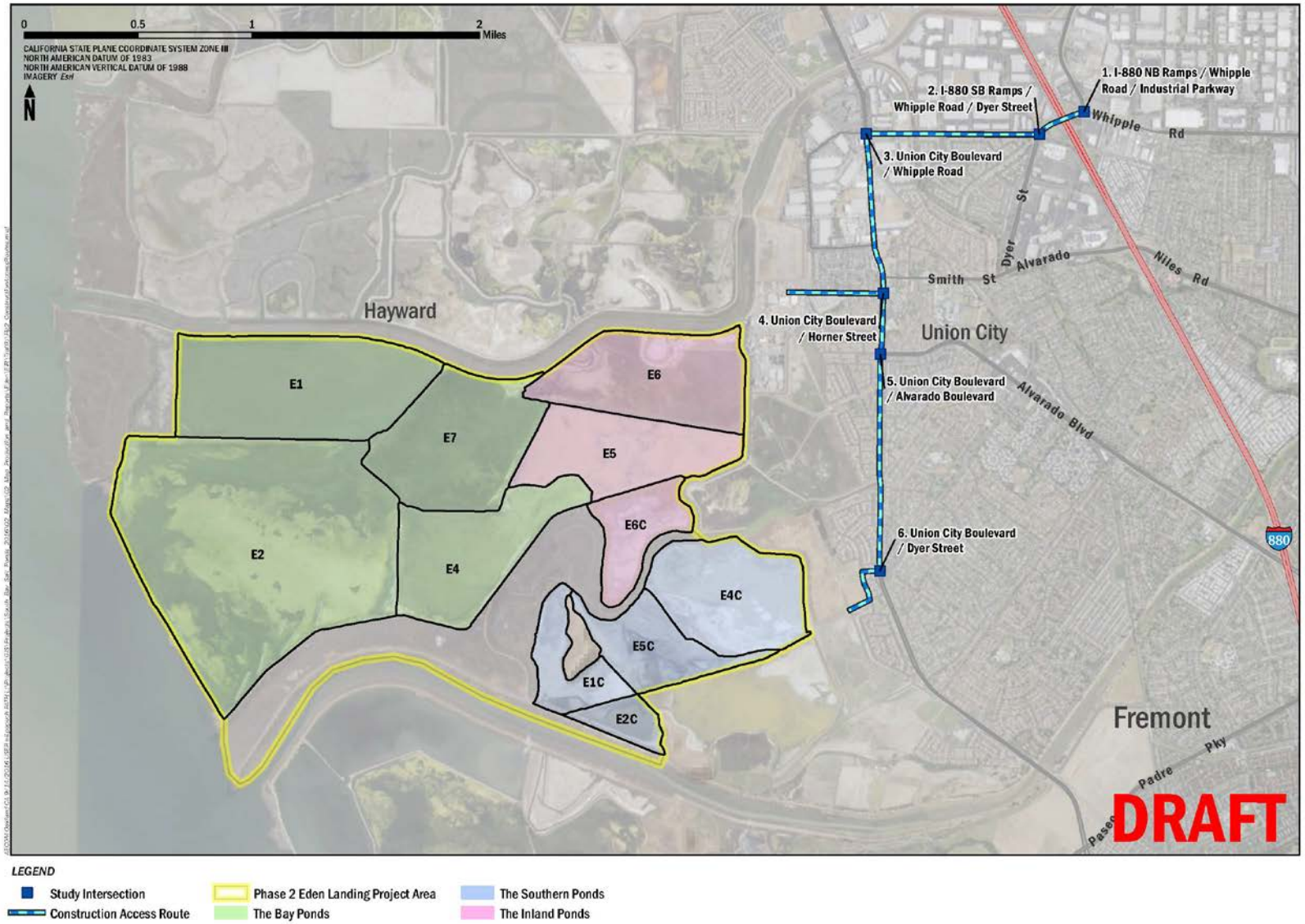


Figure 2– Construction Access Route and Study Intersections

III EVALUATION ANALYSIS

Evaluation Criteria

This section summarizes the methodologies used to perform the peak hour intersection capacity analysis at signalized intersections. Level of service analysis was performed using Synchro 9.0 software package based on the traffic data collected by AECOM according to the methodologies outlined in the Highway Capacity Manual (HCM 2000).

The resulting level of service (LOS) and delays were compared between the no-build and each project alternative. LOS measures traffic operating conditions, which varies from LOS A to LOS F. Table 1 presents a description of LOS and provides associated delays with each LOS letter grade for signalized intersections.

Table 1 – Signalized Intersection LOS Thresholds

Level of Service	Description	Delay (sec/veh)
A	Free-flow speeds prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.	≤ 10
B	Free-flow speeds are maintained. The ability to maneuver with the traffic stream is only slightly restricted.	>10-20
C	Flow with speeds at or near free-flow speeds. Freedom to maneuver with the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver.	>20-35
D	Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort.	>35-55
E	Operation at capacity. There are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing.	>55-80
F	Represents a breakdown in flow.	>80

Source: Highway Capacity Manual (Transportation Research Board, 2000)

IV EXISTING CONDITIONS

Existing lane geometries and traffic controls for the 6 study intersections are illustrated in Figure 3.

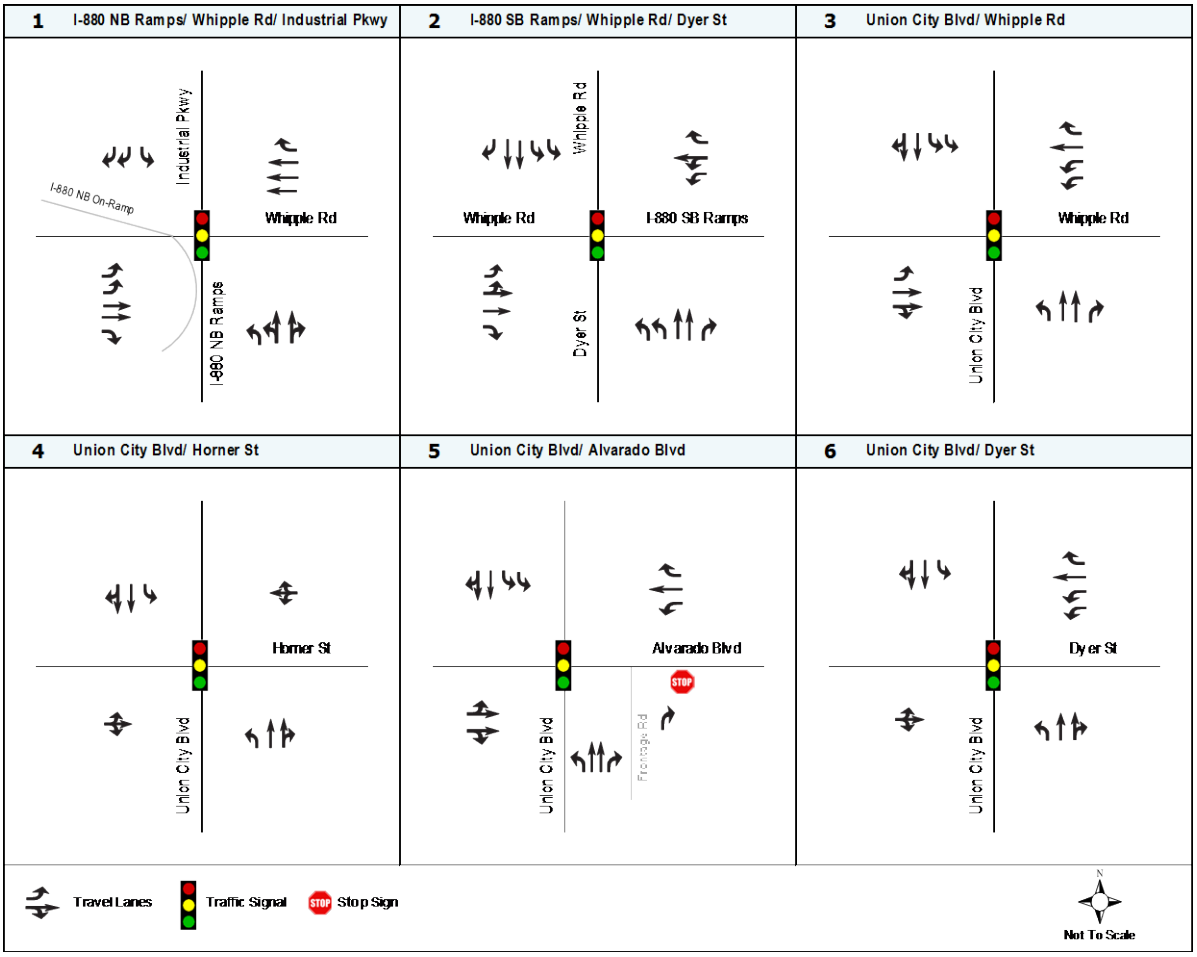


Figure 3 – Existing Lane Geometry

Existing intersection turning movement volumes at the study intersections are illustrated in Figure 4. The detailed counts for the AM and PM peak periods collected are provided in Appendix A.

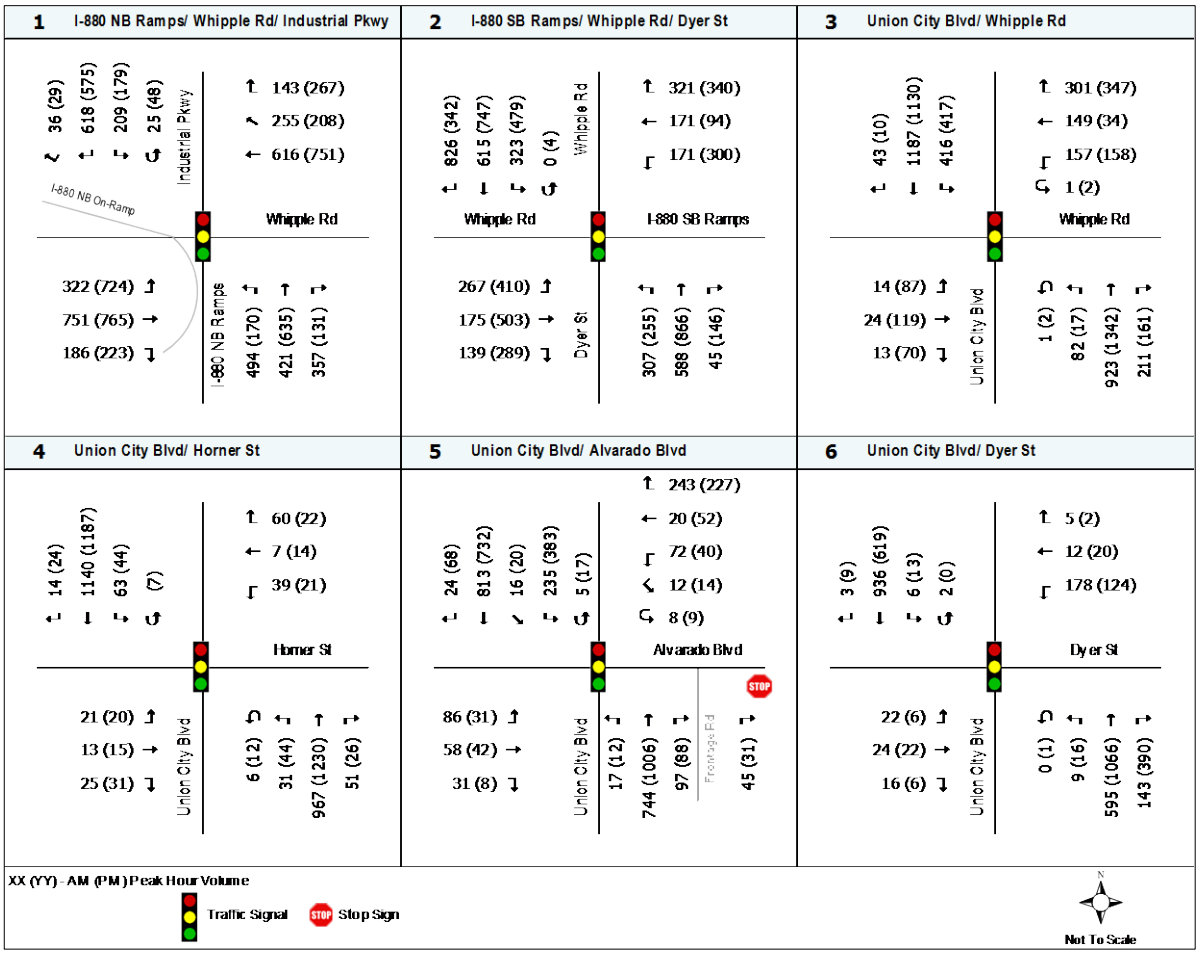


Figure 4 – Existing Peak Hour Turning Movement Volumes

V PROJECT CONDITION IMPACT ANALYSIS

There are two 'with project' scenarios being analyzed. The first scenario is the 'base case' and the second being the 'worst case'. Project trips generated under the 'base case' are dependent on the expected work duration of each project alternative, whereas the 'worst case' project trips are based on the daily maximum number of expected trips that the fill material can be brought to the project site. Details of each scenario are described below.

Trip generation

<u>Base Case:</u>
The estimated project trips using each of the two site accesses are shown in Table 2. It is assumed that each truck would carry 11 cubic yards of fill and the number of outbound trips is equal to the number of inbound trips in the same hour. The expected number of work days for each alternative as well as the number of work hours per day is also included in the table. It is projected that each alternative will generate a total of 10 trips (5 inbound, 5 outbound) in the AM and PM Peak Hours, with Alternatives B and C being expected to generate the same distribution pattern. Alternative D is expected to generate one inbound

trip a day at the South Access. This trip is assumed to be made during the peak hour for a conservative calculation. In addition, it is assumed that fill material will be brought to the project site via I-880; 50% from the north and 50% from the south. Figures 5a-b illustrate the proposed project trips at the study intersections for each alternative.

Table 2 – Base Case Trip Generation for Project Alternatives

	Project Alternative	Site Access	Net Import (CY)	Total Inbound Truck Trips	# of Work Days	Inbound Trips / Day	Work Hours / Day	Inbound Trips / Hour
A	No Build	-	-	-	-	-	-	-
B	Restore Entire South Eden Landing to Tidal Marsh	North	44,000	4,000	209	20	10	2
		South	48,000	4,364		21		3
C	Retain Inland and Southern Ponds as Managed Ponds	North	18,000	1,634	134	13	10	2
		South	41,000	3,728		28		3
D	Staged Implementation of Tidal Marsh Restoration	North	152,000	13,819	350	40	10	4
		South	2,000	182		1		1*

Source: AECOM 2016
*Assumes trip is made during peak hour for conservative calculation

Figure 5a – Base Case Project Alternatives B & C Turning Movement Volumes

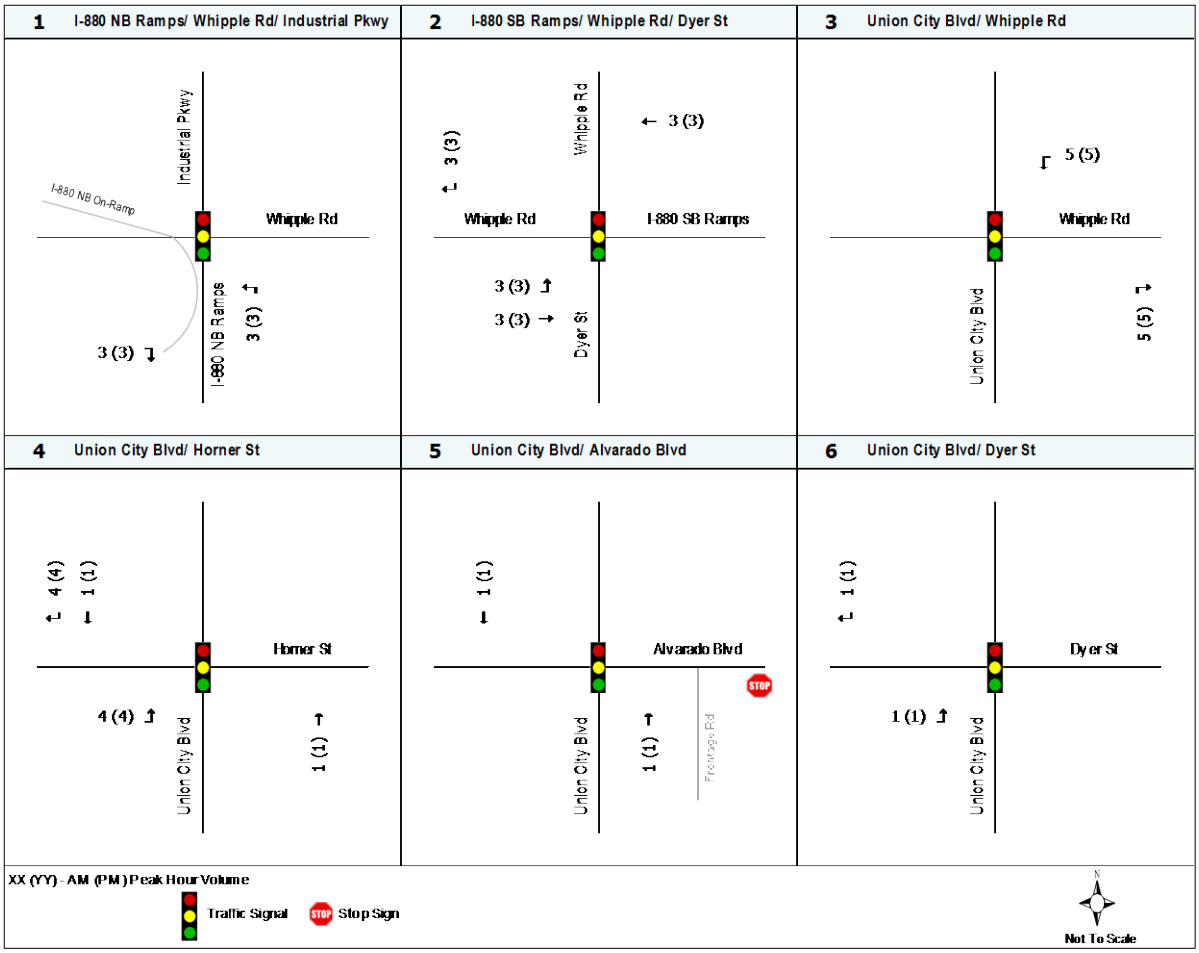


Figure 5b – Base Case Project Alternative D Turning Movement Volumes

<u>Worst Case:</u>

The estimated project trips using each of the two site accesses are shown in Table 3. It is assumed that a daily maximum of 200 trucks would bring fill material to the project site via the two accesses. It is therefore projected that each alternative will generate a total of 40 trips (20 inbound, 20 outbound) in the AM and PM Peak Hours. For a conservative calculation, Alternative B & D are expected to generate one additional inbound trip during the peak hours at the South Access. In addition, it is assumed that fill material will be brought to the project site via I-880; 50% from the north and 50% from the south. Figures 6a-c illustrate the proposed project trips at the study intersections for each alternative.

Table 3 – Worst Case Trip Generation for Project Alternatives

	Project Alternative	Site Access	Access usage	Inbound Trips / day	Work Hours / Day	Inbound Trips / Hour
A	No Build	-	-	-	-	-
B	Restore Entire South Eden Landing to Tidal Marsh	North	48%	96	10	10
		South	52%	104		11*
C	Retain Inland and Southern Ponds as Managed Ponds	North	30%	60	10	6
		South	70%	140		14
D	Staged Implementation of Tidal Marsh Restoration	North	99%	198	10	20
		South	1%	2		1*

Source: AECOM 2016
*Assumes an additional trip for conservative calculation

Figure 6a – Worst Case Project Alternative B Turning Movement Volumes

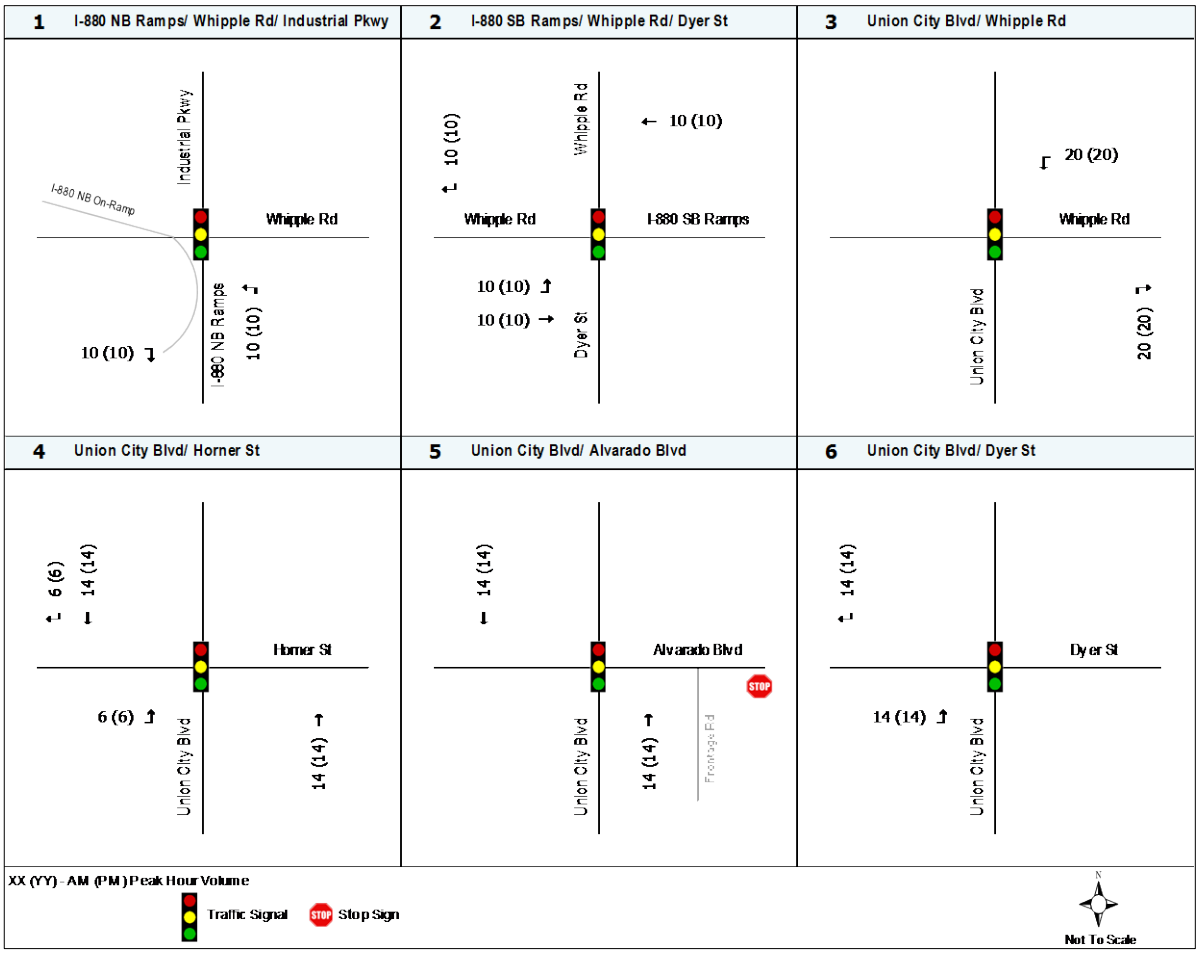


Figure 6b – Worst Case Project Alternative C Turning Movement Volumes

Significant Impact Thresholds

Two of the six study intersections are operated and maintained by Caltrans while the remaining four are operated and maintained by the City of Union City. Caltrans recommend using the corresponding City's significant impact threshold criteria for the two intersections under their charge. One of the Caltrans intersection falls within the city limits of Hayward and the other is in Union City.

For intersection #1 (I-880 NB Ramps / Whipple Road / Industrial Parkway), the City of Hayward thresholds have been considered.

For the rest of the study intersections, the City of Union City thresholds have been considered.

According to the City of Hayward guidelines for signalized intersections,

- LOS E is treated as an acceptable LOS. If the project causes an intersection operating at LOS E or better to fall below LOS E, then the project is projected to be causing a significant impact.

Figure 6c – Worst Case Project Alternative D Turning Movement Volumes

- For an intersection already operating at unacceptable LOS F, if the project increases the average control delay by five (5) seconds or more, the project is projected to be causing a significant impact.

According to the City of Union City guidelines for signalized intersections,

- LOS D is treated as an acceptable LOS. If the project causes an intersection operating at LOS D or better to fall below LOS D, then the project is projected to be causing a significant impact.

Impact Analysis

Analysis was conducted by comparing the 'with' and 'without' project intersection LOS and delay to determine if the project causes a significant impact. Tables 4a-b present the analysis results for the Base Case and Tables 5a-c present the results for the Worst Case.

Base Case:

It can be seen from Tables 4a and 4b that all study intersections, except intersection #2, will continue to operate within acceptable levels of service under all three project alternatives. The LOS for intersection #2, located in Union City, is currently at an unacceptable LOS E during the AM peak hour. It is expected to remain at the same LOS E under all the project alternatives. The average delay at this intersection is expected to increase by 2.2 seconds in the AM peak hour due to the additional project trips. Detailed level of service calculation sheets are provided in Appendix B.

Table 4a – Base Case LOS and Delay for Alternative B & C

Intersection		Peak Hour	No Project		With Project		
			LOS	Avg Delay[1] (sec)	LOS	Avg Delay[1] (sec)	Increase in Avg delay[2] (sec)
1	I-880 NB Ramps / Whipple Road / Industrial Parkway [3]	AM	E	55.4	E	55.9	n/a
		PM	E	73.1	E	73.0	
2	I-880 SB Ramps / Whipple Road / Dyer Street	AM	**E**	**66.9**	**E**	**69.1**	**2.2**
		PM	D	50.7	D	51.1	n/a
3	Union City Boulevard / Whipple Road	AM	C	30.8	C	31.0	n/a
		PM	D	48.1	D	48.1	
4	Union City Boulevard / Horner Street	AM	B	15.3	B	15.4	n/a
		PM	C	22.3	C	22.4	
5	Union City Boulevard / Alvarado Boulevard	AM	C	25.2	C	25.3	n/a
		PM	C	25.2	C	25.2	
6	Union City Boulevard / Dyer Street	AM	B	11.5	B	11.6	n/a
		PM	A	7.6	A	7.6	

Source: AECOM 2016

Bold indicates LOS at unacceptable levels

1. Intersection Control Delay per HCM 2000 methodology
2. Increase in average delay only calculated for intersection at unacceptable level under 'with project' conditions to determine project impact.
3. Intersection #1 in City of Hayward; acceptable LOS is E or better.

Table 4b – Base Case LOS and Delay for Alternative D

Intersection		Peak Hour	No Project		With Project		
			LOS	Avg Delay[1] (sec)	LOS	Avg Delay[1] (sec)	Increase in Avg delay[2] (sec)
1	I-880 NB Ramps / Whipple Road / Industrial Parkway [3]	AM	E	55.4	E	55.9	n/a
		PM	E	73.1	E	73.0	
2	I-880 SB Ramps / Whipple Road / Dyer Street	AM	**E**	**66.9**	**E**	**69.1**	**2.2**
		PM	D	50.7	D	51.1	n/a
3	Union City Boulevard /	AM	C	30.8	C	31.0	n/a

Intersection		Peak Hour	No Project LOS	No Project Avg Delay[1] (sec)	With Project LOS	With Project Avg Delay[1] (sec)	Increase in Avg delay[2] (sec)
	Whipple Road	PM	D	48.1	D	48.1	
4	Union City Boulevard / Horner Street	AM	B	15.3	B	15.4	n/a
		PM	C	22.3	C	21.8	
5	Union City Boulevard / Alvarado Boulevard	AM	C	25.2	C	25.2	n/a
		PM	C	25.2	C	25.2	
6	Union City Boulevard / Dyer Street	AM	B	11.5	B	11.5	n/a
		PM	A	7.6	A	7.6	

Source: AECOM 2016
Bold indicates LOS at unacceptable levels
1. Intersection Control Delay per HCM 2000 methodology
2. Increase in average delay only calculated for intersection at unacceptable level under 'with project' conditions to determine project impact.
3. Intersection #1 in City of Hayward; acceptable LOS is E or better.

Worst Case:
It can be seen from Tables 5a-c that all study intersections, except intersection #2, will continue to operate within acceptable levels of service under all three project alternatives.

Table 5a- Worst Case LOS and Delay for Alternative B

Intersection		Peak Hour	No Project LOS	No Project Avg Delay[1] (sec)	With Project LOS	With Project Avg Delay[1] (sec)	Increase in Avg delay[2] (sec)
1	I-880 NB Ramps / Whipple Road / Industrial Parkway [3]	AM	E	55.4	E	56.7	n/a
		PM	E	73.1	E	72.7	
2	I-880 SB Ramps / Whipple Road / Dyer Street	AM	**E**	**66.9**	**E**	**74.9**	**8.0**
		PM	D	50.7	D	52.1	n/a
3	Union City Boulevard / Whipple Road	AM	C	30.8	C	31.3	n/a
		PM	D	48.1	D	49.0	
4	Union City Boulevard / Horner Street	AM	B	15.3	B	15.8	n/a
		PM	C	22.3	C	22.2	
5	Union City Boulevard / Alvarado Boulevard	AM	C	25.2	C	25.4	n/a
		PM	C	25.2	C	25.5	
6	Union City Boulevard / Dyer Street	AM	B	11.5	B	11.8	n/a
		PM	A	7.6	A	7.8	

Source: AECOM 2016
Bold indicates LOS at unacceptable levels
1. Intersection Control Delay per HCM 2000 methodology
2. Increase in average delay only calculated for intersection at unacceptable level under 'with project' conditions to determine project impact.
3. Intersection #1 in City of Hayward; acceptable LOS is E or better.

The LOS for intersection #2, located in Union City, is currently at an unacceptable LOS E during the AM peak hour. It is expected to remain at the same LOS E under all the project alternatives. The average delay at this intersection, under the worst case scenario, is expected to increase by 8.0 seconds in the AM peak hour due to the additional project trips. Detailed level of service calculation sheets are provided in Appendix C.

Table 5b- Worst Case LOS and Delay for Alternative C

Intersection		Peak Hour	No Project		With Project		
			LOS	Avg Delay[1] (sec)	LOS	Avg Delay[1] (sec)	Increase in Avg delay[2] (sec)
1	I-880 NB Ramps / Whipple Road / Industrial Parkway [3]	AM	E	55.4	E	56.7	n/a
		PM	E	73.1	E	72.7	
2	I-880 SB Ramps / Whipple Road / Dyer Street	AM	**E**	**66.9**	**E**	**74.9**	**8.0**
		PM	D	50.7	D	52.1	n/a
3	Union City Boulevard / Whipple Road	AM	C	30.8	C	31.3	n/a
		PM	D	48.1	D	49.0	
4	Union City Boulevard / Horner Street	AM	B	15.3	B	15.6	n/a
		PM	C	22.3	C	21.9	
5	Union City Boulevard / Alvarado Boulevard	AM	C	25.2	C	25.5	n/a
		PM	C	25.2	C	25.5	
6	Union City Boulevard / Dyer Street	AM	B	11.5	B	11.8	n/a
		PM	A	7.6	A	7.8	

Source: AECOM 2016

Bold indicates LOS at unacceptable levels

1. Intersection Control Delay per HCM 2000 methodology
2. Increase in average delay only calculated for intersection at unacceptable level under 'with project' conditions to determine project impact.
3. Intersection #1 in City of Hayward; acceptable LOS is E or better.

Table 5c- Worst Case LOS and Delay for Alternative D

Intersection		Peak Hour	No Project		With Project		
			LOS	Avg Delay[1] (sec)	LOS	Avg Delay[1] (sec)	Increase in Avg delay[2] (sec)
1	I-880 NB Ramps / Whipple Road / Industrial Parkway [3]	AM	E	55.4	E	56.7	n/a
		PM	E	73.1	E	72.7	
2	I-880 SB Ramps / Whipple Road / Dyer Street	AM	**E**	**66.9**	**E**	**74.9**	**8.0**
		PM	D	50.7	D	52.1	n/a
3	Union City Boulevard / Whipple Road	AM	C	30.8	C	31.3	n/a
		PM	D	48.1	D	49.0	
4	Union City Boulevard / Horner Street	AM	B	15.3	B	17.1	n/a
		PM	C	22.3	C	23.1	
5	Union City Boulevard / Alvarado Boulevard	AM	C	25.2	C	25.2	n/a
		PM	C	25.2	C	25.2	

Intersection		Peak Hour	No Project LOS	No Project Avg Delay[1] (sec)	With Project LOS	With Project Avg Delay[1] (sec)	Increase in Avg delay[2] (sec)
6	Union City Boulevard / Dyer Street	AM	B	11.5	B	11.5	n/a
		PM	A	7.6	A	7.6	

Source: AECOM 2016

Bold indicates LOS at unacceptable levels

1. Intersection Control Delay per HCM 2000 methodology
2. Increase in average delay only calculated for intersection at unacceptable level under 'with project' conditions to determine project impact.
3. Intersection #1 in City of Hayward; acceptable LOS is E or better.

VII MITIGATION MEASURES

No mitigation measures are necessary for study intersections #1, #3, #4, #5 and #6 under both the Base Case and Worse Case scenarios. For intersection #2, it is already operating at an unacceptable LOS under existing (without project) conditions and the City of Union City does not have an impact criterion for such a condition.

Under the Base Case scenario, an additional delay of 2.2 seconds in the AM peak hour is generally considered less than significant (based on impact criteria of other surrounding cities in the Bay Area). It is therefore reasonable to conclude that the project would not cause any significant impact to intersection #2 as well and no mitigation measure would be necessary.

Under the Worst Case scenario, an additional delay of 8.0 seconds in the AM peak hour can be considered significant. Optimizing the timing at intersection #2 would mitigate the impact to less than significant. However, this mitigation is not feasible as intersection #2 is part of a synchronized series of intersections.

VIII CONCLUSION

It is determined from the analysis that the project will cause no significant impact to study intersections #1, #3, #4, #5 and #6. For intersection #2 the 'with project' LOS is expected to remain at unacceptable levels during the AM peak hour under both the Base Case and Worst Case scenarios, similar to its existing 'without project' conditions. However, under the Base Case scenario, an additional delay of 2.2 seconds in the AM peak hour can be considered insignificant. As such, intersection #2 will not be significantly impacted under the Base Case scenario. Under the Worst Case scenario, an additional 8.0 seconds of delay in the AM peak hour can be considered significant but there are no feasible mitigation measures available. As such, the project impact at intersection #2 is considered significant and unavoidable under the Worst Case scenario.

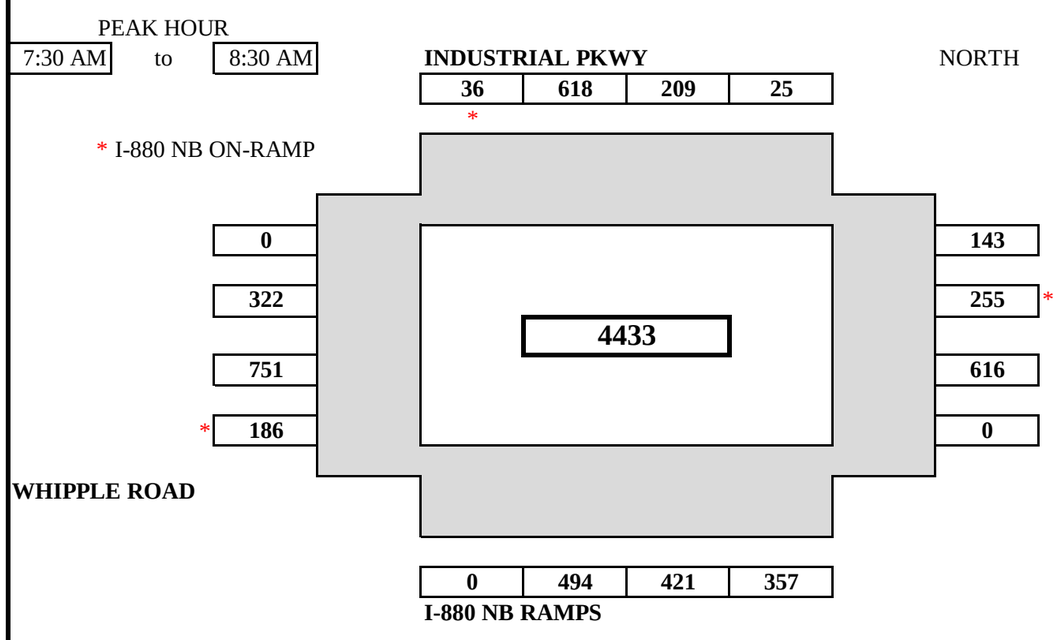
APPENDIX A
DETAILED INTERSECTION TURNING MOVEMENT VOLUMES

B.A.Y.M.E.T.R.I.C.S.

