FEHR PEERS

Memorandum

Date: October 31, 2024

To: Jennifer Harmon, Diablo Engineering Group

From: Robert Rees and Lam Ngo, Fehr & Peers

Subject: 40th Street Phase II Traffic Analysis

OK22-0501

This memorandum summarizes the results of the multimodal safety and operations analysis Fehr & Peers completed for Phase II of the 40th Street Multimodal Project (Project) in Emeryville, CA. The Phase II segment extends between the IKEA entry and Christie Avenue. The Phase I analysis is documented in a separate memorandum *40th Street Multimodal Project – Phase I Multimodal Transportation Analysis* (October 2024) which addresses traffic operations on 40th Street between the IKEA entry and Adeline Street.

This memorandum describes the analysis results for the modeled transportation conditions along Shellmound Street with and without the roadway improvements planned for Phase II of the Project.

Findings and Recommendations

Safety

The Project follows the Safe System Approach creating a self-enforcing design where "safe behaviors are the easy behaviors" and mistakes do not have lethal consequences. Behaviors that will be eliminated or reduced include speeding, right-hook crashes, contra-flow bicycle riding, and motorist encroachment into the bike lane.

The two-way cycle track on the west side of Shellmound Street separates users in space and time, and, to the extent possible, the number of intersections that bicycles interact with motor vehicles. With the west side cycle track bicycles and motor vehicles interact at two locations – the hotel driveway (opposite Ohlone Way) and the driveway serving the back side of the Powell Street Plaza. A cycle-track on the east side of Shellmound Street was discarded because bicycles would interact with motor vehicles at nine locations – two IKEA driveways, Bay Street Parking, Bay Street, Ohlone Way, two residence driveways, Brunswig Lane, and Christie Avenue.

Driving speeds with the Project's road diet are expected to decrease by 4 to 6 miles per hour because average driving speeds before the Project dictate the predominant speed when drivers

are unable to pass slower moving drivers with the Project. Speed is exponentially related to severe injuries and fatalities when a collision occurs, and so the speed reduction is meaningful for vulnerable road users i.e., pedestrians and bicyclists in the corridor.

Operations

Overall, the conversion of the rightmost general-purpose lane in both directions to a bus-only lane between the IKEA entry and Christie Avenue and the addition of separated two-way cycle track along the west side of Shellmound Street, degrades intersection operations for motor vehicle traffic at the Christie Avenue intersection with Shellmound Street. During the weekday AM and PM peak hours this intersection is anticipated to operate at acceptable levels with the Project; but is expected to degrade to LOS E during the weekend conditions. Following is the study recommendation:

- Implement the northbound and southbound bus-only lanes between the IKEA entry and Christie Avenue on the weekdays, Monday through Friday.
- Open the bus-only lanes to general traffic during the weekends.

With this recommendation Shellmound Street is expected to always operate at LOS D or better throughout the week and weekend. This recommendation should extend between the IKEA entry intersection and the Christie Avenue intersection and is needed to address the northbound queue congestion that would form during the weekend at the Christie Avenue intersection.

Safety Assessment

Vehicle Speed Implications

The Project incorporates a road diet reducing the number of motor vehicle lanes from two in each direction to one lane each way by converting the curb lane each way from a motor vehicle lane to a bus only lane. The change means that driving speeds will be determined by the drivers traveling at a slower speed, sometimes referred to as the "prudent driver." On a street with two lanes each way drivers make lane changes to pass slower moving drivers and this tends to increase driving speeds along a corridor. The Project reduces the number of lanes to one lane in each direction and so drivers are not able to change lanes to pass slower moving drivers.

Driving speeds with the Project are expected to decrease such that average driving speed before the Project becomes the 85th percentile speed after the Project's road diet. This is because average driving speeds before the Project dictate the predominant speed when drivers are unable to pass slower moving drivers with the Project. The net benefit is a speed reduction of 4 to 6 miles per hour. Because speed is exponentially related to severe injuries and fatalities when a collision occurs, this speed reduction is meaningful for vulnerable road users i.e., pedestrians and bicyclists in the corridor.

The northbound bus only lane on Shellmound Street, adjacent to the sidewalk, has a secondary comfort benefit to pedestrians using the sidewalk. There would be up to 15 buses per hour using

the northbound bus only lane and all other traffic would be in the lane adjacent to the bus only lane. This condition separates most of the motor vehicle traffic from the sidewalk by about 11 feet and this separation provides comfort to those walking on the sidewalk.

Conflict Points

Currently, bicyclists and pedestrians are proximate to high-speed vehicles with no protection. The highest kinetic energy risk (injury risk) occurs when speed and mass are high in a conflict with vulnerable road users i.e., bicyclists and pedestrians. High speed locations include midblock and high speed right turns (with large radii and on /off the corridor where turns are not protected). These conflict points are exacerbated where heavy vehicles (trucks and buses) are also present.

The project area collision summaries (**Figure 1**) show 12 injury crashes over a 7-year period (2015 through 2021) between vehicles and other vehicles, cyclists, and pedestrians. Six of the crashes occurred at intersections including two pedestrian / vehicle crashes, one bike / vehicle crash, and three vehicle / vehicle crashes while six additional vehicle / vehicle crashes occurred between intersections.

The 6 crashes at intersections occurred because of turning vehicles. At Christie Avenue and at Bay Street pedestrians in the crosswalk were hit by turning vehicles while a second collision at both Christie Avenue and Bay Street occurred when through vehicles collided with turning vehicles. At Brunswig Lane, a cyclist was hit by a turning vehicle, and at one of the IKEA intersections where a through vehicle collided with a turning vehicle. These collisions are an indication that drivers are potentially inattentive to conflicting movements when turning.

Separating bicycle and vehicle movements is a safety counter measure to address inattentive behavior. The Project proposes constructing a separated two-way cycle track on the west side of Shellmound Street to fully separate bicycle traffic from turning traffic to the extent possible. In total, the west side cycle track would fully separate bicycle traffic at 8 intersections/ driveways including two at IKEA, the Bay Street Garage, Bay Street, Brunswig Lane, two residential garage driveways, and Christie Avenue. The Project proposes separate bicycle signal phasing at Christie Avenue to fully separate bicycle and vehicle traffic. After completion, the west side cycle track will only cross the hotel driveway at the Ohlone Way intersection, and the driveway serving the back side of the Powell Street Plaza, both of which have lower turn volumes than at major driveways serving Bay Street Emeryville and IKEA on the east side of Shellmound Street.

Locating the two-way cycle track on the east side of Shellmound Street was considered and discarded because it would intersect with 9 intersections / driveways including two at IKEA, the Bay Street Garage, Bay Street, Ohlone Way, Brunswig Lane, two residential garage driveways, and Christie Avenue. The separate bicycle signal phasing at Christie Avenue, with the west side cycle track, would not be feasible if the cycle track were on the east side and so bicyclists on the east side cycle track would also conflict with turning vehicles at Christie Avenue to and from Bay Street Emeryville.

Project Phase 1

Project Phase 2

Collision Severity and Count

- Vehicle Visible Injury Collision (4)
- Bicycle Visible Injury Collision (1)
- Pedestrian Visible Injury Collision (2)
- Vehicle Complaint of Pain Collision (5)

Figure 1
Bicycle, Pedestrian, and Auto Injury Collisions (2015-2021)

To address midblock conflicts between bicycles and vehicles, the Project incorporates a raised median to separate the west side cycle track from motor vehicle traffic. The raised median is an effective counter measure because bicyclists will be buffered from the motorized traffic by the raised median. Conflicts with buses will be addressed with bus stop enhancements and dedicated bus lanes that separate bicycles from buses and bus riders.

Compliance with Laws

The Project incorporates several design elements to prevent motorists from speeding and ensure compliance with California Vehicle Code 21209 VC, which prohibits vehicles from being driven in bicycle lanes. The Project introduces physically protected bicycle lanes with barriers, putting both eastbound and westbound bicycle riders on the north side of the street in a two-way separated bikeway, making it difficult for vehicles to encroach on these lanes. This separation enhances the safety of cyclists by clearly delineating the space for bicycles and motor vehicles. Additionally, the Project reduces the number of westbound vehicle travel lanes to a single lane. This design change significantly impacts driver behavior by eliminating opportunities to pass slower traffic, naturally calming traffic flow and reducing speeds. The narrower roadway and single westbound travel lane create a visual and physical environment that encourages drivers to adhere to the posted speed limit. The implementation of these measures, including the two-way protected bike lanes and reduced lane widths, not only discourages speeding but also promotes safer interactions between motorists and cyclists. By designing the roadway to control and moderate vehicle speeds, the Project ensures a safer, more predictable environment for all road users, aligning with the goals of improving safety and accessibility in Emeryville.

Adequacy of Bike Facilities

Strictly from a traffic engineering perspective, the average daily traffic, posted speeds, and observed speeds were assessed. Observed motor vehicle speeds exceeded 20 mph along the corridor and ADT was above 10,000. Caltrans guidance (DIB 94 https://dot.ca.gov/-/media/dotmedia/ programs/design/documents/dib-94-010224-a11y.pdf) recommends a Class I or Class IV bicycle facility for this speed and volume context.