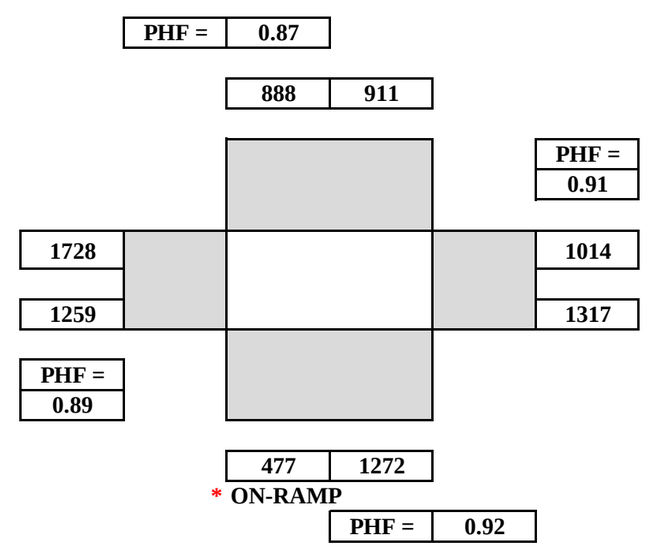
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	TRAFFIC COUNTS IN UNION CITY		SURVEY DATE:	6/7/2016	DAY: TUESDAY
N-S APPROACH:	I-880 NB RAMPS - INDUSTRIAL PKWY		SURVEY TIME:	7:00 AM	TO 9:00 AM
E-W APPROACH:	WHIPPLE ROAD		JURISDICTION:	UNION CITY	FILE: 3606057-1AM

PEAK HOUR
7:30 AM to 8:30 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From	To	NORTHBOUND U-TURN	LEFT	THRU	RIGHT	SOUTHBOUND U-TURN	LEFT	RIGHT	ONRAMP	EASTBOUND U-TURN	LEFT	THRU	ONRAMP	WESTBOUND U-TURN	THRU	ONRAMP	RIGHT	TOTAL
SURVEY DATA																		
7:00 AM	7:15 AM		56	65	82	2	46	176	11		48	102	63	0	112	67	12	**842**
7:15 AM	7:30 AM		132	154	169	5	79	352	30		99	191	137	0	225	128	52	**1753**
7:30 AM	7:45 AM		233	255	248	10	126	525	40		172	331	201	0	359	196	78	**2774**
7:45 AM	8:00 AM		353	351	352	15	191	702	48		250	583	225	0	516	262	119	**3967**
8:00 AM	8:15 AM		490	471	440	23	227	836	63		330	786	290	0	652	331	158	**5097**
8:15 AM	8:30 AM		626	575	526	30	288	970	66		421	942	323	0	841	383	195	**6186**
8:30 AM	8:45 AM		749	696	608	41	318	1136	89		482	1038	380	0	984	423	227	**7171**
8:45 AM	9:00 AM		853	801	693	47	354	1256	103		561	1179	423	0	1134	475	268	**8147**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	56	65	82	2	46	176	11	0	48	102	63	0	112	67	12	**842**
7:15 AM	7:30 AM	0	76	89	87	3	33	176	19	0	51	89	74	0	113	61	40	**911**
7:30 AM	7:45 AM	0	101	101	79	5	47	173	10	0	73	140	64	0	134	68	26	**1021**
7:45 AM	8:00 AM	0	120	96	104	5	65	177	8	0	78	252	24	0	157	66	41	**1193**
8:00 AM	8:15 AM	0	137	120	88	8	36	134	15	0	80	203	65	0	136	69	39	**1130**
8:15 AM	8:30 AM	0	136	104	86	7	61	134	3	0	91	156	33	0	189	52	37	**1089**
8:30 AM	8:45 AM	0	123	121	82	11	30	166	23	0	61	96	57	0	143	40	32	**985**
8:45 AM	9:00 AM	0	104	105	85	6	36	120	14	0	79	141	43	0	150	52	41	**976**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	353	351	352	15	191	702	48	0	250	583	225	0	516	262	119	**3967**
7:15 AM	8:15 AM	0	434	406	358	21	181	660	52	0	282	684	227	0	540	264	146	**4255**
7:30 AM	8:30 AM	0	494	421	357	25	209	618	36	0	322	751	186	0	616	255	143	**4433**
7:45 AM	8:45 AM	0	516	441	360	31	192	611	49	0	310	707	179	0	625	227	149	**4397**
8:00 AM	9:00 AM	0	500	450	341	32	163	554	55	0	311	596	198	0	618	213	149	**4180**

PEAK HOUR SUMMARY

7:30 AM to 8:30 AM	NORTHBOUND U-TURN	LEFT	THRU	RIGHT	SOUTHBOUND U-TURN	LEFT	RIGHT	ONRAMP	EASTBOUND U-TURN	LEFT	THRU	ONRAMP	WESTBOUND U-TURN	THRU	ONRAMP	RIGHT	TOTAL
VOLUME	0	494	421	357	25	209	618	36	0	322	751	186	0	616	255	143	**4433**
PHF BY MOVEMENT	0.00	0.90	0.88	0.86	0.78	0.80	0.87	0.60	0.00	0.88	0.75	0.72	0.00	0.81	0.92	0.87	OVERALL
PHF BY APPROACH	0.92				0.87				0.89				0.91				0.93
BICYCLE	0				0				0				0				**0**
PEDESTRIAN	2				0				4				2				**8**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	6				0				2				0				**8**

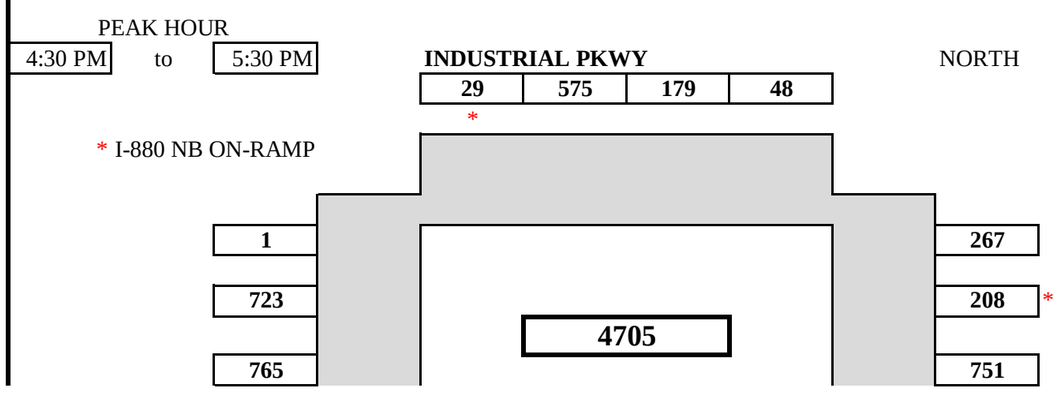
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

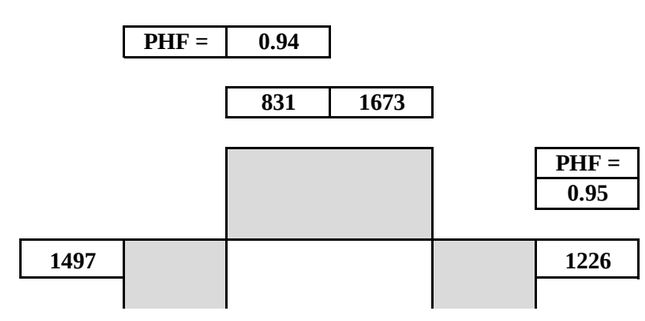
INTERSECTION TURNING MOVEMENT SUMMARY

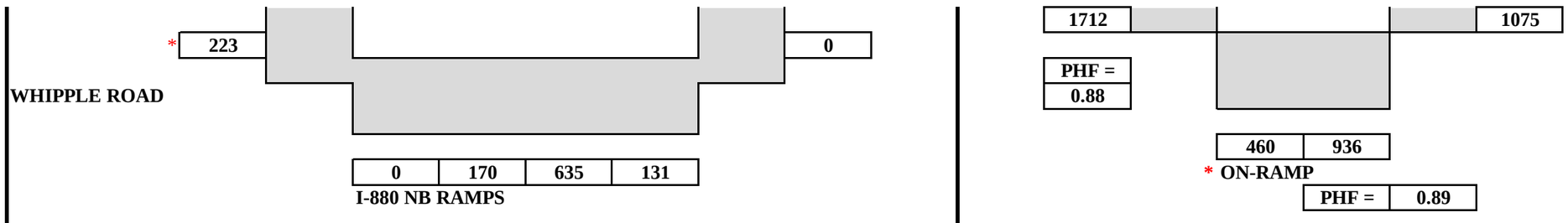
PROJECT:	TRAFFIC COUNTS IN UNION CITY		SURVEY DATE:	6/7/2016	DAY: TUESDAY
N-S APPROACH:	I-880 NB RAMPS - INDUSTRIAL PKWY		SURVEY TIME:	4:00 PM	TO 6:00 PM
E-W APPROACH:	WHIPPLE ROAD		JURISDICTION:	UNION CITY	FILE: 3606057-1PM

PEAK HOUR
4:30 PM to 5:30 PM



ARRIVAL / DEPARTURE VOLUMES





TIME PERIOD			NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From		To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	RIGHT	ONRAMP	U-TURN	LEFT	THRU	ONRAMP	U-TURN	THRU	ONRAMP	RIGHT	
SURVEY DATA																			
4:00 PM	to	4:15 PM		40	164	54	6	50	118	7	0	179	167	58		164	45	65	**1117**
4:15 PM	to	4:30 PM		102	312	99	15	97	242	15	1	348	354	127		336	87	117	**2252**
4:30 PM	to	4:45 PM		154	484	139	28	139	365	23	1	532	528	206		530	132	182	**3443**
4:45 PM	to	5:00 PM		192	627	176	41	185	517	31	1	744	752	257		721	177	249	**4670**
5:00 PM	to	5:15 PM		234	774	201	54	230	657	37	1	898	925	303		918	237	313	**5782**
5:15 PM	to	5:30 PM		272	947	230	63	276	817	44	2	1071	1119	350		1087	295	384	**6957**
5:30 PM	to	5:45 PM		330	1114	261	75	318	969	46	3	1238	1278	405		1302	327	454	**8120**
5:45 PM	to	6:00 PM		352	1293	299	84	375	1121	51	4	1413	1456	458		1477	374	525	**9282**
TOTAL BY PERIOD																			
4:00 PM	to	4:15 PM	0	40	164	54	6	50	118	7	0	179	167	58	0	164	45	65	**1117**
4:15 PM	to	4:30 PM	0	62	148	45	9	47	124	8	1	169	187	69	0	172	42	52	**1135**
4:30 PM	to	4:45 PM	0	52	172	40	13	42	123	8	0	184	174	79	0	194	45	65	**1191**
4:45 PM	to	5:00 PM	0	38	143	37	13	46	152	8	0	212	224	51	0	191	45	67	**1227**
5:00 PM	to	5:15 PM	0	42	147	25	13	45	140	6	0	154	173	46	0	197	60	64	**1112**
5:15 PM	to	5:30 PM	0	38	173	29	9	46	160	7	1	173	194	47	0	169	58	71	**1175**
5:30 PM	to	5:45 PM	0	58	167	31	12	42	152	2	1	167	159	55	0	215	32	70	**1163**
5:45 PM	to	6:00 PM	0	22	179	38	9	57	152	5	1	175	178	53	0	175	47	71	**1162**
HOURLY TOTALS																			
4:00 PM	to	5:00 PM	0	192	627	176	41	185	517	31	1	744	752	257	0	721	177	249	**4670**
4:15 PM	to	5:15 PM	0	194	610	147	48	180	539	30	1	719	758	245	0	754	192	248	**4665**
4:30 PM	to	5:30 PM	0	170	635	131	48	179	575	29	1	723	765	223	0	751	208	267	**4705**
4:45 PM	to	5:45 PM	0	176	630	122	47	179	604	23	2	706	750	199	0	772	195	272	**4677**
5:00 PM	to	6:00 PM	0	160	666	123	43	190	604	20	3	669	704	201	0	756	197	276	**4612**

PEAK HOUR SUMMARY

4:30 PM to 5:30 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	RIGHT	ONRAMP	U-TURN	LEFT	THRU	ONRAMP	U-TURN	THRU	ONRAMP	RIGHT	
VOLUME	0	170	635	131	48	179	575	29	1	723	765	223	0	751	208	267	**4705**
PHF BY MOVEMENT	0.00	0.82	0.92	0.82	0.92	0.97	0.90	0.91	0.25	0.85	0.85	0.71	0.00	0.95	0.87	0.94	OVERALL
PHF BY APPROACH	0.89				0.94				0.88				0.95				0.96
BICYCLE	0				0				0				0				**0**
PEDESTRIAN	1				3				5				4				**13**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	9				0				4				0				**13**

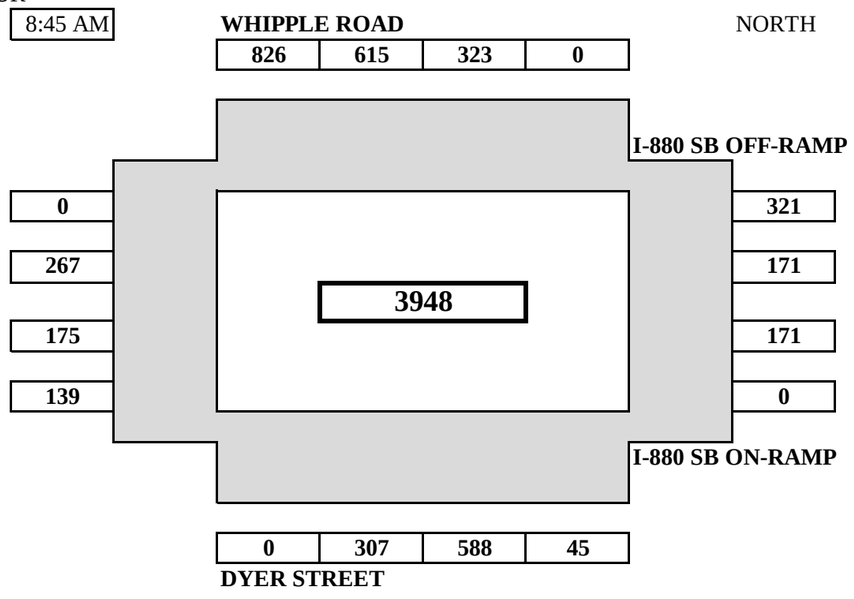
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

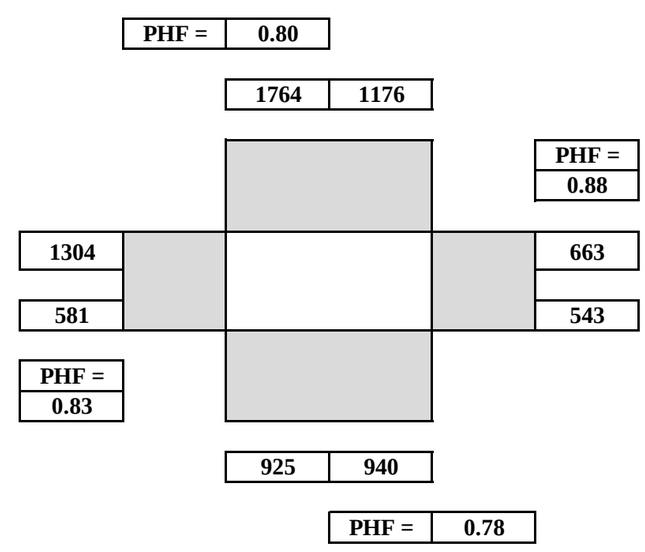
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	TRAFFIC COUNTS IN UNION CITY			SURVEY DATE:	6/7/2016	DAY:	TUESDAY
N-S APPROACH:	WHIPPLE ROAD	-	DYER STREET	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	WHIPPLE ROAD	-	I-88O SB RAMPS	JURISDICTION:	UNION CITY	FILE:	3606057-2AM

PEAK HOUR 7:45 AM to 8:45 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From	To	NORTHBOUND U-TURN	LEFT	THRU	RIGHT	SOUTHBOUND U-TURN	LEFT	THRU	RIGHT	EASTBOUND U-TURN	LEFT	THRU	RIGHT	WESTBOUND U-TURN	LEFT	THRU	RIGHT	TOTAL
SURVEY DATA																		
7:00 AM	7:15 AM		30	103	11		88	107	112		52	40	16		30	18	58	**665**
7:15 AM	7:30 AM		58	192	32		212	242	257		117	96	40		80	45	122	**1493**
7:30 AM	7:45 AM		122	327	40		299	264	415		184	157	75		103	62	218	**2266**
7:45 AM	8:00 AM		193	466	49		408	503	620		267	214	110		143	103	326	**3402**
8:00 AM	8:15 AM		295	651	62		488	611	822		345	256	146		182	136	413	**4407**
8:15 AM	8:30 AM		369	803	72		548	766	1055		407	303	174		229	187	479	**5392**
8:30 AM	8:45 AM		429	915	85		622	879	1241		451	332	214		274	233	539	**6214**
8:45 AM	9:00 AM		485	1021	94		695	1004	1455		507	380	258		326	284	638	**7147**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	30	103	11	0	88	107	112	0	52	40	16	0	30	18	58	**665**
7:15 AM	7:30 AM	0	28	89	21	0	124	135	145	0	65	56	24	0	50	27	64	**828**
7:30 AM	7:45 AM	0	64	135	8	0	87	22	158	0	67	61	35	0	23	17	96	**773**
7:45 AM	8:00 AM	0	71	139	9	0	109	239	205	0	83	57	35	0	40	41	108	**1136**
8:00 AM	8:15 AM	0	102	185	13	0	80	108	202	0	78	42	36	0	39	33	87	**1005**
8:15 AM	8:30 AM	0	74	152	10	0	60	155	233	0	62	47	28	0	47	51	66	**985**
8:30 AM	8:45 AM	0	60	112	13	0	74	113	186	0	44	29	40	0	45	46	60	**822**
8:45 AM	9:00 AM	0	56	106	9	0	73	125	214	0	56	48	44	0	52	51	99	**933**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	193	466	49	0	408	503	620	0	267	214	110	0	143	103	326	**3402**
7:15 AM	8:15 AM	0	265	548	51	0	400	504	710	0	293	216	130	0	152	118	355	**3742**
7:30 AM	8:30 AM	0	311	611	40	0	336	524	798	0	290	207	134	0	149	142	357	**3899**
7:45 AM	8:45 AM	0	307	588	45	0	323	615	826	0	267	175	139	0	171	171	321	**3948**
8:00 AM	9:00 AM	0	292	555	45	0	287	501	835	0	240	166	148	0	183	181	312	**3745**

PEAK HOUR SUMMARY

7:45 AM to 8:45 AM	NORTHBOUND NBU	NBL	NBT	NBR	SOUTHBOUND SBU	SBL	SBT	SBR	EASTBOUND EBU	EBL	EBT	EBR	WESTBOUND WBU	WBL	WBT	WBR	TOTAL
VOLUME	0	307	588	45	0	323	615	826	0	267	175	139	0	171	171	321	**3948**
PHF BY MOVEMENT	0.00	0.75	0.79	0.87	0.00	0.74	0.64	0.89	0.00	0.80	0.77	0.87	0.00	0.91	0.84	0.74	OVERALL
PHF BY APPROACH	0.78				0.80				0.83				0.88				0.87
BICYCLE	1				4				1				0				**6**
PEDESTRIAN	4				1				0				0				**5**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	0				0				0				5				**5**

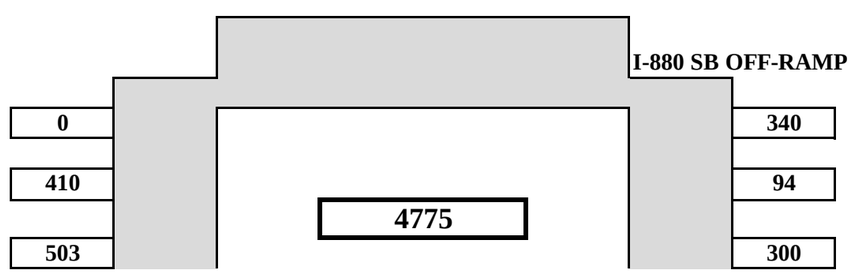
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

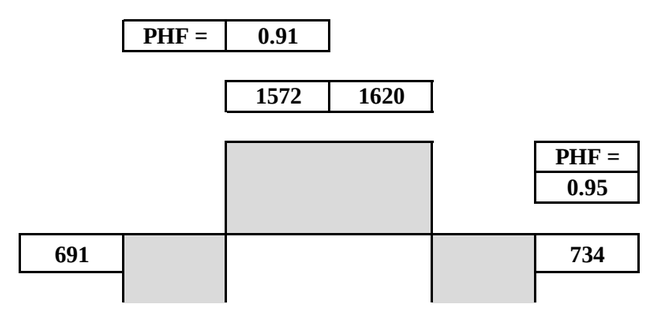
INTERSECTION TURNING MOVEMENT SUMMARY

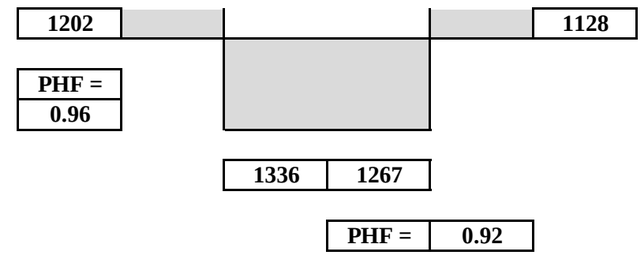
PROJECT:	TRAFFIC COUNTS IN UNION CITY			SURVEY DATE:	6/7/2016	DAY:	TUESDAY
N-S APPROACH:	WHIPPLE ROAD	-	DYER STREET	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	WHIPPLE ROAD	-	I-88O SB RAMPS	JURISDICTION:	UNION CITY	FILE:	3606057-2PM

PEAK HOUR 5:00 PM to 6:00 PM



ARRIVAL / DEPARTURE VOLUMES





TIME	PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From		To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																			
4:00 PM	to	4:15 PM	0	74	245	26	0	102	143	79		80	94	62		69	26	79	**1079**
4:15 PM	to	4:30 PM	1	135	481	57	0	205	298	200		176	185	127		133	62	176	**2236**
4:30 PM	to	4:45 PM	1	195	717	92	0	324	442	293		299	264	185		206	97	259	**3374**
4:45 PM	to	5:00 PM	3	265	951	118	2	432	640	376		438	373	273		279	120	335	**4605**
5:00 PM	to	5:15 PM	3	330	1174	150	2	557	810	456		537	509	347		349	142	436	**5802**
5:15 PM	to	5:30 PM	3	377	1381	192	3	681	970	539		646	641	419		421	166	526	**6965**
5:30 PM	to	5:45 PM	3	436	1593	228	4	801	1156	628		753	773	489		503	185	590	**8142**
5:45 PM	to	6:00 PM	3	520	1817	264	6	911	1387	718		848	876	562		579	214	675	**9380**
TOTAL BY PERIOD																			
4:00 PM	to	4:15 PM	0	74	245	26	0	102	143	79	0	80	94	62	0	69	26	79	**1079**
4:15 PM	to	4:30 PM	1	61	236	31	0	103	155	121	0	96	91	65	0	64	36	97	**1157**
4:30 PM	to	4:45 PM	0	60	236	35	0	119	144	93	0	123	79	58	0	73	35	83	**1138**
4:45 PM	to	5:00 PM	2	70	234	26	2	108	198	83	0	139	109	88	0	73	23	76	**1231**
5:00 PM	to	5:15 PM	0	65	223	32	0	125	170	80	0	99	136	74	0	70	22	101	**1197**
5:15 PM	to	5:30 PM	0	47	207	42	1	124	160	83	0	109	132	72	0	72	24	90	**1163**
5:30 PM	to	5:45 PM	0	59	212	36	1	120	186	89	0	107	132	70	0	82	19	64	**1177**
5:45 PM	to	6:00 PM	0	84	224	36	2	110	231	90	0	95	103	73	0	76	29	85	**1238**
HOURLY TOTALS																			
4:00 PM	to	5:00 PM	3	265	951	118	2	432	640	376	0	438	373	273	0	279	120	335	**4605**
4:15 PM	to	5:15 PM	3	256	929	124	2	455	667	377	0	457	415	285	0	280	116	357	**4723**
4:30 PM	to	5:30 PM	2	242	900	135	3	476	672	339	0	470	456	292	0	288	104	350	**4729**
4:45 PM	to	5:45 PM	2	241	876	136	4	477	714	335	0	454	509	304	0	297	88	331	**4768**
5:00 PM	to	6:00 PM	0	255	866	146	4	479	747	342	0	410	503	289	0	300	94	340	**4775**

PEAK HOUR SUMMARY

5:00 PM to 6:00 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	255	866	146	4	479	747	342	0	410	503	289	0	300	94	340	**4775**
PHF BY MOVEMENT	0.00	0.76	0.97	0.87	0.50	0.96	0.81	0.95	0.00	0.94	0.92	0.98	0.00	0.91	0.81	0.84	OVERALL
PHF BY APPROACH	0.92				0.91				0.96				0.95				0.96
BICYCLE	0				8				4				2				**14**
PEDESTRIAN	3				7				0				0				**10**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	0				0				0				10				**10**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	TRAFFIC COUNTS IN UNION CITY	SURVEY DATE:	6/7/2016	DAY:	TUESDAY
N-S APPROACH:	UNION CITY BOULEVARD	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	WHIPPLE ROAD	JURISDICTION:	UNION CITY	FILE:	3606057-3AM

PEAK HOUR
7:45 AM to 8:45 AM

NORTH

43 | 1187 | 416 | 0

0 | 14 | 24 | 13

3522

301 | 149 | 157 | 1

WHIPPLE ROAD

1 | 82 | 923 | 211

UNION CITY BOULEVARD

ARRIVAL / DEPARTURE VOLUMES

PHF = 0.94

1646 | 1238

PHF = 0.93

274 | 51

608 | 652

PHF = 0.91

1358 | 1217

PHF = 0.86

TIME PERIOD From	To	NORTHBOUND U-TURN	LEFT	THRU	RIGHT	SOUTHBOUND U-TURN	LEFT	THRU	RIGHT	EASTBOUND U-TURN	LEFT	THRU	RIGHT	WESTBOUND U-TURN	LEFT	THRU	RIGHT	TOTAL
SURVEY DATA																		
7:00 AM	7:15 AM	0	8	143	30	0	68	276	6		1	1	1	0	22	13	57	**626**
7:15 AM	7:30 AM	1	10	306	63	0	173	595	9		2	6	4	0	54	20	120	**1363**
7:30 AM	7:45 AM	1	15	480	104	0	282	869	15		5	12	6	1	82	38	199	**2109**
7:45 AM	8:00 AM	1	31	729	165	0	423	1157	25		9	16	11	2	130	54	276	**3029**
8:00 AM	8:15 AM	1	51	991	238	0	512	1425	39		12	22	12	2	160	97	366	**3928**
8:15 AM	8:30 AM	1	80	1178	288	0	605	1728	49		16	27	17	2	207	144	427	**4769**
8:30 AM	8:45 AM	2	97	1403	315	0	698	2056	58		19	36	19	2	239	187	500	**5631**
8:45 AM	9:00 AM	2	116	1571	353	1	791	2337	74		27	51	22	2	265	274	554	**6440**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	8	143	30	0	68	276	6	0	1	1	1	0	22	13	57	**626**
7:15 AM	7:30 AM	1	2	163	33	0	105	319	3	0	1	5	3	0	32	7	63	**737**
7:30 AM	7:45 AM	0	5	174	41	0	109	274	6	0	3	6	2	1	28	18	79	**746**
7:45 AM	8:00 AM	0	16	249	61	0	141	288	10	0	4	4	5	1	48	16	77	**920**
8:00 AM	8:15 AM	0	20	262	73	0	89	268	14	0	3	6	1	0	30	43	90	**899**
8:15 AM	8:30 AM	0	29	187	50	0	93	303	10	0	4	5	5	0	47	47	61	**841**
8:30 AM	8:45 AM	1	17	225	27	0	93	328	9	0	3	9	2	0	32	43	73	**862**
8:45 AM	9:00 AM	0	19	168	38	1	93	281	16	0	8	15	3	0	26	87	54	**809**
HOURLY TOTALS																		
7:00 AM	8:00 AM	1	31	729	165	0	423	1157	25	0	9	16	11	2	130	54	276	**3029**
7:15 AM	8:15 AM	1	43	848	208	0	444	1149	33	0	11	21	11	2	138	84	309	**3302**
7:30 AM	8:30 AM	0	70	872	225	0	432	1133	40	0	14	21	13	2	153	124	307	**3406**
7:45 AM	8:45 AM	1	82	923	211	0	416	1187	43	0	14	24	13	1	157	149	301	**3522**
8:00 AM	9:00 AM	1	85	842	188	1	368	1180	49	0	18	35	11	0	135	220	278	**3411**

PEAK HOUR SUMMARY

7:45 AM to 8:45 AM	NORTHBOUND NBU	NBL	NBT	NBR	SOUTHBOUND SBU	SBL	SBT	SBR	EASTBOUND EBU	EBL	EBT	EBR	WESTBOUND WBU	WBL	WBT	WBR	TOTAL
VOLUME	1	82	923	211	0	416	1187	43	0	14	24	13	1	157	149	301	**3522**
PHF BY MOVEMENT	0.25	0.71	0.88	0.72	0.00	0.74	0.90	0.77	0.00	0.88	0.67	0.65	0.25	0.82	0.79	0.84	OVERALL
PHF BY APPROACH	0.86				0.94				0.91				0.93				0.96
BICYCLE	2				1				0				0				**3**
PEDESTRIAN	0				2				1				1				**4**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	1				1				2				0				**4**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	TRAFFIC COUNTS IN UNION CITY	SURVEY DATE:	6/7/2016	DAY:	TUESDAY
N-S APPROACH:	UNION CITY BOULEVARD	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	WHIPPLE ROAD	JURISDICTION:	UNION CITY	FILE:	3606057-3PM

PEAK HOUR
4:45 PM to 5:45 PM

NORTH

10 | 1130 | 417 | 0

0 | 87 | 119

3896

347 | 34 | 158

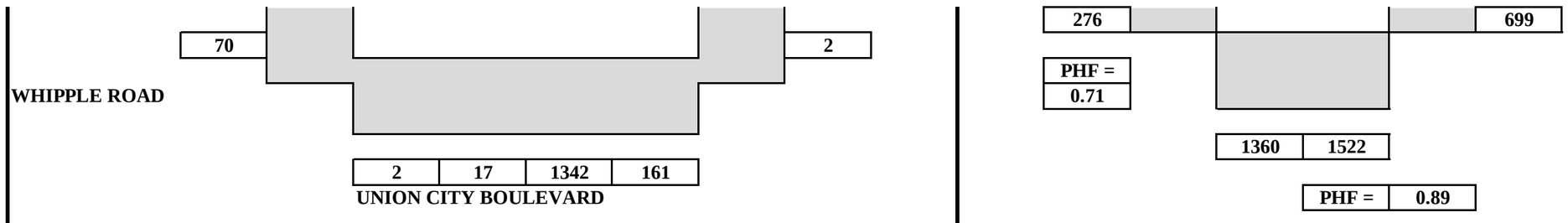
ARRIVAL / DEPARTURE VOLUMES

PHF = 0.88

1557 | 1776

PHF = 0.90

61 | 541



TIME	PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From		To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																			
4:00 PM	to	4:15 PM	0	9	367	56	0	121	241	4		12	20	7	1	28	17	70	**953**
4:15 PM	to	4:30 PM	0	15	688	101	0	225	462	7		37	48	19	2	64	42	142	**1852**
4:30 PM	to	4:45 PM	0	19	1045	159	0	308	686	8		58	78	34	2	91	57	211	**2756**
4:45 PM	to	5:00 PM	1	25	1423	202	0	415	938	11		75	100	41	2	135	68	306	**3742**
5:00 PM	to	5:15 PM	2	29	1722	248	0	508	1179	14		107	142	64	2	181	79	396	**4673**
5:15 PM	to	5:30 PM	2	31	2072	288	0	613	1489	16		123	169	86	3	212	86	486	**5676**
5:30 PM	to	5:45 PM	2	36	2387	320	0	725	1816	18		145	197	104	4	249	91	558	**6652**
5:45 PM	to	6:00 PM	3	41	2699	355	2	825	2111	23		153	214	106	4	277	101	664	**7578**
TOTAL BY PERIOD																			
4:00 PM	to	4:15 PM	0	9	367	56	0	121	241	4	0	12	20	7	1	28	17	70	**953**
4:15 PM	to	4:30 PM	0	6	321	45	0	104	221	3	0	25	28	12	1	36	25	72	**899**
4:30 PM	to	4:45 PM	0	4	357	58	0	83	224	1	0	21	30	15	0	27	15	69	**904**
4:45 PM	to	5:00 PM	1	6	378	43	0	107	252	3	0	17	22	7	0	44	11	95	**986**
5:00 PM	to	5:15 PM	1	4	299	46	0	93	241	3	0	32	42	23	0	46	11	90	**931**
5:15 PM	to	5:30 PM	0	2	350	40	0	105	310	2	0	16	27	22	1	31	7	90	**1003**
5:30 PM	to	5:45 PM	0	5	315	32	0	112	327	2	0	22	28	18	1	37	5	72	**976**
5:45 PM	to	6:00 PM	1	5	312	35	2	100	295	5	0	8	17	2	0	28	10	106	**926**
HOURLY TOTALS																			
4:00 PM	to	5:00 PM	1	25	1423	202	0	415	938	11	0	75	100	41	2	135	68	306	**3742**
4:15 PM	to	5:15 PM	2	20	1355	192	0	387	938	10	0	95	122	57	1	153	62	326	**3720**
4:30 PM	to	5:30 PM	2	16	1384	187	0	388	1027	9	0	86	121	67	1	148	44	344	**3824**
4:45 PM	to	5:45 PM	2	17	1342	161	0	417	1130	10	0	87	119	70	2	158	34	347	**3896**
5:00 PM	to	6:00 PM	2	16	1276	153	2	410	1173	12	0	78	114	65	2	142	33	358	**3836**

PEAK HOUR SUMMARY

4:45 PM	to	5:45 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
			NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME			2	17	1342	161	0	417	1130	10	0	87	119	70	2	158	34	347	**3896**
PHF BY MOVEMENT			0.50	0.71	0.89	0.88	0.00	0.93	0.86	0.83	0.00	0.68	0.71	0.76	0.50	0.86	0.77	0.91	OVERALL
PHF BY APPROACH			0.89				0.88				0.71				0.90				0.97
BICYCLE			0				5				0				1				**6**
PEDESTRIAN			1				3				5				3				**12**
			N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:			4				4				1				3				**12**

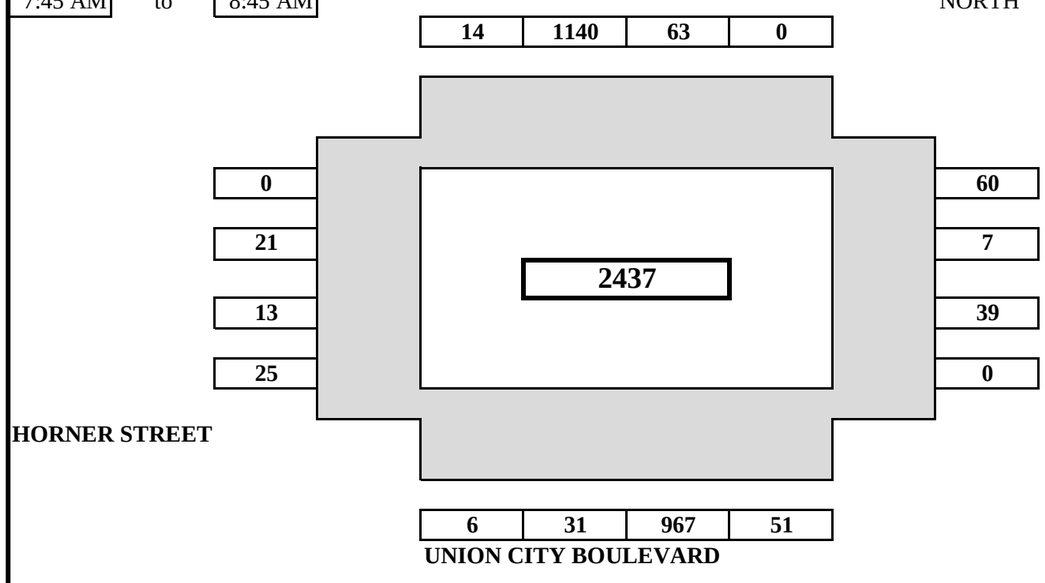
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

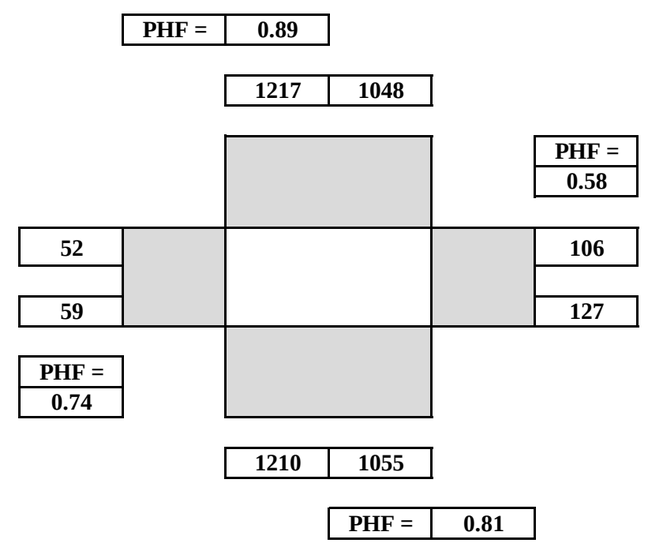
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	TRAFFIC COUNTS IN UNION CITY	SURVEY DATE:	6/7/2016	DAY:	TUESDAY
N-S APPROACH:	UNION CITY BOULEVARD	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	HORNER STREET	JURISDICTION:	UNION CITY	FILE:	3606057-4AM

PEAK HOUR
7:45 AM to 8:45 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From	To	NORTHBOUND U-TURN	LEFT	THRU	RIGHT	SOUTHBOUND U-TURN	LEFT	THRU	RIGHT	EASTBOUND U-TURN	LEFT	THRU	RIGHT	WESTBOUND U-TURN	LEFT	THRU	RIGHT	TOTAL
SURVEY DATA																		
7:00 AM	7:15 AM	2	8	159	6		5	297	25		7	4	5		3	3	4	**528**
7:15 AM	7:30 AM	2	12	340	9		15	562	26		10	6	11		4	4	11	**1012**
7:30 AM	7:45 AM	4	16	534	37		31	835	31		15	9	28		13	4	23	**1580**
7:45 AM	8:00 AM	5	24	801	57		62	1088	36		22	14	36		20	5	39	**2209**
8:00 AM	8:15 AM	5	31	1098	77		77	1338	36		25	19	43		40	6	64	**2859**
8:15 AM	8:30 AM	6	37	1296	87		94	1656	43		30	21	48		46	6	78	**3448**
8:30 AM	8:45 AM	10	47	1501	88		94	1975	45		36	22	53		52	11	83	**4017**
8:45 AM	9:00 AM	12	53	1679	92		102	2265	50		41	24	53		53	14	89	**4527**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	2	8	159	6	0	5	297	25	0	7	4	5	0	3	3	4	**528**
7:15 AM	7:30 AM	0	4	181	3	0	10	265	1	0	3	2	6	0	1	1	7	**484**
7:30 AM	7:45 AM	2	4	194	28	0	16	273	5	0	5	3	17	0	9	0	12	**568**
7:45 AM	8:00 AM	1	8	267	20	0	31	253	5	0	7	5	8	0	7	1	16	**629**
8:00 AM	8:15 AM	0	7	297	20	0	15	250	0	0	3	5	7	0	20	1	25	**650**
8:15 AM	8:30 AM	1	6	198	10	0	17	318	7	0	5	2	5	0	6	0	14	**589**
8:30 AM	8:45 AM	4	10	205	1	0	0	319	2	0	6	1	5	0	6	5	5	**569**
8:45 AM	9:00 AM	2	6	178	4	0	8	290	5	0	5	2	0	0	1	3	6	**510**
HOURLY TOTALS																		
7:00 AM	8:00 AM	5	24	801	57	0	62	1088	36	0	22	14	36	0	20	5	39	**2209**
7:15 AM	8:15 AM	3	23	939	71	0	72	1041	11	0	18	15	38	0	37	3	60	**2331**
7:30 AM	8:30 AM	4	25	956	78	0	79	1094	17	0	20	15	37	0	42	2	67	**2436**
7:45 AM	8:45 AM	6	31	967	51	0	63	1140	14	0	21	13	25	0	39	7	60	**2437**
8:00 AM	9:00 AM	7	29	878	35	0	40	1177	14	0	19	10	17	0	33	9	50	**2318**

PEAK HOUR SUMMARY

7:45 AM to 8:45 AM	NORTHBOUND NBU	NBL	NBT	NBR	SOUTHBOUND SBU	SBL	SBT	SBR	EASTBOUND EBU	EBL	EBT	EBR	WESTBOUND WBU	WBL	WBT	WBR	TOTAL
VOLUME	6	31	967	51	0	63	1140	14	0	21	13	25	0	39	7	60	**2437**
PHF BY MOVEMENT	0.38	0.78	0.81	0.64	0.00	0.51	0.89	0.50	0.00	0.75	0.65	0.78	0.00	0.49	0.35	0.60	OVERALL
PHF BY APPROACH	0.81				0.89				0.74				0.58				0.94
BICYCLE	3				1				2				1				**7**
PEDESTRIAN	7				6				26				14				**53**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	29				11				11				2				**53**

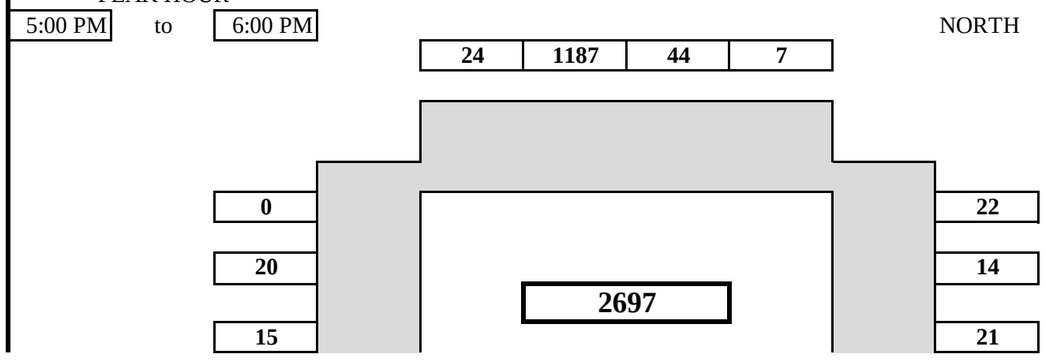
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

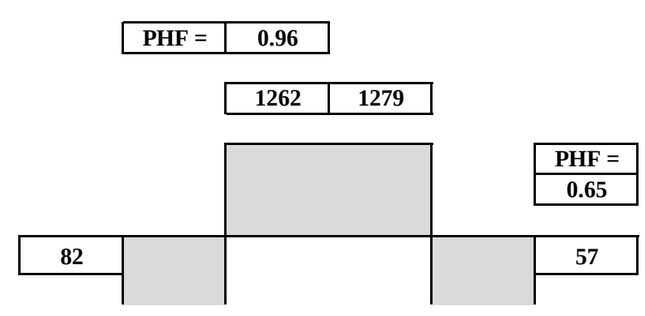
INTERSECTION TURNING MOVEMENT SUMMARY

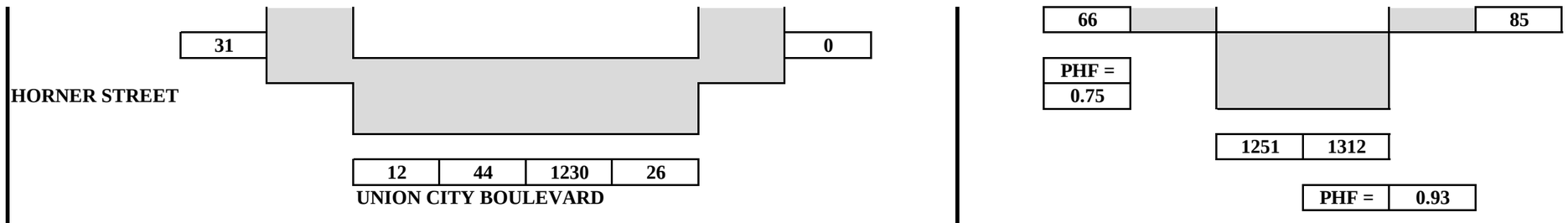
PROJECT:	TRAFFIC COUNTS IN UNION CITY	SURVEY DATE:	6/7/2016	DAY:	TUESDAY
N-S APPROACH:	UNION CITY BOULEVARD	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	HORNER STREET	JURISDICTION:	UNION CITY	FILE:	3606057-4PM

PEAK HOUR
5:00 PM to 6:00 PM



ARRIVAL / DEPARTURE VOLUMES





TIME	PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From		To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																			
4:00 PM	to	4:15 PM	1	8	328	9	1	15	228	12		2	3	0		9	3	8	**627**
4:15 PM	to	4:30 PM	3	17	693	16	2	24	449	22		3	4	4		11	4	15	**1267**
4:30 PM	to	4:45 PM	4	25	984	27	3	39	686	30		6	7	6		18	9	21	**1865**
4:45 PM	to	5:00 PM	9	33	1316	32	3	47	907	35		9	10	11		18	12	25	**2467**
5:00 PM	to	5:15 PM	10	44	1639	40	7	68	1184	39		9	11	16		20	12	27	**3126**
5:15 PM	to	5:30 PM	13	61	1960	47	7	70	1489	48		15	15	26		28	18	31	**3828**
5:30 PM	to	5:45 PM	17	72	2209	53	8	81	1795	57		21	17	36		33	20	37	**4456**
5:45 PM	to	6:00 PM	21	77	2546	58	10	91	2094	59		29	25	42		39	26	47	**5164**
TOTAL BY PERIOD																			
4:00 PM	to	4:15 PM	1	8	328	9	1	15	228	12	0	2	3	0	0	9	3	8	**627**
4:15 PM	to	4:30 PM	2	9	365	7	1	9	221	10	0	1	1	4	0	2	1	7	**640**
4:30 PM	to	4:45 PM	1	8	291	11	1	15	237	8	0	3	3	2	0	7	5	6	**598**
4:45 PM	to	5:00 PM	5	8	332	5	0	8	221	5	0	3	3	5	0	0	3	4	**602**
5:00 PM	to	5:15 PM	1	11	323	8	4	21	277	4	0	0	1	5	0	2	0	2	**659**
5:15 PM	to	5:30 PM	3	17	321	7	0	2	305	9	0	6	4	10	0	8	6	4	**702**
5:30 PM	to	5:45 PM	4	11	249	6	1	11	306	9	0	6	2	10	0	5	2	6	**628**
5:45 PM	to	6:00 PM	4	5	337	5	2	10	299	2	0	8	8	6	0	6	6	10	**708**
HOURLY TOTALS																			
4:00 PM	to	5:00 PM	9	33	1316	32	3	47	907	35	0	9	10	11	0	18	12	25	**2467**
4:15 PM	to	5:15 PM	9	36	1311	31	6	53	956	27	0	7	8	16	0	11	9	19	**2499**
4:30 PM	to	5:30 PM	10	44	1267	31	5	46	1040	26	0	12	11	22	0	17	14	16	**2561**
4:45 PM	to	5:45 PM	13	47	1225	26	5	42	1109	27	0	15	10	30	0	15	11	16	**2591**
5:00 PM	to	6:00 PM	12	44	1230	26	7	44	1187	24	0	20	15	31	0	21	14	22	**2697**

PEAK HOUR SUMMARY

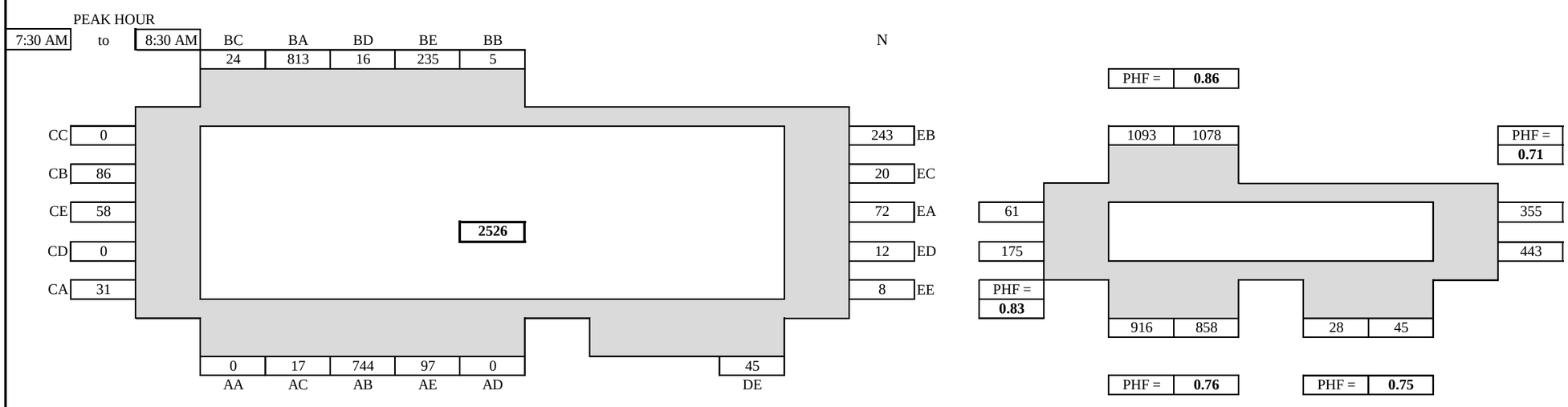
5:00 PM to 6:00 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	12	44	1230	26	7	44	1187	24	0	20	15	31	0	21	14	22	**2697**
PHF BY MOVEMENT	0.75	0.65	0.91	0.81	0.44	0.52	0.97	0.67	0.00	0.63	0.47	0.78	0.00	0.66	0.58	0.55	OVERALL
PHF BY APPROACH	0.93				0.96				0.75				0.65				0.95
BICYCLE	1				5				0				2				**8**
PEDESTRIAN	20				8				8				6				**42**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	7				7				22				6				**42**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	TRAFFIC COUNTS IN OAKLAND	SURVEY DATE:	6/7/2016	DAY:	TUESDAY
N-S APPROACH:	UNION CITY BOULEVARD	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	ALVERADO BOULEVARD	JURISDICTION:	OAKLAND	FILE:	3606057-5AM



TIME PERIOD FROM	TO	A (UNION CITY BL) NB AA	AC	AB	AE	AD	B (UNION CITY BL) SB BB	BE	BD	BA	BC	D DE	C (ALVARADO BL) EB CC	CB	CE	CD	CA	E (ALVERADO BL) WB EE	ED	EA	EC	EB	TOTAL
S U R V E Y D A T A																							
7:00 AM	7:15 AM	0	0	121	2	0	2	37	2	205	3	8		18	19	1	3	0	0	8	1	20	***450***
7:15 AM	7:30 AM	0	1	224	10	0	4	89	5	439	10	23		41	34	1	12	1	1	11	7	68	***981***
7:30 AM	7:45 AM	0	1	396	17	0	5	148	5	690	16	35		70	47	1	23	3	3	20	8	116	***1604***
7:45 AM	8:00 AM	0	7	592	53	0	7	201	10	827	18	50		90	63	1	34	5	6	34	16	180	***2194***
8:00 AM	8:15 AM	0	14	822	97	0	8	270	16	1009	28	61		108	74	1	36	7	11	65	22	261	***2910***
8:15 AM	8:30 AM	0	18	968	107	0	9	324	21	1252	34	68		127	92	1	43	9	13	83	27	311	***3507***
8:30 AM	8:45 AM	0	19	1110	115	0	12	381	22	1522	37	75		138	99	1	48	9	13	92	30	369	***4092***
8:45 AM	9:00 AM	1	20	1244	122	0	13	440	24	1751	42	83		153	115	1	53	12	14	95	33	422	***4638***
T O T A L B Y P E R I O D																							
7:00 AM	7:15 AM	0	0	121	2	0	2	37	2	205	3	8	0	18	19	1	3	0	0	8	1	20	***450***
7:15 AM	7:30 AM	0	1	103	8	0	2	52	3	234	7	15	0	23	15	0	9	1	1	3	6	48	***531***
7:30 AM	7:45 AM	0	0	172	7	0	1	59	0	251	6	12	0	29	13	0	11	2	2	9	1	48	***623***
7:45 AM	8:00 AM	0	6	196	36	0	2	53	5	137	2	15	0	20	16	0	11	2	3	14	8	64	***590***
8:00 AM	8:15 AM	0	7	230	44	0	1	69	6	182	10	11	0	18	11	0	2	2	5	31	6	81	***716***
8:15 AM	8:30 AM	0	4	146	10	0	1	54	5	243	6	7	0	19	18	0	7	2	2	18	5	50	***597***
8:30 AM	8:45 AM	0	1	142	8	0	3	57	1	270	3	7	0	11	7	0	5	0	0	9	3	58	***585***
8:45 AM	9:00 AM	1	1	134	7	0	1	59	2	229	5	8	0	15	16	0	5	3	1	3	3	53	***546***
H O U R L Y T O T A L S																							
7:00 AM	8:00 AM	0	7	592	53	0	7	201	10	827	18	50	0	90	63	1	34	5	6	34	16	180	***2194***
7:15 AM	8:15 AM	0	14	701	95	0	6	233	14	804	25	53	0	90	55	0	33	7	11	57	21	241	***2460***
7:30 AM	8:30 AM	0	17	744	97	0	5	235	16	813	24	45	0	86	58	0	31	8	12	72	20	243	***2526***
7:45 AM	8:45 AM	0	18	714	98	0	7	233	17	832	21	40	0	68	52	0	25	6	10	72	22	253	***2488***
8:00 AM	9:00 AM	1	13	652	69	0	6	239	14	924	24	33	0	63	52	0	19	7	8	61	17	242	***2444***

P E A K H O U R S U M M A R Y

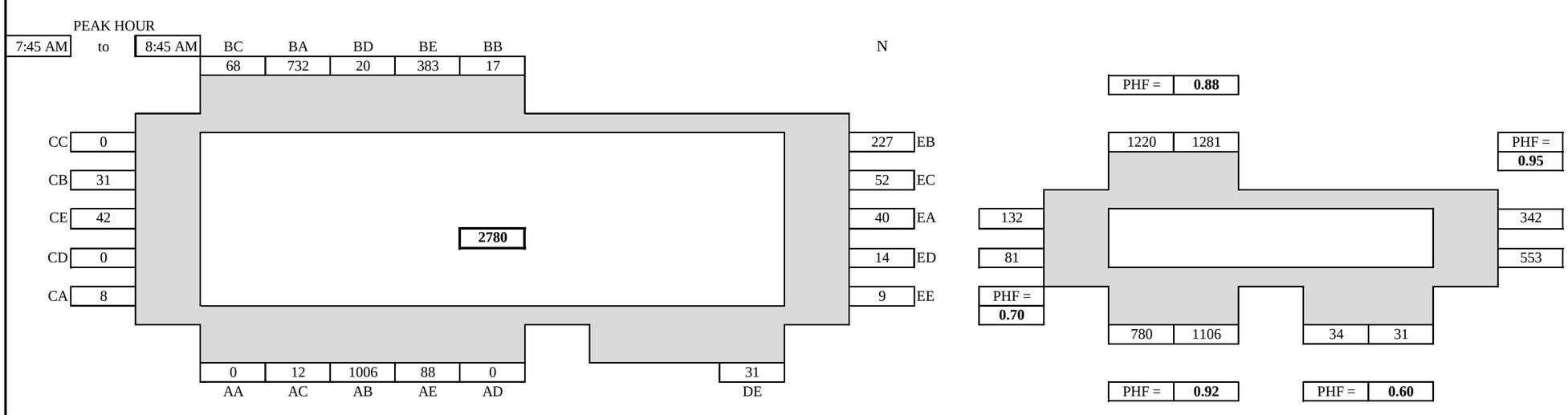
7:30 AM to 8:30 AM	A (UNION CITY BL) NB AA	AC	AB	AE	AD	B (UNION CITY BL) SB BB	BA	BD	BE	BB	D DE	C (ALVARADO BL) EB CC	CB	CE	CD	CA	E (ALVERADO BL) WB EB	EC	EA	ED	EE	TOTAL
VOLUME	0	17	744	97	0	5	235	16	813	24	45	0	86	58	0	31	8	12	72	20	243	2526
PHF BY MOVEMENT	0.00	0.61	0.81	0.55	0.00	0.63	0.85	0.67	0.81	0.60	0.75	0.00	0.74	0.81	0.00	0.70	1.00	0.60	0.58	0.63	0.75	OVERALL
PHF BY APPROACH	0.76					0.86					0.75	0.83					0.71					0.88
PEDESTRIANS	4					1						16					3					24
BICYCLE	2					0					1	0					0					3

TEL: (510) 232 - 1271 **FAX: (510) 232 - 1272**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	TRAFFIC COUNTS IN OAKLAND	SURVEY DATE:	6/7/2016	DAY:	TUESDAY
N-S APPROACH:	UNION CITY BOULEVARD	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	ALVERADO BOULEVARD	JURISDICTION:	OAKLAND	FILE:	3606057-5AM



TIME PERIOD FROM	TO	A (UNION CITY BL) NB AA	AC	AB	AE	AD	B (UNION CITY BL) SB BB	BE	BD	BA	BC	D DE	C (ALVARADO BL) EB CC	CB	CE	CD	CA	E (ALVERADO BL) WB EE	ED	EA	EC	EB	TOTAL
S U R V E Y D A T A																							
7:00 AM	7:15 AM		1	289	13	1	6	81	4	128	8	4		8	3	0	1	2	2	7	7	33	***598***
7:15 AM	7:30 AM		3	562	33	2	7	166	5	262	18	16		16	11	0	2	5	4	8	19	87	***1226***
7:30 AM	7:45 AM		6	820	47	2	8	219	6	404	27	24		24	21	0	5	5	6	23	33	153	***1833***
7:45 AM	8:00 AM		10	1087	78	2	15	321	10	564	46	32		30	33	0	10	7	9	36	45	209	***2544***
8:00 AM	8:15 AM		14	1334	101	2	18	411	14	731	62	38		38	43	0	11	9	12	45	53	277	***3213***
8:15 AM	8:30 AM		15	1576	114	2	19	511	21	917	71	42		42	49	0	11	11	16	58	66	335	***3876***
8:30 AM	8:45 AM		18	1826	135	2	25	602	26	1136	95	55		55	63	0	13	14	20	63	85	380	***4613***
8:45 AM	9:00 AM		21	2062	146	4	31	706	29	1301	113	64		65	65	0	13	16	24	67	96	435	***5258***
T O T A L B Y P E R I O D																							
7:00 AM	7:15 AM	0	1	289	13	1	6	81	4	128	8	4	0	8	3	0	1	2	2	7	7	33	***598***
7:15 AM	7:30 AM	0	2	273	20	1	1	85	1	134	10	12	0	8	8	0	1	3	2	1	12	54	***628***
7:30 AM	7:45 AM	0	3	258	14	0	1	53	1	142	9	8	0	8	10	0	3	0	2	15	14	66	***607***
7:45 AM	8:00 AM	0	4	267	31	0	7	102	4	160	19	8	0	6	12	0	5	2	3	13	12	56	***711***

8:00 AM	to	8:15 AM	0	4	247	23	0	3	90	4	167	16	6	0	8	10	0	1	2	3	9	8	68	***669***
8:15 AM	to	8:30 AM	0	1	242	13	0	1	100	7	186	9	4	0	4	6	0	0	2	4	13	13	58	***663***
8:30 AM	to	8:45 AM	0	3	250	21	0	6	91	5	219	24	13	0	13	14	0	2	3	4	5	19	45	***737***
8:45 AM	to	9:00 AM	0	3	236	11	2	6	104	3	165	18	9	0	10	2	0	0	2	4	4	11	55	***645***
H O U R L Y T O T A L S																								
7:00 AM	to	8:00 AM	0	10	1087	78	2	15	321	10	564	46	32	0	30	33	0	10	7	9	36	45	209	***2544***
7:15 AM	to	8:15 AM	0	13	1045	88	1	12	330	10	603	54	34	0	30	40	0	10	7	10	38	46	244	***2615***
7:30 AM	to	8:30 AM	0	12	1014	81	0	12	345	16	655	53	26	0	26	38	0	9	6	12	50	47	248	***2650***
7:45 AM	to	8:45 AM	0	12	1006	88	0	17	383	20	732	68	31	0	31	42	0	8	9	14	40	52	227	***2780***
8:00 AM	to	9:00 AM	0	11	975	68	2	16	385	19	737	67	32	0	35	32	0	3	9	15	31	51	226	***2714***
P E A K H O U R S U M M A R Y																								
7:45 AM	to	8:45 AM	A (UNION CITY BL) NB					B (UNION CITY BL) SB					D	C (ALVARADO BL) EB					E (ALVERADO BL) WB					TOTAL
			AA	AC	AB	AE	AD	BC	BA	BD	BE	BB	DE	CC	CB	CE	CD	CA	EB	EC	EA	ED	EE	
VOLUME			0	12	1006	88	0	17	383	20	732	68	31	0	31	42	0	8	9	14	40	52	227	2780
PHF BY MOVEMENT			0.00	0.75	0.94	0.71	0.00	0.61	0.94	0.71	0.84	0.71	0.60	0.00	0.60	0.75	0.00	0.40	0.75	0.88	0.77	0.68	0.83	OVERALL
PHF BY APPROACH			0.92					0.88					0.60	0.70					0.95					0.94
PEDESTRIANS			2					0						7					1					10
BICYCLE			1					7					0	2					1					11

TEL: (510) 232 - 1271 **FAX: (510) 232 - 1272**

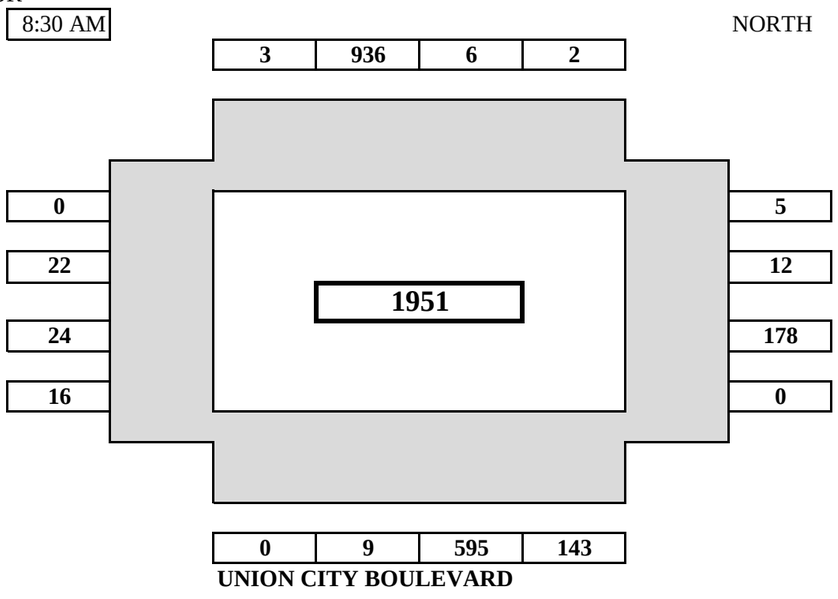
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

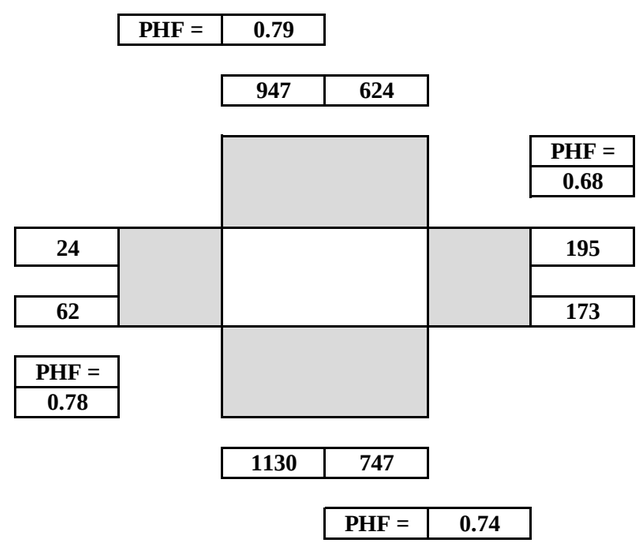
PROJECT:	TRAFFIC COUNTS IN UNION CITY	SURVEY DATE:	6/7/2016	DAY:	TUESDAY
N-S APPROACH:	UNION CITY BOULEVARD	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	DYER STREET	JURISDICTION:	UNION CITY	FILE:	3606057-6AM

PEAK HOUR
7:30 AM to 8:30 AM

NORTH



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From	To	NORTHBOUND U-TURN	LEFT	THRU	RIGHT	SOUTHBOUND U-TURN	LEFT	THRU	RIGHT	EASTBOUND U-TURN	LEFT	THRU	RIGHT	WESTBOUND U-TURN	LEFT	THRU	RIGHT	TOTAL
SURVEY DATA																		
7:00 AM	7:15 AM		0	57	14	0	1	265	1		2	4	8		74	2	1	**429**
7:15 AM	7:30 AM		1	127	34	0	1	489	4		6	9	17		135	5	1	**829**
7:30 AM	7:45 AM		1	246	70	1	5	782	4		10	19	23		186	8	3	**1358**
7:45 AM	8:00 AM		5	414	118	1	6	935	4		15	25	30		205	10	3	**1771**
8:00 AM	8:15 AM		9	620	159	2	6	1148	6		22	29	33		247	14	3	**2298**
8:15 AM	8:30 AM		10	722	177	2	7	1425	7		28	33	33		313	17	6	**2780**
8:30 AM	8:45 AM		13	829	199	2	10	1711	9		30	36	40		372	17	7	**3275**
8:45 AM	9:00 AM		13	908	212	3	10	1949	11		32	38	43		406	19	7	**3651**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	57	14	0	1	265	1	0	2	4	8	0	74	2	1	**429**
7:15 AM	7:30 AM	0	1	70	20	0	0	224	3	0	4	5	9	0	61	3	0	**400**
7:30 AM	7:45 AM	0	0	119	36	1	4	293	0	0	4	10	6	0	51	3	2	**529**
7:45 AM	8:00 AM	0	4	168	48	0	1	153	0	0	5	6	7	0	19	2	0	**413**
8:00 AM	8:15 AM	0	4	206	41	1	0	213	2	0	7	4	3	0	42	4	0	**527**
8:15 AM	8:30 AM	0	1	102	18	0	1	277	1	0	6	4	0	0	66	3	3	**482**
8:30 AM	8:45 AM	0	3	107	22	0	3	286	2	0	2	3	7	0	59	0	1	**495**
8:45 AM	9:00 AM	0	0	79	13	1	0	238	2	0	2	2	3	0	34	2	0	**376**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	5	414	118	1	6	935	4	0	15	25	30	0	205	10	3	**1771**
7:15 AM	8:15 AM	0	9	563	145	2	5	883	5	0	20	25	25	0	173	12	2	**1869**
7:30 AM	8:30 AM	0	9	595	143	2	6	936	3	0	22	24	16	0	178	12	5	**1951**
7:45 AM	8:45 AM	0	12	583	129	1	5	929	5	0	20	17	17	0	186	9	4	**1917**
8:00 AM	9:00 AM	0	8	494	94	2	4	1014	7	0	17	13	13	0	201	9	4	**1880**

PEAK HOUR SUMMARY

7:30 AM to 8:30 AM	NORTHBOUND NBU	NBL	NBT	NBR	SOUTHBOUND SBU	SBL	SBT	SBR	EASTBOUND EBU	EBL	EBT	EBR	WESTBOUND WBU	WBL	WBT	WBR	TOTAL
VOLUME	0	9	595	143	2	6	936	3	0	22	24	16	0	178	12	5	**1951**
PHF BY MOVEMENT	0.00	0.56	0.72	0.74	0.50	0.38	0.80	0.38	0.00	0.79	0.60	0.57	0.00	0.67	0.75	0.42	OVERALL
PHF BY APPROACH	0.74				0.79				0.78				0.68				0.92
BICYCLE	2				0				0				1				**3**
PEDESTRIAN	3				4				2				2				**11**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	4				0				0				7				**11**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

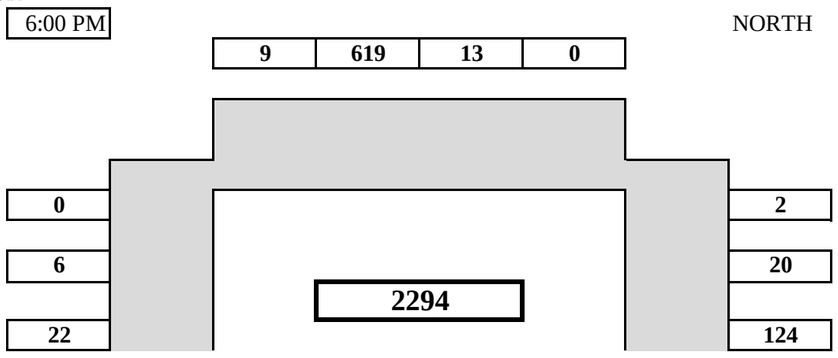
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

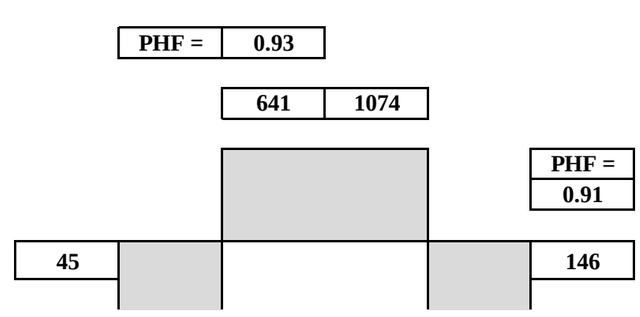
PROJECT:	TRAFFIC COUNTS IN UNION CITY	SURVEY DATE:	6/7/2016	DAY:	TUESDAY
N-S APPROACH:	UNION CITY BOULEVARD	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	DYER STREET	JURISDICTION:	UNION CITY	FILE:	3606057-6PM

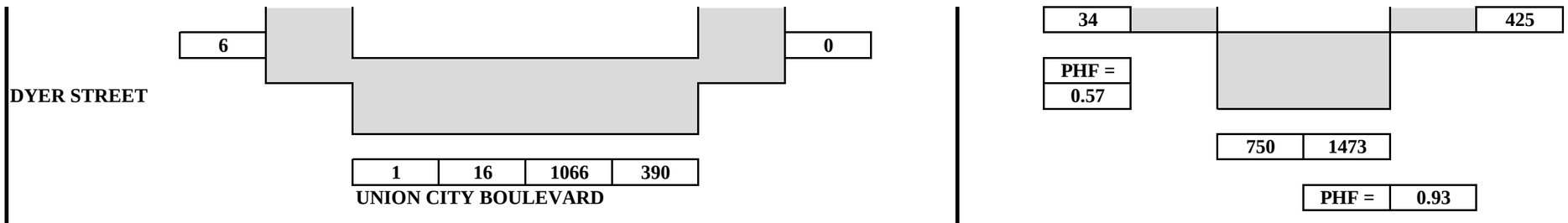
PEAK HOUR
5:00 PM to 6:00 PM

NORTH



ARRIVAL / DEPARTURE VOLUMES





TIME	PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From		To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																			
4:00 PM	to	4:15 PM	0	6	332	104		2	103	3		0	3	2		25	2	0	**582**
4:15 PM	to	4:30 PM	0	9	640	215		4	210	6		4	5	5		50	8	3	**1159**
4:30 PM	to	4:45 PM	1	10	918	333		6	338	8		5	8	8		84	8	4	**1731**
4:45 PM	to	5:00 PM	1	11	1179	447		7	446	12		7	14	8		110	13	5	**2260**
5:00 PM	to	5:15 PM	2	15	1434	537		8	592	16		11	22	11		141	20	5	**2814**
5:15 PM	to	5:30 PM	2	22	1698	652		13	744	19		11	28	12		166	25	5	**3397**
5:30 PM	to	5:45 PM	2	24	1994	749		18	909	21		12	30	12		198	31	5	**4005**
5:45 PM	to	6:00 PM	2	27	2245	837		20	1065	21		13	36	14		234	33	7	**4554**
TOTAL BY PERIOD																			
4:00 PM	to	4:15 PM	0	6	332	104	0	2	103	3	0	0	3	2	0	25	2	0	**582**
4:15 PM	to	4:30 PM	0	3	308	111	0	2	107	3	0	4	2	3	0	25	6	3	**577**
4:30 PM	to	4:45 PM	1	1	278	118	0	2	128	2	0	1	3	3	0	34	0	1	**572**
4:45 PM	to	5:00 PM	0	1	261	114	0	1	108	4	0	2	6	0	0	26	5	1	**529**
5:00 PM	to	5:15 PM	1	4	255	90	0	1	146	4	0	4	8	3	0	31	7	0	**554**
5:15 PM	to	5:30 PM	0	7	264	115	0	5	152	3	0	0	6	1	0	25	5	0	**583**
5:30 PM	to	5:45 PM	0	2	296	97	0	5	165	2	0	1	2	0	0	32	6	0	**608**
5:45 PM	to	6:00 PM	0	3	251	88	0	2	156	0	0	1	6	2	0	36	2	2	**549**
HOURLY TOTALS																			
4:00 PM	to	5:00 PM	1	11	1179	447	0	7	446	12	0	7	14	8	0	110	13	5	**2260**
4:15 PM	to	5:15 PM	2	9	1102	433	0	6	489	13	0	11	19	9	0	116	18	5	**2232**
4:30 PM	to	5:30 PM	2	13	1058	437	0	9	534	13	0	7	23	7	0	116	17	2	**2238**
4:45 PM	to	5:45 PM	1	14	1076	416	0	12	571	13	0	7	22	4	0	114	23	1	**2274**
5:00 PM	to	6:00 PM	1	16	1066	390	0	13	619	9	0	6	22	6	0	124	20	2	**2294**

PEAK HOUR SUMMARY

5:00 PM to 6:00 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	1	16	1066	390	0	13	619	9	0	6	22	6	0	124	20	2	**2294**
PHF BY MOVEMENT	0.25	0.57	0.90	0.85	0.00	0.65	0.94	0.56	0.00	0.38	0.69	0.50	0.00	0.86	0.71	0.25	OVERALL
PHF BY APPROACH	0.93				0.93				0.57				0.91				0.94
BICYCLE	1				0				3				0				**4**
PEDESTRIAN	2				4				2				3				**11**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	5				0				2				4				**11**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

APPENDIX B
LEVEL OF SERVICE CALCULATION SHEETS
for
BASE CASE SCENARIO

HCM Signalized Intersection Capacity Analysis
1: I-880 NB Off-Ramp/Industrial Pkwy & Whipple Rd

Existing AM

Movement	EBL	EBT	EBR	WBT	WBR	WBR2	NBL2	NBT	NBR	SBU	SBL	SBR
Lane Configurations												
Traffic Volume (vph)	322	751	186	616	255	143	494	421	357	25	209	618
Future Volume (vph)	322	751	186	616	255	143	494	421	357	25	209	618
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	5.4	4.0	5.4	5.4	5.4	5.1	5.1			4.4	4.4
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	1.00	1.00	0.95			1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.99			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	0.85	1.00	0.93			1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	3127	3223	1442	3223	1442	1414	1612	2982			1630	2538
Flt Permitted	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	3127	3223	1442	3223	1442	1414	1612	2982			1630	2538
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	362	844	209	677	280	157	537	458	388	29	240	710
RTOR Reduction (vph)	0	0	0	0	0	117	0	64	0	0	0	47
Lane Group Flow (vph)	362	844	209	677	280	40	537	782	0	0	269	704
Confl. Peds. (#/hr)	6					6			2		2	
Heavy Vehicles (%)	12%	12%	12%	12%	12%	12%	12%	12%	12%	0%	12%	12%
Turn Type	Prot	NA	Free	NA	Prot	Perm	Split	NA		Prot	Prot	pt+ov
Protected Phases	5	2		6	6		8	8		7	7	7 5
Permitted Phases			Free			6						
Actuated Green, G (s)	15.0	49.5	120.0	30.8	30.8	30.8	37.6	37.6			18.0	37.4
Effective Green, g (s)	15.0	49.5	120.0	30.8	30.8	30.8	37.6	37.6			18.0	37.4
Actuated g/C Ratio	0.12	0.41	1.00	0.26	0.26	0.26	0.31	0.31			0.15	0.31
Clearance Time (s)	3.7	5.4		5.4	5.4	5.4	5.1	5.1			4.4	
Vehicle Extension (s)	2.0	4.0		4.0	4.0	4.0	2.0	2.0			2.0	
Lane Grp Cap (vph)	390	1329	1442	827	370	362	505	934			244	791
v/s Ratio Prot	0.12	0.26		c0.21	0.19		c0.33	0.26			c0.16	c0.28
v/s Ratio Perm			0.14			0.03						
v/c Ratio	0.93	0.64	0.14	0.82	0.76	0.11	1.06	0.84			1.10	0.89
Uniform Delay, d1	52.0	28.1	0.0	42.0	41.1	34.1	41.2	38.4			51.0	39.3
Progression Factor	0.74	1.15	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	23.3	1.8	0.2	8.9	13.5	0.6	57.9	6.3			87.8	11.9
Delay (s)	61.9	34.1	0.2	50.8	54.6	34.7	99.1	44.7			138.8	51.3
Level of Service	E	C	A	D	D	C	F	D			F	D
Approach Delay (s)		36.2		49.5				65.8				
Approach LOS		D		D				E				

Intersection Summary			
HCM 2000 Control Delay	55.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR2
Lane Configurations	
Traffic Volume (vph)	36
Future Volume (vph)	36
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.87
Adj. Flow (vph)	41
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	12%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	267	175	139	171	171	321	307	588	45	323	615	826
Future Volume (vph)	267	175	139	171	171	321	307	588	45	323	615	826
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4	4.7	5.4	5.4
Lane Util. Factor	0.91	0.91	1.00	0.95	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1579	3258	1583	1681	1731	1410	3433	3539	1583	3127	3539	1533
Flt Permitted	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1579	3258	1583	1681	1731	1410	3433	3539	1583	3127	3539	1533
Peak-hour factor, PHF	0.83	0.83	0.83	0.88	0.88	0.88	0.78	0.78	0.78	0.80	0.80	0.80
Adj. Flow (vph)	322	211	167	194	194	365	394	754	58	404	769	1032
RTOR Reduction (vph)	0	0	143	0	0	257	0	0	36	0	0	284
Lane Group Flow (vph)	174	359	24	175	213	108	394	754	22	404	769	749
Confl. Peds. (#/hr)	5					5						
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	4%	4%	2%	2%	4%	12%	2%	2%	2%	12%	2%	4%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8			2			6
Actuated Green, G (s)	17.4	17.4	17.4	17.8	17.8	17.8	16.8	46.0	46.0	18.5	47.7	47.7
Effective Green, g (s)	17.4	17.4	17.4	17.8	17.8	17.8	16.8	46.0	46.0	18.5	47.7	47.7
Actuated g/C Ratio	0.14	0.14	0.14	0.15	0.15	0.15	0.14	0.38	0.38	0.15	0.40	0.40
Clearance Time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4	4.7	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	228	472	229	249	256	209	480	1356	606	482	1406	609
v/s Ratio Prot	c0.11	0.11		0.10	c0.12		0.11	0.21		c0.13	0.22	
v/s Ratio Perm			0.02			0.08			0.01			c0.49
v/c Ratio	0.76	0.76	0.11	0.70	0.83	0.52	0.82	0.56	0.04	0.84	0.55	1.23
Uniform Delay, d1	49.3	49.3	44.5	48.6	49.6	47.1	50.1	29.0	23.1	49.3	27.8	36.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01	0.97	0.99
Incremental Delay, d2	12.7	6.4	0.1	7.1	19.3	0.9	10.3	1.6	0.1	7.1	0.9	111.7
Delay (s)	62.0	55.7	44.6	55.7	68.9	48.0	60.4	30.6	23.3	57.0	28.0	147.6
Level of Service	E	E	D	E	E	D	E	C	C	E	C	F
Approach Delay (s)		54.6			55.7			40.0			89.3	
Approach LOS		D			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	66.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.3
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	14	24	13	1	157	149	301	1	82	923	211	416
Future Volume (vph)	14	24	13	1	157	149	301	1	82	923	211	416
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00		1.00	0.95	1.00	0.97
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.99		1.00	1.00	0.99	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.95			1.00	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)	1770	3353			3368	1863	1533		1770	3471	1530	3367
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)	1770	3353			3368	1863	1533		1770	3471	1530	3367
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.86	0.86	0.86	0.86	0.94
Adj. Flow (vph)	15	26	14	1	169	160	324	1	95	1073	245	443
RTOR Reduction (vph)	0	13	0	0	0	0	270	0	0	0	78	0
Lane Group Flow (vph)	15	27	0	0	170	160	54	0	96	1073	167	443
Confl. Peds. (#/hr)	1						1		1		2	2
Confl. Bikes (#/hr)											1	
Heavy Vehicles (%)	2%	2%	2%	0%	4%	2%	4%	0%	2%	4%	4%	4%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	4		3	3	8		5	5	2		1
Permitted Phases							8				2	
Actuated Green, G (s)	2.7	10.5			11.6	19.4	19.4		12.4	53.9	53.9	20.7
Effective Green, g (s)	2.7	10.5			11.6	19.4	19.4		12.4	53.9	53.9	20.7
Actuated g/C Ratio	0.02	0.09			0.10	0.17	0.17		0.11	0.46	0.46	0.18
Clearance Time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0		2.0	4.0	4.0	2.0
Lane Grp Cap (vph)	41	302			335	310	255		188	1605	707	598
v/s Ratio Prot	0.01	0.01			c0.05	c0.09			0.05	0.31		c0.13
v/s Ratio Perm							0.04				0.11	
v/c Ratio	0.37	0.09			0.51	0.52	0.21		0.51	0.67	0.24	0.74
Uniform Delay, d1	56.1	48.6			49.7	44.3	41.9		49.2	24.4	18.9	45.4
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.0			0.4	0.6	0.2		1.0	1.2	0.2	4.3
Delay (s)	58.1	48.7			50.2	44.9	42.1		50.2	25.5	19.1	49.7
Level of Service	E	D			D	D	D		D	C	B	D
Approach Delay (s)		51.2				44.9				26.1		
Approach LOS		D				D				C		

Intersection Summary			
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	116.5	Sum of lost time (s)	19.8
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1187	43
Future Volume (vph)	1187	43
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3452	
Flt Permitted	1.00	
Satd. Flow (perm)	3452	
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	1263	46
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1308	0
Confl. Peds. (#/hr)		1
Confl. Bikes (#/hr)		1
Heavy Vehicles (%)	4%	2%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	62.2	
Effective Green, g (s)	62.2	
Actuated g/C Ratio	0.53	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	1843	
v/s Ratio Prot	c0.38	
v/s Ratio Perm		
v/c Ratio	0.71	
Uniform Delay, d1	20.4	
Progression Factor	1.00	
Incremental Delay, d2	1.4	
Delay (s)	21.7	
Level of Service	C	
Approach Delay (s)	28.8	
Approach LOS	C	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	21	13	25	39	7	60	6	31	967	51	63	1140
Future Volume (vph)	21	13	25	39	7	60	6	31	967	51	63	1140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9			4.9	5.3		4.9	5.3
Lane Util. Factor		1.00			1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes		0.99			0.97			1.00	1.00		1.00	1.00
Flpb, ped/bikes		0.99			1.00			1.00	1.00		1.00	1.00
Frt		0.94			0.92			1.00	0.99		1.00	1.00
Flt Protected		0.98			0.98			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1694			1641			1775	3439		1770	3465
Flt Permitted		0.74			0.85			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1271			1418			1775	3439		1770	3465
Peak-hour factor, PHF	0.74	0.74	0.74	0.58	0.58	0.58	0.81	0.81	0.81	0.81	0.89	0.89
Adj. Flow (vph)	28	18	34	67	12	103	7	38	1194	63	71	1281
RTOR Reduction (vph)	0	29	0	0	52	0	0	0	2	0	0	1
Lane Group Flow (vph)	0	51	0	0	130	0	0	45	1255	0	71	1296
Confl. Peds. (#/hr)	29		11	11		29		2		11	11	
Confl. Bikes (#/hr)			2			1				3		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	2%	4%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		13.3			13.3			4.5	69.8		6.8	72.1
Effective Green, g (s)		13.3			13.3			4.5	69.8		6.8	72.1
Actuated g/C Ratio		0.13			0.13			0.04	0.66		0.06	0.69
Clearance Time (s)		4.9			4.9			4.9	5.3		4.9	5.3
Vehicle Extension (s)		1.5			1.5			1.0	4.0		1.0	4.5
Lane Grp Cap (vph)		160			179			76	2286		114	2379
v/s Ratio Prot								0.03	0.36		c0.04	c0.37
v/s Ratio Perm		0.04			c0.09							
v/c Ratio		0.32			0.73			0.59	0.55		0.62	0.54
Uniform Delay, d1		41.7			44.1			49.3	9.3		47.9	8.2
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		0.4			11.8			8.0	1.0		7.4	0.9
Delay (s)		42.2			55.9			57.3	10.2		55.2	9.1
Level of Service		D			E			E	B		E	A
Approach Delay (s)		42.2			55.9				11.9			11.5
Approach LOS		D			E				B			B

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	14
Future Volume (vph)	14
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.89
Adj. Flow (vph)	16
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR2	WBU	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	86	58	31	8	12	72	20	243	17	744	97	5
Future Volume (vph)	86	58	31	8	12	72	20	243	17	744	97	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Lane Util. Factor		0.95				1.00	1.00	1.00	1.00	0.95	1.00	
Frpb, ped/bikes		1.00				1.00	1.00	0.98	1.00	1.00	0.98	
Flpb, ped/bikes		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.97				1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3363				1746	1863	1518	1770	3471	1529	
Flt Permitted		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3363				1746	1863	1518	1770	3471	1529	
Peak-hour factor, PHF	0.83	0.83	0.83	0.71	0.71	0.71	0.71	0.71	0.76	0.76	0.76	0.86
Adj. Flow (vph)	104	70	37	11	17	101	28	342	22	979	128	6
RTOR Reduction (vph)	0	130	0	0	0	0	0	297	0	0	0	0
Lane Group Flow (vph)	0	81	0	0	0	129	28	45	22	979	128	0
Confl. Peds. (#/hr)	13					3		13	3		2	
Confl. Bikes (#/hr)											2	
Heavy Vehicles (%)	2%	2%	2%	0%	2%	4%	2%	4%	2%	4%	4%	0%
Turn Type	Split	NA		Split	Split	Split	NA	Perm	Prot	NA	Perm	Prot
Protected Phases	4	4		8	8	8	8		5	2		1
Permitted Phases								8			2	
Actuated Green, G (s)		8.0				11.9	11.9	11.9	2.4	38.2	38.2	
Effective Green, g (s)		8.0				11.9	11.9	11.9	2.4	38.2	38.2	
Actuated g/C Ratio		0.09				0.13	0.13	0.13	0.03	0.42	0.42	
Clearance Time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Vehicle Extension (s)		3.0				2.0	2.0	2.0	2.0	4.0	4.0	
Lane Grp Cap (vph)		296				229	244	199	46	1463	644	
v/s Ratio Prot		c0.02				c0.07	0.02		0.01	c0.28		
v/s Ratio Perm								0.03			0.08	
v/c Ratio		0.27				0.56	0.11	0.23	0.48	0.67	0.20	
Uniform Delay, d1		38.6				36.9	34.7	35.2	43.5	21.1	16.5	
Progression Factor		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.5				1.9	0.1	0.2	2.8	1.3	0.2	
Delay (s)		39.1				38.8	34.8	35.4	46.3	22.4	16.7	
Level of Service		D				D	C	D	D	C	B	
Approach Delay (s)		39.1					36.3			22.2		
Approach LOS		D					D			C		