Currently, bicyclists using the corridor are confronted with Class II bike lanes with no intersection treatments or dedicated bicycle signal phasing. As noted in Caltrans DIB 94, Class II bike lanes are not appropriate for the speed and volume of the corridor. Lack of bicycle treatments at intersections increases the risk of right-hook and left-hook bicycle-vehicle collisions at intersections.

The Project follows the Safe System Approach to proactively address vulnerable road user safety by reducing speed, removing conflicts, and separating users in space and time. The Project replaces the existing Class II bike lanes with Class IV bike lanes, which may reduce bicycle-vehicle crashes by up to 53% according to the California Local Road Safety Manual (LRSM). The addition of advance stop bars may reduce pedestrian crashes by up to 25%. Protected corners and dedicated bicycle phasing reduce conflict at intersections by separating bicyclists from other road

users in space and time. The Project reduces the number of vehicles crossing bicycle movements throughout the corridor by locating the two-way cycle track on the west side of Shellmound Street.

Reduce Behaviors Leading to Crashes

Following the Safe System Approach, the Project creates a self-enforcing design where "safe behaviors are the easy behaviors" and mistakes do not have lethal consequences. Behaviors that will be eliminated or reduced include speeding, right-hook crashes, contra-flow bicycle riding, and motorist encroachment into the bike lane. As noted above, the road diet is expected to reduce corridor speeds.

The two-way separated bikeway and increased multimodal accessibility at intersections will reduce contra-flow bicycle travel. The separation also provides a barrier that prevents moving vehicles from passing, loading, or parking in the bike lane. The Project separates users in time using protected left and right turn phases at high-volume conflict points, reducing crashes associated with turning movements.

Operations Methodology

Project Study Intersections

There are five (5) study intersections. **Appendix A** shows the locations and turning movements at the project study intersections. All intersections are signalized and coordinated along Shellmound Street.

1. Shellmound Street at Christie Avenue
2. Shellmound Street at Ohlone Way
3. Shellmound Street at Bay Street
4. Shellmound Street at IKEA Exit
5. Shellmound Street at IKEA Entrance

The analysis was done for five (5) identified peak hour timing plans: AM, Midday, PM, Weekend Midday, and Weekend PM. The study intersections were evaluated for three (3) scenarios:

- **Scenario 1 (Existing Conditions)**: Existing lane configuration, volumes, and timings
- **Scenario 2**: Proposed lane configuration, existing volumes, existing timings
- **Scenario 3**: Proposed lane configuration, existing volumes, optimized timings

Intersection Analysis Methodology

Existing operational conditions at the 5 study intersections were evaluated using the 2000 Highway Capacity Manual (HCM) Level of Service (LOS) methodology. Synchro software was used for this analysis.

Level of service is an expression, in the form of a scale, of the relationship between the capacity of an intersection and the demand volume of traffic moving through it. The level of service scale

describes traffic flow with six ratings ranging from A to F, with A indicating free flow and F indicating jammed conditions with excessive delay.

For signalized intersections, the HCM methodology determines the capacity of each lane group approaching the intersection. The LOS is based on average control delay (in seconds per vehicle) for various movements within the intersection. A combined weighted average control delay and LOS are presented for the intersection. **Appendix B** summarizes the HCM 2000 results for the study intersections. **Table 1** on the next page describes the relationship between LOS and the average control delay at signalized intersections.

Table 1: HCM 2000 Level of Service for Signalized Intersections

Level of Service	Delay (seconds per vehicle)	Description of Operations
A	< 10	**Free Flow/Insignificant Delays**: No approach phase fully utilized by traffic and no vehicle waits longer than one red indication. Most vehicles do not stop at all. Progression is favorable and most vehicles arrive during the green phase.
B	> 10 – 20	**Stable Operation/Minimal Delays**: Occasional approach phase is fully utilized. Many drivers begin to feel restricted within vehicle platoons. Occurs with good progression and/or short cycles.
C	> 20 – 35	**Stable Operation/Acceptable Delays**: Major approach phases fully utilized. Most drivers feel restricted. Higher delays from fair progression and longer cycles. Individual cycle failures may occur, and the number of vehicles stopping is significant.
D	> 35 – 55	**Approaching Unstable/Tolerable Delays**: Congestion becomes more noticeable. Drivers may wait through more than one red signal indication. Longer delays result from combination of unfavorable progression and long cycle lengths, or high v/c ratios. Proportion of vehicles not stopping declines, and individual cycle failures are noticeable.
E	> 55 – 80	**Unstable Operation/Significant Delays**: Vehicles may wait several cycles. Long queues form upstream from the intersection. High delays indicate poor progression, long cycles, and high v/c ratios. Individual cycle failures are a frequent occurrence.
F	> 80	**Forced Flow/Excessive Delays**: Represents jammed conditions. Queues may block upstream intersections. Arrival flow rates exceed capacity and are unacceptable to most drivers. Poor progression, long cycle lengths, and v/c ratios approaching 1.0 contribute to high delay.

Source: Highway Capacity Manual, Transportation Research Board, Washington D.C.

Synchro Model

The Synchro analysis model was built from the City of Emeryville's (City) citywide Synchro software network and field observations. The same peak hours were used for all analysis scenarios. A peak hour factor of 1.00 is assumed for all scenarios due to even demand volumes across the peak period and the expectation that the Project may cause congestion, thereby dispersing traffic more evenly across the peak hours of analysis.

Project Assumptions

Scenario 1 assumes existing lane configuration as described in the City's Synchro model. Under Scenarios 2 and Scenario 3, the proposed geometry is sourced from the 40th Street Bay Trail Gap Closure Project which constructs a two-way cycle track on the west side of the Shellmound Street corridor and converts one vehicle lane in each direction to bus-only lanes.

Two-way Cycle Track Features

The Project (Phase II of the 40th Street Multimodal Project) proposes a separated two-way bikeway on the west side of Shellmound Street between the IKEA entry and Christie Avenue. This Project would connect the two-way cycle track as part of Phase I of the 40th Street Multimodal Project with the existing east-west two-way cycle track on Christie Avenue. At the IKEA entry, the cycle track shifts from the east side to the west side of Shellmound Street and cyclists would cross the southern leg crosswalk at the IKEA entry to make this transition. To enhance the safety of cyclists using the cycle track at the IKEA entry, turning right on red would be prohibited.

Bus-Only Lanes

The concept design assumes no change to the current cross-section along Shellmound Street between the IKEA entry and Bay Street and between Ohlone Way and Christie Avenue. At Ohlone Way, the northbound right turn lane is removed, and the rightmost lane is converted to a transit-only lane where vehicles can merge into the bus-only lane to turn right.

The southbound bus-only lane starts south of Christie Avenue and extends to IKEA, where it then continues over the Shellmound Street bridge as part of Phase I of the 40th Street Multimodal Project. The northbound bus-only lane starts at the IKEA entry and goes up to Christie Avenue where it ends. A future project would extend the transit-only north of Christie Avenue.

Analysis Results

As a reminder, the analysis was done for five (5) peak hour timing plans: AM, Midday, PM, Weekend Midday, and Weekend PM. And, evaluated for three (3) scenarios:

- **Scenario 1 (Existing Conditions)**: Existing lane configuration, volumes, and timings
- **Scenario 2**: Proposed lane configuration, existing volumes, existing timings
- **Scenario 3**: Proposed lane configuration, existing volumes, optimized timings

Level of Service and Delay Analysis

Table 2a documents the existing level of service conditions at the study intersections. Under existing conditions, all intersections are performing at LOS D or better.

Table 2a: Intersection Level of Service Conditions under Scenario 1 (Existing Conditions)

Intersection along Shellmound Street		Control type	Level of Service (delay in seconds) during peak hour				
			AM	Midday	PM	Weekend Midday	Weekend PM
1	Christie Avenue	Signalized	C (34)	C (30)	C (31)	D (47)	D (51)
2	Ohlone Way	Signalized	B (11)	B (13)	B (18)	B (20)	C (24)
3	Bay Street	Signalized	A (3)	A (7)	B (10)	B (12)	B (14)
4	IKEA Exit	Signalized	A (3)	A (5)	A (5)	A (8)	A (9)
5	IKEA Entrance	Signalized	A (2)	B (11)	A (7)	B (18)	B (13)

Source: Fehr & Peers, October 2024.

Table 2b documents the level of service conditions at the study intersections under Scenario 2. Notably, the Christie Avenue intersection experiences LOS F under the new geometry with existing timing plans and the poor operations occur on the weekends in the afternoon and evening. Between Scenarios 1 and Scenario 2, the operations at all study intersections deteriorate during all peak hours. Vehicles are reduced to a single mixed-flow lane of travel in both directions along Shellmound Street through the study corridor. The existing timing plan is not sufficient to serve this concentrated demand, therefore intersection operations degrade under the proposed lane configurations. But only the Christie Avenue intersection operations fall below LOS D during weekend operations.

Table 2c documents the level of service conditions at the study intersections under Scenario 3. Modifying the existing timing plans in Synchro to serve demand within the new geometry requires re-timing of the signals within the project area. Under Scenario 3 using the built-in Synchro optimization function, the timing plans are coordinated to a cycle length of 55/110 seconds during weekday AM peak hour, 60/120 seconds during weekday midday and weekday PM peak hours, and 75/150 seconds during weekend peak hours. The study intersections are coordinated to the northbound and southbound approaches along Shellmound Street.