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL2	SBL	SBT	SBR	NWR2
Lane Configurations					
Traffic Volume (vph)	235	16	813	24	45
Future Volume (vph)	235	16	813	24	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	5.3		4.9
Lane Util. Factor	0.91	0.95	0.95		1.00
Frpb, ped/bikes	1.00	1.00	1.00		0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00
Frt	1.00	1.00	1.00		0.86
Flt Protected	0.95	0.95	1.00		1.00
Satd. Flow (prot)	1582	1653	3456		1589
Flt Permitted	0.95	0.95	1.00		1.00
Satd. Flow (perm)	1582	1653	3456		1589
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.75
Adj. Flow (vph)	273	19	945	28	60
RTOR Reduction (vph)	0	0	1	0	52
Lane Group Flow (vph)	148	150	972	0	8
Confl. Peds. (#/hr)	2	2		3	
Confl. Bikes (#/hr)					1
Heavy Vehicles (%)	4%	2%	4%	2%	2%
Turn Type	Prot	Prot	NA		Perm
Protected Phases	1	1	6		
Permitted Phases					8
Actuated Green, G (s)	12.5	12.5	48.3		11.9
Effective Green, g (s)	12.5	12.5	48.3		11.9
Actuated g/C Ratio	0.14	0.14	0.53		0.13
Clearance Time (s)	4.9	4.9	5.3		4.9
Vehicle Extension (s)	1.0	1.0	4.0		2.0
Lane Grp Cap (vph)	218	228	1842		208
v/s Ratio Prot	c0.09	0.09	0.28		
v/s Ratio Perm					0.00
v/c Ratio	0.68	0.66	0.53		0.04
Uniform Delay, d1	37.1	37.0	13.7		34.4
Progression Factor	1.00	1.00	1.00		1.00
Incremental Delay, d2	6.5	5.1	0.4		0.0
Delay (s)	43.6	42.2	14.1		34.4
Level of Service	D	D	B		C
Approach Delay (s)			20.8		
Approach LOS			C		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	22	24	16	178	12	5	9	595	143	2	6	936
Future Volume (vph)	22	24	16	178	12	5	9	595	143	2	6	936
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9	4.9	4.9	5.7	5.7		4.9	5.7
Lane Util. Factor		1.00		0.95	0.95	1.00	1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00		1.00	1.00	0.98	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		0.96		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00
Flt Protected		0.98		0.95	0.96	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1764		1681	1696	1555	1766	3471	1550		1770	3469
Flt Permitted		0.85		0.83	0.77	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1527		1469	1367	1555	1766	3471	1550		1770	3469
Peak-hour factor, PHF	0.78	0.78	0.78	0.68	0.68	0.68	0.74	0.74	0.74	0.79	0.79	0.79
Adj. Flow (vph)	28	31	21	262	18	7	12	804	193	3	8	1185
RTOR Reduction (vph)	0	12	0	0	0	6	0	0	62	0	0	0
Lane Group Flow (vph)	0	68	0	139	141	1	12	804	131	0	11	1189
Confl. Peds. (#/hr)	4					4	7					
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Perm	Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4			8		8			2			
Actuated Green, G (s)		11.6		11.6	11.6	11.6	0.8	36.1	36.1		0.8	36.1
Effective Green, g (s)		11.6		11.6	11.6	11.6	0.8	36.1	36.1		0.8	36.1
Actuated g/C Ratio		0.18		0.18	0.18	0.18	0.01	0.56	0.56		0.01	0.56
Clearance Time (s)		4.9		4.9	4.9	4.9	4.9	5.7	5.7		4.9	5.7
Vehicle Extension (s)		2.0		2.0	2.0	2.0	1.0	4.0	4.0		1.0	4.0
Lane Grp Cap (vph)		276		266	247	281	22	1957	874		22	1956
v/s Ratio Prot							c0.01	0.23			0.01	c0.34
v/s Ratio Perm		0.04		0.09	c0.10	0.00			0.08			
v/c Ratio		0.25		0.52	0.57	0.00	0.55	0.41	0.15		0.50	0.61
Uniform Delay, d1		22.4		23.7	23.9	21.5	31.4	7.9	6.6		31.4	9.3
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2		0.9	2.0	0.0	14.0	0.2	0.1		6.4	0.6
Delay (s)		22.6		24.6	25.9	21.5	45.4	8.1	6.7		37.8	9.9
Level of Service		C		C	C	C	D	A	A		D	A
Approach Delay (s)		22.6			25.1			8.3				10.1
Approach LOS		C			C			A				B

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	64.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	3
Future Volume (vph)	3
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.79
Adj. Flow (vph)	4
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	7
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: I-880 NB Off-Ramp/Industrial Pkwy & Whipple Rd

Existing PM

Movement	EBL	EBT	EBR	WBT	WBR	WBR2	NBL2	NBT	NBR	SBU	SBL	SBR
Lane Configurations												
Traffic Volume (vph)	724	765	223	751	208	267	170	635	131	48	179	575
Future Volume (vph)	724	765	223	751	208	267	170	635	131	48	179	575
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	2.6	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	1.00	1.00	0.95			1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	0.85	1.00	0.97			1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	3127	3223	1442	3223	1442	1408	1612	3132			1649	2538
Flt Permitted	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	3127	3223	1442	3223	1442	1408	1612	3132			1649	2538
Peak-hour factor, PHF	0.88	0.88	0.88	0.95	0.95	0.95	0.89	0.89	0.89	0.94	0.94	0.94
Adj. Flow (vph)	823	869	253	791	219	281	191	713	147	51	190	612
RTOR Reduction (vph)	0	0	0	0	0	112	0	14	0	0	0	40
Lane Group Flow (vph)	823	869	253	791	219	169	191	846	0	0	241	603
Confl. Peds. (#/hr)	9					9			4		4	
Heavy Vehicles (%)	12%	12%	12%	12%	12%	12%	12%	12%	12%	0%	12%	12%
Turn Type	Prot	NA	Free	NA	Prot	Perm	Split	NA		Prot	Prot	pt+ov
Protected Phases	5	2		6	6		8	8		7	7	7 5
Permitted Phases			Free			6						
Actuated Green, G (s)	26.0	62.1	130.0	32.4	32.4	32.4	35.6	35.6			17.4	47.8
Effective Green, g (s)	25.7	63.5	130.0	33.8	33.8	33.8	36.7	36.7			17.8	48.2
Actuated g/C Ratio	0.20	0.49	1.00	0.26	0.26	0.26	0.28	0.28			0.14	0.37
Clearance Time (s)	3.7	5.4		5.4	5.4	5.4	5.1	5.1			4.4	
Vehicle Extension (s)	2.0	4.0		4.0	4.0	4.0	2.0	2.0			2.0	
Lane Grp Cap (vph)	618	1574	1442	837	374	366	455	884			225	941
v/s Ratio Prot	c0.26	0.27		c0.25	0.15		0.12	c0.27			c0.15	0.24
v/s Ratio Perm			0.18			0.12						
v/c Ratio	1.33	0.55	0.18	0.95	0.59	0.46	0.42	0.96			1.07	0.64
Uniform Delay, d1	52.1	23.3	0.0	47.2	42.0	40.5	38.0	45.9			56.1	33.8
Progression Factor	0.72	1.05	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	156.5	0.9	0.2	20.3	6.6	4.2	0.2	20.3			80.1	1.1
Delay (s)	194.2	25.4	0.2	67.5	48.6	44.6	38.2	66.1			136.2	34.9
Level of Service	F	C	A	E	D	D	D	E			F	C
Approach Delay (s)		93.5		59.3				61.1				
Approach LOS		F		E				E				

Intersection Summary			
HCM 2000 Control Delay	73.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	130.0	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	SBR2
Lane Configurations	
Traffic Volume (vph)	29
Future Volume (vph)	29
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	31
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	12%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	410	503	289	300	94	340	255	866	146	4	479	747
Future Volume (vph)	410	503	289	300	94	340	255	866	146	4	479	747
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	0.91	0.91	1.00	0.95	0.95	1.00	0.97	0.95	1.00		0.97	0.95
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00
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	0.85		1.00	1.00
Flt Protected	0.95	0.99	1.00	0.95	0.97	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1579	3294	1583	1681	1708	1423	3433	3539	1583		3129	3539
Flt Permitted	0.95	0.99	1.00	0.95	0.97	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1579	3294	1583	1681	1708	1423	3433	3539	1583		3129	3539
Peak-hour factor, PHF	0.96	0.96	0.96	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	427	524	301	316	99	358	277	941	159	4	526	821
RTOR Reduction (vph)	0	0	194	0	0	226	0	0	95	0	0	0
Lane Group Flow (vph)	307	644	107	205	210	132	277	941	64	0	530	821
Confl. Peds. (#/hr)							10					
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	4%	4%	2%	2%	4%	12%	2%	2%	2%	0%	12%	2%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	Prot	NA
Protected Phases	7	7		8	8		5	2		1	1	6
Permitted Phases			7			8			2			
Actuated Green, G (s)	29.1	29.1	29.1	19.3	19.3	19.3	14.5	36.7	36.7		24.6	46.8
Effective Green, g (s)	30.4	30.4	30.4	20.2	20.2	20.2	15.2	38.1	38.1		25.3	48.2
Actuated g/C Ratio	0.23	0.23	0.23	0.16	0.16	0.16	0.12	0.29	0.29		0.19	0.37
Clearance Time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4		4.7	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		2.0	3.0
Lane Grp Cap (vph)	369	770	370	261	265	221	401	1037	463		608	1312
v/s Ratio Prot	0.19	c0.20		0.12	c0.12		0.08	c0.27			c0.17	0.23
v/s Ratio Perm			0.07			0.09			0.04			
v/c Ratio	0.83	0.84	0.29	0.79	0.79	0.60	0.69	0.91	0.14		0.87	0.63
Uniform Delay, d1	47.4	47.4	40.9	52.8	52.9	51.1	55.1	44.3	33.9		50.8	33.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.96	0.83
Incremental Delay, d2	14.1	7.5	0.2	13.3	14.0	2.9	4.1	13.0	0.6		9.1	1.6
Delay (s)	61.5	55.0	41.1	66.1	66.9	54.0	59.3	57.2	34.5		57.8	29.3
Level of Service	E	D	D	E	E	D	E	E	C		E	C
Approach Delay (s)		53.2			60.7			55.0				40.8
Approach LOS		D			E			E				D

Intersection Summary			
HCM 2000 Control Delay	50.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.7
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	342
Future Volume (vph)	342
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.97
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1511
Flt Permitted	1.00
Satd. Flow (perm)	1511
Peak-hour factor, PHF	0.91
Adj. Flow (vph)	376
RTOR Reduction (vph)	237
Lane Group Flow (vph)	139
Confl. Peds. (#/hr)	10
Confl. Bikes (#/hr)	7
Heavy Vehicles (%)	4%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	46.8
Effective Green, g (s)	48.2
Actuated g/C Ratio	0.37
Clearance Time (s)	5.4
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	560
v/s Ratio Prot	
v/s Ratio Perm	0.09
v/c Ratio	0.25
Uniform Delay, d1	28.4
Progression Factor	1.46
Incremental Delay, d2	0.7
Delay (s)	42.1
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	87	119	70	2	158	34	347	2	17	1342	161	417
Future Volume (vph)	87	119	70	2	158	34	347	2	17	1342	161	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			3.3	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00		1.00	0.95	1.00	0.97
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98		1.00	1.00	0.99	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.94			1.00	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)	1770	3322			3368	1863	1527		1773	3471	1532	3367
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)	1770	3322			3368	1863	1527		1773	3471	1532	3367
Peak-hour factor, PHF	0.71	0.71	0.71	0.90	0.90	0.90	0.90	0.89	0.89	0.89	0.89	0.88
Adj. Flow (vph)	123	168	99	2	176	38	386	2	19	1508	181	474
RTOR Reduction (vph)	0	75	0	0	0	0	254	0	0	0	55	0
Lane Group Flow (vph)	123	192	0	0	178	38	132	0	21	1508	126	474
Confl. Peds. (#/hr)	4		4		4		4		3		1	1
Confl. Bikes (#/hr)												
Heavy Vehicles (%)	2%	2%	2%	0%	4%	2%	4%	0%	2%	4%	4%	4%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	4		3	3	8		5	5	2		1
Permitted Phases							8				2	
Actuated Green, G (s)	14.0	18.0			12.4	16.4	16.4		6.0	55.6	55.6	28.2
Effective Green, g (s)	14.6	19.3			13.7	17.7	17.7		6.6	56.9	56.9	28.8
Actuated g/C Ratio	0.11	0.14			0.10	0.13	0.13		0.05	0.42	0.42	0.21
Clearance Time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Vehicle Extension (s)	3.0	2.0			3.0	2.0	2.0		2.0	4.0	4.0	2.0
Lane Grp Cap (vph)	192	478			344	246	201		87	1473	650	723
v/s Ratio Prot	c0.07	0.06			0.05	0.02			0.01	c0.43		c0.14
v/s Ratio Perm							c0.09				0.08	
v/c Ratio	0.64	0.40			0.52	0.15	0.66		0.24	1.02	0.19	0.66
Uniform Delay, d1	57.2	52.1			57.0	51.5	55.3		61.3	38.5	24.2	48.1
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	7.1	0.2			1.3	0.1	5.7		0.5	29.7	0.7	1.6
Delay (s)	64.3	52.3			58.3	51.6	61.0		61.8	68.2	24.8	49.7
Level of Service	E	D			E	D	E		E	E	C	D
Approach Delay (s)		56.1				59.6				63.5		
Approach LOS		E				E				E		

Intersection Summary			
HCM 2000 Control Delay	48.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1130	10
Future Volume (vph)	1130	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	3466	
Flt Permitted	1.00	
Satd. Flow (perm)	3466	
Peak-hour factor, PHF	0.88	0.88
Adj. Flow (vph)	1284	11
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1295	0
Confl. Peds. (#/hr)		3
Confl. Bikes (#/hr)		4
Heavy Vehicles (%)	4%	2%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	77.8	
Effective Green, g (s)	79.1	
Actuated g/C Ratio	0.59	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	2045	
v/s Ratio Prot	0.37	
v/s Ratio Perm		
v/c Ratio	0.63	
Uniform Delay, d1	18.0	
Progression Factor	1.00	
Incremental Delay, d2	1.5	
Delay (s)	19.5	
Level of Service	B	
Approach Delay (s)	27.6	
Approach LOS	C	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	20	15	31	21	14	22	12	44	1230	26	7	44
Future Volume (vph)	20	15	31	21	14	22	12	44	1230	26	7	44
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
Lane Util. Factor		1.00			1.00			1.00	0.95			1.00
Frpb, ped/bikes		0.99			0.99			1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00			1.00
Frt		0.94			0.95			1.00	1.00			1.00
Flt Protected		0.98			0.98			0.95	1.00			0.95
Satd. Flow (prot)		1700			1713			1777	3456			1774
Flt Permitted		0.79			0.75			0.95	1.00			0.11
Satd. Flow (perm)		1369			1305			1777	3456			197
Peak-hour factor, PHF	0.75	0.75	0.75	0.65	0.65	0.65	0.93	0.93	0.93	0.93	0.96	0.96
Adj. Flow (vph)	27	20	41	32	22	34	13	47	1323	28	7	46
RTOR Reduction (vph)	0	32	0	0	23	0	0	0	2	0	0	0
Lane Group Flow (vph)	0	56	0	0	65	0	0	60	1349	0	0	53
Confl. Peds. (#/hr)	7		7	7		7		6		22		22
Confl. Bikes (#/hr)						2				1		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	2%	4%	2%	0%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA			Prot
Protected Phases		4			8		5	5	2			1
Permitted Phases	4			8								
Actuated Green, G (s)		8.0			8.0			6.6	54.8			37.1
Effective Green, g (s)		8.9			8.9			7.5	56.1			38.0
Actuated g/C Ratio		0.08			0.08			0.07	0.49			0.33
Clearance Time (s)		4.9			4.9			4.9	5.3			4.9
Vehicle Extension (s)		1.5			1.5			1.0	4.0			1.0
Lane Grp Cap (vph)		105			100			115	1685			65
v/s Ratio Prot								0.03	c0.39			
v/s Ratio Perm		0.04			c0.05							c0.27
v/c Ratio		0.53			0.65			0.52	0.80			0.82
Uniform Delay, d1		51.0			51.5			52.0	24.8			35.3
Progression Factor		1.00			1.00			1.00	1.00			1.00
Incremental Delay, d2		2.6			10.4			2.0	4.1			50.2
Delay (s)		53.6			61.9			54.0	28.9			85.5
Level of Service		D			E			D	C			F
Approach Delay (s)		53.6			61.9				29.9			
Approach LOS		D			E				C			

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)	115.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1187	24
Future Volume (vph)	1187	24
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	3460	
Flt Permitted	1.00	
Satd. Flow (perm)	3460	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	1236	25
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1260	0
Confl. Peds. (#/hr)		6
Confl. Bikes (#/hr)		5
Heavy Vehicles (%)	4%	2%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	85.3	
Effective Green, g (s)	86.6	
Actuated g/C Ratio	0.75	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.5	
Lane Grp Cap (vph)	2605	
v/s Ratio Prot	0.36	
v/s Ratio Perm		
v/c Ratio	0.48	
Uniform Delay, d1	5.5	
Progression Factor	1.00	
Incremental Delay, d2	0.6	
Delay (s)	6.2	
Level of Service	A	
Approach Delay (s)	9.4	
Approach LOS	A	

Intersection Summary

Movement	EBL	EBT	EBR2	WBU	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	31	42	8	9	14	40	52	227	12	1006	88	17
Future Volume (vph)	31	42	8	9	14	40	52	227	12	1006	88	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95				1.00	1.00	1.00	1.00	0.95	1.00	
Frpb, ped/bikes		1.00				1.00	1.00	0.98	1.00	1.00	0.99	
Flpb, ped/bikes		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.99				1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3418				1752	1863	1526	1770	3471	1532	
Flt Permitted		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3418				1752	1863	1526	1770	3471	1532	
Peak-hour factor, PHF	0.70	0.70	0.70	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92	0.88
Adj. Flow (vph)	44	60	11	9	15	42	55	239	13	1093	96	19
RTOR Reduction (vph)	0	106	0	0	0	0	0	214	0	0	0	0
Lane Group Flow (vph)	0	9	0	0	0	66	55	25	13	1093	96	0
Confl. Peds. (#/hr)	4		2			2		4			1	
Confl. Bikes (#/hr)								1			1	
Heavy Vehicles (%)	2%	2%	2%	0%	2%	4%	2%	4%	2%	4%	4%	0%
Turn Type	Split	NA		Split	Split	Split	NA	Perm	Prot	NA	Perm	Prot
Protected Phases	4	4		8	8	8	8		5	2		1
Permitted Phases								8			2	
Actuated Green, G (s)		6.2				8.4	8.4	8.4	1.1	40.6	40.6	
Effective Green, g (s)		7.1				9.3	9.3	9.3	2.0	41.9	41.9	
Actuated g/C Ratio		0.08				0.10	0.10	0.10	0.02	0.46	0.46	
Clearance Time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Vehicle Extension (s)		3.0				2.0	2.0	2.0	2.0	4.0	4.0	
Lane Grp Cap (vph)		268				180	191	156	39	1607	709	
v/s Ratio Prot		c0.00				c0.04	0.03		0.01	c0.31		
v/s Ratio Perm								0.02			0.06	
v/c Ratio		0.03				0.37	0.29	0.16	0.33	0.68	0.14	
Uniform Delay, d1		38.5				37.9	37.5	37.0	43.6	19.0	13.9	
Progression Factor		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1				0.5	0.3	0.2	1.8	1.3	0.1	
Delay (s)		38.6				38.3	37.8	37.2	45.4	20.4	14.0	
Level of Service		D				D	D	D	D	C	B	
Approach Delay (s)		38.6					37.5			20.1		
Approach LOS		D					D			C		

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	90.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL2	SBL	SBT	SBR	NWR2
Lane Configurations					
Traffic Volume (vph)	383	20	732	68	31
Future Volume (vph)	383	20	732	68	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0
Lane Util. Factor	0.91	0.95	0.95		1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00
Frt	1.00	1.00	0.99		0.86
Flt Protected	0.95	0.95	1.00		1.00
Satd. Flow (prot)	1584	1652	3426		1611
Flt Permitted	0.95	0.95	1.00		1.00
Satd. Flow (perm)	1584	1652	3426		1611
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.60
Adj. Flow (vph)	435	23	832	77	52
RTOR Reduction (vph)	0	0	3	0	47
Lane Group Flow (vph)	254	223	906	0	5
Confl. Peds. (#/hr)	1	1			
Confl. Bikes (#/hr)				5	
Heavy Vehicles (%)	4%	2%	4%	2%	2%
Turn Type	Prot	Prot	NA		Perm
Protected Phases	1	1	6		
Permitted Phases					8
Actuated Green, G (s)	15.3	15.3	54.8		8.4
Effective Green, g (s)	16.2	16.2	56.1		9.3
Actuated g/C Ratio	0.18	0.18	0.62		0.10
Clearance Time (s)	4.9	4.9	5.3		4.9
Vehicle Extension (s)	1.0	1.0	4.0		2.0
Lane Grp Cap (vph)	283	295	2123		165
v/s Ratio Prot	c0.16	0.13	0.26		
v/s Ratio Perm					0.00
v/c Ratio	0.90	0.76	0.43		0.03
Uniform Delay, d1	36.3	35.3	8.9		36.5
Progression Factor	1.00	1.00	1.00		1.00
Incremental Delay, d2	27.9	9.4	0.2		0.0
Delay (s)	64.2	44.7	9.1		36.6
Level of Service	E	D	A		D
Approach Delay (s)			24.9		
Approach LOS			C		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	6	22	6	124	20	2	1	16	1066	390	13	619
Future Volume (vph)	6	22	6	124	20	2	1	16	1066	390	13	619
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	3.2	4.0
Lane Util. Factor		1.00		0.95	0.95	1.00		1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes		1.00		1.00	1.00	0.98		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.98		1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.99		0.95	0.96	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1794		1681	1706	1557		1772	3471	1548	1770	3463
Flt Permitted		0.93		0.94	0.78	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1680		1665	1378	1557		1772	3471	1548	1770	3463
Peak-hour factor, PHF	0.57	0.57	0.57	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	11	39	11	136	22	2	1	17	1146	419	14	666
RTOR Reduction (vph)	0	8	0	0	0	2	0	0	0	83	0	0
Lane Group Flow (vph)	0	53	0	72	86	0	0	18	1146	336	14	676
Confl. Peds. (#/hr)	5					5		4		2	2	
Confl. Bikes (#/hr)			3									
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	2%	4%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8		8				2		
Actuated Green, G (s)		6.9		6.9	6.9	6.9		0.8	33.8	33.8	0.7	33.7
Effective Green, g (s)		7.8		7.8	7.8	7.8		1.7	35.5	35.5	2.4	35.4
Actuated g/C Ratio		0.14		0.14	0.14	0.14		0.03	0.62	0.62	0.04	0.62
Clearance Time (s)		4.9		4.9	4.9	4.9		4.9	5.7	5.7	4.9	5.7
Vehicle Extension (s)		2.0		2.0	2.0	2.0		1.0	4.0	4.0	1.0	4.0
Lane Grp Cap (vph)		230		228	188	213		52	2165	965	74	2154
v/s Ratio Prot								c0.01	c0.33		0.01	0.20
v/s Ratio Perm		0.03		0.04	c0.06	0.00				0.22		
v/c Ratio		0.23		0.32	0.46	0.00		0.35	0.53	0.35	0.19	0.31
Uniform Delay, d1		21.9		22.1	22.6	21.2		27.1	6.0	5.1	26.3	5.0
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.2		0.3	0.6	0.0		1.5	0.3	0.3	0.5	0.1
Delay (s)		22.1		22.4	23.2	21.2		28.5	6.3	5.4	26.8	5.2
Level of Service		C		C	C	C		C	A	A	C	A
Approach Delay (s)		22.1			22.9				6.3			5.6
Approach LOS		C			C				A			A

Intersection Summary			
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	56.9	Sum of lost time (s)	12.9
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	9
Future Volume (vph)	9
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	10
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	4
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: I-880 NB Off-Ramp/Industrial Pkwy & Whipple Rd

Project Alternative B&C AM

Movement	EBL	EBT	EBR	WBT	WBR	WBR2	NBL2	NBT	NBR	SBU	SBL	SBR
Lane Configurations												
Traffic Volume (vph)	322	751	189	616	255	143	497	421	357	25	209	618
Future Volume (vph)	322	751	189	616	255	143	497	421	357	25	209	618
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	5.4	4.0	5.4	5.4	5.4	5.1	5.1			4.4	4.4
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	1.00	1.00	0.95			1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.99			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	0.85	1.00	0.93			1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	3127	3223	1417	3223	1442	1414	1597	2982			1630	2538
Flt Permitted	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	3127	3223	1417	3223	1442	1414	1597	2982			1630	2538
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	362	844	212	677	280	157	540	458	388	29	240	710
RTOR Reduction (vph)	0	0	0	0	0	117	0	64	0	0	0	47
Lane Group Flow (vph)	362	844	212	677	280	40	540	782	0	0	269	704
Confl. Peds. (#/hr)	6					6			2		2	
Heavy Vehicles (%)	12%	12%	14%	12%	12%	12%	13%	12%	12%	0%	12%	12%
Turn Type	Prot	NA	Free	NA	Prot	Perm	Split	NA		Prot	Prot	pt+ov
Protected Phases	5	2		6	6		8	8		7	7	7 5
Permitted Phases			Free			6						
Actuated Green, G (s)	15.0	49.5	120.0	30.8	30.8	30.8	37.6	37.6			18.0	37.4
Effective Green, g (s)	15.0	49.5	120.0	30.8	30.8	30.8	37.6	37.6			18.0	37.4
Actuated g/C Ratio	0.12	0.41	1.00	0.26	0.26	0.26	0.31	0.31			0.15	0.31
Clearance Time (s)	3.7	5.4		5.4	5.4	5.4	5.1	5.1			4.4	
Vehicle Extension (s)	2.0	4.0		4.0	4.0	4.0	2.0	2.0			2.0	
Lane Grp Cap (vph)	390	1329	1417	827	370	362	500	934			244	791
v/s Ratio Prot	0.12	0.26		c0.21	0.19		c0.34	0.26			c0.16	c0.28
v/s Ratio Perm			0.15			0.03						
v/c Ratio	0.93	0.64	0.15	0.82	0.76	0.11	1.08	0.84			1.10	0.89
Uniform Delay, d1	52.0	28.1	0.0	42.0	41.1	34.1	41.2	38.4			51.0	39.3
Progression Factor	0.74	1.14	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	23.1	1.8	0.2	8.9	13.5	0.6	63.5	6.3			87.8	11.9
Delay (s)	61.7	33.8	0.2	50.8	54.6	34.7	104.7	44.7			138.8	51.3
Level of Service	E	C	A	D	D	C	F	D			F	D
Approach Delay (s)		35.9		49.5				68.1				
Approach LOS		D		D				E				

Intersection Summary			
HCM 2000 Control Delay	55.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR2
Lane Configurations	
Traffic Volume (vph)	36
Future Volume (vph)	36
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.87
Adj. Flow (vph)	41
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	12%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	178	139	171	174	321	307	588	45	323	615	829
Future Volume (vph)	270	178	139	171	174	321	307	588	45	323	615	829
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4	4.7	5.4	5.4
Lane Util. Factor	0.91	0.91	1.00	0.95	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1564	3209	1583	1681	1701	1411	3433	3539	1583	3127	3539	1533
Flt Permitted	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1564	3209	1583	1681	1701	1411	3433	3539	1583	3127	3539	1533
Peak-hour factor, PHF	0.83	0.83	0.83	0.88	0.88	0.88	0.78	0.78	0.78	0.80	0.80	0.80
Adj. Flow (vph)	325	214	167	194	198	365	394	754	58	404	769	1036
RTOR Reduction (vph)	0	0	142	0	0	255	0	0	36	0	0	286
Lane Group Flow (vph)	175	364	25	175	217	110	394	754	22	404	769	750
Confl. Peds. (#/hr)	5					5						
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	5%	6%	2%	2%	6%	12%	2%	2%	2%	12%	2%	4%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8			2			6
Actuated Green, G (s)	17.7	17.7	17.7	18.2	18.2	18.2	16.8	45.3	45.3	18.5	47.0	47.0
Effective Green, g (s)	17.7	17.7	17.7	18.2	18.2	18.2	16.8	45.3	45.3	18.5	47.0	47.0
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15	0.15	0.14	0.38	0.38	0.15	0.39	0.39
Clearance Time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4	4.7	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	230	473	233	254	257	214	480	1335	597	482	1386	600
v/s Ratio Prot	0.11	c0.11		0.10	c0.13		0.11	0.21		c0.13	0.22	
v/s Ratio Perm			0.02			0.08			0.01			c0.49
v/c Ratio	0.76	0.77	0.11	0.69	0.84	0.51	0.82	0.56	0.04	0.84	0.55	1.25
Uniform Delay, d1	49.1	49.2	44.3	48.2	49.5	46.8	50.1	29.6	23.6	49.3	28.4	36.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01	0.98	0.99
Incremental Delay, d2	12.5	6.7	0.1	6.1	20.8	0.9	10.3	1.7	0.1	7.1	0.9	120.7
Delay (s)	61.6	55.9	44.4	54.3	70.4	47.7	60.4	31.3	23.7	56.7	28.6	157.0
Level of Service	E	E	D	D	E	D	E	C	C	E	C	F
Approach Delay (s)		54.6			55.7			40.4			94.0	
Approach LOS		D			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	69.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.3
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	14	24	13	1	162	149	301	1	82	923	216	416
Future Volume (vph)	14	24	13	1	162	149	301	1	82	923	216	416
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00		1.00	0.95	1.00	0.97
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.99		1.00	1.00	0.99	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.95			1.00	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)	1770	3353			3274	1863	1533		1770	3471	1501	3367
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)	1770	3353			3274	1863	1533		1770	3471	1501	3367
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.86	0.86	0.86	0.86	0.94
Adj. Flow (vph)	15	26	14	1	174	160	324	1	95	1073	251	443
RTOR Reduction (vph)	0	13	0	0	0	0	270	0	0	0	80	0
Lane Group Flow (vph)	15	27	0	0	175	160	54	0	96	1073	171	443
Confl. Peds. (#/hr)	1						1		1		2	2
Confl. Bikes (#/hr)											1	
Heavy Vehicles (%)	2%	2%	2%	0%	7%	2%	4%	0%	2%	4%	6%	4%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	4		3	3	8		5	5	2		1
Permitted Phases							8				2	
Actuated Green, G (s)	2.7	10.4			11.9	19.6	19.6		12.4	54.0	54.0	20.7
Effective Green, g (s)	2.7	10.4			11.9	19.6	19.6		12.4	54.0	54.0	20.7
Actuated g/C Ratio	0.02	0.09			0.10	0.17	0.17		0.11	0.46	0.46	0.18
Clearance Time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0		2.0	4.0	4.0	2.0
Lane Grp Cap (vph)	40	298			333	312	257		187	1604	693	596
v/s Ratio Prot	0.01	0.01			c0.05	c0.09			0.05	0.31		c0.13
v/s Ratio Perm							0.04				0.11	
v/c Ratio	0.38	0.09			0.53	0.51	0.21		0.51	0.67	0.25	0.74
Uniform Delay, d1	56.2	48.9			49.8	44.3	41.9		49.3	24.4	19.1	45.5
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.0			0.7	0.6	0.2		1.0	1.2	0.3	4.4
Delay (s)	58.4	48.9			50.5	44.8	42.1		50.3	25.6	19.3	49.9
Level of Service	E	D			D	D	D		D	C	B	D
Approach Delay (s)		51.5				45.0				26.2		
Approach LOS		D				D				C		

Intersection Summary			
HCM 2000 Control Delay	31.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	116.8	Sum of lost time (s)	19.8
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1187	43
Future Volume (vph)	1187	43
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3452	
Flt Permitted	1.00	
Satd. Flow (perm)	3452	
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	1263	46
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1308	0
Confl. Peds. (#/hr)		1
Confl. Bikes (#/hr)		1
Heavy Vehicles (%)	4%	2%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	62.3	
Effective Green, g (s)	62.3	
Actuated g/C Ratio	0.53	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	1841	
v/s Ratio Prot	c0.38	
v/s Ratio Perm		
v/c Ratio	0.71	
Uniform Delay, d1	20.5	
Progression Factor	1.00	
Incremental Delay, d2	1.4	
Delay (s)	21.9	
Level of Service	C	
Approach Delay (s)	29.0	
Approach LOS	C	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	23	13	25	39	7	60	6	31	970	51	63	1143
Future Volume (vph)	23	13	25	39	7	60	6	31	970	51	63	1143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9			4.9	5.3		4.9	5.3
Lane Util. Factor		1.00			1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes		0.99			0.97			1.00	1.00		1.00	1.00
Flpb, ped/bikes		0.99			1.00			1.00	1.00		1.00	1.00
Frt		0.94			0.92			1.00	0.99		1.00	1.00
Flt Protected		0.98			0.98			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1630			1641			1775	3440		1770	3456
Flt Permitted		0.71			0.84			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1183			1411			1775	3440		1770	3456
Peak-hour factor, PHF	0.74	0.74	0.74	0.58	0.58	0.58	0.81	0.81	0.81	0.81	0.89	0.89
Adj. Flow (vph)	31	18	34	67	12	103	7	38	1198	63	71	1284
RTOR Reduction (vph)	0	27	0	0	52	0	0	0	2	0	0	1
Lane Group Flow (vph)	0	56	0	0	130	0	0	45	1259	0	71	1301
Confl. Peds. (#/hr)	29		11	11		29		2		11	11	
Confl. Bikes (#/hr)			2			1				3		
Heavy Vehicles (%)	13%	2%	2%	2%	2%	2%	0%	2%	4%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		13.2			13.2			4.5	69.9		6.8	72.2
Effective Green, g (s)		13.2			13.2			4.5	69.9		6.8	72.2
Actuated g/C Ratio		0.13			0.13			0.04	0.67		0.06	0.69
Clearance Time (s)		4.9			4.9			4.9	5.3		4.9	5.3
Vehicle Extension (s)		1.5			1.5			1.0	4.0		1.0	4.5
Lane Grp Cap (vph)		148			177			76	2290		114	2376
v/s Ratio Prot								0.03	0.37		c0.04	c0.38
v/s Ratio Perm		0.05			c0.09							
v/c Ratio		0.38			0.74			0.59	0.55		0.62	0.55
Uniform Delay, d1		42.1			44.2			49.3	9.3		47.9	8.2
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		0.6			12.8			8.0	1.0		7.4	0.9
Delay (s)		42.7			57.1			57.3	10.2		55.2	9.1
Level of Service		D			E			E	B		E	A
Approach Delay (s)		42.7			57.1				11.8			11.5
Approach LOS		D			E				B			B

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	16
Future Volume (vph)	16
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.89
Adj. Flow (vph)	18
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	19%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR2	WBU	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	86	58	31	8	12	72	20	243	17	747	97	5
Future Volume (vph)	86	58	31	8	12	72	20	243	17	747	97	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Lane Util. Factor		0.95				1.00	1.00	1.00	1.00	0.95	1.00	
Frpb, ped/bikes		1.00				1.00	1.00	0.98	1.00	1.00	0.98	
Flpb, ped/bikes		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.97				1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3363				1746	1863	1518	1770	3471	1529	
Flt Permitted		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3363				1746	1863	1518	1770	3471	1529	
Peak-hour factor, PHF	0.83	0.83	0.83	0.71	0.71	0.71	0.71	0.71	0.76	0.76	0.76	0.86
Adj. Flow (vph)	104	70	37	11	17	101	28	342	22	983	128	6
RTOR Reduction (vph)	0	130	0	0	0	0	0	297	0	0	0	0
Lane Group Flow (vph)	0	81	0	0	0	129	28	45	22	983	128	0
Confl. Peds. (#/hr)	13					3		13	3		2	
Confl. Bikes (#/hr)											2	
Heavy Vehicles (%)	2%	2%	2%	0%	2%	4%	2%	4%	2%	4%	4%	0%
Turn Type	Split	NA		Split	Split	Split	NA	Perm	Prot	NA	Perm	Prot
Protected Phases	4	4		8	8	8	8		5	2		1
Permitted Phases								8			2	
Actuated Green, G (s)		8.0				11.9	11.9	11.9	2.4	38.3	38.3	
Effective Green, g (s)		8.0				11.9	11.9	11.9	2.4	38.3	38.3	
Actuated g/C Ratio		0.09				0.13	0.13	0.13	0.03	0.42	0.42	
Clearance Time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Vehicle Extension (s)		3.0				2.0	2.0	2.0	2.0	4.0	4.0	
Lane Grp Cap (vph)		296				229	244	199	46	1465	645	
v/s Ratio Prot		c0.02				c0.07	0.02		0.01	c0.28		
v/s Ratio Perm								0.03			0.08	
v/c Ratio		0.27				0.56	0.11	0.23	0.48	0.67	0.20	
Uniform Delay, d1		38.6				37.0	34.8	35.3	43.5	21.1	16.5	
Progression Factor		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.5				1.9	0.1	0.2	2.8	1.3	0.2	
Delay (s)		39.1				38.9	34.8	35.5	46.4	22.5	16.7	
Level of Service		D				D	C	D	D	C	B	
Approach Delay (s)		39.1					36.3			22.3		
Approach LOS		D					D			C		

Intersection Summary			
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL2	SBL	SBT	SBR	NWR2
Lane Configurations					
Traffic Volume (vph)	235	16	816	24	45
Future Volume (vph)	235	16	816	24	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	5.3		4.9
Lane Util. Factor	0.91	0.95	0.95		1.00
Frpb, ped/bikes	1.00	1.00	1.00		0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00
Frt	1.00	1.00	1.00		0.86
Flt Protected	0.95	0.95	1.00		1.00
Satd. Flow (prot)	1582	1653	3456		1589
Flt Permitted	0.95	0.95	1.00		1.00
Satd. Flow (perm)	1582	1653	3456		1589
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.75
Adj. Flow (vph)	273	19	949	28	60
RTOR Reduction (vph)	0	0	1	0	52
Lane Group Flow (vph)	148	150	976	0	8
Confl. Peds. (#/hr)	2	2		3	
Confl. Bikes (#/hr)					1
Heavy Vehicles (%)	4%	2%	4%	2%	2%
Turn Type	Prot	Prot	NA		Perm
Protected Phases	1	1	6		
Permitted Phases					8
Actuated Green, G (s)	12.5	12.5	48.4		11.9
Effective Green, g (s)	12.5	12.5	48.4		11.9
Actuated g/C Ratio	0.14	0.14	0.53		0.13
Clearance Time (s)	4.9	4.9	5.3		4.9
Vehicle Extension (s)	1.0	1.0	4.0		2.0
Lane Grp Cap (vph)	218	227	1844		208
v/s Ratio Prot	c0.09	0.09	0.28		
v/s Ratio Perm					0.00
v/c Ratio	0.68	0.66	0.53		0.04
Uniform Delay, d1	37.2	37.1	13.7		34.4
Progression Factor	1.00	1.00	1.00		1.00
Incremental Delay, d2	6.5	5.5	0.4		0.0
Delay (s)	43.6	42.6	14.1		34.4
Level of Service	D	D	B		C
Approach Delay (s)			20.9		
Approach LOS			C		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	25	24	16	178	12	5	9	595	143	2	6	936
Future Volume (vph)	25	24	16	178	12	5	9	595	143	2	6	936
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9	4.9	4.9	5.7	5.7		4.9	5.7
Lane Util. Factor		1.00		0.95	0.95	1.00	1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00		1.00	1.00	0.98	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		0.97		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00
Flt Protected		0.98		0.95	0.96	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1676		1681	1696	1555	1766	3471	1550		1770	3453
Flt Permitted		0.83		0.81	0.78	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1425		1439	1376	1555	1766	3471	1550		1770	3453
Peak-hour factor, PHF	0.78	0.78	0.78	0.68	0.68	0.68	0.74	0.74	0.74	0.79	0.79	0.79
Adj. Flow (vph)	32	31	21	262	18	7	12	804	193	3	8	1185
RTOR Reduction (vph)	0	11	0	0	0	6	0	0	62	0	0	0
Lane Group Flow (vph)	0	73	0	139	141	1	12	804	131	0	11	1193
Confl. Peds. (#/hr)	4					4	7					
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	16%	2%	2%	2%	2%	2%	2%	4%	2%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Perm	Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4			8		8			2			
Actuated Green, G (s)		11.6		11.6	11.6	11.6	0.8	36.9	36.9		0.8	36.9
Effective Green, g (s)		11.6		11.6	11.6	11.6	0.8	36.9	36.9		0.8	36.9
Actuated g/C Ratio		0.18		0.18	0.18	0.18	0.01	0.57	0.57		0.01	0.57
Clearance Time (s)		4.9		4.9	4.9	4.9	4.9	5.7	5.7		4.9	5.7
Vehicle Extension (s)		2.0		2.0	2.0	2.0	1.0	4.0	4.0		1.0	4.0
Lane Grp Cap (vph)		255		257	246	278	21	1976	882		21	1966
v/s Ratio Prot							c0.01	0.23			0.01	c0.35
v/s Ratio Perm		0.05		0.10	c0.10	0.00			0.08			
v/c Ratio		0.28		0.54	0.57	0.00	0.57	0.41	0.15		0.52	0.61
Uniform Delay, d1		23.0		24.2	24.3	21.9	31.8	7.8	6.6		31.8	9.2
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2		1.2	2.0	0.0	21.2	0.2	0.1		10.4	0.6
Delay (s)		23.2		25.4	26.3	21.9	53.0	8.0	6.7		42.2	9.8
Level of Service		C		C	C	C	D	A	A		D	A
Approach Delay (s)		23.2			25.8			8.3				10.1
Approach LOS		C			C			A				B

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	64.8	Sum of lost time (s)	15.5
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	6
Future Volume (vph)	6
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.79
Adj. Flow (vph)	8
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	7
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	67%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: I-880 NB Off-Ramp/Industrial Pkwy & Whipple Rd