Table 2b: Intersection Level of Service Conditions under Scenario 2

Intersection along Shellmound Street		Control type	Level of Service (delay in seconds) during peak hour				
			AM	Midday	PM	Weekend Midday	Weekend PM
1	Christie Avenue	Signalized	C (30)	D (43)	D (43)	**F (85)**	**F (149)**
2	Ohlone Way	Signalized	B (11)	B (19)	C (23)	C (34)	D (48)
3	Bay Street	Signalized	A (2)	A (10)	B (10)	B (15)	B (14)
4	IKEA Exit	Signalized	A (2)	A (9)	B (11)	B (16)	C (25)
5	IKEA Entrance	Signalized	A (2)	B (12)	B (12)	D (52)	B (18)

Source: Fehr & Peers, October 2024.

Table 2c: Intersection Level of Service Conditions under Scenario 3

Intersection along Shellmound Street		Control type	Level of Service (delay in seconds) during peak hour				
			AM	Midday	PM	Weekend Midday	Weekend PM
1	Christie Avenue	Signalized	C (27)	C (29)	C (34)	**E (62)**	**E (75)**
2	Ohlone Way	Signalized	B (12)	C (24)	C (22)	C (32)	D (51)
3	Bay Street	Signalized	A (2)	A (8)	A (8)	B (13)	B (15)
4	IKEA Exit	Signalized	A (2)	A (8)	A (9)	B (13)	B (17)
5	IKEA Entrance	Signalized	A (2)	B (14)	B (11)	D (37)	C (21)

Source: Fehr & Peers, October 2024.

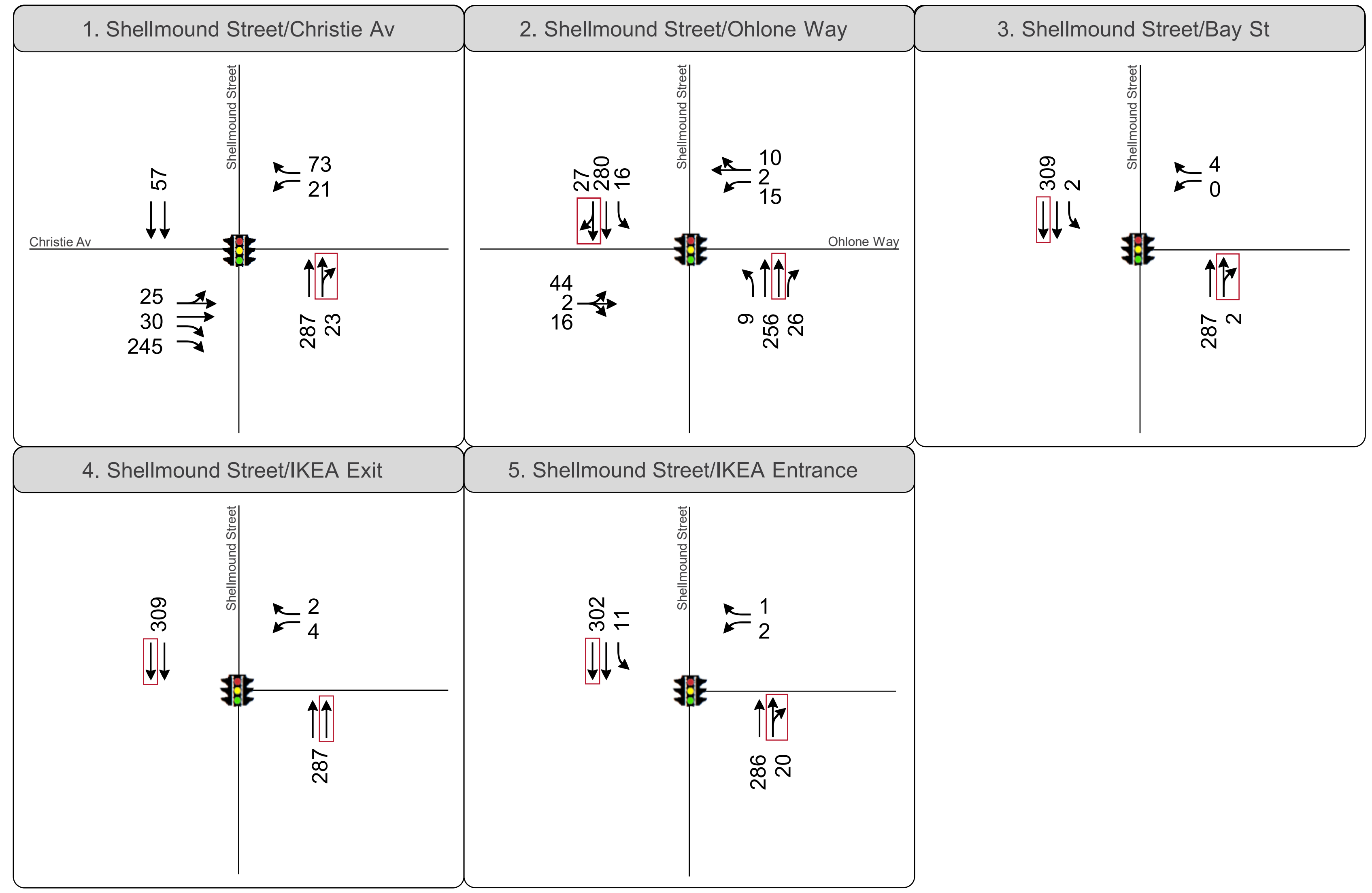
Between Scenarios 2 and Scenario 3, weekday operations improve. All intersections perform at LOS D or better during weekday peak travel hours. During weekend operations, the intersection operations at the Christie Avenue continue to fail at LOS F during the weekend midday and PM peak hours. During these two periods, the resulting northbound queues on Shellmound Street are anticipated to extend back through the Ohlone Way and Bay Street intersections.

Based on the intersection operations analysis, bus-only lanes should be considered for the Shellmound Street study segment for the weekdays but during the weekend the bus-only lanes should be open to all traffic.

Appendix

Attachment A Scenarios 1, 2, and 3 Peak Hour Intersection Traffic Volumes
Attachment B Scenarios 1, 2 and 3 HCM 2000 Intersection Results

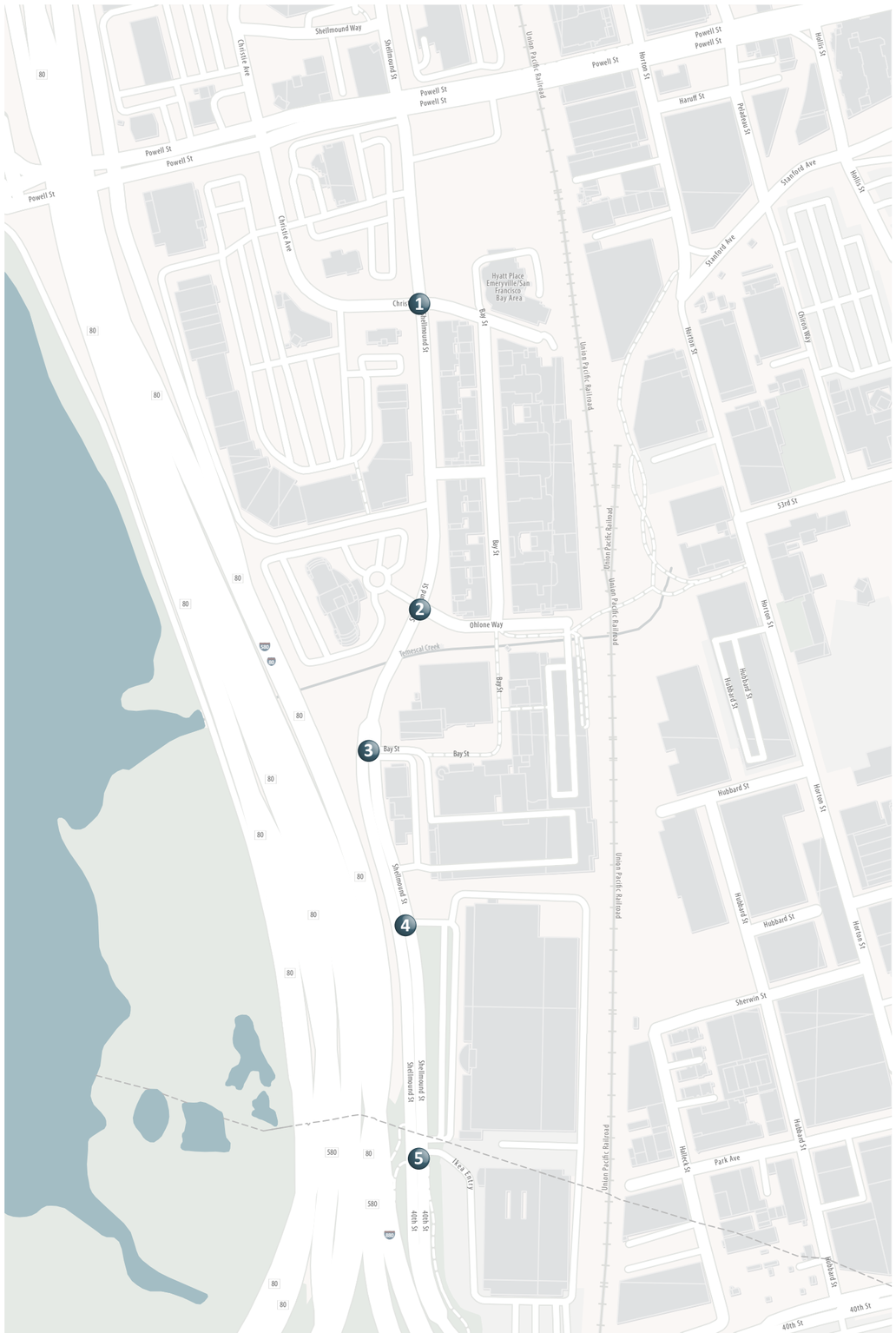
Attachment A:
Scenarios 1, 2, and 3 Peak Hour Intersection Traffic Volumes

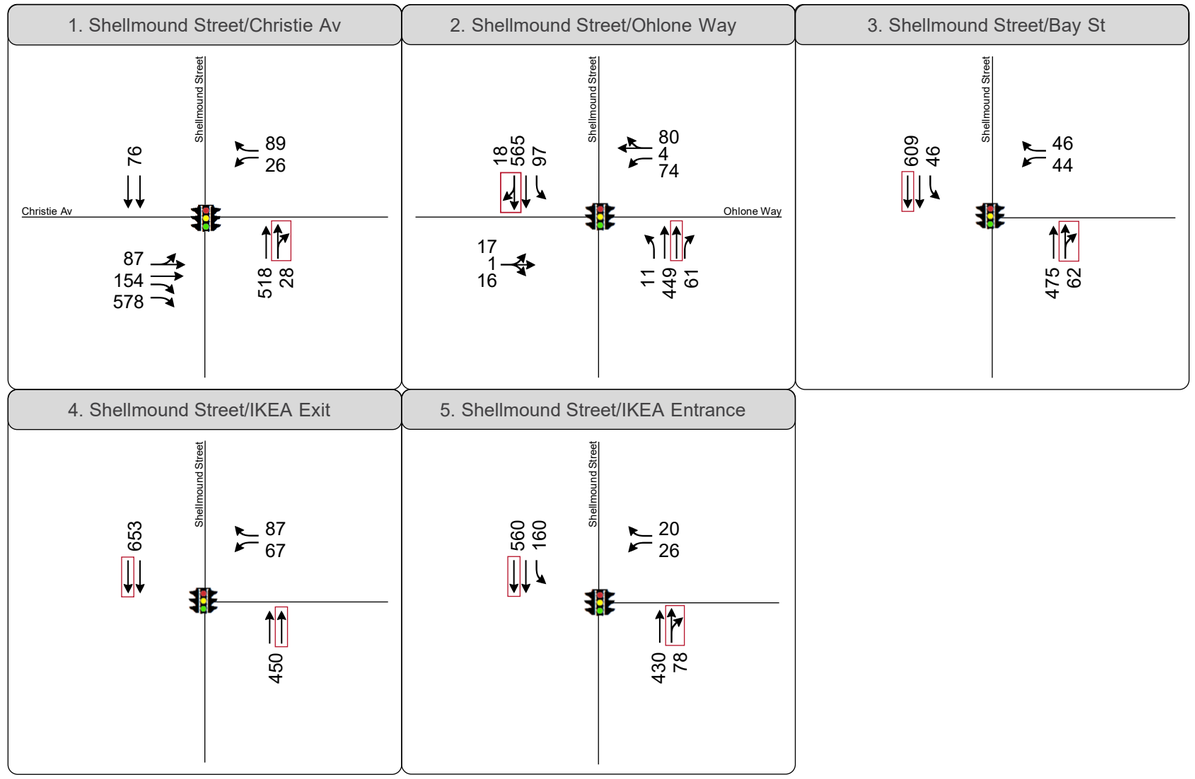


Study Intersection
Signalized Intersection
XX AM Peak Hour Traffic Volumes
Lane to be converted to transit-only in Scenarios 2 and 3

Appendix A-1

Scenario 1, 2 and 3: Weekday AM Peak Hour Intersection Traffic Volumes





Study Intersection

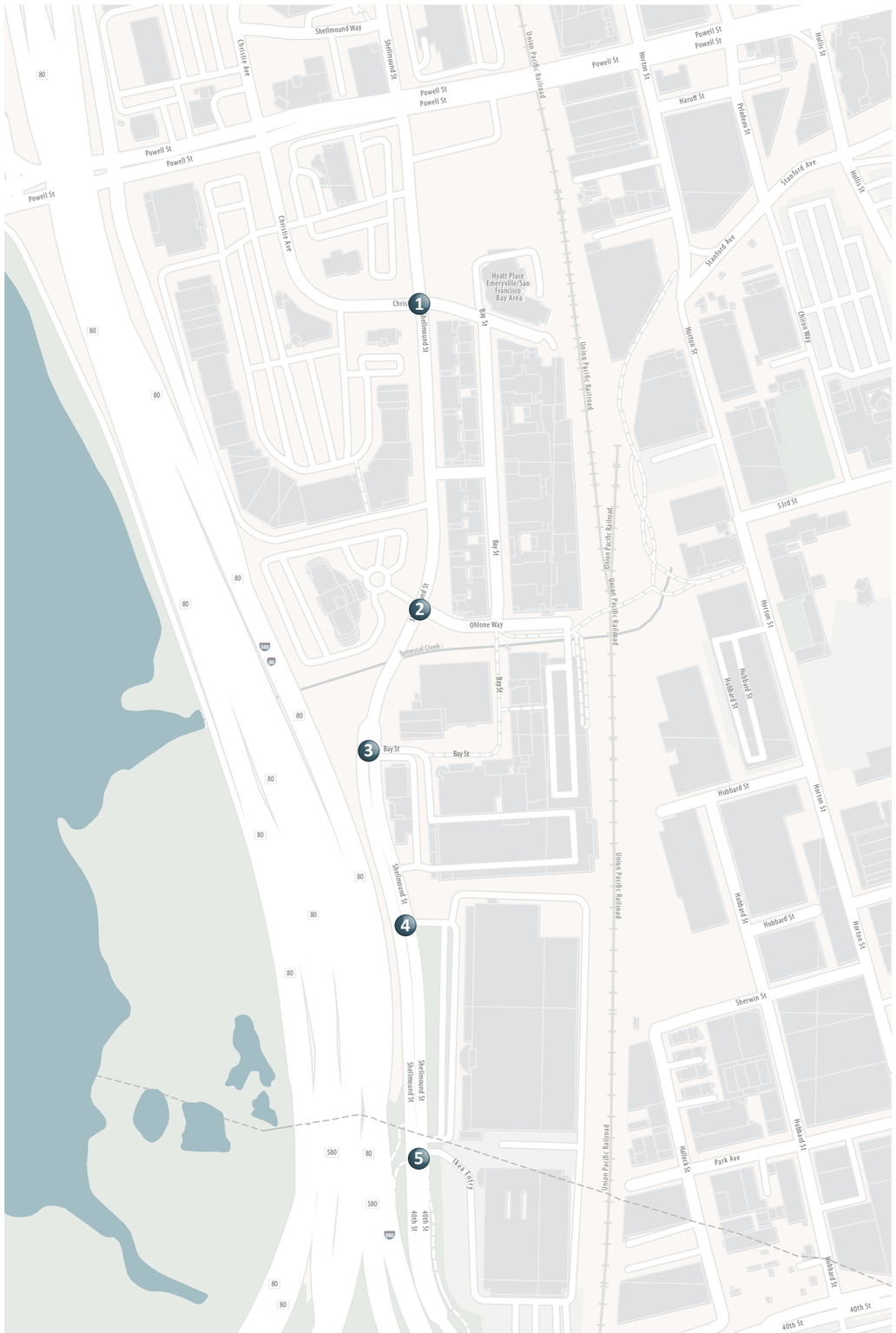
Signalized Intersection

XX Midday Peak Hour Traffic Volumes

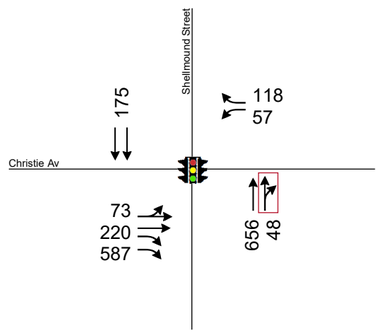
Lane to be converted to transit-only in Scenarios 2 and 3

Appendix A-2

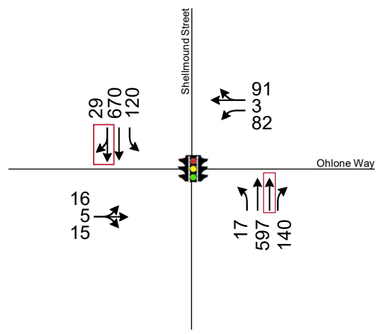
Scenario 1, 2 and 3: Weekday Midday Peak Hour Intersection Traffic Volumes