Project Alternative B&C PM

Movement	EBL	EBT	EBR	WBT	WBR	WBR2	NBL2	NBT	NBR	SBU	SBL	SBR
Lane Configurations												
Traffic Volume (vph)	724	765	226	751	208	267	173	635	131	48	179	575
Future Volume (vph)	724	765	226	751	208	267	173	635	131	48	179	575
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	2.6	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	1.00	1.00	0.95			1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	0.85	1.00	0.97			1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	3127	3223	1429	3223	1442	1408	1583	3132			1649	2538
Flt Permitted	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	3127	3223	1429	3223	1442	1408	1583	3132			1649	2538
Peak-hour factor, PHF	0.88	0.88	0.88	0.95	0.95	0.95	0.89	0.89	0.89	0.94	0.94	0.94
Adj. Flow (vph)	823	869	257	791	219	281	194	713	147	51	190	612
RTOR Reduction (vph)	0	0	0	0	0	112	0	14	0	0	0	40
Lane Group Flow (vph)	823	869	257	791	219	169	194	846	0	0	241	603
Confl. Peds. (#/hr)	9					9			4		4	
Heavy Vehicles (%)	12%	12%	13%	12%	12%	12%	14%	12%	12%	0%	12%	12%
Turn Type	Prot	NA	Free	NA	Prot	Perm	Split	NA		Prot	Prot	pt+ov
Protected Phases	5	2		6	6		8	8		7	7	7 5
Permitted Phases			Free			6						
Actuated Green, G (s)	26.0	62.1	130.0	32.4	32.4	32.4	35.6	35.6			17.4	47.8
Effective Green, g (s)	25.7	63.5	130.0	33.8	33.8	33.8	36.7	36.7			17.8	48.2
Actuated g/C Ratio	0.20	0.49	1.00	0.26	0.26	0.26	0.28	0.28			0.14	0.37
Clearance Time (s)	3.7	5.4		5.4	5.4	5.4	5.1	5.1			4.4	
Vehicle Extension (s)	2.0	4.0		4.0	4.0	4.0	2.0	2.0			2.0	
Lane Grp Cap (vph)	618	1574	1429	837	374	366	446	884			225	941
v/s Ratio Prot	c0.26	0.27		c0.25	0.15		0.12	c0.27			c0.15	0.24
v/s Ratio Perm			0.18			0.12						
v/c Ratio	1.33	0.55	0.18	0.95	0.59	0.46	0.43	0.96			1.07	0.64
Uniform Delay, d1	52.1	23.3	0.0	47.2	42.0	40.5	38.2	45.9			56.1	33.8
Progression Factor	0.72	1.04	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	156.4	0.9	0.2	20.3	6.6	4.2	0.2	20.3			80.1	1.1
Delay (s)	194.2	25.2	0.2	67.5	48.6	44.6	38.4	66.1			136.2	34.9
Level of Service	F	C	A	E	D	D	D	E			F	C
Approach Delay (s)		93.3		59.3				61.0				
Approach LOS		F		E				E				

Intersection Summary			
HCM 2000 Control Delay	73.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	130.0	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	SBR2
Lane Configurations	
Traffic Volume (vph)	29
Future Volume (vph)	29
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	31
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	12%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	413	506	289	300	97	340	255	866	146	4	479	747
Future Volume (vph)	413	506	289	300	97	340	255	866	146	4	479	747
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	0.91	0.91	1.00	0.95	0.95	1.00	0.97	0.95	1.00		0.97	0.95
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00
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	0.85		1.00	1.00
Flt Protected	0.95	0.99	1.00	0.95	0.97	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1564	3263	1583	1681	1685	1423	3433	3539	1583		3129	3539
Flt Permitted	0.95	0.99	1.00	0.95	0.97	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1564	3263	1583	1681	1685	1423	3433	3539	1583		3129	3539
Peak-hour factor, PHF	0.96	0.96	0.96	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	430	527	301	316	102	358	277	941	159	4	526	821
RTOR Reduction (vph)	0	0	193	0	0	225	0	0	95	0	0	0
Lane Group Flow (vph)	310	647	108	205	213	133	277	941	64	0	530	821
Confl. Peds. (#/hr)							10					
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	2%	2%	7%	12%	2%	2%	2%	0%	12%	2%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	Prot	NA
Protected Phases	7	7		8	8		5	2		1	1	6
Permitted Phases			7			8			2			
Actuated Green, G (s)	29.3	29.3	29.3	19.5	19.5	19.5	14.5	36.6	36.6		24.3	46.4
Effective Green, g (s)	30.6	30.6	30.6	20.4	20.4	20.4	15.2	38.0	38.0		25.0	47.8
Actuated g/C Ratio	0.24	0.24	0.24	0.16	0.16	0.16	0.12	0.29	0.29		0.19	0.37
Clearance Time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4		4.7	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		2.0	3.0
Lane Grp Cap (vph)	368	768	372	263	264	223	401	1034	462		601	1301
v/s Ratio Prot	0.20	c0.20		0.12	c0.13		0.08	c0.27			c0.17	0.23
v/s Ratio Perm			0.07			0.09			0.04			
v/c Ratio	0.84	0.84	0.29	0.78	0.81	0.60	0.69	0.91	0.14		0.88	0.63
Uniform Delay, d1	47.4	47.4	40.8	52.6	52.9	51.0	55.1	44.4	33.9		51.1	33.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.95	0.83
Incremental Delay, d2	15.3	8.0	0.2	12.5	15.5	2.8	4.1	13.3	0.6		10.1	1.6
Delay (s)	62.7	55.4	40.9	65.1	68.4	53.8	59.3	57.6	34.6		58.8	29.6
Level of Service	E	E	D	E	E	D	E	E	C		E	C
Approach Delay (s)		53.7			60.8			55.3				41.5
Approach LOS		D			E			E				D

Intersection Summary			
HCM 2000 Control Delay	51.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.7
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	345
Future Volume (vph)	345
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.97
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1497
Flt Permitted	1.00
Satd. Flow (perm)	1497
Peak-hour factor, PHF	0.91
Adj. Flow (vph)	379
RTOR Reduction (vph)	240
Lane Group Flow (vph)	139
Confl. Peds. (#/hr)	10
Confl. Bikes (#/hr)	7
Heavy Vehicles (%)	5%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	46.4
Effective Green, g (s)	47.8
Actuated g/C Ratio	0.37
Clearance Time (s)	5.4
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	550
v/s Ratio Prot	
v/s Ratio Perm	0.09
v/c Ratio	0.25
Uniform Delay, d1	28.7
Progression Factor	1.47
Incremental Delay, d2	0.8
Delay (s)	42.9
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	87	119	70	2	163	34	347	2	17	1342	166	417
Future Volume (vph)	87	119	70	2	163	34	347	2	17	1342	166	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			3.3	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00		1.00	0.95	1.00	0.97
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98		1.00	1.00	0.99	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.94			1.00	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)	1770	3322			3275	1863	1527		1773	3471	1489	3367
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)	1770	3322			3275	1863	1527		1773	3471	1489	3367
Peak-hour factor, PHF	0.71	0.71	0.71	0.90	0.90	0.90	0.90	0.89	0.89	0.89	0.89	0.88
Adj. Flow (vph)	123	168	99	2	181	38	386	2	19	1508	187	474
RTOR Reduction (vph)	0	76	0	0	0	0	254	0	0	0	56	0
Lane Group Flow (vph)	123	191	0	0	183	38	132	0	21	1508	131	474
Confl. Peds. (#/hr)	4		4		4		4		3		1	1
Confl. Bikes (#/hr)												
Heavy Vehicles (%)	2%	2%	2%	0%	7%	2%	4%	0%	2%	4%	7%	4%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	4		3	3	8		5	5	2		1
Permitted Phases							8				2	
Actuated Green, G (s)	14.0	17.6			12.8	16.4	16.4		6.0	55.6	55.6	28.2
Effective Green, g (s)	14.6	18.9			14.1	17.7	17.7		6.6	56.9	56.9	28.8
Actuated g/C Ratio	0.11	0.14			0.11	0.13	0.13		0.05	0.42	0.42	0.21
Clearance Time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Vehicle Extension (s)	3.0	2.0			3.0	2.0	2.0		2.0	4.0	4.0	2.0
Lane Grp Cap (vph)	192	468			344	246	201		87	1473	632	723
v/s Ratio Prot	c0.07	0.06			0.06	0.02			0.01	c0.43		c0.14
v/s Ratio Perm							c0.09				0.09	
v/c Ratio	0.64	0.41			0.53	0.15	0.66		0.24	1.02	0.21	0.66
Uniform Delay, d1	57.2	52.5			56.8	51.5	55.3		61.3	38.5	24.3	48.1
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	7.1	0.2			1.6	0.1	5.7		0.5	29.7	0.7	1.6
Delay (s)	64.3	52.7			58.4	51.6	61.0		61.8	68.2	25.1	49.7
Level of Service	E	D			E	D	E		E	E	C	D
Approach Delay (s)		56.3				59.6				63.4		
Approach LOS		E				E				E		

Intersection Summary			
HCM 2000 Control Delay	48.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1130	10
Future Volume (vph)	1130	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	3466	
Flt Permitted	1.00	
Satd. Flow (perm)	3466	
Peak-hour factor, PHF	0.88	0.88
Adj. Flow (vph)	1284	11
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1295	0
Confl. Peds. (#/hr)		3
Confl. Bikes (#/hr)		4
Heavy Vehicles (%)	4%	2%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	77.8	
Effective Green, g (s)	79.1	
Actuated g/C Ratio	0.59	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	2045	
v/s Ratio Prot	0.37	
v/s Ratio Perm		
v/c Ratio	0.63	
Uniform Delay, d1	18.0	
Progression Factor	1.00	
Incremental Delay, d2	1.5	
Delay (s)	19.5	
Level of Service	B	
Approach Delay (s)	27.6	
Approach LOS	C	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	22	15	31	21	14	22	12	44	1233	26	7	44
Future Volume (vph)	22	15	31	21	14	22	12	44	1233	26	7	44
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
Lane Util. Factor		1.00			1.00			1.00	0.95			1.00
Frpb, ped/bikes		0.99			0.99			1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00			1.00
Frt		0.94			0.95			1.00	1.00			1.00
Flt Protected		0.98			0.98			0.95	1.00			0.95
Satd. Flow (prot)		1639			1713			1777	3456			1774
Flt Permitted		0.79			0.75			0.95	1.00			0.11
Satd. Flow (perm)		1308			1301			1777	3456			197
Peak-hour factor, PHF	0.75	0.75	0.75	0.65	0.65	0.65	0.93	0.93	0.93	0.93	0.96	0.96
Adj. Flow (vph)	29	20	41	32	22	34	13	47	1326	28	7	46
RTOR Reduction (vph)	0	31	0	0	23	0	0	0	2	0	0	0
Lane Group Flow (vph)	0	59	0	0	65	0	0	60	1352	0	0	53
Confl. Peds. (#/hr)	7		7	7		7		6		22		22
Confl. Bikes (#/hr)						2				1		
Heavy Vehicles (%)	14%	2%	2%	2%	2%	2%	0%	2%	4%	2%	0%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA			Prot
Protected Phases		4			8		5	5	2			1
Permitted Phases	4			8								
Actuated Green, G (s)		8.0			8.0			6.6	54.8			37.1
Effective Green, g (s)		8.9			8.9			7.5	56.1			38.0
Actuated g/C Ratio		0.08			0.08			0.07	0.49			0.33
Clearance Time (s)		4.9			4.9			4.9	5.3			4.9
Vehicle Extension (s)		1.5			1.5			1.0	4.0			1.0
Lane Grp Cap (vph)		101			100			115	1685			65
v/s Ratio Prot								0.03	c0.39			
v/s Ratio Perm		0.04			c0.05							c0.27
v/c Ratio		0.58			0.65			0.52	0.80			0.82
Uniform Delay, d1		51.2			51.5			52.0	24.8			35.3
Progression Factor		1.00			1.00			1.00	1.00			1.00
Incremental Delay, d2		5.4			10.4			2.0	4.2			50.2
Delay (s)		56.6			61.9			54.0	28.9			85.5
Level of Service		E			E			D	C			F
Approach Delay (s)		56.6			61.9				30.0			
Approach LOS		E			E				C			

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1190	26
Future Volume (vph)	1190	26
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	3452	
Flt Permitted	1.00	
Satd. Flow (perm)	3452	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	1240	27
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1266	0
Confl. Peds. (#/hr)		6
Confl. Bikes (#/hr)		5
Heavy Vehicles (%)	4%	12%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	85.3	
Effective Green, g (s)	86.6	
Actuated g/C Ratio	0.75	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.5	
Lane Grp Cap (vph)	2599	
v/s Ratio Prot	0.37	
v/s Ratio Perm		
v/c Ratio	0.49	
Uniform Delay, d1	5.5	
Progression Factor	1.00	
Incremental Delay, d2	0.7	
Delay (s)	6.2	
Level of Service	A	
Approach Delay (s)	9.4	
Approach LOS	A	

Intersection Summary

Movement	EBL	EBT	EBR2	WBU	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	31	42	8	9	14	40	52	227	12	1009	88	17
Future Volume (vph)	31	42	8	9	14	40	52	227	12	1009	88	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95				1.00	1.00	1.00	1.00	0.95	1.00	
Frpb, ped/bikes		1.00				1.00	1.00	0.98	1.00	1.00	0.99	
Flpb, ped/bikes		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.99				1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3418				1752	1863	1526	1770	3471	1532	
Flt Permitted		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3418				1752	1863	1526	1770	3471	1532	
Peak-hour factor, PHF	0.70	0.70	0.70	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92	0.88
Adj. Flow (vph)	44	60	11	9	15	42	55	239	13	1097	96	19
RTOR Reduction (vph)	0	106	0	0	0	0	0	214	0	0	0	0
Lane Group Flow (vph)	0	9	0	0	0	66	55	25	13	1097	96	0
Confl. Peds. (#/hr)	4		2			2		4			1	
Confl. Bikes (#/hr)								1			1	
Heavy Vehicles (%)	2%	2%	2%	0%	2%	4%	2%	4%	2%	4%	4%	0%
Turn Type	Split	NA		Split	Split	Split	NA	Perm	Prot	NA	Perm	Prot
Protected Phases	4	4		8	8	8	8		5	2		1
Permitted Phases								8			2	
Actuated Green, G (s)		6.2				8.4	8.4	8.4	1.1	40.7	40.7	
Effective Green, g (s)		7.1				9.3	9.3	9.3	2.0	42.0	42.0	
Actuated g/C Ratio		0.08				0.10	0.10	0.10	0.02	0.46	0.46	
Clearance Time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Vehicle Extension (s)		3.0				2.0	2.0	2.0	2.0	4.0	4.0	
Lane Grp Cap (vph)		267				179	191	156	39	1609	710	
v/s Ratio Prot		c0.00				c0.04	0.03		0.01	c0.32		
v/s Ratio Perm								0.02			0.06	
v/c Ratio		0.03				0.37	0.29	0.16	0.33	0.68	0.14	
Uniform Delay, d1		38.6				37.9	37.6	37.1	43.6	19.1	13.9	
Progression Factor		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1				0.5	0.3	0.2	1.8	1.3	0.1	
Delay (s)		38.6				38.4	37.9	37.2	45.5	20.4	14.0	
Level of Service		D				D	D	D	D	C	B	
Approach Delay (s)		38.6					37.6			20.1		
Approach LOS		D					D			C		

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL2	SBL	SBT	SBR	NWR2
Lane Configurations					
Traffic Volume (vph)	383	20	735	68	31
Future Volume (vph)	383	20	735	68	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0
Lane Util. Factor	0.91	0.95	0.95		1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00
Frt	1.00	1.00	0.99		0.86
Flt Protected	0.95	0.95	1.00		1.00
Satd. Flow (prot)	1584	1652	3426		1611
Flt Permitted	0.95	0.95	1.00		1.00
Satd. Flow (perm)	1584	1652	3426		1611
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.60
Adj. Flow (vph)	435	23	835	77	52
RTOR Reduction (vph)	0	0	3	0	47
Lane Group Flow (vph)	254	223	909	0	5
Confl. Peds. (#/hr)	1	1			
Confl. Bikes (#/hr)				5	
Heavy Vehicles (%)	4%	2%	4%	2%	2%
Turn Type	Prot	Prot	NA		Perm
Protected Phases	1	1	6		
Permitted Phases					8
Actuated Green, G (s)	15.3	15.3	54.9		8.4
Effective Green, g (s)	16.2	16.2	56.2		9.3
Actuated g/C Ratio	0.18	0.18	0.62		0.10
Clearance Time (s)	4.9	4.9	5.3		4.9
Vehicle Extension (s)	1.0	1.0	4.0		2.0
Lane Grp Cap (vph)	283	295	2125		165
v/s Ratio Prot	c0.16	0.13	0.27		
v/s Ratio Perm					0.00
v/c Ratio	0.90	0.76	0.43		0.03
Uniform Delay, d1	36.4	35.3	8.9		36.6
Progression Factor	1.00	1.00	1.00		1.00
Incremental Delay, d2	27.9	9.4	0.2		0.0
Delay (s)	64.2	44.7	9.1		36.6
Level of Service	E	D	A		D
Approach Delay (s)			24.9		
Approach LOS			C		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	9	22	6	124	20	2	1	16	1066	390	13	619
Future Volume (vph)	9	22	6	124	20	2	1	16	1066	390	13	619
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	3.2	4.0
Lane Util. Factor		1.00		0.95	0.95	1.00		1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes		1.00		1.00	1.00	0.98		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.98		1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.99		0.95	0.96	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1629		1681	1706	1557		1772	3471	1548	1770	3441
Flt Permitted		0.90		0.91	0.82	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1485		1611	1449	1557		1772	3471	1548	1770	3441
Peak-hour factor, PHF	0.57	0.57	0.57	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	16	39	11	136	22	2	1	17	1146	419	14	666
RTOR Reduction (vph)	0	8	0	0	0	2	0	0	0	83	0	1
Lane Group Flow (vph)	0	58	0	72	86	0	0	18	1146	336	14	678
Confl. Peds. (#/hr)	5					5		4		2	2	
Confl. Bikes (#/hr)			3									
Heavy Vehicles (%)	44%	2%	2%	2%	2%	2%	0%	2%	4%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8		8				2		
Actuated Green, G (s)		6.9		6.9	6.9	6.9		0.8	33.8	33.8	0.7	33.7
Effective Green, g (s)		7.8		7.8	7.8	7.8		1.7	35.5	35.5	2.4	35.4
Actuated g/C Ratio		0.14		0.14	0.14	0.14		0.03	0.62	0.62	0.04	0.62
Clearance Time (s)		4.9		4.9	4.9	4.9		4.9	5.7	5.7	4.9	5.7
Vehicle Extension (s)		2.0		2.0	2.0	2.0		1.0	4.0	4.0	1.0	4.0
Lane Grp Cap (vph)		203		220	198	213		52	2165	965	74	2140
v/s Ratio Prot								c0.01	c0.33		0.01	0.20
v/s Ratio Perm		0.04		0.04	c0.06	0.00				0.22		
v/c Ratio		0.29		0.33	0.43	0.00		0.35	0.53	0.35	0.19	0.32
Uniform Delay, d1		22.1		22.2	22.5	21.2		27.1	6.0	5.1	26.3	5.1
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.3		0.3	0.6	0.0		1.5	0.3	0.3	0.5	0.1
Delay (s)		22.3		22.5	23.1	21.2		28.5	6.3	5.4	26.8	5.2
Level of Service		C		C	C	C		C	A	A	C	A
Approach Delay (s)		22.3			22.8				6.3			5.6
Approach LOS		C			C				A			A

Intersection Summary			
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	56.9	Sum of lost time (s)	12.9
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	12
Future Volume (vph)	12
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	13
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	4
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	33%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: I-880 NB Off-Ramp/Industrial Pkwy & Whipple Rd

Project Alternative D AM

Movement	EBL	EBT	EBR	WBT	WBR	WBR2	NBL2	NBT	NBR	SBU	SBL	SBR
Lane Configurations												
Traffic Volume (vph)	322	751	189	616	255	143	497	421	357	25	209	618
Future Volume (vph)	322	751	189	616	255	143	497	421	357	25	209	618
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	5.4	4.0	5.4	5.4	5.4	5.1	5.1			4.4	4.4
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	1.00	1.00	0.95			1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.99			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	0.85	1.00	0.93			1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	3127	3223	1417	3223	1442	1414	1597	2982			1630	2538
Flt Permitted	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	3127	3223	1417	3223	1442	1414	1597	2982			1630	2538
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	362	844	212	677	280	157	540	458	388	29	240	710
RTOR Reduction (vph)	0	0	0	0	0	117	0	64	0	0	0	47
Lane Group Flow (vph)	362	844	212	677	280	40	540	782	0	0	269	704
Confl. Peds. (#/hr)	6					6			2		2	
Heavy Vehicles (%)	12%	12%	14%	12%	12%	12%	13%	12%	12%	0%	12%	12%
Turn Type	Prot	NA	Free	NA	Prot	Perm	Split	NA		Prot	Prot	pt+ov
Protected Phases	5	2		6	6		8	8		7	7	7 5
Permitted Phases			Free			6						
Actuated Green, G (s)	15.0	49.5	120.0	30.8	30.8	30.8	37.6	37.6			18.0	37.4
Effective Green, g (s)	15.0	49.5	120.0	30.8	30.8	30.8	37.6	37.6			18.0	37.4
Actuated g/C Ratio	0.12	0.41	1.00	0.26	0.26	0.26	0.31	0.31			0.15	0.31
Clearance Time (s)	3.7	5.4		5.4	5.4	5.4	5.1	5.1			4.4	
Vehicle Extension (s)	2.0	4.0		4.0	4.0	4.0	2.0	2.0			2.0	
Lane Grp Cap (vph)	390	1329	1417	827	370	362	500	934			244	791
v/s Ratio Prot	0.12	0.26		c0.21	0.19		c0.34	0.26			c0.16	c0.28
v/s Ratio Perm			0.15			0.03						
v/c Ratio	0.93	0.64	0.15	0.82	0.76	0.11	1.08	0.84			1.10	0.89
Uniform Delay, d1	52.0	28.1	0.0	42.0	41.1	34.1	41.2	38.4			51.0	39.3
Progression Factor	0.74	1.14	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	23.1	1.8	0.2	8.9	13.5	0.6	63.5	6.3			87.8	11.9
Delay (s)	61.7	33.8	0.2	50.8	54.6	34.7	104.7	44.7			138.8	51.3
Level of Service	E	C	A	D	D	C	F	D			F	D
Approach Delay (s)		35.9		49.5				68.1				
Approach LOS		D		D				E				

Intersection Summary			
HCM 2000 Control Delay	55.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR2
Lane Configurations	
Traffic Volume (vph)	36
Future Volume (vph)	36
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.87
Adj. Flow (vph)	41
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	12%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	178	139	171	174	321	307	588	45	323	615	829
Future Volume (vph)	270	178	139	171	174	321	307	588	45	323	615	829
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4	4.7	5.4	5.4
Lane Util. Factor	0.91	0.91	1.00	0.95	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1564	3209	1583	1681	1701	1411	3433	3539	1583	3127	3539	1533
Flt Permitted	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1564	3209	1583	1681	1701	1411	3433	3539	1583	3127	3539	1533
Peak-hour factor, PHF	0.83	0.83	0.83	0.88	0.88	0.88	0.78	0.78	0.78	0.80	0.80	0.80
Adj. Flow (vph)	325	214	167	194	198	365	394	754	58	404	769	1036
RTOR Reduction (vph)	0	0	142	0	0	255	0	0	36	0	0	286
Lane Group Flow (vph)	175	364	25	175	217	110	394	754	22	404	769	750
Confl. Peds. (#/hr)	5					5						
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	5%	6%	2%	2%	6%	12%	2%	2%	2%	12%	2%	4%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8			2			6
Actuated Green, G (s)	17.7	17.7	17.7	18.2	18.2	18.2	16.8	45.3	45.3	18.5	47.0	47.0
Effective Green, g (s)	17.7	17.7	17.7	18.2	18.2	18.2	16.8	45.3	45.3	18.5	47.0	47.0
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15	0.15	0.14	0.38	0.38	0.15	0.39	0.39
Clearance Time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4	4.7	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	230	473	233	254	257	214	480	1335	597	482	1386	600
v/s Ratio Prot	0.11	c0.11		0.10	c0.13		0.11	0.21		c0.13	0.22	
v/s Ratio Perm			0.02			0.08			0.01			c0.49
v/c Ratio	0.76	0.77	0.11	0.69	0.84	0.51	0.82	0.56	0.04	0.84	0.55	1.25
Uniform Delay, d1	49.1	49.2	44.3	48.2	49.5	46.8	50.1	29.6	23.6	49.3	28.4	36.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01	0.98	0.99
Incremental Delay, d2	12.5	6.7	0.1	6.1	20.8	0.9	10.3	1.7	0.1	7.1	0.9	120.7
Delay (s)	61.6	55.9	44.4	54.3	70.4	47.7	60.4	31.3	23.7	56.7	28.6	157.0
Level of Service	E	E	D	D	E	D	E	C	C	E	C	F
Approach Delay (s)		54.6			55.7			40.4			94.0	
Approach LOS		D			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	69.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.3
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	14	24	13	1	162	149	301	1	82	923	216	416
Future Volume (vph)	14	24	13	1	162	149	301	1	82	923	216	416
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00		1.00	0.95	1.00	0.97
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.99		1.00	1.00	0.99	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.95			1.00	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)	1770	3353			3274	1863	1533		1770	3471	1501	3367
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)	1770	3353			3274	1863	1533		1770	3471	1501	3367
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.86	0.86	0.86	0.86	0.94
Adj. Flow (vph)	15	26	14	1	174	160	324	1	95	1073	251	443
RTOR Reduction (vph)	0	13	0	0	0	0	270	0	0	0	80	0
Lane Group Flow (vph)	15	27	0	0	175	160	54	0	96	1073	171	443
Confl. Peds. (#/hr)	1						1		1		2	2
Confl. Bikes (#/hr)											1	
Heavy Vehicles (%)	2%	2%	2%	0%	7%	2%	4%	0%	2%	4%	6%	4%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	4		3	3	8		5	5	2		1
Permitted Phases							8				2	
Actuated Green, G (s)	2.7	10.4			11.9	19.6	19.6		12.4	54.0	54.0	20.7
Effective Green, g (s)	2.7	10.4			11.9	19.6	19.6		12.4	54.0	54.0	20.7
Actuated g/C Ratio	0.02	0.09			0.10	0.17	0.17		0.11	0.46	0.46	0.18
Clearance Time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0		2.0	4.0	4.0	2.0
Lane Grp Cap (vph)	40	298			333	312	257		187	1604	693	596
v/s Ratio Prot	0.01	0.01			c0.05	c0.09			0.05	0.31		c0.13
v/s Ratio Perm							0.04				0.11	
v/c Ratio	0.38	0.09			0.53	0.51	0.21		0.51	0.67	0.25	0.74
Uniform Delay, d1	56.2	48.9			49.8	44.3	41.9		49.3	24.4	19.1	45.5
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.0			0.7	0.6	0.2		1.0	1.2	0.3	4.4
Delay (s)	58.4	48.9			50.5	44.8	42.1		50.3	25.6	19.3	49.9
Level of Service	E	D			D	D	D		D	C	B	D
Approach Delay (s)		51.5				45.0				26.2		
Approach LOS		D				D				C		

Intersection Summary			
HCM 2000 Control Delay	31.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	116.8	Sum of lost time (s)	19.8
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1187	43
Future Volume (vph)	1187	43
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3452	
Flt Permitted	1.00	
Satd. Flow (perm)	3452	
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	1263	46
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1308	0
Confl. Peds. (#/hr)		1
Confl. Bikes (#/hr)		1
Heavy Vehicles (%)	4%	2%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	62.3	
Effective Green, g (s)	62.3	
Actuated g/C Ratio	0.53	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	1841	
v/s Ratio Prot	c0.38	
v/s Ratio Perm		
v/c Ratio	0.71	
Uniform Delay, d1	20.5	
Progression Factor	1.00	
Incremental Delay, d2	1.4	
Delay (s)	21.9	
Level of Service	C	
Approach Delay (s)	29.0	
Approach LOS	C	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	25	13	25	39	7	60	6	31	968	51	63	1141
Future Volume (vph)	25	13	25	39	7	60	6	31	968	51	63	1141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9			4.9	5.3		4.9	5.3
Lane Util. Factor		1.00			1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes		0.99			0.97			1.00	1.00		1.00	1.00
Flpb, ped/bikes		0.99			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.92			1.00	0.99		1.00	1.00
Flt Protected		0.98			0.98			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1586			1641			1775	3440		1770	3450
Flt Permitted		0.69			0.84			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1119			1404			1775	3440		1770	3450
Peak-hour factor, PHF	0.74	0.74	0.74	0.58	0.58	0.58	0.81	0.81	0.81	0.81	0.89	0.89
Adj. Flow (vph)	34	18	34	67	12	103	7	38	1195	63	71	1282
RTOR Reduction (vph)	0	25	0	0	52	0	0	0	2	0	0	1
Lane Group Flow (vph)	0	61	0	0	130	0	0	45	1256	0	71	1301
Confl. Peds. (#/hr)	29		11	11		29		2		11	11	
Confl. Bikes (#/hr)			2			1				3		
Heavy Vehicles (%)	20%	2%	2%	2%	2%	2%	0%	2%	4%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		13.2			13.2			4.5	69.9		6.8	72.2
Effective Green, g (s)		13.2			13.2			4.5	69.9		6.8	72.2
Actuated g/C Ratio		0.13			0.13			0.04	0.67		0.06	0.69
Clearance Time (s)		4.9			4.9			4.9	5.3		4.9	5.3
Vehicle Extension (s)		1.5			1.5			1.0	4.0		1.0	4.5
Lane Grp Cap (vph)		140			176			76	2290		114	2372
v/s Ratio Prot								0.03	0.37		c0.04	c0.38
v/s Ratio Perm		0.05			c0.09							
v/c Ratio		0.43			0.74			0.59	0.55		0.62	0.55
Uniform Delay, d1		42.4			44.3			49.3	9.2		47.9	8.2
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		0.8			13.6			8.0	0.9		7.4	0.9
Delay (s)		43.2			57.9			57.3	10.2		55.2	9.1
Level of Service		D			E			E	B		E	A
Approach Delay (s)		43.2			57.9				11.8			11.5
Approach LOS		D			E				B			B

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	18
Future Volume (vph)	18
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.89
Adj. Flow (vph)	20
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	28%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR2	WBU	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	86	58	31	8	12	72	20	243	17	745	97	5
Future Volume (vph)	86	58	31	8	12	72	20	243	17	745	97	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Lane Util. Factor		0.95				1.00	1.00	1.00	1.00	0.95	1.00	
Frpb, ped/bikes		1.00				1.00	1.00	0.98	1.00	1.00	0.98	
Flpb, ped/bikes		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.97				1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3363				1746	1863	1518	1770	3471	1529	
Flt Permitted		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3363				1746	1863	1518	1770	3471	1529	
Peak-hour factor, PHF	0.83	0.83	0.83	0.71	0.71	0.71	0.71	0.71	0.76	0.76	0.76	0.86
Adj. Flow (vph)	104	70	37	11	17	101	28	342	22	980	128	6
RTOR Reduction (vph)	0	130	0	0	0	0	0	297	0	0	0	0
Lane Group Flow (vph)	0	81	0	0	0	129	28	45	22	980	128	0
Confl. Peds. (#/hr)	13					3		13	3		2	
Confl. Bikes (#/hr)											2	
Heavy Vehicles (%)	2%	2%	2%	0%	2%	4%	2%	4%	2%	4%	4%	0%
Turn Type	Split	NA		Split	Split	Split	NA	Perm	Prot	NA	Perm	Prot
Protected Phases	4	4		8	8	8	8		5	2		1
Permitted Phases								8			2	
Actuated Green, G (s)		8.0				11.9	11.9	11.9	2.4	38.2	38.2	
Effective Green, g (s)		8.0				11.9	11.9	11.9	2.4	38.2	38.2	
Actuated g/C Ratio		0.09				0.13	0.13	0.13	0.03	0.42	0.42	
Clearance Time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Vehicle Extension (s)		3.0				2.0	2.0	2.0	2.0	4.0	4.0	
Lane Grp Cap (vph)		296				229	244	199	46	1463	644	
v/s Ratio Prot		c0.02				c0.07	0.02		0.01	c0.28		
v/s Ratio Perm								0.03			0.08	
v/c Ratio		0.27				0.56	0.11	0.23	0.48	0.67	0.20	
Uniform Delay, d1		38.6				36.9	34.7	35.2	43.5	21.1	16.5	
Progression Factor		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.5				1.9	0.1	0.2	2.8	1.3	0.2	
Delay (s)		39.1				38.8	34.8	35.4	46.3	22.4	16.7	
Level of Service		D				D	C	D	D	C	B	
Approach Delay (s)		39.1					36.3			22.2		
Approach LOS		D					D			C		

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL2	SBL	SBT	SBR	NWR2
Lane Configurations					
Traffic Volume (vph)	235	16	814	24	45
Future Volume (vph)	235	16	814	24	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	5.3		4.9
Lane Util. Factor	0.91	0.95	0.95		1.00
Frpb, ped/bikes	1.00	1.00	1.00		0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00
Frt	1.00	1.00	1.00		0.86
Flt Protected	0.95	0.95	1.00		1.00
Satd. Flow (prot)	1582	1653	3456		1589
Flt Permitted	0.95	0.95	1.00		1.00
Satd. Flow (perm)	1582	1653	3456		1589
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.75
Adj. Flow (vph)	273	19	947	28	60
RTOR Reduction (vph)	0	0	1	0	52
Lane Group Flow (vph)	148	150	974	0	8
Confl. Peds. (#/hr)	2	2		3	
Confl. Bikes (#/hr)					1
Heavy Vehicles (%)	4%	2%	4%	2%	2%
Turn Type	Prot	Prot	NA		Perm
Protected Phases	1	1	6		
Permitted Phases					8
Actuated Green, G (s)	12.5	12.5	48.3		11.9
Effective Green, g (s)	12.5	12.5	48.3		11.9
Actuated g/C Ratio	0.14	0.14	0.53		0.13
Clearance Time (s)	4.9	4.9	5.3		4.9
Vehicle Extension (s)	1.0	1.0	4.0		2.0
Lane Grp Cap (vph)	218	228	1842		208
v/s Ratio Prot	c0.09	0.09	0.28		
v/s Ratio Perm					0.00
v/c Ratio	0.68	0.66	0.53		0.04
Uniform Delay, d1	37.1	37.0	13.8		34.4
Progression Factor	1.00	1.00	1.00		1.00
Incremental Delay, d2	6.5	5.1	0.4		0.0
Delay (s)	43.6	42.2	14.1		34.4
Level of Service	D	D	B		C
Approach Delay (s)			20.8		
Approach LOS			C		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	23	24	16	178	12	5	9	595	143	2	6	936
Future Volume (vph)	23	24	16	178	12	5	9	595	143	2	6	936
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9	4.9	4.9	5.7	5.7		4.9	5.7
Lane Util. Factor		1.00		0.95	0.95	1.00	1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00		1.00	1.00	0.98	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		0.96		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00
Flt Protected		0.98		0.95	0.96	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1721		1681	1696	1555	1766	3471	1550		1770	3462
Flt Permitted		0.85		0.83	0.78	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1483		1461	1372	1555	1766	3471	1550		1770	3462
Peak-hour factor, PHF	0.78	0.78	0.78	0.68	0.68	0.68	0.74	0.74	0.74	0.79	0.79	0.79
Adj. Flow (vph)	29	31	21	262	18	7	12	804	193	3	8	1185
RTOR Reduction (vph)	0	12	0	0	0	6	0	0	62	0	0	0
Lane Group Flow (vph)	0	69	0	139	141	1	12	804	131	0	11	1190
Confl. Peds. (#/hr)	4					4	7					
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	9%	2%	2%	2%	2%	2%	2%	4%	2%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Perm	Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4			8		8			2			
Actuated Green, G (s)		11.6		11.6	11.6	11.6	0.8	36.3	36.3		0.8	36.3
Effective Green, g (s)		11.6		11.6	11.6	11.6	0.8	36.3	36.3		0.8	36.3
Actuated g/C Ratio		0.18		0.18	0.18	0.18	0.01	0.57	0.57		0.01	0.57
Clearance Time (s)		4.9		4.9	4.9	4.9	4.9	5.7	5.7		4.9	5.7
Vehicle Extension (s)		2.0		2.0	2.0	2.0	1.0	4.0	4.0		1.0	4.0
Lane Grp Cap (vph)		267		263	247	280	22	1962	876		22	1957
v/s Ratio Prot							c0.01	0.23			0.01	c0.34
v/s Ratio Perm		0.05		0.10	c0.10	0.00			0.08			
v/c Ratio		0.26		0.53	0.57	0.00	0.55	0.41	0.15		0.50	0.61
Uniform Delay, d1		22.6		23.8	24.0	21.6	31.5	7.9	6.6		31.5	9.2
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2		0.9	2.0	0.0	14.0	0.2	0.1		6.4	0.6
Delay (s)		22.8		24.7	26.0	21.6	45.5	8.1	6.7		37.9	9.9
Level of Service		C		C	C	C	D	A	A		D	A
Approach Delay (s)		22.8			25.3			8.3				10.1
Approach LOS		C			C			A				B

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	64.2	Sum of lost time (s)	15.5
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	4
Future Volume (vph)	4
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.79
Adj. Flow (vph)	5
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	7
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	50%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: I-880 NB Off-Ramp/Industrial Pkwy & Whipple Rd

Project Alternative D PM

Movement	EBL	EBT	EBR	WBT	WBR	WBR2	NBL2	NBT	NBR	SBU	SBL	SBR
Lane Configurations												
Traffic Volume (vph)	724	765	226	751	208	267	173	635	131	48	179	575
Future Volume (vph)	724	765	226	751	208	267	173	635	131	48	179	575
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	2.6	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	1.00	1.00	0.95			1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	0.85	1.00	0.97			1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	3127	3223	1429	3223	1442	1408	1583	3132			1649	2538
Flt Permitted	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	3127	3223	1429	3223	1442	1408	1583	3132			1649	2538
Peak-hour factor, PHF	0.88	0.88	0.88	0.95	0.95	0.95	0.89	0.89	0.89	0.94	0.94	0.94
Adj. Flow (vph)	823	869	257	791	219	281	194	713	147	51	190	612
RTOR Reduction (vph)	0	0	0	0	0	112	0	14	0	0	0	40
Lane Group Flow (vph)	823	869	257	791	219	169	194	846	0	0	241	603
Confl. Peds. (#/hr)	9					9			4		4	
Heavy Vehicles (%)	12%	12%	13%	12%	12%	12%	14%	12%	12%	0%	12%	12%
Turn Type	Prot	NA	Free	NA	Prot	Perm	Split	NA		Prot	Prot	pt+ov
Protected Phases	5	2		6	6		8	8		7	7	7 5
Permitted Phases			Free			6						
Actuated Green, G (s)	26.0	62.1	130.0	32.4	32.4	32.4	35.6	35.6			17.4	47.8
Effective Green, g (s)	25.7	63.5	130.0	33.8	33.8	33.8	36.7	36.7			17.8	48.2
Actuated g/C Ratio	0.20	0.49	1.00	0.26	0.26	0.26	0.28	0.28			0.14	0.37
Clearance Time (s)	3.7	5.4		5.4	5.4	5.4	5.1	5.1			4.4	
Vehicle Extension (s)	2.0	4.0		4.0	4.0	4.0	2.0	2.0			2.0	
Lane Grp Cap (vph)	618	1574	1429	837	374	366	446	884			225	941
v/s Ratio Prot	c0.26	0.27		c0.25	0.15		0.12	c0.27			c0.15	0.24
v/s Ratio Perm			0.18			0.12						
v/c Ratio	1.33	0.55	0.18	0.95	0.59	0.46	0.43	0.96			1.07	0.64
Uniform Delay, d1	52.1	23.3	0.0	47.2	42.0	40.5	38.2	45.9			56.1	33.8
Progression Factor	0.72	1.04	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	156.4	0.9	0.2	20.3	6.6	4.2	0.2	20.3			80.1	1.1
Delay (s)	194.2	25.2	0.2	67.5	48.6	44.6	38.4	66.1			136.2	34.9
Level of Service	F	C	A	E	D	D	D	E			F	C
Approach Delay (s)		93.3		59.3				61.0				
Approach LOS		F		E				E				

Intersection Summary			
HCM 2000 Control Delay	73.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	130.0	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	SBR2
Lane Configurations	
Traffic Volume (vph)	29
Future Volume (vph)	29
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	31
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	12%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	413	506	289	300	97	340	255	866	146	4	479	747
Future Volume (vph)	413	506	289	300	97	340	255	866	146	4	479	747
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	0.91	0.91	1.00	0.95	0.95	1.00	0.97	0.95	1.00		0.97	0.95
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00
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	0.85		1.00	1.00
Flt Protected	0.95	0.99	1.00	0.95	0.97	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1564	3263	1583	1681	1685	1423	3433	3539	1583		3129	3539
Flt Permitted	0.95	0.99	1.00	0.95	0.97	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1564	3263	1583	1681	1685	1423	3433	3539	1583		3129	3539
Peak-hour factor, PHF	0.96	0.96	0.96	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	430	527	301	316	102	358	277	941	159	4	526	821
RTOR Reduction (vph)	0	0	193	0	0	225	0	0	95	0	0	0
Lane Group Flow (vph)	310	647	108	205	213	133	277	941	64	0	530	821
Confl. Peds. (#/hr)							10					
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	2%	2%	7%	12%	2%	2%	2%	0%	12%	2%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	Prot	NA
Protected Phases	7	7		8	8		5	2		1	1	6
Permitted Phases			7			8			2			
Actuated Green, G (s)	29.3	29.3	29.3	19.5	19.5	19.5	14.5	36.6	36.6		24.3	46.4
Effective Green, g (s)	30.6	30.6	30.6	20.4	20.4	20.4	15.2	38.0	38.0		25.0	47.8
Actuated g/C Ratio	0.24	0.24	0.24	0.16	0.16	0.16	0.12	0.29	0.29		0.19	0.37
Clearance Time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4		4.7	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		2.0	3.0
Lane Grp Cap (vph)	368	768	372	263	264	223	401	1034	462		601	1301
v/s Ratio Prot	0.20	c0.20		0.12	c0.13		0.08	c0.27			c0.17	0.23
v/s Ratio Perm			0.07			0.09			0.04			
v/c Ratio	0.84	0.84	0.29	0.78	0.81	0.60	0.69	0.91	0.14		0.88	0.63
Uniform Delay, d1	47.4	47.4	40.8	52.6	52.9	51.0	55.1	44.4	33.9		51.1	33.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.95	0.83
Incremental Delay, d2	15.3	8.0	0.2	12.5	15.5	2.8	4.1	13.3	0.6		10.1	1.6
Delay (s)	62.7	55.4	40.9	65.1	68.4	53.8	59.3	57.6	34.6		58.8	29.6
Level of Service	E	E	D	E	E	D	E	E	C		E	C
Approach Delay (s)		53.7			60.8			55.3				41.5
Approach LOS		D			E			E				D