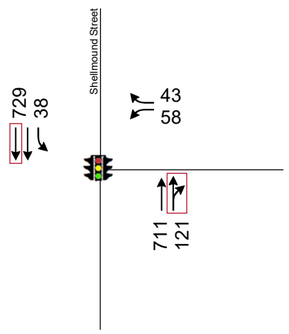
1. Shellmound Street/Christie Av



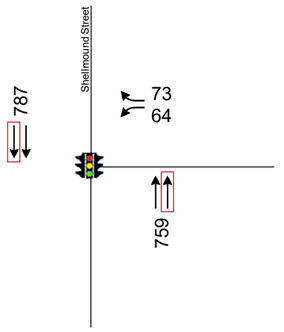
2. Shellmound Street/Ohlone Way



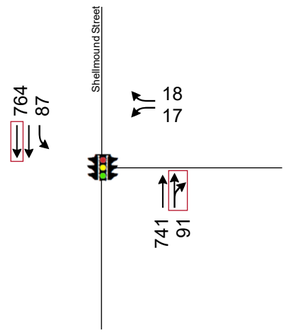
3. Shellmound Street/Bay St



4. Shellmound Street/IKEA Exit



5. Shellmound Street/IKEA Entrance



Study Intersection

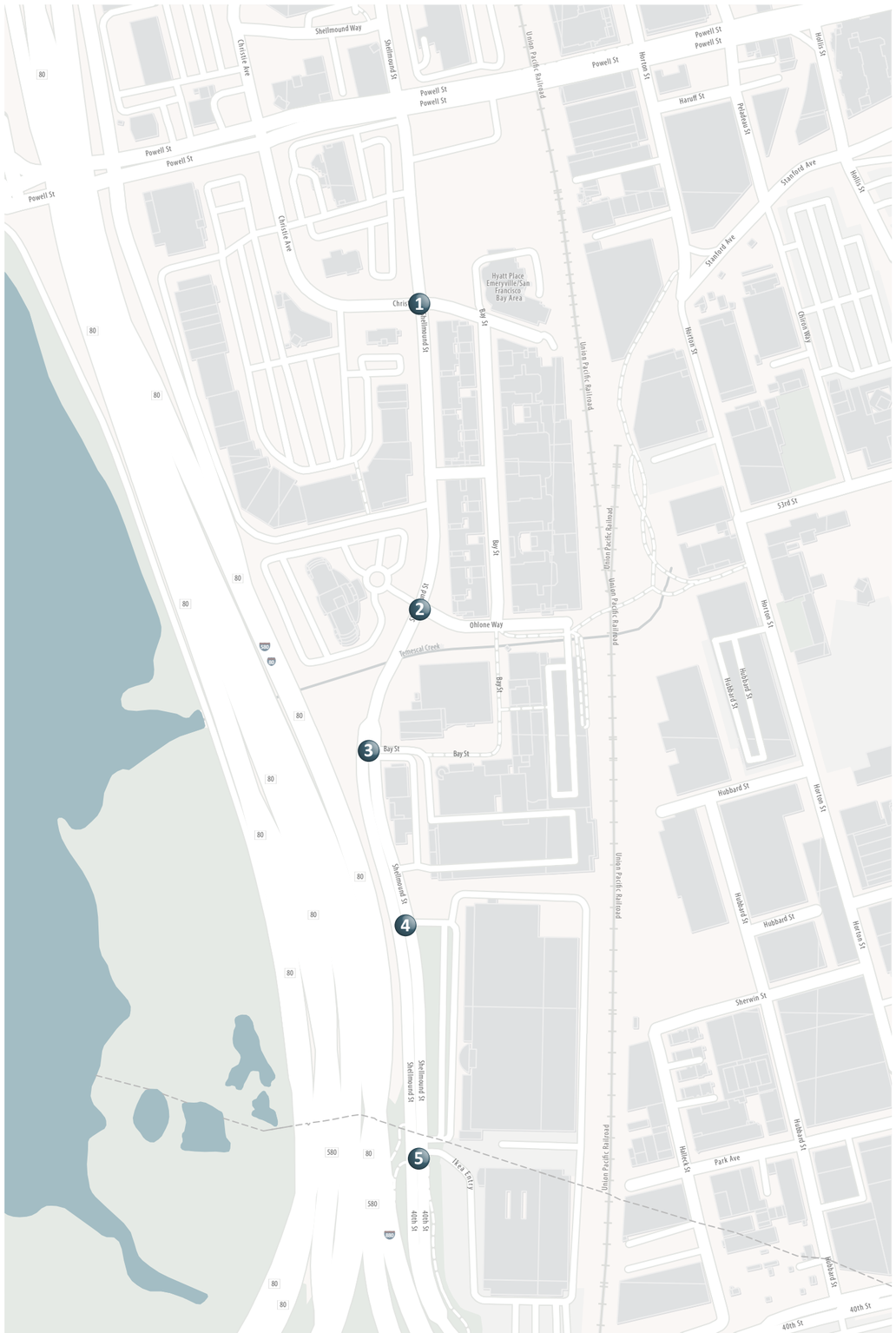
Signalized Intersection

XX PM Peak Hour Traffic Volumes

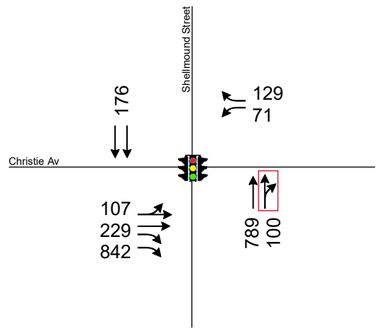
Lane to be converted to transit-only in Scenarios 2 and 3

Appendix A-3

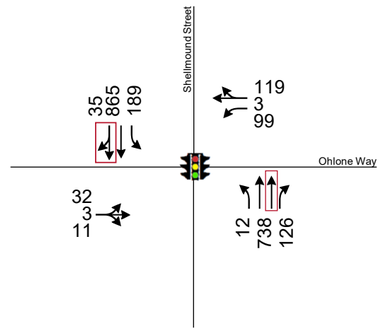
Scenario 1, 2 and 3: Weekday PM Peak Hour Intersection Traffic Volumes



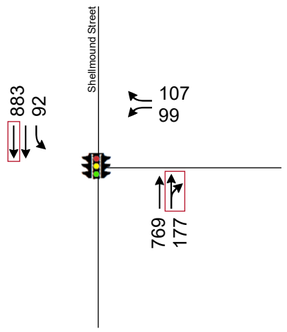
1. Shellmound Street/Christie Av



2. Shellmound Street/Ohlone Way



3. Shellmound Street/Bay St



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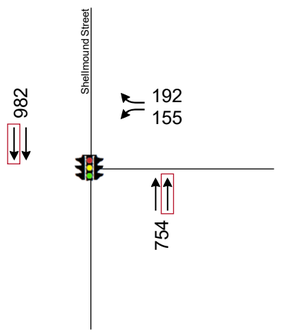
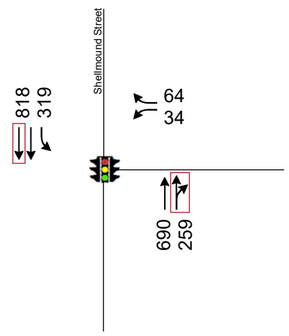


5. Shellmound Street/IKEA Entrance



Study Intersection

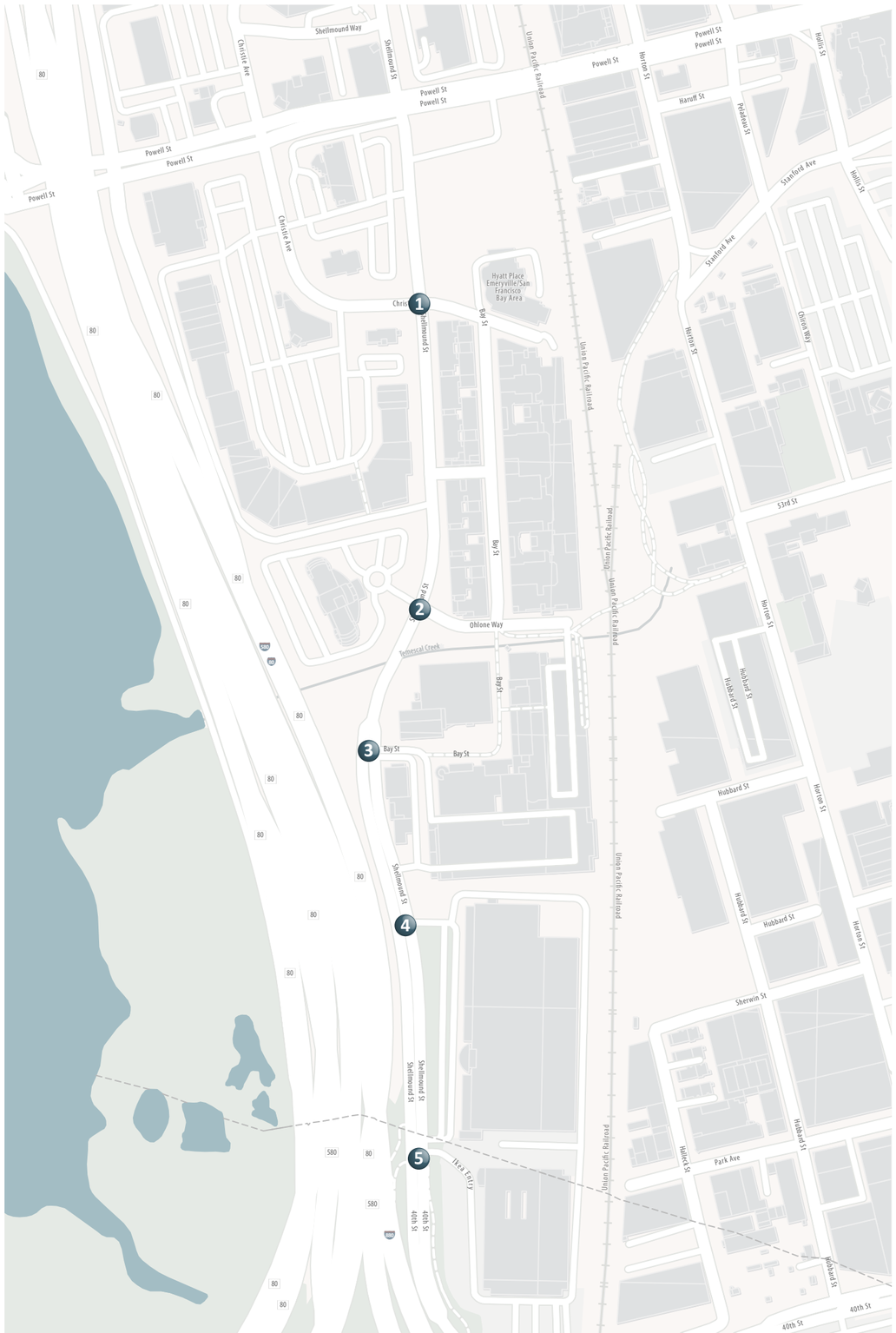
Signalized Intersection

XX Midday Peak Hour Traffic Volumes

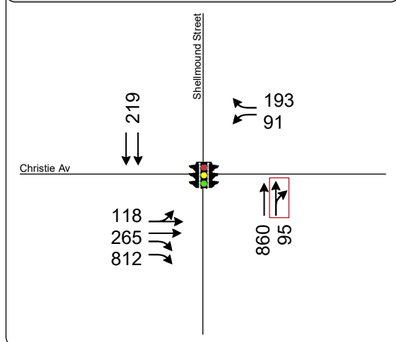
Lane to be converted to transit-only in Scenarios 2 and 3

Appendix A-4

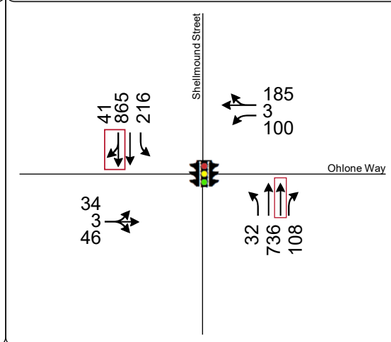
Scenario 1, 2 and 3: Weekend Midday Peak Hour Intersection Traffic Volumes



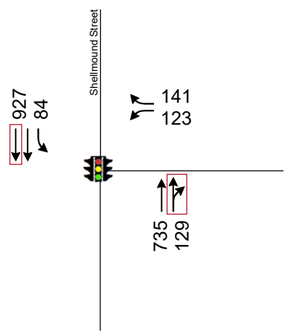
1. Shellmound Street/Christie Av



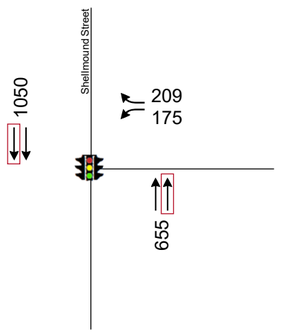
2. Shellmound Street/Ohlone Way



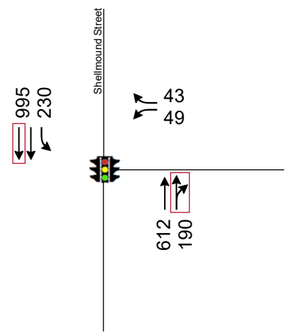
3. Shellmound Street/Bay St



4. Shellmound Street/IKEA Exit



5. Shellmound Street/IKEA Entrance



Study Intersection

Signalized Intersection

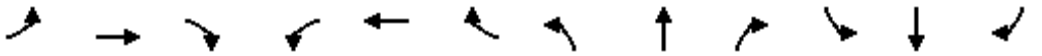
XX PM Peak Hour Traffic Volumes

Lane to be converted to transit-only in Scenarios 2 and 3

Appendix A-5

Scenario 1, 2 and 3: Weekend PM Peak Hour Intersection Traffic Volumes

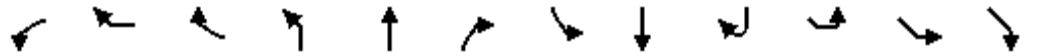
Appendix B-1:
Scenario 1 HCM 2000 Intersection Results



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	30	245	21	0	73	0	287	23	0	57	0
Future Volume (vph)	25	30	245	21	0	73	0	287	23	0	57	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	10	12	11	12	9	12	12	11	12
Total Lost time (s)		4.6	4.6	4.6		4.6		4.7			4.6	
Lane Util. Factor		0.95	*0.75	1.00		1.00		0.95			0.95	
Frpb, ped/bikes		1.00	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	
Frt		1.00	0.85	1.00		0.85		0.99			1.00	
Flt Protected		0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)		3278	2175	1565		1450		2981			3241	
Flt Permitted		0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)		3278	2175	1565		1450		2981			3241	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	30	245	21	0	73	0	287	23	0	57	0
RTOR Reduction (vph)	0	0	170	0	0	68	0	3	0	0	0	0
Lane Group Flow (vph)	0	55	75	21	0	5	0	307	0	0	57	0
Confl. Bikes (#/hr)			7						2			2
Turn Type	Split	NA	custom	Prot		Perm		NA			NA	
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)		9.2	37.8	8.0		8.0		69.9			42.0	
Effective Green, g (s)		8.2	36.8	7.5		7.5		69.4			41.5	
Actuated g/C Ratio		0.07	0.31	0.06		0.06		0.58			0.35	
Clearance Time (s)		3.6		4.1		4.1		4.2			4.1	
Vehicle Extension (s)		2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)		223	667	97		90		1724			1120	
v/s Ratio Prot		c0.02	0.03	c0.01				c0.10			0.02	
v/s Ratio Perm						0.00						
v/c Ratio		0.25	0.11	0.22		0.05		0.18			0.05	
Uniform Delay, d1		53.0	29.9	53.5		52.9		11.9			26.1	
Progression Factor		1.07	1.77	1.00		1.00		1.00			0.74	
Incremental Delay, d2		0.4	0.1	0.8		0.2		0.2			0.1	
Delay (s)		56.9	52.9	54.3		53.1		12.1			19.5	
Level of Service		E	D	D		D		B			B	
Approach Delay (s)		53.6			53.3			12.1			19.5	
Approach LOS		D			D			B			B	

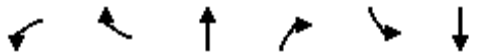
Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.16		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations												
Traffic Volume (vph)	15	2	10	9	256	26	16	280	27	44	2	16
Future Volume (vph)	15	2	10	9	256	26	16	280	27	44	2	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	10	12	9	12	11	9	9	12	12	12	12
Total Lost time (s)	4.6	4.6		4.0	4.2	4.2	4.0	4.2			4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	1.00	1.00	0.95			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00			0.98	
Flpb, ped/bikes	0.93	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	0.99			0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.96	
Satd. Flow (prot)	1407	1400		1509	3353	1410	1509	2966			1611	
Flt Permitted	0.82	1.00		0.95	1.00	1.00	0.95	1.00			0.96	
Satd. Flow (perm)	1209	1400		1509	3353	1410	1509	2966			1611	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	15	2	10	9	256	26	16	280	27	44	2	16
RTOR Reduction (vph)	0	11	0	0	0	9	0	5	0	0	57	0
Lane Group Flow (vph)	15	1	0	9	256	17	16	302	0	0	5	0
Confl. Peds. (#/hr)	15		1			5			12	1		15
Confl. Bikes (#/hr)									10			1
Turn Type	Perm	Prot		Prot	NA	Perm	Prot	NA		Prot	Prot	
Protected Phases		8		5	2		1	6		7	7	
Permitted Phases	8					2						
Actuated Green, G (s)	4.9	4.9		1.6	50.4	50.4	2.0	50.8			6.4	
Effective Green, g (s)	4.9	4.9		1.1	50.9	50.9	1.5	51.3			5.9	
Actuated g/C Ratio	0.06	0.06		0.01	0.64	0.64	0.02	0.64			0.07	
Clearance Time (s)	4.6	4.6		3.5	4.7	4.7	3.5	4.7			3.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.5	2.5	2.0	2.5			2.0	
Lane Grp Cap (vph)	74	85		20	2133	897	28	1901			118	
v/s Ratio Prot		0.00		0.01	0.08		c0.01	c0.10			c0.00	
v/s Ratio Perm	c0.01					0.01						
v/c Ratio	0.20	0.01		0.45	0.12	0.02	0.57	0.16			0.04	
Uniform Delay, d1	35.7	35.3		39.1	5.7	5.4	38.9	5.7			34.4	
Progression Factor	1.00	1.00		0.99	0.73	1.00	1.00	1.00			1.00	
Incremental Delay, d2	0.5	0.0		5.7	0.1	0.0	16.3	0.2			0.0	
Delay (s)	36.2	35.3		44.4	4.3	5.4	55.2	5.9			34.5	
Level of Service	D	D		D	A	A	E	A			C	
Approach Delay (s)	35.8				5.6			8.4			34.5	
Approach LOS	D				A			A			C	