Intersection Summary			
HCM 2000 Control Delay	51.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.7
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	345
Future Volume (vph)	345
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.97
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1497
Flt Permitted	1.00
Satd. Flow (perm)	1497
Peak-hour factor, PHF	0.91
Adj. Flow (vph)	379
RTOR Reduction (vph)	240
Lane Group Flow (vph)	139
Confl. Peds. (#/hr)	10
Confl. Bikes (#/hr)	7
Heavy Vehicles (%)	5%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	46.4
Effective Green, g (s)	47.8
Actuated g/C Ratio	0.37
Clearance Time (s)	5.4
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	550
v/s Ratio Prot	
v/s Ratio Perm	0.09
v/c Ratio	0.25
Uniform Delay, d1	28.7
Progression Factor	1.47
Incremental Delay, d2	0.8
Delay (s)	42.9
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	87	119	70	2	163	34	347	2	17	1342	166	417
Future Volume (vph)	87	119	70	2	163	34	347	2	17	1342	166	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			3.3	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00		1.00	0.95	1.00	0.97
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98		1.00	1.00	0.99	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.94			1.00	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)	1770	3322			3275	1863	1527		1773	3471	1489	3367
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)	1770	3322			3275	1863	1527		1773	3471	1489	3367
Peak-hour factor, PHF	0.71	0.71	0.71	0.90	0.90	0.90	0.90	0.89	0.89	0.89	0.89	0.88
Adj. Flow (vph)	123	168	99	2	181	38	386	2	19	1508	187	474
RTOR Reduction (vph)	0	76	0	0	0	0	254	0	0	0	56	0
Lane Group Flow (vph)	123	191	0	0	183	38	132	0	21	1508	131	474
Confl. Peds. (#/hr)	4		4		4		4		3		1	1
Confl. Bikes (#/hr)												
Heavy Vehicles (%)	2%	2%	2%	0%	7%	2%	4%	0%	2%	4%	7%	4%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	4		3	3	8		5	5	2		1
Permitted Phases							8				2	
Actuated Green, G (s)	14.0	17.6			12.8	16.4	16.4		6.0	55.6	55.6	28.2
Effective Green, g (s)	14.6	18.9			14.1	17.7	17.7		6.6	56.9	56.9	28.8
Actuated g/C Ratio	0.11	0.14			0.11	0.13	0.13		0.05	0.42	0.42	0.21
Clearance Time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Vehicle Extension (s)	3.0	2.0			3.0	2.0	2.0		2.0	4.0	4.0	2.0
Lane Grp Cap (vph)	192	468			344	246	201		87	1473	632	723
v/s Ratio Prot	c0.07	0.06			0.06	0.02			0.01	c0.43		c0.14
v/s Ratio Perm							c0.09				0.09	
v/c Ratio	0.64	0.41			0.53	0.15	0.66		0.24	1.02	0.21	0.66
Uniform Delay, d1	57.2	52.5			56.8	51.5	55.3		61.3	38.5	24.3	48.1
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	7.1	0.2			1.6	0.1	5.7		0.5	29.7	0.7	1.6
Delay (s)	64.3	52.7			58.4	51.6	61.0		61.8	68.2	25.1	49.7
Level of Service	E	D			E	D	E		E	E	C	D
Approach Delay (s)		56.3				59.6				63.4		
Approach LOS		E				E				E		

Intersection Summary			
HCM 2000 Control Delay	48.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1130	10
Future Volume (vph)	1130	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	3466	
Flt Permitted	1.00	
Satd. Flow (perm)	3466	
Peak-hour factor, PHF	0.88	0.88
Adj. Flow (vph)	1284	11
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1295	0
Confl. Peds. (#/hr)		3
Confl. Bikes (#/hr)		4
Heavy Vehicles (%)	4%	2%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	77.8	
Effective Green, g (s)	79.1	
Actuated g/C Ratio	0.59	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	2045	
v/s Ratio Prot	0.37	
v/s Ratio Perm		
v/c Ratio	0.63	
Uniform Delay, d1	18.0	
Progression Factor	1.00	
Incremental Delay, d2	1.5	
Delay (s)	19.5	
Level of Service	B	
Approach Delay (s)	27.6	
Approach LOS	C	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	24	15	31	21	14	22	12	44	1231	26	7	44
Future Volume (vph)	24	15	31	21	14	22	12	44	1231	26	7	44
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
Lane Util. Factor		1.00			1.00			1.00	0.95			1.00
Frpb, ped/bikes		0.99			0.99			1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00			1.00
Frt		0.94			0.95			1.00	1.00			1.00
Flt Protected		0.98			0.98			0.95	1.00			0.95
Satd. Flow (prot)		1600			1713			1777	3456			1774
Flt Permitted		0.78			0.76			0.95	1.00			0.11
Satd. Flow (perm)		1278			1319			1777	3456			208
Peak-hour factor, PHF	0.75	0.75	0.75	0.65	0.65	0.65	0.93	0.93	0.93	0.93	0.96	0.96
Adj. Flow (vph)	32	20	41	32	22	34	13	47	1324	28	7	46
RTOR Reduction (vph)	0	29	0	0	23	0	0	0	2	0	0	0
Lane Group Flow (vph)	0	64	0	0	65	0	0	60	1350	0	0	53
Confl. Peds. (#/hr)	7		7	7		7		6		22		22
Confl. Bikes (#/hr)						2				1		
Heavy Vehicles (%)	21%	2%	2%	2%	2%	2%	0%	2%	4%	2%	0%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA			Prot
Protected Phases		4			8		5	5	2			1
Permitted Phases	4			8								
Actuated Green, G (s)		9.0			9.0			6.6	55.8			35.1
Effective Green, g (s)		9.9			9.9			7.5	57.1			36.0
Actuated g/C Ratio		0.09			0.09			0.07	0.50			0.31
Clearance Time (s)		4.9			4.9			4.9	5.3			4.9
Vehicle Extension (s)		1.5			1.5			1.0	4.0			1.0
Lane Grp Cap (vph)		110			113			115	1715			65
v/s Ratio Prot								0.03	c0.39			
v/s Ratio Perm		c0.05			0.05							c0.26
v/c Ratio		0.58			0.58			0.52	0.79			0.82
Uniform Delay, d1		50.5			50.5			52.0	23.9			36.4
Progression Factor		1.00			1.00			1.00	1.00			1.00
Incremental Delay, d2		4.5			4.4			2.0	3.7			50.2
Delay (s)		55.1			54.9			54.0	27.7			86.6
Level of Service		E			D			D	C			F
Approach Delay (s)		55.1			54.9				28.8			
Approach LOS		E			D				C			

Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1188	28
Future Volume (vph)	1188	28
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	3446	
Flt Permitted	1.00	
Satd. Flow (perm)	3446	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	1238	29
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1266	0
Confl. Peds. (#/hr)		6
Confl. Bikes (#/hr)		5
Heavy Vehicles (%)	4%	18%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	84.3	
Effective Green, g (s)	85.6	
Actuated g/C Ratio	0.74	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.5	
Lane Grp Cap (vph)	2565	
v/s Ratio Prot	0.37	
v/s Ratio Perm		
v/c Ratio	0.49	
Uniform Delay, d1	5.9	
Progression Factor	1.00	
Incremental Delay, d2	0.7	
Delay (s)	6.6	
Level of Service	A	
Approach Delay (s)	9.8	
Approach LOS	A	

Intersection Summary

Movement	EBL	EBT	EBR2	WBU	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	31	42	8	9	14	40	52	227	12	1007	88	17
Future Volume (vph)	31	42	8	9	14	40	52	227	12	1007	88	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95				1.00	1.00	1.00	1.00	0.95	1.00	
Frpb, ped/bikes		1.00				1.00	1.00	0.98	1.00	1.00	0.99	
Flpb, ped/bikes		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.99				1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3418				1752	1863	1526	1770	3471	1532	
Flt Permitted		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3418				1752	1863	1526	1770	3471	1532	
Peak-hour factor, PHF	0.70	0.70	0.70	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92	0.88
Adj. Flow (vph)	44	60	11	9	15	42	55	239	13	1095	96	19
RTOR Reduction (vph)	0	106	0	0	0	0	0	214	0	0	0	0
Lane Group Flow (vph)	0	9	0	0	0	66	55	25	13	1095	96	0
Confl. Peds. (#/hr)	4		2			2		4			1	
Confl. Bikes (#/hr)								1			1	
Heavy Vehicles (%)	2%	2%	2%	0%	2%	4%	2%	4%	2%	4%	4%	0%
Turn Type	Split	NA		Split	Split	Split	NA	Perm	Prot	NA	Perm	Prot
Protected Phases	4	4		8	8	8	8		5	2		1
Permitted Phases								8			2	
Actuated Green, G (s)		6.2				8.4	8.4	8.4	1.1	40.7	40.7	
Effective Green, g (s)		7.1				9.3	9.3	9.3	2.0	42.0	42.0	
Actuated g/C Ratio		0.08				0.10	0.10	0.10	0.02	0.46	0.46	
Clearance Time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Vehicle Extension (s)		3.0				2.0	2.0	2.0	2.0	4.0	4.0	
Lane Grp Cap (vph)		267				179	191	156	39	1609	710	
v/s Ratio Prot		c0.00				c0.04	0.03		0.01	c0.32		
v/s Ratio Perm								0.02			0.06	
v/c Ratio		0.03				0.37	0.29	0.16	0.33	0.68	0.14	
Uniform Delay, d1		38.6				37.9	37.6	37.1	43.6	19.0	13.9	
Progression Factor		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1				0.5	0.3	0.2	1.8	1.3	0.1	
Delay (s)		38.6				38.4	37.9	37.2	45.5	20.3	14.0	
Level of Service		D				D	D	D	D	C	B	
Approach Delay (s)		38.6					37.6			20.1		
Approach LOS		D					D			C		

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL2	SBL	SBT	SBR	NWR2
Lane Configurations					
Traffic Volume (vph)	383	20	733	68	31
Future Volume (vph)	383	20	733	68	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0
Lane Util. Factor	0.91	0.95	0.95		1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00
Frt	1.00	1.00	0.99		0.86
Flt Protected	0.95	0.95	1.00		1.00
Satd. Flow (prot)	1584	1652	3426		1611
Flt Permitted	0.95	0.95	1.00		1.00
Satd. Flow (perm)	1584	1652	3426		1611
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.60
Adj. Flow (vph)	435	23	833	77	52
RTOR Reduction (vph)	0	0	3	0	47
Lane Group Flow (vph)	254	223	907	0	5
Confl. Peds. (#/hr)	1	1			
Confl. Bikes (#/hr)				5	
Heavy Vehicles (%)	4%	2%	4%	2%	2%
Turn Type	Prot	Prot	NA		Perm
Protected Phases	1	1	6		
Permitted Phases					8
Actuated Green, G (s)	15.3	15.3	54.9		8.4
Effective Green, g (s)	16.2	16.2	56.2		9.3
Actuated g/C Ratio	0.18	0.18	0.62		0.10
Clearance Time (s)	4.9	4.9	5.3		4.9
Vehicle Extension (s)	1.0	1.0	4.0		2.0
Lane Grp Cap (vph)	283	295	2125		165
v/s Ratio Prot	c0.16	0.13	0.26		
v/s Ratio Perm					0.00
v/c Ratio	0.90	0.76	0.43		0.03
Uniform Delay, d1	36.4	35.3	8.9		36.6
Progression Factor	1.00	1.00	1.00		1.00
Incremental Delay, d2	27.9	9.4	0.2		0.0
Delay (s)	64.2	44.7	9.1		36.6
Level of Service	E	D	A		D
Approach Delay (s)			24.9		
Approach LOS			C		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	7	22	6	124	20	2	1	16	1066	390	13	619
Future Volume (vph)	7	22	6	124	20	2	1	16	1066	390	13	619
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	3.2	4.0
Lane Util. Factor		1.00		0.95	0.95	1.00		1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes		1.00		1.00	1.00	0.98		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.98		1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.99		0.95	0.96	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1706		1681	1706	1557		1772	3471	1548	1770	3453
Flt Permitted		0.92		0.93	0.79	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1589		1654	1398	1557		1772	3471	1548	1770	3453
Peak-hour factor, PHF	0.57	0.57	0.57	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	12	39	11	136	22	2	1	17	1146	419	14	666
RTOR Reduction (vph)	0	8	0	0	0	2	0	0	0	83	0	0
Lane Group Flow (vph)	0	54	0	72	86	0	0	18	1146	336	14	677
Confl. Peds. (#/hr)	5					5		4		2	2	
Confl. Bikes (#/hr)			3									
Heavy Vehicles (%)	29%	2%	2%	2%	2%	2%	0%	2%	4%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8		8				2		
Actuated Green, G (s)		6.9		6.9	6.9	6.9		0.8	33.8	33.8	0.7	33.7
Effective Green, g (s)		7.8		7.8	7.8	7.8		1.7	35.5	35.5	2.4	35.4
Actuated g/C Ratio		0.14		0.14	0.14	0.14		0.03	0.62	0.62	0.04	0.62
Clearance Time (s)		4.9		4.9	4.9	4.9		4.9	5.7	5.7	4.9	5.7
Vehicle Extension (s)		2.0		2.0	2.0	2.0		1.0	4.0	4.0	1.0	4.0
Lane Grp Cap (vph)		217		226	191	213		52	2165	965	74	2148
v/s Ratio Prot								c0.01	c0.33		0.01	0.20
v/s Ratio Perm		0.03		0.04	c0.06	0.00				0.22		
v/c Ratio		0.25		0.32	0.45	0.00		0.35	0.53	0.35	0.19	0.32
Uniform Delay, d1		21.9		22.2	22.6	21.2		27.1	6.0	5.1	26.3	5.1
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.2		0.3	0.6	0.0		1.5	0.3	0.3	0.5	0.1
Delay (s)		22.2		22.4	23.2	21.2		28.5	6.3	5.4	26.8	5.2
Level of Service		C		C	C	C		C	A	A	C	A
Approach Delay (s)		22.2			22.8				6.3			5.6
Approach LOS		C			C				A			A

Intersection Summary			
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	56.9	Sum of lost time (s)	12.9
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	10
Future Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	11
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	4
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	20%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

APPENDIX C
LEVEL OF SERVICE CALCULATION SHEETS
for
WORST CASE SCENARIO

Movement	EBL	EBT	EBR	WBT	WBR	WBR2	NBL2	NBT	NBR	SBU	SBL	SBR
Lane Configurations												
Traffic Volume (vph)	322	751	196	616	255	143	504	421	357	25	209	618
Future Volume (vph)	322	751	196	616	255	143	504	421	357	25	209	618
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	5.4	4.0	5.4	5.4	5.4	5.1	5.1			4.4	4.4
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	1.00	1.00	0.95			1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.99			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	0.85	1.00	0.93			1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	3127	3223	1380	3223	1442	1414	1583	2982			1630	2538
Flt Permitted	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	3127	3223	1380	3223	1442	1414	1583	2982			1630	2538
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	362	844	220	677	280	157	548	458	388	29	240	710
RTOR Reduction (vph)	0	0	0	0	0	117	0	64	0	0	0	47
Lane Group Flow (vph)	362	844	220	677	280	40	548	782	0	0	269	704
Confl. Peds. (#/hr)	6					6			2		2	
Heavy Vehicles (%)	12%	12%	17%	12%	12%	12%	14%	12%	12%	0%	12%	12%
Turn Type	Prot	NA	Free	NA	Prot	Perm	Split	NA		Prot	Prot	pt+ov
Protected Phases	5	2		6	6		8	8		7	7	7 5
Permitted Phases			Free			6						
Actuated Green, G (s)	15.0	49.5	120.0	30.8	30.8	30.8	37.6	37.6			18.0	37.4
Effective Green, g (s)	15.0	49.5	120.0	30.8	30.8	30.8	37.6	37.6			18.0	37.4
Actuated g/C Ratio	0.12	0.41	1.00	0.26	0.26	0.26	0.31	0.31			0.15	0.31
Clearance Time (s)	3.7	5.4		5.4	5.4	5.4	5.1	5.1			4.4	
Vehicle Extension (s)	2.0	4.0		4.0	4.0	4.0	2.0	2.0			2.0	
Lane Grp Cap (vph)	390	1329	1380	827	370	362	496	934			244	791
v/s Ratio Prot	0.12	0.26		c0.21	0.19		c0.35	0.26			c0.16	c0.28
v/s Ratio Perm			0.16			0.03						
v/c Ratio	0.93	0.64	0.16	0.82	0.76	0.11	1.10	0.84			1.10	0.89
Uniform Delay, d1	52.0	28.1	0.0	42.0	41.1	34.1	41.2	38.4			51.0	39.3
Progression Factor	0.74	1.11	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	22.8	1.8	0.2	8.9	13.5	0.6	72.2	6.3			87.8	11.9
Delay (s)	61.3	33.1	0.2	50.8	54.6	34.7	113.4	44.7			138.8	51.3
Level of Service	E	C	A	D	D	C	F	D			F	D
Approach Delay (s)		35.2		49.5				71.7				
Approach LOS		D		D				E				

Intersection Summary			
HCM 2000 Control Delay	56.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR2
Lane Configurations	
Traffic Volume (vph)	36
Future Volume (vph)	36
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.87
Adj. Flow (vph)	41
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	12%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	277	185	139	171	181	321	307	588	45	323	615	836
Future Volume (vph)	277	185	139	171	181	321	307	588	45	323	615	836
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4	4.7	5.4	5.4
Lane Util. Factor	0.91	0.91	1.00	0.95	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1521	3121	1583	1681	1658	1411	3433	3539	1583	3127	3539	1519
Flt Permitted	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1521	3121	1583	1681	1658	1411	3433	3539	1583	3127	3539	1519
Peak-hour factor, PHF	0.83	0.83	0.83	0.88	0.88	0.88	0.78	0.78	0.78	0.80	0.80	0.80
Adj. Flow (vph)	334	223	167	194	206	365	394	754	58	404	769	1045
RTOR Reduction (vph)	0	0	142	0	0	253	0	0	37	0	0	287
Lane Group Flow (vph)	184	373	25	175	225	112	394	754	21	404	769	758
Confl. Peds. (#/hr)	5					5						
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	8%	9%	2%	2%	9%	12%	2%	2%	2%	12%	2%	5%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8			2			6
Actuated Green, G (s)	18.2	18.2	18.2	18.8	18.8	18.8	16.8	44.2	44.2	18.5	45.9	45.9
Effective Green, g (s)	18.2	18.2	18.2	18.8	18.8	18.8	16.8	44.2	44.2	18.5	45.9	45.9
Actuated g/C Ratio	0.15	0.15	0.15	0.16	0.16	0.16	0.14	0.37	0.37	0.15	0.38	0.38
Clearance Time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4	4.7	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	230	473	240	263	259	221	480	1303	583	482	1353	581
v/s Ratio Prot	c0.12	0.12		0.10	c0.14		0.11	0.21		c0.13	0.22	
v/s Ratio Perm			0.02			0.08			0.01			c0.50
v/c Ratio	0.80	0.79	0.11	0.67	0.87	0.51	0.82	0.58	0.04	0.84	0.57	1.30
Uniform Delay, d1	49.1	49.0	43.9	47.6	49.4	46.4	50.1	30.4	24.3	49.3	29.2	37.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00
Incremental Delay, d2	16.9	7.9	0.1	4.9	24.4	0.7	10.3	1.9	0.1	7.0	1.0	144.2
Delay (s)	66.0	56.9	44.0	52.5	73.8	47.0	60.4	32.3	24.4	56.2	29.6	181.0
Level of Service	E	E	D	D	E	D	E	C	C	E	C	F
Approach Delay (s)		56.2			56.1			41.1			105.8	
Approach LOS		E			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	74.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.3
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	14	24	13	1	177	149	301	1	82	923	231	416
Future Volume (vph)	14	24	13	1	177	149	301	1	82	923	231	416
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00		1.00	0.95	1.00	0.97
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.99		1.00	1.00	0.99	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.95			1.00	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)	1770	3353			3047	1863	1533		1770	3471	1408	3367
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)	1770	3353			3047	1863	1533		1770	3471	1408	3367
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.86	0.86	0.86	0.86	0.94
Adj. Flow (vph)	15	26	14	1	190	160	324	1	95	1073	269	443
RTOR Reduction (vph)	0	13	0	0	0	0	269	0	0	0	86	0
Lane Group Flow (vph)	15	27	0	0	191	160	55	0	96	1073	183	443
Confl. Peds. (#/hr)	1						1		1		2	2
Confl. Bikes (#/hr)											1	
Heavy Vehicles (%)	2%	2%	2%	0%	15%	2%	4%	0%	2%	4%	13%	4%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	4		3	3	8		5	5	2		1
Permitted Phases							8				2	
Actuated Green, G (s)	2.7	9.8			12.9	20.0	20.0		12.4	54.3	54.3	20.7
Effective Green, g (s)	2.7	9.8			12.9	20.0	20.0		12.4	54.3	54.3	20.7
Actuated g/C Ratio	0.02	0.08			0.11	0.17	0.17		0.11	0.46	0.46	0.18
Clearance Time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0		2.0	4.0	4.0	2.0
Lane Grp Cap (vph)	40	279			334	317	260		186	1604	650	593
v/s Ratio Prot	0.01	0.01			c0.06	c0.09			0.05	0.31		c0.13
v/s Ratio Perm							0.04				0.13	
v/c Ratio	0.38	0.10			0.57	0.50	0.21		0.52	0.67	0.28	0.75
Uniform Delay, d1	56.6	49.8			49.7	44.3	42.0		49.7	24.6	19.5	45.9
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.1			1.5	0.5	0.1		1.0	1.2	0.3	4.5
Delay (s)	58.7	49.8			51.1	44.7	42.1		50.7	25.8	19.9	50.4
Level of Service	E	D			D	D	D		D	C	B	D
Approach Delay (s)		52.2				45.3				26.3		
Approach LOS		D				D				C		

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	117.5	Sum of lost time (s)	19.8
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1187	43
Future Volume (vph)	1187	43
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3452	
Flt Permitted	1.00	
Satd. Flow (perm)	3452	
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	1263	46
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1308	0
Confl. Peds. (#/hr)		1
Confl. Bikes (#/hr)		1
Heavy Vehicles (%)	4%	2%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	62.6	
Effective Green, g (s)	62.6	
Actuated g/C Ratio	0.53	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	1839	
v/s Ratio Prot	c0.38	
v/s Ratio Perm		
v/c Ratio	0.71	
Uniform Delay, d1	20.7	
Progression Factor	1.00	
Incremental Delay, d2	1.4	
Delay (s)	22.1	
Level of Service	C	
Approach Delay (s)	29.2	
Approach LOS	C	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	31	13	25	39	7	60	6	31	978	51	63	1151
Future Volume (vph)	31	13	25	39	7	60	6	31	978	51	63	1151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9			4.9	5.3		4.9	5.3
Lane Util. Factor		1.00			1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes		0.99			0.97			1.00	1.00		1.00	1.00
Flpb, ped/bikes		0.99			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.92			1.00	0.99		1.00	1.00
Flt Protected		0.98			0.98			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1486			1641			1775	3409		1770	3399
Flt Permitted		0.64			0.83			0.95	1.00		0.95	1.00
Satd. Flow (perm)		975			1389			1775	3409		1770	3399
Peak-hour factor, PHF	0.74	0.74	0.74	0.58	0.58	0.58	0.81	0.81	0.81	0.81	0.89	0.89
Adj. Flow (vph)	42	18	34	67	12	103	7	38	1207	63	71	1293
RTOR Reduction (vph)	0	23	0	0	52	0	0	0	2	0	0	1
Lane Group Flow (vph)	0	71	0	0	130	0	0	45	1268	0	71	1319
Confl. Peds. (#/hr)	29		11	11		29		2		11	11	
Confl. Bikes (#/hr)			2			1				3		
Heavy Vehicles (%)	35%	2%	2%	2%	2%	2%	0%	2%	5%	2%	2%	5%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		13.2			13.2			4.5	69.9		6.8	72.2
Effective Green, g (s)		13.2			13.2			4.5	69.9		6.8	72.2
Actuated g/C Ratio		0.13			0.13			0.04	0.67		0.06	0.69
Clearance Time (s)		4.9			4.9			4.9	5.3		4.9	5.3
Vehicle Extension (s)		1.5			1.5			1.0	4.0		1.0	4.5
Lane Grp Cap (vph)		122			174			76	2269		114	2337
v/s Ratio Prot								0.03	0.37		c0.04	c0.39
v/s Ratio Perm		0.07			c0.09							
v/c Ratio		0.58			0.75			0.59	0.56		0.62	0.56
Uniform Delay, d1		43.3			44.3			49.3	9.3		47.9	8.4
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		4.5			14.3			8.0	1.0		7.4	1.0
Delay (s)		47.8			58.6			57.3	10.3		55.2	9.4
Level of Service		D			E			E	B		E	A
Approach Delay (s)		47.8			58.6				11.9			11.7
Approach LOS		D			E				B			B

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	24
Future Volume (vph)	24
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.89
Adj. Flow (vph)	27
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	46%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR2	WBU	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	86	58	31	8	12	72	20	243	17	755	97	5
Future Volume (vph)	86	58	31	8	12	72	20	243	17	755	97	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Lane Util. Factor		0.95				1.00	1.00	1.00	1.00	0.95	1.00	
Frpb, ped/bikes		1.00				1.00	1.00	0.98	1.00	1.00	0.98	
Flpb, ped/bikes		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.97				1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3363				1746	1863	1518	1770	3438	1529	
Flt Permitted		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3363				1746	1863	1518	1770	3438	1529	
Peak-hour factor, PHF	0.83	0.83	0.83	0.71	0.71	0.71	0.71	0.71	0.76	0.76	0.76	0.86
Adj. Flow (vph)	104	70	37	11	17	101	28	342	22	993	128	6
RTOR Reduction (vph)	0	130	0	0	0	0	0	297	0	0	0	0
Lane Group Flow (vph)	0	81	0	0	0	129	28	45	22	993	128	0
Confl. Peds. (#/hr)	13					3		13	3		2	
Confl. Bikes (#/hr)											2	
Heavy Vehicles (%)	2%	2%	2%	0%	2%	4%	2%	4%	2%	5%	4%	0%
Turn Type	Split	NA		Split	Split	Split	NA	Perm	Prot	NA	Perm	Prot
Protected Phases	4	4		8	8	8	8		5	2		1
Permitted Phases								8			2	
Actuated Green, G (s)		8.0				12.0	12.0	12.0	2.4	38.7	38.7	
Effective Green, g (s)		8.0				12.0	12.0	12.0	2.4	38.7	38.7	
Actuated g/C Ratio		0.09				0.13	0.13	0.13	0.03	0.42	0.42	
Clearance Time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Vehicle Extension (s)		3.0				2.0	2.0	2.0	2.0	4.0	4.0	
Lane Grp Cap (vph)		294				229	244	199	46	1457	648	
v/s Ratio Prot		c0.02				c0.07	0.02		0.01	c0.29		
v/s Ratio Perm								0.03			0.08	
v/c Ratio		0.27				0.56	0.11	0.23	0.48	0.68	0.20	
Uniform Delay, d1		38.9				37.2	35.0	35.5	43.8	21.3	16.5	
Progression Factor		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.5				1.9	0.1	0.2	2.8	1.4	0.2	
Delay (s)		39.4				39.1	35.0	35.7	46.7	22.8	16.7	
Level of Service		D				D	D	D	D	C	B	
Approach Delay (s)		39.4					36.5			22.5		
Approach LOS		D					D			C		

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	91.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL2	SBL	SBT	SBR	NWR2
Lane Configurations					
Traffic Volume (vph)	235	16	824	24	45
Future Volume (vph)	235	16	824	24	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	5.3		4.9
Lane Util. Factor	0.91	0.95	0.95		1.00
Frpb, ped/bikes	1.00	1.00	1.00		0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00
Frt	1.00	1.00	1.00		0.86
Flt Protected	0.95	0.95	1.00		1.00
Satd. Flow (prot)	1582	1653	3424		1589
Flt Permitted	0.95	0.95	1.00		1.00
Satd. Flow (perm)	1582	1653	3424		1589
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.75
Adj. Flow (vph)	273	19	958	28	60
RTOR Reduction (vph)	0	0	1	0	52
Lane Group Flow (vph)	148	150	985	0	8
Confl. Peds. (#/hr)	2	2		3	
Confl. Bikes (#/hr)					1
Heavy Vehicles (%)	4%	2%	5%	2%	2%
Turn Type	Prot	Prot	NA		Perm
Protected Phases	1	1	6		
Permitted Phases					8
Actuated Green, G (s)	12.6	12.6	48.9		12.0
Effective Green, g (s)	12.6	12.6	48.9		12.0
Actuated g/C Ratio	0.14	0.14	0.54		0.13
Clearance Time (s)	4.9	4.9	5.3		4.9
Vehicle Extension (s)	1.0	1.0	4.0		2.0
Lane Grp Cap (vph)	218	228	1833		208
v/s Ratio Prot	c0.09	0.09	0.29		
v/s Ratio Perm					0.00
v/c Ratio	0.68	0.66	0.54		0.04
Uniform Delay, d1	37.4	37.3	13.8		34.6
Progression Factor	1.00	1.00	1.00		1.00
Incremental Delay, d2	6.5	5.1	0.4		0.0
Delay (s)	43.9	42.4	14.2		34.6
Level of Service	D	D	B		C
Approach Delay (s)			20.9		
Approach LOS			C		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	33	24	16	178	12	5	9	595	143	2	6	936
Future Volume (vph)	33	24	16	178	12	5	9	595	143	2	6	936
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9	4.9	4.9	5.7	5.7		4.9	5.7
Lane Util. Factor		1.00		0.95	0.95	1.00	1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00		1.00	1.00	0.98	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		0.97		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00
Flt Protected		0.98		0.95	0.96	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1535		1681	1696	1555	1766	3471	1550		1770	3421
Flt Permitted		0.80		0.78	0.76	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1256		1377	1347	1555	1766	3471	1550		1770	3421
Peak-hour factor, PHF	0.78	0.78	0.78	0.68	0.68	0.68	0.74	0.74	0.74	0.79	0.79	0.79
Adj. Flow (vph)	42	31	21	262	18	7	12	804	193	3	8	1185
RTOR Reduction (vph)	0	10	0	0	0	6	0	0	61	0	0	0
Lane Group Flow (vph)	0	84	0	139	141	1	12	804	132	0	11	1203
Confl. Peds. (#/hr)	4					4	7					
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	36%	2%	2%	2%	2%	2%	2%	4%	2%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Perm	Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4			8		8			2			
Actuated Green, G (s)		11.8		11.8	11.8	11.8	0.8	38.0	38.0		0.8	38.0
Effective Green, g (s)		11.8		11.8	11.8	11.8	0.8	38.0	38.0		0.8	38.0
Actuated g/C Ratio		0.18		0.18	0.18	0.18	0.01	0.57	0.57		0.01	0.57
Clearance Time (s)		4.9		4.9	4.9	4.9	4.9	5.7	5.7		4.9	5.7
Vehicle Extension (s)		2.0		2.0	2.0	2.0	1.0	4.0	4.0		1.0	4.0
Lane Grp Cap (vph)		224		245	240	277	21	1995	891		21	1966
v/s Ratio Prot							c0.01	0.23			0.01	c0.35
v/s Ratio Perm		0.07		0.10	c0.10	0.00			0.09			
v/c Ratio		0.38		0.57	0.59	0.00	0.57	0.40	0.15		0.52	0.61
Uniform Delay, d1		23.9		24.8	24.9	22.3	32.5	7.8	6.5		32.5	9.2
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		0.4		1.8	2.4	0.0	21.2	0.2	0.1		10.4	0.7
Delay (s)		24.3		26.6	27.3	22.3	53.7	8.0	6.6		42.9	9.9
Level of Service		C		C	C	C	D	A	A		D	A
Approach Delay (s)		24.3			26.8			8.2				10.2
Approach LOS		C			C			A				B

Intersection Summary			
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	66.1	Sum of lost time (s)	15.5
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	14
Future Volume (vph)	14
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.79
Adj. Flow (vph)	18
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	7
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	86%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBT	WBR	WBR2	NBL2	NBT	NBR	SBU	SBL	SBR
Lane Configurations												
Traffic Volume (vph)	724	765	233	751	208	267	180	635	131	48	179	575
Future Volume (vph)	724	765	233	751	208	267	180	635	131	48	179	575
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	2.6	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	1.00	1.00	0.95			1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	0.85	1.00	0.97			1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	3127	3223	1392	3223	1442	1408	1543	3132			1649	2538
Flt Permitted	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	3127	3223	1392	3223	1442	1408	1543	3132			1649	2538
Peak-hour factor, PHF	0.88	0.88	0.88	0.95	0.95	0.95	0.89	0.89	0.89	0.94	0.94	0.94
Adj. Flow (vph)	823	869	265	791	219	281	202	713	147	51	190	612
RTOR Reduction (vph)	0	0	0	0	0	112	0	14	0	0	0	40
Lane Group Flow (vph)	823	869	265	791	219	169	202	846	0	0	241	603
Confl. Peds. (#/hr)	9					9			4		4	
Heavy Vehicles (%)	12%	12%	16%	12%	12%	12%	17%	12%	12%	0%	12%	12%
Turn Type	Prot	NA	Free	NA	Prot	Perm	Split	NA		Prot	Prot	pt+ov
Protected Phases	5	2		6	6		8	8		7	7	7 5
Permitted Phases			Free			6						
Actuated Green, G (s)	26.0	62.1	130.0	32.4	32.4	32.4	35.6	35.6			17.4	47.8
Effective Green, g (s)	25.7	63.5	130.0	33.8	33.8	33.8	36.7	36.7			17.8	48.2
Actuated g/C Ratio	0.20	0.49	1.00	0.26	0.26	0.26	0.28	0.28			0.14	0.37
Clearance Time (s)	3.7	5.4		5.4	5.4	5.4	5.1	5.1			4.4	
Vehicle Extension (s)	2.0	4.0		4.0	4.0	4.0	2.0	2.0			2.0	
Lane Grp Cap (vph)	618	1574	1392	837	374	366	435	884			225	941
v/s Ratio Prot	c0.26	0.27		c0.25	0.15		0.13	c0.27			c0.15	0.24
v/s Ratio Perm			0.19			0.12						
v/c Ratio	1.33	0.55	0.19	0.95	0.59	0.46	0.46	0.96			1.07	0.64
Uniform Delay, d1	52.1	23.3	0.0	47.2	42.0	40.5	38.5	45.9			56.1	33.8
Progression Factor	0.72	1.03	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	156.3	0.9	0.2	20.3	6.6	4.2	0.3	20.3			80.1	1.1
Delay (s)	194.0	24.8	0.2	67.5	48.6	44.6	38.8	66.1			136.2	34.9
Level of Service	F	C	A	E	D	D	D	E			F	C
Approach Delay (s)		92.6		59.3				60.9				
Approach LOS		F		E				E				

Intersection Summary			
HCM 2000 Control Delay	72.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	130.0	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	SBR2
Lane Configurations	
Traffic Volume (vph)	29
Future Volume (vph)	29
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	31
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	12%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	420	513	289	300	104	340	255	866	146	4	479	747
Future Volume (vph)	420	513	289	300	104	340	255	866	146	4	479	747
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	0.91	0.91	1.00	0.95	0.95	1.00	0.97	0.95	1.00		0.97	0.95
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00
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	0.85		1.00	1.00
Flt Protected	0.95	0.99	1.00	0.95	0.98	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1550	3232	1583	1681	1638	1423	3433	3539	1583		3129	3539
Flt Permitted	0.95	0.99	1.00	0.95	0.98	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1550	3232	1583	1681	1638	1423	3433	3539	1583		3129	3539
Peak-hour factor, PHF	0.96	0.96	0.96	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	438	534	301	316	109	358	277	941	159	4	526	821
RTOR Reduction (vph)	0	0	189	0	0	222	0	0	95	0	0	0
Lane Group Flow (vph)	315	657	112	209	216	136	277	941	64	0	530	821
Confl. Peds. (#/hr)							10					
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	6%	6%	2%	2%	13%	12%	2%	2%	2%	0%	12%	2%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	Prot	NA
Protected Phases	7	7		8	8		5	2		1	1	6
Permitted Phases			7			8			2			
Actuated Green, G (s)	29.7	29.7	29.7	20.0	20.0	20.0	14.5	36.0	36.0		24.0	45.5
Effective Green, g (s)	31.0	31.0	31.0	20.9	20.9	20.9	15.2	37.4	37.4		24.7	46.9
Actuated g/C Ratio	0.24	0.24	0.24	0.16	0.16	0.16	0.12	0.29	0.29		0.19	0.36
Clearance Time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4		4.7	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		2.0	3.0
Lane Grp Cap (vph)	369	770	377	270	263	228	401	1018	455		594	1276
v/s Ratio Prot	0.20	c0.20		0.12	c0.13		0.08	c0.27			c0.17	0.23
v/s Ratio Perm			0.07			0.10			0.04			
v/c Ratio	0.85	0.85	0.30	0.77	0.82	0.59	0.69	0.92	0.14		0.89	0.64
Uniform Delay, d1	47.3	47.3	40.6	52.3	52.7	50.6	55.1	44.9	34.4		51.4	34.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.95	0.83
Incremental Delay, d2	16.6	8.8	0.2	11.9	17.5	2.8	4.1	15.0	0.6		11.2	1.7
Delay (s)	63.9	56.1	40.7	64.2	70.2	53.4	59.3	59.9	35.0		59.7	30.5
Level of Service	E	E	D	E	E	D	E	E	D		E	C
Approach Delay (s)		54.4			60.9			56.9				42.5
Approach LOS		D			E			E				D

Intersection Summary			
HCM 2000 Control Delay	52.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.7
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	352
Future Volume (vph)	352
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.97
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1469
Flt Permitted	1.00
Satd. Flow (perm)	1469
Peak-hour factor, PHF	0.91
Adj. Flow (vph)	387
RTOR Reduction (vph)	247
Lane Group Flow (vph)	140
Confl. Peds. (#/hr)	10
Confl. Bikes (#/hr)	7
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	45.5
Effective Green, g (s)	46.9
Actuated g/C Ratio	0.36
Clearance Time (s)	5.4
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	529
v/s Ratio Prot	
v/s Ratio Perm	0.10
v/c Ratio	0.26
Uniform Delay, d1	29.4
Progression Factor	1.49
Incremental Delay, d2	0.8
Delay (s)	44.6
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	87	119	70	2	178	34	347	2	17	1342	181	417
Future Volume (vph)	87	119	70	2	178	34	347	2	17	1342	181	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			3.3	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00		1.00	0.95	1.00	0.97
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98		1.00	1.00	0.99	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.94			1.00	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)	1770	3322			3049	1863	1527		1773	3471	1386	3367
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)	1770	3322			3049	1863	1527		1773	3471	1386	3367
Peak-hour factor, PHF	0.71	0.71	0.71	0.90	0.90	0.90	0.90	0.89	0.89	0.89	0.89	0.88
Adj. Flow (vph)	123	168	99	2	198	38	386	2	19	1508	203	474
RTOR Reduction (vph)	0	76	0	0	0	0	253	0	0	0	62	0
Lane Group Flow (vph)	123	191	0	0	200	38	133	0	21	1508	141	474
Confl. Peds. (#/hr)	4		4		4		4		3		1	1
Confl. Bikes (#/hr)												
Heavy Vehicles (%)	2%	2%	2%	0%	15%	2%	4%	0%	2%	4%	15%	4%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	4		3	3	8		5	5	2		1
Permitted Phases							8				2	
Actuated Green, G (s)	14.0	16.9			13.9	16.8	16.8		6.0	55.2	55.2	28.2
Effective Green, g (s)	14.6	18.2			15.2	18.1	18.1		6.6	56.5	56.5	28.8
Actuated g/C Ratio	0.11	0.14			0.11	0.14	0.14		0.05	0.42	0.42	0.21
Clearance Time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Vehicle Extension (s)	3.0	2.0			3.0	2.0	2.0		2.0	4.0	4.0	2.0
Lane Grp Cap (vph)	192	451			345	251	206		87	1463	584	723
v/s Ratio Prot	c0.07	0.06			0.07	0.02			0.01	c0.43		c0.14
v/s Ratio Perm							c0.09				0.10	
v/c Ratio	0.64	0.42			0.58	0.15	0.64		0.24	1.03	0.24	0.66
Uniform Delay, d1	57.2	53.1			56.4	51.2	54.9		61.3	38.8	25.0	48.1
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	7.1	0.2			2.4	0.1	5.1		0.5	31.8	1.0	1.6
Delay (s)	64.3	53.3			58.7	51.3	60.0		61.8	70.5	25.9	49.7
Level of Service	E	D			E	D	E		E	E	C	D
Approach Delay (s)		56.8				59.0				65.2		
Approach LOS		E				E				E		

Intersection Summary			
HCM 2000 Control Delay	49.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1130	10
Future Volume (vph)	1130	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	3466	
Flt Permitted	1.00	
Satd. Flow (perm)	3466	
Peak-hour factor, PHF	0.88	0.88
Adj. Flow (vph)	1284	11
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1295	0
Confl. Peds. (#/hr)		3
Confl. Bikes (#/hr)		4
Heavy Vehicles (%)	4%	2%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	77.4	
Effective Green, g (s)	78.7	
Actuated g/C Ratio	0.59	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	2035	
v/s Ratio Prot	0.37	
v/s Ratio Perm		
v/c Ratio	0.64	
Uniform Delay, d1	18.2	
Progression Factor	1.00	
Incremental Delay, d2	1.5	
Delay (s)	19.7	
Level of Service	B	
Approach Delay (s)	27.8	
Approach LOS	C	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	30	15	31	21	14	22	12	44	1241	26	7	44
Future Volume (vph)	30	15	31	21	14	22	12	44	1241	26	7	44
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
Lane Util. Factor		1.00			1.00			1.00	0.95			1.00
Frpb, ped/bikes		0.99			0.99			1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00			1.00
Frt		0.95			0.95			1.00	1.00			1.00
Flt Protected		0.98			0.98			0.95	1.00			0.95
Satd. Flow (prot)		1504			1714			1777	3423			1774
Flt Permitted		0.77			0.78			0.95	1.00			0.12
Satd. Flow (perm)		1186			1360			1777	3423			220
Peak-hour factor, PHF	0.75	0.75	0.75	0.65	0.65	0.65	0.93	0.93	0.93	0.93	0.96	0.96
Adj. Flow (vph)	40	20	41	32	22	34	13	47	1334	28	7	46
RTOR Reduction (vph)	0	25	0	0	23	0	0	0	1	0	0	0
Lane Group Flow (vph)	0	76	0	0	65	0	0	60	1361	0	0	53
Confl. Peds. (#/hr)	7		7	7		7		6		22		22
Confl. Bikes (#/hr)						2				1		
Heavy Vehicles (%)	37%	2%	2%	2%	2%	2%	0%	2%	5%	2%	0%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA			Prot
Protected Phases		4			8		5	5	2			1
Permitted Phases	4			8								
Actuated Green, G (s)		10.4			10.4			6.6	56.4			33.1
Effective Green, g (s)		11.3			11.3			7.5	57.7			34.0
Actuated g/C Ratio		0.10			0.10			0.07	0.50			0.30
Clearance Time (s)		4.9			4.9			4.9	5.3			4.9
Vehicle Extension (s)		1.5			1.5			1.0	4.0			1.0
Lane Grp Cap (vph)		116			133			115	1717			65
v/s Ratio Prot								0.03	c0.40			
v/s Ratio Perm		c0.06			0.05							c0.24
v/c Ratio		0.65			0.49			0.52	0.79			0.82
Uniform Delay, d1		50.0			49.1			52.0	23.7			37.6
Progression Factor		1.00			1.00			1.00	1.00			1.00
Incremental Delay, d2		9.6			1.0			2.0	3.8			50.2
Delay (s)		59.6			50.2			54.0	27.5			87.8
Level of Service		E			D			D	C			F
Approach Delay (s)		59.6			50.2				28.7			
Approach LOS		E			D				C			