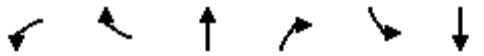
Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.16		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	4	287	2	2	309
Future Volume (vph)	0	4	287	2	2	309
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	12	9	11
Total Lost time (s)		4.0	4.2		4.0	4.2
Lane Util. Factor		1.00	0.95		1.00	0.95
Frpb, ped/bikes		1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		0.85	1.00		1.00	1.00
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1450	3237		1509	3189
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1450	3237		1509	3189
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	4	287	2	2	309
RTOR Reduction (vph)	0	4	0	0	0	0
Lane Group Flow (vph)	0	0	289	0	2	309
Confl. Peds. (#/hr)	14			10		
Confl. Bikes (#/hr)				18		
Bus Blockages (#/hr)	0	0	0	0	0	8
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)		5.2	61.5		1.6	66.6
Effective Green, g (s)		4.7	62.0		1.1	67.1
Actuated g/C Ratio		0.06	0.78		0.01	0.84
Clearance Time (s)		3.5	4.7		3.5	4.7
Vehicle Extension (s)		2.0	2.5		2.0	2.5
Lane Grp Cap (vph)		85	2508		20	2674
v/s Ratio Prot			0.09		0.00	c0.10
v/s Ratio Perm		c0.00				
v/c Ratio		0.00	0.12		0.10	0.12
Uniform Delay, d1		35.4	2.2		39.0	1.2
Progression Factor		1.00	0.81		0.78	2.72
Incremental Delay, d2		0.0	0.1		0.8	0.1
Delay (s)		35.4	1.9		31.1	3.2
Level of Service		D	A		C	A
Approach Delay (s)	35.4		1.9			3.4
Approach LOS	D		A			A

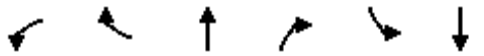
Intersection Summary			
HCM 2000 Control Delay	2.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.11		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



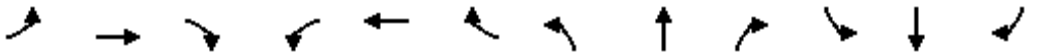
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	2	287	0	0	309
Future Volume (vph)	4	2	287	0	0	309
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	11	12	12	10
Total Lost time (s)	5.1	5.1	4.2			4.2
Lane Util. Factor	1.00	1.00	0.95			0.95
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1732	1550	3241			3129
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1732	1550	3241			3129
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	4	2	287	0	0	309
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	4	0	287	0	0	309
Confl. Peds. (#/hr)				5		
Confl. Bikes (#/hr)				19		
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	1.8	1.8	28.9			28.9
Effective Green, g (s)	1.3	1.3	29.4			29.4
Actuated g/C Ratio	0.03	0.03	0.73			0.73
Clearance Time (s)	4.6	4.6	4.7			4.7
Vehicle Extension (s)	2.5	2.5	3.0			3.0
Lane Grp Cap (vph)	56	50	2382			2299
v/s Ratio Prot	c0.00		0.09			c0.10
v/s Ratio Perm		0.00				
v/c Ratio	0.07	0.00	0.12			0.13
Uniform Delay, d1	18.8	18.7	1.5			1.6
Progression Factor	1.00	1.00	0.52			2.53
Incremental Delay, d2	0.4	0.0	0.1			0.1
Delay (s)	19.2	18.7	0.9			4.1
Level of Service	B	B	A			A
Approach Delay (s)	19.0		0.9			4.1
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	2.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	9.3
Intersection Capacity Utilization	26.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	1	286	20	11	302
Future Volume (vph)	2	1	286	20	11	302
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	10	12	9	10
Total Lost time (s)	4.1	4.1	4.2		3.5	4.2
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1732	1550	3094		1509	3129
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1732	1550	3094		1509	3129
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2	1	286	20	11	302
RTOR Reduction (vph)	0	1	2	0	0	0
Lane Group Flow (vph)	2	0	304	0	11	302
Confl. Peds. (#/hr)				4		
Confl. Bikes (#/hr)				20		
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	8	8 1	2		1	6
Permitted Phases						
Actuated Green, G (s)	1.8	7.2	65.1		1.8	69.9
Effective Green, g (s)	1.3	6.7	65.6		1.3	70.4
Actuated g/C Ratio	0.02	0.08	0.82		0.02	0.88
Clearance Time (s)	3.6		4.7		3.0	4.7
Vehicle Extension (s)	3.6		3.6		2.0	3.6
Lane Grp Cap (vph)	28	129	2537		24	2753
v/s Ratio Prot	c0.00	0.00	c0.10		c0.01	0.10
v/s Ratio Perm						
v/c Ratio	0.07	0.00	0.12		0.46	0.11
Uniform Delay, d1	38.8	33.6	1.4		39.0	0.6
Progression Factor	1.00	1.00	1.00		0.97	0.04
Incremental Delay, d2	1.3	0.0	0.1		5.0	0.1
Delay (s)	40.1	33.6	1.5		42.8	0.1
Level of Service	D	C	A		D	A
Approach Delay (s)	37.9		1.5			1.6
Approach LOS	D		A			A

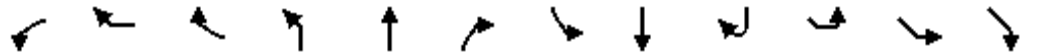
Intersection Summary			
HCM 2000 Control Delay	1.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	154	578	26	0	89	0	518	28	0	76	0
Future Volume (vph)	87	154	578	26	0	89	0	518	28	0	76	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	10	12	11	12	9	12	12	11	12
Total Lost time (s)		4.6	4.6	4.6		4.6		4.7			4.6	
Lane Util. Factor		0.95	*0.75	1.00		1.00		0.95			0.95	
Frpb, ped/bikes		1.00	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	
Frt		1.00	0.85	1.00		0.85		0.99			1.00	
Flt Protected		0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)		3293	2175	1565		1450		2992			3241	
Flt Permitted		0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)		3293	2175	1565		1450		2992			3241	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	87	154	578	26	0	89	0	518	28	0	76	0
RTOR Reduction (vph)	0	0	380	0	0	82	0	2	0	0	0	0
Lane Group Flow (vph)	0	241	198	26	0	7	0	544	0	0	76	0
Confl. Bikes (#/hr)			7						2			2
Turn Type	Split	NA	custom	Prot		Perm		NA			NA	
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)		13.6	42.2	10.0		10.0		63.5			35.6	
Effective Green, g (s)		12.6	41.2	9.5		9.5		63.0			35.1	
Actuated g/C Ratio		0.10	0.34	0.08		0.08		0.52			0.29	
Clearance Time (s)		3.6		4.1		4.1		4.2			4.1	
Vehicle Extension (s)		2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)		345	746	123		114		1570			947	
v/s Ratio Prot		c0.07	0.09	c0.02				c0.18			0.02	
v/s Ratio Perm						0.00						
v/c Ratio		0.70	0.27	0.21		0.06		0.35			0.08	
Uniform Delay, d1		51.9	28.5	51.7		51.1		16.5			30.8	
Progression Factor		1.00	1.00	1.00		1.00		1.00			0.66	
Incremental Delay, d2		5.6	0.1	0.6		0.2		0.6			0.2	
Delay (s)		57.5	28.6	52.4		51.3		17.2			20.3	
Level of Service		E	C	D		D		B			C	
Approach Delay (s)		37.1			51.5			17.2			20.3	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	30.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