Intersection Summary			
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1198	34
Future Volume (vph)	1198	34
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	3397	
Flt Permitted	1.00	
Satd. Flow (perm)	3397	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	1248	35
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1282	0
Confl. Peds. (#/hr)		6
Confl. Bikes (#/hr)		5
Heavy Vehicles (%)	5%	32%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	82.9	
Effective Green, g (s)	84.2	
Actuated g/C Ratio	0.73	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.5	
Lane Grp Cap (vph)	2487	
v/s Ratio Prot	0.38	
v/s Ratio Perm		
v/c Ratio	0.52	
Uniform Delay, d1	6.6	
Progression Factor	1.00	
Incremental Delay, d2	0.8	
Delay (s)	7.4	
Level of Service	A	
Approach Delay (s)	10.6	
Approach LOS	B	

Intersection Summary

Movement	EBL	EBT	EBR2	WBU	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	31	42	8	9	14	40	52	227	12	1017	88	17
Future Volume (vph)	31	42	8	9	14	40	52	227	12	1017	88	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95				1.00	1.00	1.00	1.00	0.95	1.00	
Frpb, ped/bikes		1.00				1.00	1.00	0.98	1.00	1.00	0.99	
Flpb, ped/bikes		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.99				1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3418				1752	1863	1526	1770	3438	1532	
Flt Permitted		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3418				1752	1863	1526	1770	3438	1532	
Peak-hour factor, PHF	0.70	0.70	0.70	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92	0.88
Adj. Flow (vph)	44	60	11	9	15	42	55	239	13	1105	96	19
RTOR Reduction (vph)	0	106	0	0	0	0	0	215	0	0	0	0
Lane Group Flow (vph)	0	9	0	0	0	66	55	24	13	1105	96	0
Confl. Peds. (#/hr)	4		2			2		4			1	
Confl. Bikes (#/hr)								1			1	
Heavy Vehicles (%)	2%	2%	2%	0%	2%	4%	2%	4%	2%	5%	4%	0%
Turn Type	Split	NA		Split	Split	Split	NA	Perm	Prot	NA	Perm	Prot
Protected Phases	4	4		8	8	8	8		5	2		1
Permitted Phases								8			2	
Actuated Green, G (s)		6.2				8.4	8.4	8.4	1.1	41.2	41.2	
Effective Green, g (s)		7.1				9.3	9.3	9.3	2.0	42.5	42.5	
Actuated g/C Ratio		0.08				0.10	0.10	0.10	0.02	0.47	0.47	
Clearance Time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Vehicle Extension (s)		3.0				2.0	2.0	2.0	2.0	4.0	4.0	
Lane Grp Cap (vph)		266				178	190	155	38	1603	714	
v/s Ratio Prot		c0.00				c0.04	0.03		0.01	c0.32		
v/s Ratio Perm								0.02			0.06	
v/c Ratio		0.03				0.37	0.29	0.16	0.34	0.69	0.13	
Uniform Delay, d1		38.8				38.2	37.8	37.3	43.9	19.1	13.8	
Progression Factor		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1				0.5	0.3	0.2	2.0	1.4	0.1	
Delay (s)		38.9				38.6	38.2	37.5	45.9	20.5	13.9	
Level of Service		D				D	D	D	D	C	B	
Approach Delay (s)		38.9					37.8			20.2		
Approach LOS		D					D			C		

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	91.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL2	SBL	SBT	SBR	NWR2
Lane Configurations					
Traffic Volume (vph)	383	20	743	68	31
Future Volume (vph)	383	20	743	68	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0
Lane Util. Factor	0.91	0.95	0.95		1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00
Frt	1.00	1.00	0.99		0.86
Flt Protected	0.95	0.95	1.00		1.00
Satd. Flow (prot)	1584	1652	3367		1611
Flt Permitted	0.95	0.95	1.00		1.00
Satd. Flow (perm)	1584	1652	3367		1611
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.60
Adj. Flow (vph)	435	23	844	77	52
RTOR Reduction (vph)	0	0	3	0	47
Lane Group Flow (vph)	254	223	918	0	5
Confl. Peds. (#/hr)	1	1			
Confl. Bikes (#/hr)				5	
Heavy Vehicles (%)	4%	2%	6%	2%	2%
Turn Type	Prot	Prot	NA		Perm
Protected Phases	1	1	6		
Permitted Phases					8
Actuated Green, G (s)	15.3	15.3	55.4		8.4
Effective Green, g (s)	16.2	16.2	56.7		9.3
Actuated g/C Ratio	0.18	0.18	0.62		0.10
Clearance Time (s)	4.9	4.9	5.3		4.9
Vehicle Extension (s)	1.0	1.0	4.0		2.0
Lane Grp Cap (vph)	281	293	2095		164
v/s Ratio Prot	c0.16	0.13	0.27		
v/s Ratio Perm					0.00
v/c Ratio	0.90	0.76	0.44		0.03
Uniform Delay, d1	36.7	35.6	8.9		36.8
Progression Factor	1.00	1.00	1.00		1.00
Incremental Delay, d2	29.4	10.0	0.2		0.0
Delay (s)	66.1	45.6	9.1		36.9
Level of Service	E	D	A		D
Approach Delay (s)			25.3		
Approach LOS			C		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	17	22	6	124	20	2	1	16	1066	390	13	619
Future Volume (vph)	17	22	6	124	20	2	1	16	1066	390	13	619
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	3.2	4.0
Lane Util. Factor		1.00		0.95	0.95	1.00		1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes		1.00		1.00	1.00	0.98		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.98		1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.98		0.95	0.96	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1426		1681	1706	1557		1772	3471	1548	1770	3393
Flt Permitted		0.84		0.84	0.83	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1220		1485	1461	1557		1772	3471	1548	1770	3393
Peak-hour factor, PHF	0.57	0.57	0.57	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	30	39	11	136	22	2	1	17	1146	419	14	666
RTOR Reduction (vph)	0	6	0	0	0	2	0	0	0	84	0	1
Lane Group Flow (vph)	0	74	0	72	86	0	0	18	1146	335	14	687
Confl. Peds. (#/hr)	5					5		4		2	2	
Confl. Bikes (#/hr)			3									
Heavy Vehicles (%)	71%	2%	2%	2%	2%	2%	0%	2%	4%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8		8				2		
Actuated Green, G (s)		7.0		7.0	7.0	7.0		0.8	33.8	33.8	0.7	33.7
Effective Green, g (s)		7.9		7.9	7.9	7.9		1.7	35.5	35.5	2.4	35.4
Actuated g/C Ratio		0.14		0.14	0.14	0.14		0.03	0.62	0.62	0.04	0.62
Clearance Time (s)		4.9		4.9	4.9	4.9		4.9	5.7	5.7	4.9	5.7
Vehicle Extension (s)		2.0		2.0	2.0	2.0		1.0	4.0	4.0	1.0	4.0
Lane Grp Cap (vph)		169		205	202	215		52	2161	964	74	2107
v/s Ratio Prot								c0.01	c0.33		0.01	0.20
v/s Ratio Perm		c0.06		0.05	0.06	0.00				0.22		
v/c Ratio		0.44		0.35	0.43	0.00		0.35	0.53	0.35	0.19	0.33
Uniform Delay, d1		22.5		22.2	22.5	21.2		27.1	6.1	5.2	26.4	5.1
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.7		0.4	0.5	0.0		1.5	0.3	0.3	0.5	0.1
Delay (s)		23.2		22.6	23.0	21.2		28.6	6.4	5.5	26.8	5.3
Level of Service		C		C	C	C		C	A	A	C	A
Approach Delay (s)		23.2			22.8				6.4			5.7
Approach LOS		C			C				A			A

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	57.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	22
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	4
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	60%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBT	WBR	WBR2	NBL2	NBT	NBR	SBU	SBL	SBR
Lane Configurations												
Traffic Volume (vph)	322	751	196	616	255	143	504	421	357	25	209	618
Future Volume (vph)	322	751	196	616	255	143	504	421	357	25	209	618
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	5.4	4.0	5.4	5.4	5.4	5.1	5.1			4.4	4.4
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	1.00	1.00	0.95			1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.99			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	0.85	1.00	0.93			1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	3127	3223	1380	3223	1442	1414	1583	2982			1630	2538
Flt Permitted	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	3127	3223	1380	3223	1442	1414	1583	2982			1630	2538
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	362	844	220	677	280	157	548	458	388	29	240	710
RTOR Reduction (vph)	0	0	0	0	0	117	0	64	0	0	0	47
Lane Group Flow (vph)	362	844	220	677	280	40	548	782	0	0	269	704
Confl. Peds. (#/hr)	6					6			2		2	
Heavy Vehicles (%)	12%	12%	17%	12%	12%	12%	14%	12%	12%	0%	12%	12%
Turn Type	Prot	NA	Free	NA	Prot	Perm	Split	NA		Prot	Prot	pt+ov
Protected Phases	5	2		6	6		8	8		7	7	7 5
Permitted Phases			Free			6						
Actuated Green, G (s)	15.0	49.5	120.0	30.8	30.8	30.8	37.6	37.6			18.0	37.4
Effective Green, g (s)	15.0	49.5	120.0	30.8	30.8	30.8	37.6	37.6			18.0	37.4
Actuated g/C Ratio	0.12	0.41	1.00	0.26	0.26	0.26	0.31	0.31			0.15	0.31
Clearance Time (s)	3.7	5.4		5.4	5.4	5.4	5.1	5.1			4.4	
Vehicle Extension (s)	2.0	4.0		4.0	4.0	4.0	2.0	2.0			2.0	
Lane Grp Cap (vph)	390	1329	1380	827	370	362	496	934			244	791
v/s Ratio Prot	0.12	0.26		c0.21	0.19		c0.35	0.26			c0.16	c0.28
v/s Ratio Perm			0.16			0.03						
v/c Ratio	0.93	0.64	0.16	0.82	0.76	0.11	1.10	0.84			1.10	0.89
Uniform Delay, d1	52.0	28.1	0.0	42.0	41.1	34.1	41.2	38.4			51.0	39.3
Progression Factor	0.74	1.11	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	22.8	1.8	0.2	8.9	13.5	0.6	72.2	6.3			87.8	11.9
Delay (s)	61.3	33.1	0.2	50.8	54.6	34.7	113.4	44.7			138.8	51.3
Level of Service	E	C	A	D	D	C	F	D			F	D
Approach Delay (s)		35.2		49.5				71.7				
Approach LOS		D		D				E				

Intersection Summary			
HCM 2000 Control Delay	56.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR2
Lane Configurations	
Traffic Volume (vph)	36
Future Volume (vph)	36
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.87
Adj. Flow (vph)	41
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	12%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	277	185	139	171	181	321	307	588	45	323	615	836
Future Volume (vph)	277	185	139	171	181	321	307	588	45	323	615	836
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4	4.7	5.4	5.4
Lane Util. Factor	0.91	0.91	1.00	0.95	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1521	3121	1583	1681	1658	1411	3433	3539	1583	3127	3539	1519
Flt Permitted	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1521	3121	1583	1681	1658	1411	3433	3539	1583	3127	3539	1519
Peak-hour factor, PHF	0.83	0.83	0.83	0.88	0.88	0.88	0.78	0.78	0.78	0.80	0.80	0.80
Adj. Flow (vph)	334	223	167	194	206	365	394	754	58	404	769	1045
RTOR Reduction (vph)	0	0	142	0	0	253	0	0	37	0	0	287
Lane Group Flow (vph)	184	373	25	175	225	112	394	754	21	404	769	758
Confl. Peds. (#/hr)	5					5						
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	8%	9%	2%	2%	9%	12%	2%	2%	2%	12%	2%	5%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8			2			6
Actuated Green, G (s)	18.2	18.2	18.2	18.8	18.8	18.8	16.8	44.2	44.2	18.5	45.9	45.9
Effective Green, g (s)	18.2	18.2	18.2	18.8	18.8	18.8	16.8	44.2	44.2	18.5	45.9	45.9
Actuated g/C Ratio	0.15	0.15	0.15	0.16	0.16	0.16	0.14	0.37	0.37	0.15	0.38	0.38
Clearance Time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4	4.7	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	230	473	240	263	259	221	480	1303	583	482	1353	581
v/s Ratio Prot	c0.12	0.12		0.10	c0.14		0.11	0.21		c0.13	0.22	
v/s Ratio Perm			0.02			0.08			0.01			c0.50
v/c Ratio	0.80	0.79	0.11	0.67	0.87	0.51	0.82	0.58	0.04	0.84	0.57	1.30
Uniform Delay, d1	49.1	49.0	43.9	47.6	49.4	46.4	50.1	30.4	24.3	49.3	29.2	37.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00
Incremental Delay, d2	16.9	7.9	0.1	4.9	24.4	0.7	10.3	1.9	0.1	7.0	1.0	144.2
Delay (s)	66.0	56.9	44.0	52.5	73.8	47.0	60.4	32.3	24.4	56.2	29.6	181.0
Level of Service	E	E	D	D	E	D	E	C	C	E	C	F
Approach Delay (s)		56.2			56.1			41.1			105.8	
Approach LOS		E			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	74.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.3
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	14	24	13	1	177	149	301	1	82	923	231	416
Future Volume (vph)	14	24	13	1	177	149	301	1	82	923	231	416
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00		1.00	0.95	1.00	0.97
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.99		1.00	1.00	0.99	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.95			1.00	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)	1770	3353			3047	1863	1533		1770	3471	1408	3367
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)	1770	3353			3047	1863	1533		1770	3471	1408	3367
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.86	0.86	0.86	0.86	0.94
Adj. Flow (vph)	15	26	14	1	190	160	324	1	95	1073	269	443
RTOR Reduction (vph)	0	13	0	0	0	0	269	0	0	0	86	0
Lane Group Flow (vph)	15	27	0	0	191	160	55	0	96	1073	183	443
Confl. Peds. (#/hr)	1						1		1		2	2
Confl. Bikes (#/hr)											1	
Heavy Vehicles (%)	2%	2%	2%	0%	15%	2%	4%	0%	2%	4%	13%	4%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	4		3	3	8		5	5	2		1
Permitted Phases							8				2	
Actuated Green, G (s)	2.7	9.8			12.9	20.0	20.0		12.4	54.3	54.3	20.7
Effective Green, g (s)	2.7	9.8			12.9	20.0	20.0		12.4	54.3	54.3	20.7
Actuated g/C Ratio	0.02	0.08			0.11	0.17	0.17		0.11	0.46	0.46	0.18
Clearance Time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0		2.0	4.0	4.0	2.0
Lane Grp Cap (vph)	40	279			334	317	260		186	1604	650	593
v/s Ratio Prot	0.01	0.01			c0.06	c0.09			0.05	0.31		c0.13
v/s Ratio Perm							0.04				0.13	
v/c Ratio	0.38	0.10			0.57	0.50	0.21		0.52	0.67	0.28	0.75
Uniform Delay, d1	56.6	49.8			49.7	44.3	42.0		49.7	24.6	19.5	45.9
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.1			1.5	0.5	0.1		1.0	1.2	0.3	4.5
Delay (s)	58.7	49.8			51.1	44.7	42.1		50.7	25.8	19.9	50.4
Level of Service	E	D			D	D	D		D	C	B	D
Approach Delay (s)		52.2				45.3				26.3		
Approach LOS		D				D				C		

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	117.5	Sum of lost time (s)	19.8
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1187	43
Future Volume (vph)	1187	43
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3452	
Flt Permitted	1.00	
Satd. Flow (perm)	3452	
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	1263	46
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1308	0
Confl. Peds. (#/hr)		1
Confl. Bikes (#/hr)		1
Heavy Vehicles (%)	4%	2%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	62.6	
Effective Green, g (s)	62.6	
Actuated g/C Ratio	0.53	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	1839	
v/s Ratio Prot	c0.38	
v/s Ratio Perm		
v/c Ratio	0.71	
Uniform Delay, d1	20.7	
Progression Factor	1.00	
Incremental Delay, d2	1.4	
Delay (s)	22.1	
Level of Service	C	
Approach Delay (s)	29.2	
Approach LOS	C	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	27	13	25	39	7	60	6	31	981	51	63	1154
Future Volume (vph)	27	13	25	39	7	60	6	31	981	51	63	1154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9			4.9	5.3		4.9	5.3
Lane Util. Factor		1.00			1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes		0.99			0.97			1.00	1.00		1.00	1.00
Flpb, ped/bikes		0.99			1.00			1.00	1.00		1.00	1.00
Frt		0.95			0.92			1.00	0.99		1.00	1.00
Flt Protected		0.98			0.98			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1549			1641			1775	3409		1770	3412
Flt Permitted		0.68			0.84			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1072			1400			1775	3409		1770	3412
Peak-hour factor, PHF	0.74	0.74	0.74	0.58	0.58	0.58	0.81	0.81	0.81	0.81	0.89	0.89
Adj. Flow (vph)	36	18	34	67	12	103	7	38	1211	63	71	1297
RTOR Reduction (vph)	0	24	0	0	52	0	0	0	2	0	0	1
Lane Group Flow (vph)	0	64	0	0	130	0	0	45	1272	0	71	1318
Confl. Peds. (#/hr)	29		11	11		29		2		11	11	
Confl. Bikes (#/hr)			2			1				3		
Heavy Vehicles (%)	26%	2%	2%	2%	2%	2%	0%	2%	5%	2%	2%	5%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		13.2			13.2			4.5	69.9		6.8	72.2
Effective Green, g (s)		13.2			13.2			4.5	69.9		6.8	72.2
Actuated g/C Ratio		0.13			0.13			0.04	0.67		0.06	0.69
Clearance Time (s)		4.9			4.9			4.9	5.3		4.9	5.3
Vehicle Extension (s)		1.5			1.5			1.0	4.0		1.0	4.5
Lane Grp Cap (vph)		134			176			76	2269		114	2346
v/s Ratio Prot								0.03	0.37		c0.04	c0.39
v/s Ratio Perm		0.06			c0.09							
v/c Ratio		0.47			0.74			0.59	0.56		0.62	0.56
Uniform Delay, d1		42.7			44.3			49.3	9.4		47.9	8.3
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		1.0			13.6			8.0	1.0		7.4	1.0
Delay (s)		43.6			57.9			57.3	10.4		55.2	9.3
Level of Service		D			E			E	B		E	A
Approach Delay (s)		43.6			57.9				12.0			11.7
Approach LOS		D			E				B			B

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.89
Adj. Flow (vph)	22
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	35%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR2	WBU	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	86	58	31	8	12	72	20	243	17	758	97	5
Future Volume (vph)	86	58	31	8	12	72	20	243	17	758	97	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Lane Util. Factor		0.95				1.00	1.00	1.00	1.00	0.95	1.00	
Frpb, ped/bikes		1.00				1.00	1.00	0.98	1.00	1.00	0.98	
Flpb, ped/bikes		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.97				1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3363				1746	1863	1518	1770	3406	1529	
Flt Permitted		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3363				1746	1863	1518	1770	3406	1529	
Peak-hour factor, PHF	0.83	0.83	0.83	0.71	0.71	0.71	0.71	0.71	0.76	0.76	0.76	0.86
Adj. Flow (vph)	104	70	37	11	17	101	28	342	22	997	128	6
RTOR Reduction (vph)	0	131	0	0	0	0	0	297	0	0	0	0
Lane Group Flow (vph)	0	80	0	0	0	129	28	45	22	997	128	0
Confl. Peds. (#/hr)	13					3		13	3		2	
Confl. Bikes (#/hr)											2	
Heavy Vehicles (%)	2%	2%	2%	0%	2%	4%	2%	4%	2%	6%	4%	0%
Turn Type	Split	NA		Split	Split	Split	NA	Perm	Prot	NA	Perm	Prot
Protected Phases	4	4		8	8	8	8		5	2		1
Permitted Phases								8			2	
Actuated Green, G (s)		8.0				12.0	12.0	12.0	2.4	39.1	39.1	
Effective Green, g (s)		8.0				12.0	12.0	12.0	2.4	39.1	39.1	
Actuated g/C Ratio		0.09				0.13	0.13	0.13	0.03	0.43	0.43	
Clearance Time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Vehicle Extension (s)		3.0				2.0	2.0	2.0	2.0	4.0	4.0	
Lane Grp Cap (vph)		293				228	243	198	46	1452	651	
v/s Ratio Prot		c0.02				c0.07	0.02		0.01	c0.29		
v/s Ratio Perm								0.03			0.08	
v/c Ratio		0.27				0.57	0.12	0.23	0.48	0.69	0.20	
Uniform Delay, d1		39.1				37.4	35.2	35.7	44.0	21.3	16.5	
Progression Factor		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.5				1.9	0.1	0.2	2.8	1.5	0.2	
Delay (s)		39.6				39.3	35.2	35.9	46.9	22.8	16.7	
Level of Service		D				D	D	D	D	C	B	
Approach Delay (s)		39.6					36.7			22.6		
Approach LOS		D					D			C		

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	91.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL2	SBL	SBT	SBR	NWR2
Lane Configurations					
Traffic Volume (vph)	235	16	827	24	45
Future Volume (vph)	235	16	827	24	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	5.3		4.9
Lane Util. Factor	0.91	0.95	0.95		1.00
Frpb, ped/bikes	1.00	1.00	1.00		0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00
Frt	1.00	1.00	1.00		0.86
Flt Protected	0.95	0.95	1.00		1.00
Satd. Flow (prot)	1582	1653	3392		1589
Flt Permitted	0.95	0.95	1.00		1.00
Satd. Flow (perm)	1582	1653	3392		1589
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.75
Adj. Flow (vph)	273	19	962	28	60
RTOR Reduction (vph)	0	0	1	0	52
Lane Group Flow (vph)	148	150	989	0	8
Confl. Peds. (#/hr)	2	2		3	
Confl. Bikes (#/hr)					1
Heavy Vehicles (%)	4%	2%	6%	2%	2%
Turn Type	Prot	Prot	NA		Perm
Protected Phases	1	1	6		
Permitted Phases					8
Actuated Green, G (s)	12.6	12.6	49.3		12.0
Effective Green, g (s)	12.6	12.6	49.3		12.0
Actuated g/C Ratio	0.14	0.14	0.54		0.13
Clearance Time (s)	4.9	4.9	5.3		4.9
Vehicle Extension (s)	1.0	1.0	4.0		2.0
Lane Grp Cap (vph)	217	227	1823		207
v/s Ratio Prot	c0.09	0.09	0.29		
v/s Ratio Perm					0.00
v/c Ratio	0.68	0.66	0.54		0.04
Uniform Delay, d1	37.6	37.5	13.8		34.8
Progression Factor	1.00	1.00	1.00		1.00
Incremental Delay, d2	6.9	5.5	0.4		0.0
Delay (s)	44.5	43.0	14.3		34.8
Level of Service	D	D	B		C
Approach Delay (s)			21.1		
Approach LOS			C		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	36	24	16	178	12	5	9	595	143	2	6	936
Future Volume (vph)	36	24	16	178	12	5	9	595	143	2	6	936
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9	4.9	4.9	5.7	5.7		4.9	5.7
Lane Util. Factor		1.00		0.95	0.95	1.00	1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00		1.00	1.00	0.98	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		0.97		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00
Flt Protected		0.98		0.95	0.96	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1490		1681	1696	1555	1766	3471	1550		1770	3410
Flt Permitted		0.79		0.77	0.75	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1201		1356	1333	1555	1766	3471	1550		1770	3410
Peak-hour factor, PHF	0.78	0.78	0.78	0.68	0.68	0.68	0.74	0.74	0.74	0.79	0.79	0.79
Adj. Flow (vph)	46	31	21	262	18	7	12	804	193	3	8	1185
RTOR Reduction (vph)	0	9	0	0	0	6	0	0	60	0	0	1
Lane Group Flow (vph)	0	89	0	139	141	1	12	804	133	0	11	1206
Confl. Peds. (#/hr)	4					4	7					
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	42%	2%	2%	2%	2%	2%	2%	4%	2%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Perm	Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4			8		8			2			
Actuated Green, G (s)		11.8		11.8	11.8	11.8	0.8	38.4	38.4		0.8	38.4
Effective Green, g (s)		11.8		11.8	11.8	11.8	0.8	38.4	38.4		0.8	38.4
Actuated g/C Ratio		0.18		0.18	0.18	0.18	0.01	0.58	0.58		0.01	0.58
Clearance Time (s)		4.9		4.9	4.9	4.9	4.9	5.7	5.7		4.9	5.7
Vehicle Extension (s)		2.0		2.0	2.0	2.0	1.0	4.0	4.0		1.0	4.0
Lane Grp Cap (vph)		213		240	236	275	21	2004	895		21	1969
v/s Ratio Prot							c0.01	0.23			0.01	c0.35
v/s Ratio Perm		0.07		0.10	c0.11	0.00			0.09			
v/c Ratio		0.42		0.58	0.60	0.00	0.57	0.40	0.15		0.52	0.61
Uniform Delay, d1		24.3		25.1	25.2	22.5	32.7	7.7	6.5		32.7	9.2
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		0.5		2.1	2.7	0.0	21.2	0.2	0.1		10.4	0.7
Delay (s)		24.8		27.2	27.9	22.5	53.9	7.9	6.6		43.1	9.8
Level of Service		C		C	C	C	D	A	A		D	A
Approach Delay (s)		24.8			27.4			8.2				10.1
Approach LOS		C			C			A				B

Intersection Summary			
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	15.5
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	17
Future Volume (vph)	17
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.79
Adj. Flow (vph)	22
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	7
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	88%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBT	WBR	WBR2	NBL2	NBT	NBR	SBU	SBL	SBR
Lane Configurations												
Traffic Volume (vph)	724	765	233	751	208	267	180	635	131	48	179	575
Future Volume (vph)	724	765	233	751	208	267	180	635	131	48	179	575
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	2.6	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	1.00	1.00	0.95			1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	0.85	1.00	0.97			1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	3127	3223	1392	3223	1442	1408	1543	3132			1649	2538
Flt Permitted	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	3127	3223	1392	3223	1442	1408	1543	3132			1649	2538
Peak-hour factor, PHF	0.88	0.88	0.88	0.95	0.95	0.95	0.89	0.89	0.89	0.94	0.94	0.94
Adj. Flow (vph)	823	869	265	791	219	281	202	713	147	51	190	612
RTOR Reduction (vph)	0	0	0	0	0	112	0	14	0	0	0	40
Lane Group Flow (vph)	823	869	265	791	219	169	202	846	0	0	241	603
Confl. Peds. (#/hr)	9					9			4		4	
Heavy Vehicles (%)	12%	12%	16%	12%	12%	12%	17%	12%	12%	0%	12%	12%
Turn Type	Prot	NA	Free	NA	Prot	Perm	Split	NA		Prot	Prot	pt+ov
Protected Phases	5	2		6	6		8	8		7	7	7 5
Permitted Phases			Free			6						
Actuated Green, G (s)	26.0	62.1	130.0	32.4	32.4	32.4	35.6	35.6			17.4	47.8
Effective Green, g (s)	25.7	63.5	130.0	33.8	33.8	33.8	36.7	36.7			17.8	48.2
Actuated g/C Ratio	0.20	0.49	1.00	0.26	0.26	0.26	0.28	0.28			0.14	0.37
Clearance Time (s)	3.7	5.4		5.4	5.4	5.4	5.1	5.1			4.4	
Vehicle Extension (s)	2.0	4.0		4.0	4.0	4.0	2.0	2.0			2.0	
Lane Grp Cap (vph)	618	1574	1392	837	374	366	435	884			225	941
v/s Ratio Prot	c0.26	0.27		c0.25	0.15		0.13	c0.27			c0.15	0.24
v/s Ratio Perm			0.19			0.12						
v/c Ratio	1.33	0.55	0.19	0.95	0.59	0.46	0.46	0.96			1.07	0.64
Uniform Delay, d1	52.1	23.3	0.0	47.2	42.0	40.5	38.5	45.9			56.1	33.8
Progression Factor	0.72	1.03	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	156.3	0.9	0.2	20.3	6.6	4.2	0.3	20.3			80.1	1.1
Delay (s)	194.0	24.8	0.2	67.5	48.6	44.6	38.8	66.1			136.2	34.9
Level of Service	F	C	A	E	D	D	D	E			F	C
Approach Delay (s)		92.6		59.3				60.9				
Approach LOS		F		E				E				

Intersection Summary			
HCM 2000 Control Delay	72.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	130.0	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	SBR2
Lane Configurations	
Traffic Volume (vph)	29
Future Volume (vph)	29
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	31
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	12%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	420	513	289	300	104	340	255	866	146	4	479	747
Future Volume (vph)	420	513	289	300	104	340	255	866	146	4	479	747
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	0.91	0.91	1.00	0.95	0.95	1.00	0.97	0.95	1.00		0.97	0.95
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00
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	0.85		1.00	1.00
Flt Protected	0.95	0.99	1.00	0.95	0.98	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1550	3232	1583	1681	1638	1423	3433	3539	1583		3129	3539
Flt Permitted	0.95	0.99	1.00	0.95	0.98	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1550	3232	1583	1681	1638	1423	3433	3539	1583		3129	3539
Peak-hour factor, PHF	0.96	0.96	0.96	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	438	534	301	316	109	358	277	941	159	4	526	821
RTOR Reduction (vph)	0	0	189	0	0	222	0	0	95	0	0	0
Lane Group Flow (vph)	315	657	112	209	216	136	277	941	64	0	530	821
Confl. Peds. (#/hr)							10					
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	6%	6%	2%	2%	13%	12%	2%	2%	2%	0%	12%	2%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	Prot	NA
Protected Phases	7	7		8	8		5	2		1	1	6
Permitted Phases			7			8			2			
Actuated Green, G (s)	29.7	29.7	29.7	20.0	20.0	20.0	14.5	36.0	36.0		24.0	45.5
Effective Green, g (s)	31.0	31.0	31.0	20.9	20.9	20.9	15.2	37.4	37.4		24.7	46.9
Actuated g/C Ratio	0.24	0.24	0.24	0.16	0.16	0.16	0.12	0.29	0.29		0.19	0.36
Clearance Time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4		4.7	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		2.0	3.0
Lane Grp Cap (vph)	369	770	377	270	263	228	401	1018	455		594	1276
v/s Ratio Prot	0.20	c0.20		0.12	c0.13		0.08	c0.27			c0.17	0.23
v/s Ratio Perm			0.07			0.10			0.04			
v/c Ratio	0.85	0.85	0.30	0.77	0.82	0.59	0.69	0.92	0.14		0.89	0.64
Uniform Delay, d1	47.3	47.3	40.6	52.3	52.7	50.6	55.1	44.9	34.4		51.4	34.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.95	0.83
Incremental Delay, d2	16.6	8.8	0.2	11.9	17.5	2.8	4.1	15.0	0.6		11.2	1.7
Delay (s)	63.9	56.1	40.7	64.2	70.2	53.4	59.3	59.9	35.0		59.7	30.5
Level of Service	E	E	D	E	E	D	E	E	D		E	C
Approach Delay (s)		54.4			60.9			56.9				42.5
Approach LOS		D			E			E				D

Intersection Summary			
HCM 2000 Control Delay	52.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.7
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	352
Future Volume (vph)	352
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.97
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1469
Flt Permitted	1.00
Satd. Flow (perm)	1469
Peak-hour factor, PHF	0.91
Adj. Flow (vph)	387
RTOR Reduction (vph)	247
Lane Group Flow (vph)	140
Confl. Peds. (#/hr)	10
Confl. Bikes (#/hr)	7
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	45.5
Effective Green, g (s)	46.9
Actuated g/C Ratio	0.36
Clearance Time (s)	5.4
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	529
v/s Ratio Prot	
v/s Ratio Perm	0.10
v/c Ratio	0.26
Uniform Delay, d1	29.4
Progression Factor	1.49
Incremental Delay, d2	0.8
Delay (s)	44.6
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	87	119	70	2	178	34	347	2	17	1342	181	417
Future Volume (vph)	87	119	70	2	178	34	347	2	17	1342	181	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			3.3	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00		1.00	0.95	1.00	0.97
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98		1.00	1.00	0.99	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.94			1.00	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)	1770	3322			3049	1863	1527		1773	3471	1386	3367
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)	1770	3322			3049	1863	1527		1773	3471	1386	3367
Peak-hour factor, PHF	0.71	0.71	0.71	0.90	0.90	0.90	0.90	0.89	0.89	0.89	0.89	0.88
Adj. Flow (vph)	123	168	99	2	198	38	386	2	19	1508	203	474
RTOR Reduction (vph)	0	76	0	0	0	0	253	0	0	0	62	0
Lane Group Flow (vph)	123	191	0	0	200	38	133	0	21	1508	141	474
Confl. Peds. (#/hr)	4		4		4		4		3		1	1
Confl. Bikes (#/hr)												
Heavy Vehicles (%)	2%	2%	2%	0%	15%	2%	4%	0%	2%	4%	15%	4%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	4		3	3	8		5	5	2		1
Permitted Phases							8				2	
Actuated Green, G (s)	14.0	16.9			13.9	16.8	16.8		6.0	55.2	55.2	28.2
Effective Green, g (s)	14.6	18.2			15.2	18.1	18.1		6.6	56.5	56.5	28.8
Actuated g/C Ratio	0.11	0.14			0.11	0.14	0.14		0.05	0.42	0.42	0.21
Clearance Time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Vehicle Extension (s)	3.0	2.0			3.0	2.0	2.0		2.0	4.0	4.0	2.0
Lane Grp Cap (vph)	192	451			345	251	206		87	1463	584	723
v/s Ratio Prot	c0.07	0.06			0.07	0.02			0.01	c0.43		c0.14
v/s Ratio Perm							c0.09				0.10	
v/c Ratio	0.64	0.42			0.58	0.15	0.64		0.24	1.03	0.24	0.66
Uniform Delay, d1	57.2	53.1			56.4	51.2	54.9		61.3	38.8	25.0	48.1
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	7.1	0.2			2.4	0.1	5.1		0.5	31.8	1.0	1.6
Delay (s)	64.3	53.3			58.7	51.3	60.0		61.8	70.5	25.9	49.7
Level of Service	E	D			E	D	E		E	E	C	D
Approach Delay (s)		56.8				59.0				65.2		
Approach LOS		E				E				E		

Intersection Summary			
HCM 2000 Control Delay	49.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1130	10
Future Volume (vph)	1130	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	3466	
Flt Permitted	1.00	
Satd. Flow (perm)	3466	
Peak-hour factor, PHF	0.88	0.88
Adj. Flow (vph)	1284	11
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1295	0
Confl. Peds. (#/hr)		3
Confl. Bikes (#/hr)		4
Heavy Vehicles (%)	4%	2%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	77.4	
Effective Green, g (s)	78.7	
Actuated g/C Ratio	0.59	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	2035	
v/s Ratio Prot	0.37	
v/s Ratio Perm		
v/c Ratio	0.64	
Uniform Delay, d1	18.2	
Progression Factor	1.00	
Incremental Delay, d2	1.5	
Delay (s)	19.7	
Level of Service	B	
Approach Delay (s)	27.8	
Approach LOS	C	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	26	15	31	21	14	22	12	44	1244	26	7	44
Future Volume (vph)	26	15	31	21	14	22	12	44	1244	26	7	44
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
Lane Util. Factor		1.00			1.00			1.00	0.95			1.00
Frpb, ped/bikes		0.99			0.99			1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00			1.00
Frt		0.94			0.95			1.00	1.00			1.00
Flt Protected		0.98			0.98			0.95	1.00			0.95
Satd. Flow (prot)		1565			1713			1777	3423			1774
Flt Permitted		0.78			0.76			0.95	1.00			0.11
Satd. Flow (perm)		1243			1325			1777	3423			215
Peak-hour factor, PHF	0.75	0.75	0.75	0.65	0.65	0.65	0.93	0.93	0.93	0.93	0.96	0.96
Adj. Flow (vph)	35	20	41	32	22	34	13	47	1338	28	7	46
RTOR Reduction (vph)	0	27	0	0	23	0	0	0	1	0	0	0
Lane Group Flow (vph)	0	69	0	0	65	0	0	60	1365	0	0	53
Confl. Peds. (#/hr)	7		7	7		7		6		22		22
Confl. Bikes (#/hr)						2				1		
Heavy Vehicles (%)	27%	2%	2%	2%	2%	2%	0%	2%	5%	2%	0%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA			Prot
Protected Phases		4			8		5	5	2			1
Permitted Phases	4			8								
Actuated Green, G (s)		9.5			9.5			6.6	56.5			33.9
Effective Green, g (s)		10.4			10.4			7.5	57.8			34.8
Actuated g/C Ratio		0.09			0.09			0.07	0.50			0.30
Clearance Time (s)		4.9			4.9			4.9	5.3			4.9
Vehicle Extension (s)		1.5			1.5			1.0	4.0			1.0
Lane Grp Cap (vph)		112			119			115	1720			65
v/s Ratio Prot								0.03	c0.40			
v/s Ratio Perm		c0.06			0.05							c0.25
v/c Ratio		0.61			0.55			0.52	0.79			0.82
Uniform Delay, d1		50.4			50.1			52.0	23.7			37.1
Progression Factor		1.00			1.00			1.00	1.00			1.00
Incremental Delay, d2		6.8			2.8			2.0	3.9			50.2
Delay (s)		57.2			52.8			54.0	27.5			87.3
Level of Service		E			D			D	C			F
Approach Delay (s)		57.2			52.8				28.6			
Approach LOS		E			D				C			

Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1201	30
Future Volume (vph)	1201	30
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	3408	
Flt Permitted	1.00	
Satd. Flow (perm)	3408	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	1251	31
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1281	0
Confl. Peds. (#/hr)		6
Confl. Bikes (#/hr)		5
Heavy Vehicles (%)	5%	23%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	83.8	
Effective Green, g (s)	85.1	
Actuated g/C Ratio	0.74	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.5	
Lane Grp Cap (vph)	2521	
v/s Ratio Prot	0.38	
v/s Ratio Perm		
v/c Ratio	0.51	
Uniform Delay, d1	6.2	
Progression Factor	1.00	
Incremental Delay, d2	0.7	
Delay (s)	7.0	
Level of Service	A	
Approach Delay (s)	10.2	
Approach LOS	B	

Intersection Summary

Movement	EBL	EBT	EBR2	WBU	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	31	42	8	9	14	40	52	227	12	1020	88	17
Future Volume (vph)	31	42	8	9	14	40	52	227	12	1020	88	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95				1.00	1.00	1.00	1.00	0.95	1.00	
Frpb, ped/bikes		1.00				1.00	1.00	0.98	1.00	1.00	0.99	
Flpb, ped/bikes		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.99				1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3418				1752	1863	1526	1770	3438	1532	
Flt Permitted		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3418				1752	1863	1526	1770	3438	1532	
Peak-hour factor, PHF	0.70	0.70	0.70	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92	0.88
Adj. Flow (vph)	44	60	11	9	15	42	55	239	13	1109	96	19
RTOR Reduction (vph)	0	106	0	0	0	0	0	215	0	0	0	0
Lane Group Flow (vph)	0	9	0	0	0	66	55	24	13	1109	96	0
Confl. Peds. (#/hr)	4		2			2		4			1	
Confl. Bikes (#/hr)								1			1	
Heavy Vehicles (%)	2%	2%	2%	0%	2%	4%	2%	4%	2%	5%	4%	0%
Turn Type	Split	NA		Split	Split	Split	NA	Perm	Prot	NA	Perm	Prot
Protected Phases	4	4		8	8	8	8		5	2		1
Permitted Phases								8			2	
Actuated Green, G (s)		6.2				8.4	8.4	8.4	1.1	41.3	41.3	
Effective Green, g (s)		7.1				9.3	9.3	9.3	2.0	42.6	42.6	
Actuated g/C Ratio		0.08				0.10	0.10	0.10	0.02	0.47	0.47	
Clearance Time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Vehicle Extension (s)		3.0				2.0	2.0	2.0	2.0	4.0	4.0	
Lane Grp Cap (vph)		266				178	189	155	38	1605	715	
v/s Ratio Prot		c0.00				c0.04	0.03		0.01	c0.32		
v/s Ratio Perm								0.02			0.06	
v/c Ratio		0.03				0.37	0.29	0.16	0.34	0.69	0.13	
Uniform Delay, d1		38.9				38.2	37.9	37.4	44.0	19.1	13.8	
Progression Factor		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1				0.5	0.3	0.2	2.0	1.4	0.1	
Delay (s)		38.9				38.7	38.2	37.5	45.9	20.5	13.9	
Level of Service		D				D	D	D	D	C	B	
Approach Delay (s)		38.9					37.9			20.3		
Approach LOS		D					D			C		