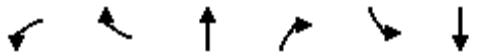
Movement	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations												
Traffic Volume (vph)	74	4	80	11	449	61	97	565	18	17	1	16
Future Volume (vph)	74	4	80	11	449	61	97	565	18	17	1	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	10	12	9	12	11	9	9	12	12	12	12
Total Lost time (s)	4.6	4.6		4.0	4.2	4.2	4.0	4.2			4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	1.00	1.00	0.95			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.94	1.00	1.00			0.85	
Flpb, ped/bikes	0.86	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	1.00			0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.97	
Satd. Flow (prot)	1304	1400		1509	3353	1364	1509	2994			1362	
Flt Permitted	0.73	1.00		0.95	1.00	1.00	0.95	1.00			0.97	
Satd. Flow (perm)	1009	1400		1509	3353	1364	1509	2994			1362	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	74	4	80	11	449	61	97	565	18	17	1	16
RTOR Reduction (vph)	0	71	0	0	0	31	0	2	0	0	32	0
Lane Group Flow (vph)	74	13	0	11	449	30	97	581	0	0	2	0
Confl. Peds. (#/hr)	71		3			25			50	3		71
Confl. Bikes (#/hr)									10			1
Turn Type	Perm	Prot		Prot	NA	Perm	Prot	NA		Prot	Prot	
Protected Phases		8		5	2		1	6		7	7	
Permitted Phases	8					2						
Actuated Green, G (s)	12.0	12.0		1.6	38.5	38.5	8.4	45.3			4.8	
Effective Green, g (s)	12.0	12.0		1.1	39.0	39.0	7.9	45.8			4.3	
Actuated g/C Ratio	0.15	0.15		0.01	0.49	0.49	0.10	0.57			0.05	
Clearance Time (s)	4.6	4.6		3.5	4.7	4.7	3.5	4.7			3.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.5	2.5	2.0	2.5			2.0	
Lane Grp Cap (vph)	151	210		20	1634	664	149	1714			73	
v/s Ratio Prot		0.01		0.01	0.13		c0.06	c0.19			c0.00	
v/s Ratio Perm	c0.07					0.02						
v/c Ratio	0.49	0.06		0.55	0.27	0.04	0.65	0.34			0.03	
Uniform Delay, d1	31.2	29.2		39.2	12.1	10.7	34.7	9.1			35.9	
Progression Factor	1.00	1.00		1.45	0.27	0.26	1.00	1.00			1.00	
Incremental Delay, d2	0.9	0.0		16.9	0.4	0.1	7.5	0.5			0.1	
Delay (s)	32.1	29.2		74.0	3.7	2.9	42.2	9.6			35.9	
Level of Service	C	C		E	A	A	D	A			D	
Approach Delay (s)	30.6				5.1			14.3			35.9	
Approach LOS	C				A			B			D	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	44	46	475	62	46	609
Future Volume (vph)	44	46	475	62	46	609
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	12	9	11
Total Lost time (s)	4.0	4.0	4.2		4.0	4.2
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1621	1450	3163		1509	3189
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1621	1450	3163		1509	3189
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	44	46	475	62	46	609
RTOR Reduction (vph)	0	38	7	0	0	0
Lane Group Flow (vph)	44	8	530	0	46	609
Confl. Peds. (#/hr)	20			17		
Confl. Bikes (#/hr)				18		
Bus Blockages (#/hr)	0	0	0	0	0	8
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8	2			
Actuated Green, G (s)	14.4	14.4	48.7		5.2	57.4
Effective Green, g (s)	13.9	13.9	49.2		4.7	57.9
Actuated g/C Ratio	0.17	0.17	0.62		0.06	0.72
Clearance Time (s)	3.5	3.5	4.7		3.5	4.7
Vehicle Extension (s)	2.0	2.0	2.5		2.0	2.5
Lane Grp Cap (vph)	281	251	1945		88	2308
v/s Ratio Prot	c0.03		0.17		c0.03	c0.19
v/s Ratio Perm		0.01				
v/c Ratio	0.16	0.03	0.27		0.52	0.26
Uniform Delay, d1	28.1	27.5	7.1		36.6	3.8
Progression Factor	1.00	1.00	0.76		1.32	0.45
Incremental Delay, d2	0.1	0.0	0.3		2.5	0.3
Delay (s)	28.2	27.5	5.8		50.7	2.0
Level of Service	C	C	A		D	A
Approach Delay (s)	27.8		5.8			5.4
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

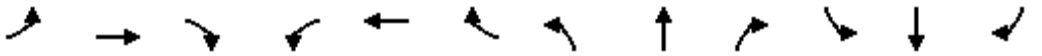


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	67	87	450	0	0	653
Future Volume (vph)	67	87	450	0	0	653
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	11	12	12	10
Total Lost time (s)	5.1	5.1	4.2			4.2
Lane Util. Factor	1.00	1.00	0.95			0.95
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1732	1550	3241			3129
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1732	1550	3241			3129
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	67	87	450	0	0	653
RTOR Reduction (vph)	0	76	0	0	0	0
Lane Group Flow (vph)	67	11	450	0	0	653
Confl. Peds. (#/hr)				11		
Confl. Bikes (#/hr)				19		
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	5.4	5.4	25.3			25.3
Effective Green, g (s)	4.9	4.9	25.8			25.8
Actuated g/C Ratio	0.12	0.12	0.65			0.65
Clearance Time (s)	4.6	4.6	4.7			4.7
Vehicle Extension (s)	2.5	2.5	3.0			3.0
Lane Grp Cap (vph)	212	189	2090			2018
v/s Ratio Prot	c0.04		0.14			c0.21
v/s Ratio Perm		0.01				
v/c Ratio	0.32	0.06	0.22			0.32
Uniform Delay, d1	16.0	15.5	2.9			3.2
Progression Factor	1.00	1.00	0.98			1.00
Incremental Delay, d2	0.6	0.1	0.2			0.4
Delay (s)	16.6	15.6	3.1			3.6
Level of Service	B	B	A			A
Approach Delay (s)	16.1		3.1			3.6
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	9.3
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	26	20	430	78	160	560
Future Volume (vph)	26	20	430	78	160	560
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	10	12	9	10
Total Lost time (s)	4.1	4.1	4.2		3.5	4.2
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1732	1550	3042		1509	3129
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1732	1550	3042		1509	3129
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	26	20	430	78	160	560
RTOR Reduction (vph)	0	14	12	0	0	0
Lane Group Flow (vph)	26	6	496	0	160	560
Confl. Peds. (#/hr)	2			14		
Confl. Bikes (#/hr)				20		
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	8	8 1	2		1	6
Permitted Phases						
Actuated Green, G (s)	8.6	24.5	47.8		12.3	63.1
Effective Green, g (s)	8.1	24.0	48.3		11.8	63.6
Actuated g/C Ratio	0.10	0.30	0.60		0.15	0.80
Clearance Time (s)	3.6		4.7		3.0	4.7
Vehicle Extension (s)	3.6		3.6		2.0	3.6
Lane Grp Cap (vph)	175	465	1836		222	2487
v/s Ratio Prot	c0.02	0.00	c0.16		c0.11	0.18
v/s Ratio Perm						
v/c Ratio	0.15	0.01	0.27		0.72	0.23
Uniform Delay, d1	32.8	19.7	7.5		32.5	2.0
Progression Factor	1.00	1.00	1.00		1.17	0.80
Incremental Delay, d2	0.5	0.0	0.4		9.1	0.2
Delay (s)	33.3	19.7	7.9		47.1	1.9
Level of Service	C	B	A		D	A
Approach Delay (s)	27.4		7.9			11.9
Approach LOS	C		A			B

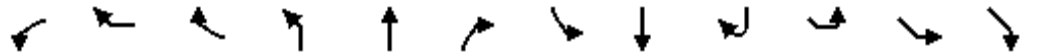
Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	220	587	57	0	118	0	656	48	0	175	0
Future Volume (vph)	73	220	587	57	0	118	0	656	48	0	175	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	10	12	11	12	9	12	12	11	12
Total Lost time (s)		4.6	4.6	4.6		4.6		4.7			4.6	
Lane Util. Factor		0.95	*0.75	1.00		1.00		0.95			0.95	
Frpb, ped/bikes		1.00	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	
Frt		1.00	0.85	1.00		0.85		0.99			1.00	
Flt Protected		0.99	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)		3312	2175	1565		1450		2984			3241	
Flt Permitted		0.99	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)		3312	2175	1565		1450		2984			3241	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	220	587	57	0	118	0	656	48	0	175	0
RTOR Reduction (vph)	0	0	377	0	0	108	0	3	0	0	0	0
Lane Group Flow (vph)	0	293	210	57	0	10	0	701	0	0	175	0
Confl. Bikes (#/hr)			7						2			2
Turn Type	Split	NA	custom	Prot		Perm		NA			NA	
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)		15.3	43.9	10.8		10.8		61.0			33.1	
Effective Green, g (s)		14.3	42.9	10.3		10.3		60.5			32.6	
Actuated g/C Ratio		0.12	0.36	0.09		0.09		0.50			0.27	
Clearance Time (s)		3.6		4.1		4.1		4.2			4.1	
Vehicle Extension (s)		2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)		394	777	134		124		1504			880	
v/s Ratio Prot		c0.09	0.10	c0.04				c0.23			0.05	
v/s Ratio Perm						0.01						
v/c Ratio		0.74	0.27	0.43		0.08		0.47			0.20	
Uniform Delay, d1		51.1	27.4	52.0		50.5		19.3			33.6	
Progression Factor		1.00	1.00	1.00		1.00		1.00			0.48	
Incremental Delay, d2		7.0	0.1	1.6		0.2		1.0			0.5	
Delay (s)		58.1	27.6	53.6		50.7		20.3			16.5	
Level of Service		E	C	D		D		C			B	
Approach Delay (s)		37.7			51.7			20.3			16.5	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



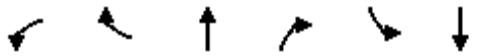
Movement	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations												
Traffic Volume (vph)	82	3	91	17	597	140	120	670	29	16	5	15
Future Volume (vph)	82	3	91	17	597	140	120	670	29	16	5	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	10	12	9	12	11	9	9	12	12	12	12
Total Lost time (s)	4.6	4.6		4.0	4.2	4.2	4.0	4.2			4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	1.00	1.00	0.95			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.94	1.00	1.00			0.86	
Flpb, ped/bikes	0.87	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	0.99			0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.97	
Satd. Flow (prot)	1307	1400		1509	3353	1368	1509	2985			1398	
Flt Permitted	0.73	1.00		0.95	1.00	1.00	0.95	1.00			0.97	
Satd. Flow (perm)	1009	1400		1509	3353	1368	1509	2985			1398	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	82	3	91	17	597	140	120	670	29	16	5	15
RTOR Reduction (vph)	0	80	0	0	0	73	0	3	0	0	34	0
Lane Group Flow (vph)	82	14	0	17	597	67	120	696	0	0	2	0
Confl. Peds. (#/hr)	70		11			23			52	11		70
Confl. Bikes (#/hr)									10			1
Turn Type	Perm	Prot		Prot	NA	Perm	Prot	NA		Prot	Prot	
Protected Phases		8		5	2		1	6		7	7	