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	91.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL2	SBL	SBT	SBR	NWR2
Lane Configurations					
Traffic Volume (vph)	383	20	746	68	31
Future Volume (vph)	383	20	746	68	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0
Lane Util. Factor	0.91	0.95	0.95		1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00
Frt	1.00	1.00	0.99		0.86
Flt Protected	0.95	0.95	1.00		1.00
Satd. Flow (prot)	1584	1652	3367		1611
Flt Permitted	0.95	0.95	1.00		1.00
Satd. Flow (perm)	1584	1652	3367		1611
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.60
Adj. Flow (vph)	435	23	848	77	52
RTOR Reduction (vph)	0	0	3	0	47
Lane Group Flow (vph)	254	223	922	0	5
Confl. Peds. (#/hr)	1	1			
Confl. Bikes (#/hr)				5	
Heavy Vehicles (%)	4%	2%	6%	2%	2%
Turn Type	Prot	Prot	NA		Perm
Protected Phases	1	1	6		
Permitted Phases					8
Actuated Green, G (s)	15.3	15.3	55.5		8.4
Effective Green, g (s)	16.2	16.2	56.8		9.3
Actuated g/C Ratio	0.18	0.18	0.62		0.10
Clearance Time (s)	4.9	4.9	5.3		4.9
Vehicle Extension (s)	1.0	1.0	4.0		2.0
Lane Grp Cap (vph)	281	293	2096		164
v/s Ratio Prot	c0.16	0.13	0.27		
v/s Ratio Perm					0.00
v/c Ratio	0.90	0.76	0.44		0.03
Uniform Delay, d1	36.7	35.7	8.9		36.9
Progression Factor	1.00	1.00	1.00		1.00
Incremental Delay, d2	29.4	10.0	0.2		0.0
Delay (s)	66.1	45.7	9.1		36.9
Level of Service	E	D	A		D
Approach Delay (s)			25.3		
Approach LOS			C		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	20	22	6	124	20	2	1	16	1066	390	13	619
Future Volume (vph)	20	22	6	124	20	2	1	16	1066	390	13	619
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	3.2	4.0
Lane Util. Factor		1.00		0.95	0.95	1.00		1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes		1.00		1.00	1.00	0.98		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.98		1.00	1.00	0.85		1.00	1.00	0.85	1.00	0.99
Flt Protected		0.98		0.95	0.96	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1380		1681	1706	1557		1772	3471	1548	1770	3378
Flt Permitted		0.83		0.82	0.82	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1162		1446	1444	1557		1772	3471	1548	1770	3378
Peak-hour factor, PHF	0.57	0.57	0.57	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	35	39	11	136	22	2	1	17	1146	419	14	666
RTOR Reduction (vph)	0	5	0	0	0	2	0	0	0	84	0	1
Lane Group Flow (vph)	0	80	0	72	86	0	0	18	1146	335	14	690
Confl. Peds. (#/hr)	5					5		4		2	2	
Confl. Bikes (#/hr)			3									
Heavy Vehicles (%)	75%	2%	2%	2%	2%	2%	0%	2%	4%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8		8				2		
Actuated Green, G (s)		7.1		7.1	7.1	7.1		0.8	33.9	33.9	0.7	33.8
Effective Green, g (s)		8.0		8.0	8.0	8.0		1.7	35.6	35.6	2.4	35.5
Actuated g/C Ratio		0.14		0.14	0.14	0.14		0.03	0.62	0.62	0.04	0.62
Clearance Time (s)		4.9		4.9	4.9	4.9		4.9	5.7	5.7	4.9	5.7
Vehicle Extension (s)		2.0		2.0	2.0	2.0		1.0	4.0	4.0	1.0	4.0
Lane Grp Cap (vph)		162		202	201	217		52	2160	963	74	2096
v/s Ratio Prot								c0.01	c0.33		0.01	0.20
v/s Ratio Perm		c0.07		0.05	0.06	0.00				0.22		
v/c Ratio		0.49		0.36	0.43	0.00		0.35	0.53	0.35	0.19	0.33
Uniform Delay, d1		22.7		22.3	22.5	21.2		27.2	6.1	5.2	26.5	5.2
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.9		0.4	0.5	0.0		1.5	0.3	0.3	0.5	0.1
Delay (s)		23.6		22.7	23.0	21.2		28.7	6.4	5.5	26.9	5.3
Level of Service		C		C	C	C		C	A	A	C	A
Approach Delay (s)		23.6			22.8				6.4			5.7
Approach LOS		C			C				A			A

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	57.2	Sum of lost time (s)	12.9
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	23
Future Volume (vph)	23
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	25
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	4
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	65%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBT	WBR	WBR2	NBL2	NBT	NBR	SBU	SBL	SBR
Lane Configurations												
Traffic Volume (vph)	322	751	196	616	255	143	504	421	357	25	209	618
Future Volume (vph)	322	751	196	616	255	143	504	421	357	25	209	618
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	5.4	4.0	5.4	5.4	5.4	5.1	5.1			4.4	4.4
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	1.00	1.00	0.95			1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.99			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	0.85	1.00	0.93			1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	3127	3223	1380	3223	1442	1414	1583	2982			1630	2538
Flt Permitted	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	3127	3223	1380	3223	1442	1414	1583	2982			1630	2538
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	362	844	220	677	280	157	548	458	388	29	240	710
RTOR Reduction (vph)	0	0	0	0	0	117	0	64	0	0	0	47
Lane Group Flow (vph)	362	844	220	677	280	40	548	782	0	0	269	704
Confl. Peds. (#/hr)	6					6			2		2	
Heavy Vehicles (%)	12%	12%	17%	12%	12%	12%	14%	12%	12%	0%	12%	12%
Turn Type	Prot	NA	Free	NA	Prot	Perm	Split	NA		Prot	Prot	pt+ov
Protected Phases	5	2		6	6		8	8		7	7	7 5
Permitted Phases			Free			6						
Actuated Green, G (s)	15.0	49.5	120.0	30.8	30.8	30.8	37.6	37.6			18.0	37.4
Effective Green, g (s)	15.0	49.5	120.0	30.8	30.8	30.8	37.6	37.6			18.0	37.4
Actuated g/C Ratio	0.12	0.41	1.00	0.26	0.26	0.26	0.31	0.31			0.15	0.31
Clearance Time (s)	3.7	5.4		5.4	5.4	5.4	5.1	5.1			4.4	
Vehicle Extension (s)	2.0	4.0		4.0	4.0	4.0	2.0	2.0			2.0	
Lane Grp Cap (vph)	390	1329	1380	827	370	362	496	934			244	791
v/s Ratio Prot	0.12	0.26		c0.21	0.19		c0.35	0.26			c0.16	c0.28
v/s Ratio Perm			0.16			0.03						
v/c Ratio	0.93	0.64	0.16	0.82	0.76	0.11	1.10	0.84			1.10	0.89
Uniform Delay, d1	52.0	28.1	0.0	42.0	41.1	34.1	41.2	38.4			51.0	39.3
Progression Factor	0.74	1.11	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	22.8	1.8	0.2	8.9	13.5	0.6	72.2	6.3			87.8	11.9
Delay (s)	61.3	33.1	0.2	50.8	54.6	34.7	113.4	44.7			138.8	51.3
Level of Service	E	C	A	D	D	C	F	D			F	D
Approach Delay (s)		35.2		49.5				71.7				
Approach LOS		D		D				E				

Intersection Summary			
HCM 2000 Control Delay	56.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR2
Lane Configurations	
Traffic Volume (vph)	36
Future Volume (vph)	36
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.87
Adj. Flow (vph)	41
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	12%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	277	185	139	171	181	321	307	588	45	323	615	836
Future Volume (vph)	277	185	139	171	181	321	307	588	45	323	615	836
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4	4.7	5.4	5.4
Lane Util. Factor	0.91	0.91	1.00	0.95	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	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	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1521	3121	1583	1681	1658	1411	3433	3539	1583	3127	3539	1519
Flt Permitted	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1521	3121	1583	1681	1658	1411	3433	3539	1583	3127	3539	1519
Peak-hour factor, PHF	0.83	0.83	0.83	0.88	0.88	0.88	0.78	0.78	0.78	0.80	0.80	0.80
Adj. Flow (vph)	334	223	167	194	206	365	394	754	58	404	769	1045
RTOR Reduction (vph)	0	0	142	0	0	253	0	0	37	0	0	287
Lane Group Flow (vph)	184	373	25	175	225	112	394	754	21	404	769	758
Confl. Peds. (#/hr)	5					5						
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	8%	9%	2%	2%	9%	12%	2%	2%	2%	12%	2%	5%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8			2			6
Actuated Green, G (s)	18.2	18.2	18.2	18.8	18.8	18.8	16.8	44.2	44.2	18.5	45.9	45.9
Effective Green, g (s)	18.2	18.2	18.2	18.8	18.8	18.8	16.8	44.2	44.2	18.5	45.9	45.9
Actuated g/C Ratio	0.15	0.15	0.15	0.16	0.16	0.16	0.14	0.37	0.37	0.15	0.38	0.38
Clearance Time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4	4.7	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	230	473	240	263	259	221	480	1303	583	482	1353	581
v/s Ratio Prot	c0.12	0.12		0.10	c0.14		0.11	0.21		c0.13	0.22	
v/s Ratio Perm			0.02			0.08			0.01			c0.50
v/c Ratio	0.80	0.79	0.11	0.67	0.87	0.51	0.82	0.58	0.04	0.84	0.57	1.30
Uniform Delay, d1	49.1	49.0	43.9	47.6	49.4	46.4	50.1	30.4	24.3	49.3	29.2	37.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00
Incremental Delay, d2	16.9	7.9	0.1	4.9	24.4	0.7	10.3	1.9	0.1	7.0	1.0	144.2
Delay (s)	66.0	56.9	44.0	52.5	73.8	47.0	60.4	32.3	24.4	56.2	29.6	181.0
Level of Service	E	E	D	D	E	D	E	C	C	E	C	F
Approach Delay (s)		56.2			56.1			41.1			105.8	
Approach LOS		E			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	74.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.3
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	14	24	13	1	177	149	301	1	82	923	231	416
Future Volume (vph)	14	24	13	1	177	149	301	1	82	923	231	416
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00		1.00	0.95	1.00	0.97
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.99		1.00	1.00	0.99	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.95			1.00	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)	1770	3353			3047	1863	1533		1770	3471	1408	3367
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)	1770	3353			3047	1863	1533		1770	3471	1408	3367
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.86	0.86	0.86	0.86	0.94
Adj. Flow (vph)	15	26	14	1	190	160	324	1	95	1073	269	443
RTOR Reduction (vph)	0	13	0	0	0	0	269	0	0	0	86	0
Lane Group Flow (vph)	15	27	0	0	191	160	55	0	96	1073	183	443
Confl. Peds. (#/hr)	1						1		1		2	2
Confl. Bikes (#/hr)											1	
Heavy Vehicles (%)	2%	2%	2%	0%	15%	2%	4%	0%	2%	4%	13%	4%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	4		3	3	8		5	5	2		1
Permitted Phases							8				2	
Actuated Green, G (s)	2.7	9.8			12.9	20.0	20.0		12.4	54.3	54.3	20.7
Effective Green, g (s)	2.7	9.8			12.9	20.0	20.0		12.4	54.3	54.3	20.7
Actuated g/C Ratio	0.02	0.08			0.11	0.17	0.17		0.11	0.46	0.46	0.18
Clearance Time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0		2.0	4.0	4.0	2.0
Lane Grp Cap (vph)	40	279			334	317	260		186	1604	650	593
v/s Ratio Prot	0.01	0.01			c0.06	c0.09			0.05	0.31		c0.13
v/s Ratio Perm							0.04				0.13	
v/c Ratio	0.38	0.10			0.57	0.50	0.21		0.52	0.67	0.28	0.75
Uniform Delay, d1	56.6	49.8			49.7	44.3	42.0		49.7	24.6	19.5	45.9
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.1			1.5	0.5	0.1		1.0	1.2	0.3	4.5
Delay (s)	58.7	49.8			51.1	44.7	42.1		50.7	25.8	19.9	50.4
Level of Service	E	D			D	D	D		D	C	B	D
Approach Delay (s)		52.2				45.3				26.3		
Approach LOS		D				D				C		

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	117.5	Sum of lost time (s)	19.8
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1187	43
Future Volume (vph)	1187	43
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.3	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3452	
Flt Permitted	1.00	
Satd. Flow (perm)	3452	
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	1263	46
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1308	0
Confl. Peds. (#/hr)		1
Confl. Bikes (#/hr)		1
Heavy Vehicles (%)	4%	2%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	62.6	
Effective Green, g (s)	62.6	
Actuated g/C Ratio	0.53	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	1839	
v/s Ratio Prot	c0.38	
v/s Ratio Perm		
v/c Ratio	0.71	
Uniform Delay, d1	20.7	
Progression Factor	1.00	
Incremental Delay, d2	1.4	
Delay (s)	22.1	
Level of Service	C	
Approach Delay (s)	29.2	
Approach LOS	C	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	41	13	25	39	7	60	6	31	968	51	63	1141
Future Volume (vph)	41	13	25	39	7	60	6	31	968	51	63	1141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9			4.9	5.3		4.9	5.3
Lane Util. Factor		1.00			1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes		0.99			0.97			1.00	1.00		1.00	1.00
Flpb, ped/bikes		0.99			1.00			1.00	1.00		1.00	1.00
Frt		0.96			0.92			1.00	0.99		1.00	1.00
Flt Protected		0.97			0.98			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1368			1641			1775	3440		1770	3399
Flt Permitted		0.61			0.82			0.95	1.00		0.95	1.00
Satd. Flow (perm)		854			1375			1775	3440		1770	3399
Peak-hour factor, PHF	0.74	0.74	0.74	0.58	0.58	0.58	0.81	0.81	0.81	0.81	0.89	0.89
Adj. Flow (vph)	55	18	34	67	12	103	7	38	1195	63	71	1282
RTOR Reduction (vph)	0	18	0	0	52	0	0	0	2	0	0	1
Lane Group Flow (vph)	0	89	0	0	130	0	0	45	1256	0	71	1319
Confl. Peds. (#/hr)	29		11	11		29		2		11	11	
Confl. Bikes (#/hr)			2			1				3		
Heavy Vehicles (%)	51%	2%	2%	2%	2%	2%	0%	2%	4%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)		13.3			13.3			4.5	69.8		6.8	72.1
Effective Green, g (s)		13.3			13.3			4.5	69.8		6.8	72.1
Actuated g/C Ratio		0.13			0.13			0.04	0.66		0.06	0.69
Clearance Time (s)		4.9			4.9			4.9	5.3		4.9	5.3
Vehicle Extension (s)		1.5			1.5			1.0	4.0		1.0	4.5
Lane Grp Cap (vph)		108			174			76	2286		114	2333
v/s Ratio Prot								0.03	0.37		c0.04	c0.39
v/s Ratio Perm		c0.10			0.09							
v/c Ratio		0.82			0.75			0.59	0.55		0.62	0.57
Uniform Delay, d1		44.7			44.2			49.3	9.3		47.9	8.4
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		35.8			14.3			8.0	1.0		7.4	1.0
Delay (s)		80.5			58.6			57.3	10.2		55.2	9.4
Level of Service		F			E			E	B		E	A
Approach Delay (s)		80.5			58.6				11.9			11.8
Approach LOS		F			E				B			B

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	34
Future Volume (vph)	34
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.89
Adj. Flow (vph)	38
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	62%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR2	WBU	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	86	58	31	8	12	72	20	243	17	745	97	5
Future Volume (vph)	86	58	31	8	12	72	20	243	17	745	97	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Lane Util. Factor		0.95				1.00	1.00	1.00	1.00	0.95	1.00	
Frpb, ped/bikes		1.00				1.00	1.00	0.98	1.00	1.00	0.98	
Flpb, ped/bikes		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.97				1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3363				1746	1863	1518	1770	3471	1529	
Flt Permitted		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3363				1746	1863	1518	1770	3471	1529	
Peak-hour factor, PHF	0.83	0.83	0.83	0.71	0.71	0.71	0.71	0.71	0.76	0.76	0.76	0.86
Adj. Flow (vph)	104	70	37	11	17	101	28	342	22	980	128	6
RTOR Reduction (vph)	0	130	0	0	0	0	0	297	0	0	0	0
Lane Group Flow (vph)	0	81	0	0	0	129	28	45	22	980	128	0
Confl. Peds. (#/hr)	13					3		13	3		2	
Confl. Bikes (#/hr)											2	
Heavy Vehicles (%)	2%	2%	2%	0%	2%	4%	2%	4%	2%	4%	4%	0%
Turn Type	Split	NA		Split	Split	Split	NA	Perm	Prot	NA	Perm	Prot
Protected Phases	4	4		8	8	8	8		5	2		1
Permitted Phases								8			2	
Actuated Green, G (s)		8.0				11.9	11.9	11.9	2.4	38.2	38.2	
Effective Green, g (s)		8.0				11.9	11.9	11.9	2.4	38.2	38.2	
Actuated g/C Ratio		0.09				0.13	0.13	0.13	0.03	0.42	0.42	
Clearance Time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Vehicle Extension (s)		3.0				2.0	2.0	2.0	2.0	4.0	4.0	
Lane Grp Cap (vph)		296				229	244	199	46	1463	644	
v/s Ratio Prot		c0.02				c0.07	0.02		0.01	c0.28		
v/s Ratio Perm								0.03			0.08	
v/c Ratio		0.27				0.56	0.11	0.23	0.48	0.67	0.20	
Uniform Delay, d1		38.6				36.9	34.7	35.2	43.5	21.1	16.5	
Progression Factor		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.5				1.9	0.1	0.2	2.8	1.3	0.2	
Delay (s)		39.1				38.8	34.8	35.4	46.3	22.4	16.7	
Level of Service		D				D	C	D	D	C	B	
Approach Delay (s)		39.1					36.3			22.2		
Approach LOS		D					D			C		

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL2	SBL	SBT	SBR	NWR2
Lane Configurations					
Traffic Volume (vph)	235	16	814	24	45
Future Volume (vph)	235	16	814	24	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	5.3		4.9
Lane Util. Factor	0.91	0.95	0.95		1.00
Frpb, ped/bikes	1.00	1.00	1.00		0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00
Frt	1.00	1.00	1.00		0.86
Flt Protected	0.95	0.95	1.00		1.00
Satd. Flow (prot)	1582	1653	3456		1589
Flt Permitted	0.95	0.95	1.00		1.00
Satd. Flow (perm)	1582	1653	3456		1589
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.75
Adj. Flow (vph)	273	19	947	28	60
RTOR Reduction (vph)	0	0	1	0	52
Lane Group Flow (vph)	148	150	974	0	8
Confl. Peds. (#/hr)	2	2		3	
Confl. Bikes (#/hr)					1
Heavy Vehicles (%)	4%	2%	4%	2%	2%
Turn Type	Prot	Prot	NA		Perm
Protected Phases	1	1	6		
Permitted Phases					8
Actuated Green, G (s)	12.5	12.5	48.3		11.9
Effective Green, g (s)	12.5	12.5	48.3		11.9
Actuated g/C Ratio	0.14	0.14	0.53		0.13
Clearance Time (s)	4.9	4.9	5.3		4.9
Vehicle Extension (s)	1.0	1.0	4.0		2.0
Lane Grp Cap (vph)	218	228	1842		208
v/s Ratio Prot	c0.09	0.09	0.28		
v/s Ratio Perm					0.00
v/c Ratio	0.68	0.66	0.53		0.04
Uniform Delay, d1	37.1	37.0	13.8		34.4
Progression Factor	1.00	1.00	1.00		1.00
Incremental Delay, d2	6.5	5.1	0.4		0.0
Delay (s)	43.6	42.2	14.1		34.4
Level of Service	D	D	B		C
Approach Delay (s)			20.8		
Approach LOS			C		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	23	24	16	178	12	5	9	595	143	2	6	936
Future Volume (vph)	23	24	16	178	12	5	9	595	143	2	6	936
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.9	4.9	4.9	4.9	5.7	5.7		4.9	5.7
Lane Util. Factor		1.00		0.95	0.95	1.00	1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00		1.00	1.00	0.98	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		0.96		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00
Flt Protected		0.98		0.95	0.96	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		1721		1681	1696	1555	1766	3471	1550		1770	3462
Flt Permitted		0.85		0.83	0.78	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		1483		1461	1372	1555	1766	3471	1550		1770	3462
Peak-hour factor, PHF	0.78	0.78	0.78	0.68	0.68	0.68	0.74	0.74	0.74	0.79	0.79	0.79
Adj. Flow (vph)	29	31	21	262	18	7	12	804	193	3	8	1185
RTOR Reduction (vph)	0	12	0	0	0	6	0	0	62	0	0	0
Lane Group Flow (vph)	0	69	0	139	141	1	12	804	131	0	11	1190
Confl. Peds. (#/hr)	4					4	7					
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	9%	2%	2%	2%	2%	2%	2%	4%	2%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Perm	Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4			8		8			2			
Actuated Green, G (s)		11.6		11.6	11.6	11.6	0.8	36.3	36.3		0.8	36.3
Effective Green, g (s)		11.6		11.6	11.6	11.6	0.8	36.3	36.3		0.8	36.3
Actuated g/C Ratio		0.18		0.18	0.18	0.18	0.01	0.57	0.57		0.01	0.57
Clearance Time (s)		4.9		4.9	4.9	4.9	4.9	5.7	5.7		4.9	5.7
Vehicle Extension (s)		2.0		2.0	2.0	2.0	1.0	4.0	4.0		1.0	4.0
Lane Grp Cap (vph)		267		263	247	280	22	1962	876		22	1957
v/s Ratio Prot							c0.01	0.23			0.01	c0.34
v/s Ratio Perm		0.05		0.10	c0.10	0.00			0.08			
v/c Ratio		0.26		0.53	0.57	0.00	0.55	0.41	0.15		0.50	0.61
Uniform Delay, d1		22.6		23.8	24.0	21.6	31.5	7.9	6.6		31.5	9.2
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2		0.9	2.0	0.0	14.0	0.2	0.1		6.4	0.6
Delay (s)		22.8		24.7	26.0	21.6	45.5	8.1	6.7		37.9	9.9
Level of Service		C		C	C	C	D	A	A		D	A
Approach Delay (s)		22.8			25.3			8.3				10.1
Approach LOS		C			C			A				B

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	64.2	Sum of lost time (s)	15.5
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	4
Future Volume (vph)	4
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.79
Adj. Flow (vph)	5
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	7
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	50%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBT	WBR	WBR2	NBL2	NBT	NBR	SBU	SBL	SBR
Lane Configurations												
Traffic Volume (vph)	724	765	233	751	208	267	180	635	131	48	179	575
Future Volume (vph)	724	765	233	751	208	267	180	635	131	48	179	575
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	2.6	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	1.00	1.00	0.95			1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	0.85	1.00	0.97			1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	3127	3223	1392	3223	1442	1408	1543	3132			1649	2538
Flt Permitted	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	3127	3223	1392	3223	1442	1408	1543	3132			1649	2538
Peak-hour factor, PHF	0.88	0.88	0.88	0.95	0.95	0.95	0.89	0.89	0.89	0.94	0.94	0.94
Adj. Flow (vph)	823	869	265	791	219	281	202	713	147	51	190	612
RTOR Reduction (vph)	0	0	0	0	0	112	0	14	0	0	0	40
Lane Group Flow (vph)	823	869	265	791	219	169	202	846	0	0	241	603
Confl. Peds. (#/hr)	9					9			4		4	
Heavy Vehicles (%)	12%	12%	16%	12%	12%	12%	17%	12%	12%	0%	12%	12%
Turn Type	Prot	NA	Free	NA	Prot	Perm	Split	NA		Prot	Prot	pt+ov
Protected Phases	5	2		6	6		8	8		7	7	7 5
Permitted Phases			Free			6						
Actuated Green, G (s)	26.0	62.1	130.0	32.4	32.4	32.4	35.6	35.6			17.4	47.8
Effective Green, g (s)	25.7	63.5	130.0	33.8	33.8	33.8	36.7	36.7			17.8	48.2
Actuated g/C Ratio	0.20	0.49	1.00	0.26	0.26	0.26	0.28	0.28			0.14	0.37
Clearance Time (s)	3.7	5.4		5.4	5.4	5.4	5.1	5.1			4.4	
Vehicle Extension (s)	2.0	4.0		4.0	4.0	4.0	2.0	2.0			2.0	
Lane Grp Cap (vph)	618	1574	1392	837	374	366	435	884			225	941
v/s Ratio Prot	c0.26	0.27		c0.25	0.15		0.13	c0.27			c0.15	0.24
v/s Ratio Perm			0.19			0.12						
v/c Ratio	1.33	0.55	0.19	0.95	0.59	0.46	0.46	0.96			1.07	0.64
Uniform Delay, d1	52.1	23.3	0.0	47.2	42.0	40.5	38.5	45.9			56.1	33.8
Progression Factor	0.72	1.03	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	156.3	0.9	0.2	20.3	6.6	4.2	0.3	20.3			80.1	1.1
Delay (s)	194.0	24.8	0.2	67.5	48.6	44.6	38.8	66.1			136.2	34.9
Level of Service	F	C	A	E	D	D	D	E			F	C
Approach Delay (s)		92.6		59.3				60.9				
Approach LOS		F		E				E				

Intersection Summary			
HCM 2000 Control Delay	72.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	130.0	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	SBR2
Lane Configurations	
Traffic Volume (vph)	29
Future Volume (vph)	29
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	31
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	12%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	420	513	289	300	104	340	255	866	146	4	479	747
Future Volume (vph)	420	513	289	300	104	340	255	866	146	4	479	747
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	0.91	0.91	1.00	0.95	0.95	1.00	0.97	0.95	1.00		0.97	0.95
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00
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	0.85		1.00	1.00
Flt Protected	0.95	0.99	1.00	0.95	0.98	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1550	3232	1583	1681	1638	1423	3433	3539	1583		3129	3539
Flt Permitted	0.95	0.99	1.00	0.95	0.98	1.00	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1550	3232	1583	1681	1638	1423	3433	3539	1583		3129	3539
Peak-hour factor, PHF	0.96	0.96	0.96	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	438	534	301	316	109	358	277	941	159	4	526	821
RTOR Reduction (vph)	0	0	189	0	0	222	0	0	95	0	0	0
Lane Group Flow (vph)	315	657	112	209	216	136	277	941	64	0	530	821
Confl. Peds. (#/hr)							10					
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	6%	6%	2%	2%	13%	12%	2%	2%	2%	0%	12%	2%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	Prot	NA
Protected Phases	7	7		8	8		5	2		1	1	6
Permitted Phases			7			8			2			
Actuated Green, G (s)	29.7	29.7	29.7	20.0	20.0	20.0	14.5	36.0	36.0		24.0	45.5
Effective Green, g (s)	31.0	31.0	31.0	20.9	20.9	20.9	15.2	37.4	37.4		24.7	46.9
Actuated g/C Ratio	0.24	0.24	0.24	0.16	0.16	0.16	0.12	0.29	0.29		0.19	0.36
Clearance Time (s)	5.3	5.3	5.3	4.9	4.9	4.9	4.7	5.4	5.4		4.7	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		2.0	3.0
Lane Grp Cap (vph)	369	770	377	270	263	228	401	1018	455		594	1276
v/s Ratio Prot	0.20	c0.20		0.12	c0.13		0.08	c0.27			c0.17	0.23
v/s Ratio Perm			0.07			0.10			0.04			
v/c Ratio	0.85	0.85	0.30	0.77	0.82	0.59	0.69	0.92	0.14		0.89	0.64
Uniform Delay, d1	47.3	47.3	40.6	52.3	52.7	50.6	55.1	44.9	34.4		51.4	34.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.95	0.83
Incremental Delay, d2	16.6	8.8	0.2	11.9	17.5	2.8	4.1	15.0	0.6		11.2	1.7
Delay (s)	63.9	56.1	40.7	64.2	70.2	53.4	59.3	59.9	35.0		59.7	30.5
Level of Service	E	E	D	E	E	D	E	E	D		E	C
Approach Delay (s)		54.4			60.9			56.9				42.5
Approach LOS		D			E			E				D

Intersection Summary			
HCM 2000 Control Delay	52.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.7
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	352
Future Volume (vph)	352
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.97
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1469
Flt Permitted	1.00
Satd. Flow (perm)	1469
Peak-hour factor, PHF	0.91
Adj. Flow (vph)	387
RTOR Reduction (vph)	247
Lane Group Flow (vph)	140
Confl. Peds. (#/hr)	10
Confl. Bikes (#/hr)	7
Heavy Vehicles (%)	7%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	45.5
Effective Green, g (s)	46.9
Actuated g/C Ratio	0.36
Clearance Time (s)	5.4
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	529
v/s Ratio Prot	
v/s Ratio Perm	0.10
v/c Ratio	0.26
Uniform Delay, d1	29.4
Progression Factor	1.49
Incremental Delay, d2	0.8
Delay (s)	44.6
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	87	119	70	2	178	34	347	2	17	1342	181	417
Future Volume (vph)	87	119	70	2	178	34	347	2	17	1342	181	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			3.3	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00		1.00	0.95	1.00	0.97
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98		1.00	1.00	0.99	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.94			1.00	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)	1770	3322			3049	1863	1527		1773	3471	1386	3367
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)	1770	3322			3049	1863	1527		1773	3471	1386	3367
Peak-hour factor, PHF	0.71	0.71	0.71	0.90	0.90	0.90	0.90	0.89	0.89	0.89	0.89	0.88
Adj. Flow (vph)	123	168	99	2	198	38	386	2	19	1508	203	474
RTOR Reduction (vph)	0	76	0	0	0	0	253	0	0	0	62	0
Lane Group Flow (vph)	123	191	0	0	200	38	133	0	21	1508	141	474
Confl. Peds. (#/hr)	4		4		4		4		3		1	1
Confl. Bikes (#/hr)												
Heavy Vehicles (%)	2%	2%	2%	0%	15%	2%	4%	0%	2%	4%	15%	4%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	4		3	3	8		5	5	2		1
Permitted Phases							8				2	
Actuated Green, G (s)	14.0	16.9			13.9	16.8	16.8		6.0	55.2	55.2	28.2
Effective Green, g (s)	14.6	18.2			15.2	18.1	18.1		6.6	56.5	56.5	28.8
Actuated g/C Ratio	0.11	0.14			0.11	0.14	0.14		0.05	0.42	0.42	0.21
Clearance Time (s)	4.6	5.3			4.6	5.3	5.3		4.6	5.3	5.3	4.6
Vehicle Extension (s)	3.0	2.0			3.0	2.0	2.0		2.0	4.0	4.0	2.0
Lane Grp Cap (vph)	192	451			345	251	206		87	1463	584	723
v/s Ratio Prot	c0.07	0.06			0.07	0.02			0.01	c0.43		c0.14
v/s Ratio Perm							c0.09				0.10	
v/c Ratio	0.64	0.42			0.58	0.15	0.64		0.24	1.03	0.24	0.66
Uniform Delay, d1	57.2	53.1			56.4	51.2	54.9		61.3	38.8	25.0	48.1
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	7.1	0.2			2.4	0.1	5.1		0.5	31.8	1.0	1.6
Delay (s)	64.3	53.3			58.7	51.3	60.0		61.8	70.5	25.9	49.7
Level of Service	E	D			E	D	E		E	E	C	D
Approach Delay (s)		56.8				59.0				65.2		
Approach LOS		E				E				E		

Intersection Summary			
HCM 2000 Control Delay	49.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1130	10
Future Volume (vph)	1130	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	3466	
Flt Permitted	1.00	
Satd. Flow (perm)	3466	
Peak-hour factor, PHF	0.88	0.88
Adj. Flow (vph)	1284	11
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1295	0
Confl. Peds. (#/hr)		3
Confl. Bikes (#/hr)		4
Heavy Vehicles (%)	4%	2%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	77.4	
Effective Green, g (s)	78.7	
Actuated g/C Ratio	0.59	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.0	
Lane Grp Cap (vph)	2035	
v/s Ratio Prot	0.37	
v/s Ratio Perm		
v/c Ratio	0.64	
Uniform Delay, d1	18.2	
Progression Factor	1.00	
Incremental Delay, d2	1.5	
Delay (s)	19.7	
Level of Service	B	
Approach Delay (s)	27.8	
Approach LOS	C	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	40	15	31	21	14	22	12	44	1231	26	7	44
Future Volume (vph)	40	15	31	21	14	22	12	44	1231	26	7	44
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
Lane Util. Factor		1.00			1.00			1.00	0.95			1.00
Frpb, ped/bikes		0.99			0.99			1.00	1.00			1.00
Flpb, ped/bikes		1.00			1.00			1.00	1.00			1.00
Frt		0.95			0.95			1.00	1.00			1.00
Flt Protected		0.98			0.98			0.95	1.00			0.95
Satd. Flow (prot)		1391			1714			1777	3456			1774
Flt Permitted		0.76			0.82			0.95	1.00			0.12
Satd. Flow (perm)		1084			1429			1777	3456			232
Peak-hour factor, PHF	0.75	0.75	0.75	0.65	0.65	0.65	0.93	0.93	0.93	0.93	0.96	0.96
Adj. Flow (vph)	53	20	41	32	22	34	13	47	1324	28	7	46
RTOR Reduction (vph)	0	20	0	0	22	0	0	0	2	0	0	0
Lane Group Flow (vph)	0	94	0	0	66	0	0	60	1350	0	0	53
Confl. Peds. (#/hr)	7		7	7		7		6		22		22
Confl. Bikes (#/hr)						2				1		
Heavy Vehicles (%)	53%	2%	2%	2%	2%	2%	0%	2%	4%	2%	0%	2%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA			Prot
Protected Phases		4			8		5	5	2			1
Permitted Phases	4			8								
Actuated Green, G (s)		12.8			12.8			6.6	55.8			31.3
Effective Green, g (s)		13.7			13.7			7.5	57.1			32.2
Actuated g/C Ratio		0.12			0.12			0.07	0.50			0.28
Clearance Time (s)		4.9			4.9			4.9	5.3			4.9
Vehicle Extension (s)		1.5			1.5			1.0	4.0			1.0
Lane Grp Cap (vph)		129			170			115	1715			64
v/s Ratio Prot								0.03	c0.39			
v/s Ratio Perm		c0.09			0.05							c0.23
v/c Ratio		0.73			0.39			0.52	0.79			0.83
Uniform Delay, d1		48.8			46.8			52.0	23.9			38.8
Progression Factor		1.00			1.00			1.00	1.00			1.00
Incremental Delay, d2		15.8			0.5			2.0	3.7			54.0
Delay (s)		64.6			47.3			54.0	27.7			92.8
Level of Service		E			D			D	C			F
Approach Delay (s)		64.6			47.3				28.8			
Approach LOS		E			D				C			

Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1188	44
Future Volume (vph)	1188	44
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3396	
Flt Permitted	1.00	
Satd. Flow (perm)	3396	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	1238	46
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1283	0
Confl. Peds. (#/hr)		6
Confl. Bikes (#/hr)		5
Heavy Vehicles (%)	4%	48%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	80.5	
Effective Green, g (s)	81.8	
Actuated g/C Ratio	0.71	
Clearance Time (s)	5.3	
Vehicle Extension (s)	4.5	
Lane Grp Cap (vph)	2415	
v/s Ratio Prot	0.38	
v/s Ratio Perm		
v/c Ratio	0.53	
Uniform Delay, d1	7.7	
Progression Factor	1.00	
Incremental Delay, d2	0.8	
Delay (s)	8.5	
Level of Service	A	
Approach Delay (s)	11.9	
Approach LOS	B	

Intersection Summary

Movement	EBL	EBT	EBR2	WBU	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	31	42	8	9	14	40	52	227	12	1007	88	17
Future Volume (vph)	31	42	8	9	14	40	52	227	12	1007	88	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95				1.00	1.00	1.00	1.00	0.95	1.00	
Frpb, ped/bikes		1.00				1.00	1.00	0.98	1.00	1.00	0.99	
Flpb, ped/bikes		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.99				1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3418				1752	1863	1526	1770	3471	1532	
Flt Permitted		0.98				0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3418				1752	1863	1526	1770	3471	1532	
Peak-hour factor, PHF	0.70	0.70	0.70	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92	0.88
Adj. Flow (vph)	44	60	11	9	15	42	55	239	13	1095	96	19
RTOR Reduction (vph)	0	106	0	0	0	0	0	214	0	0	0	0
Lane Group Flow (vph)	0	9	0	0	0	66	55	25	13	1095	96	0
Confl. Peds. (#/hr)	4		2			2		4			1	
Confl. Bikes (#/hr)								1			1	
Heavy Vehicles (%)	2%	2%	2%	0%	2%	4%	2%	4%	2%	4%	4%	0%
Turn Type	Split	NA		Split	Split	Split	NA	Perm	Prot	NA	Perm	Prot
Protected Phases	4	4		8	8	8	8		5	2		1
Permitted Phases								8			2	
Actuated Green, G (s)		6.2				8.4	8.4	8.4	1.1	40.7	40.7	
Effective Green, g (s)		7.1				9.3	9.3	9.3	2.0	42.0	42.0	
Actuated g/C Ratio		0.08				0.10	0.10	0.10	0.02	0.46	0.46	
Clearance Time (s)		4.9				4.9	4.9	4.9	4.9	5.3	5.3	
Vehicle Extension (s)		3.0				2.0	2.0	2.0	2.0	4.0	4.0	
Lane Grp Cap (vph)		267				179	191	156	39	1609	710	
v/s Ratio Prot		c0.00				c0.04	0.03		0.01	c0.32		
v/s Ratio Perm								0.02			0.06	
v/c Ratio		0.03				0.37	0.29	0.16	0.33	0.68	0.14	
Uniform Delay, d1		38.6				37.9	37.6	37.1	43.6	19.0	13.9	
Progression Factor		1.00				1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1				0.5	0.3	0.2	1.8	1.3	0.1	
Delay (s)		38.6				38.4	37.9	37.2	45.5	20.3	14.0	
Level of Service		D				D	D	D	D	C	B	
Approach Delay (s)		38.6					37.6			20.1		
Approach LOS		D					D			C		

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL2	SBL	SBT	SBR	NWR2
Lane Configurations					
Traffic Volume (vph)	383	20	733	68	31
Future Volume (vph)	383	20	733	68	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0
Lane Util. Factor	0.91	0.95	0.95		1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00
Frt	1.00	1.00	0.99		0.86
Flt Protected	0.95	0.95	1.00		1.00
Satd. Flow (prot)	1584	1652	3426		1611
Flt Permitted	0.95	0.95	1.00		1.00
Satd. Flow (perm)	1584	1652	3426		1611
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.60
Adj. Flow (vph)	435	23	833	77	52
RTOR Reduction (vph)	0	0	3	0	47
Lane Group Flow (vph)	254	223	907	0	5
Confl. Peds. (#/hr)	1	1			
Confl. Bikes (#/hr)				5	
Heavy Vehicles (%)	4%	2%	4%	2%	2%
Turn Type	Prot	Prot	NA		Perm
Protected Phases	1	1	6		
Permitted Phases					8
Actuated Green, G (s)	15.3	15.3	54.9		8.4
Effective Green, g (s)	16.2	16.2	56.2		9.3
Actuated g/C Ratio	0.18	0.18	0.62		0.10
Clearance Time (s)	4.9	4.9	5.3		4.9
Vehicle Extension (s)	1.0	1.0	4.0		2.0
Lane Grp Cap (vph)	283	295	2125		165
v/s Ratio Prot	c0.16	0.13	0.26		
v/s Ratio Perm					0.00
v/c Ratio	0.90	0.76	0.43		0.03
Uniform Delay, d1	36.4	35.3	8.9		36.6
Progression Factor	1.00	1.00	1.00		1.00
Incremental Delay, d2	27.9	9.4	0.2		0.0
Delay (s)	64.2	44.7	9.1		36.6
Level of Service	E	D	A		D
Approach Delay (s)			24.9		
Approach LOS			C		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	7	22	6	124	20	2	1	16	1066	390	13	619
Future Volume (vph)	7	22	6	124	20	2	1	16	1066	390	13	619
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	3.2	4.0
Lane Util. Factor		1.00		0.95	0.95	1.00		1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes		1.00		1.00	1.00	0.98		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.98		1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.99		0.95	0.96	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1706		1681	1706	1557		1772	3471	1548	1770	3453
Flt Permitted		0.92		0.93	0.79	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1589		1654	1398	1557		1772	3471	1548	1770	3453
Peak-hour factor, PHF	0.57	0.57	0.57	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	12	39	11	136	22	2	1	17	1146	419	14	666
RTOR Reduction (vph)	0	8	0	0	0	2	0	0	0	83	0	0
Lane Group Flow (vph)	0	54	0	72	86	0	0	18	1146	336	14	677
Confl. Peds. (#/hr)	5					5		4		2	2	
Confl. Bikes (#/hr)			3									
Heavy Vehicles (%)	29%	2%	2%	2%	2%	2%	0%	2%	4%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8		8				2		
Actuated Green, G (s)		6.9		6.9	6.9	6.9		0.8	33.8	33.8	0.7	33.7
Effective Green, g (s)		7.8		7.8	7.8	7.8		1.7	35.5	35.5	2.4	35.4
Actuated g/C Ratio		0.14		0.14	0.14	0.14		0.03	0.62	0.62	0.04	0.62
Clearance Time (s)		4.9		4.9	4.9	4.9		4.9	5.7	5.7	4.9	5.7
Vehicle Extension (s)		2.0		2.0	2.0	2.0		1.0	4.0	4.0	1.0	4.0
Lane Grp Cap (vph)		217		226	191	213		52	2165	965	74	2148
v/s Ratio Prot								c0.01	c0.33		0.01	0.20
v/s Ratio Perm		0.03		0.04	c0.06	0.00				0.22		
v/c Ratio		0.25		0.32	0.45	0.00		0.35	0.53	0.35	0.19	0.32
Uniform Delay, d1		21.9		22.2	22.6	21.2		27.1	6.0	5.1	26.3	5.1
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.2		0.3	0.6	0.0		1.5	0.3	0.3	0.5	0.1
Delay (s)		22.2		22.4	23.2	21.2		28.5	6.3	5.4	26.8	5.2
Level of Service		C		C	C	C		C	A	A	C	A
Approach Delay (s)		22.2			22.8				6.3			5.6
Approach LOS		C			C				A			A

Intersection Summary			
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	56.9	Sum of lost time (s)	12.9
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	10
Future Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	11
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	4
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	20%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary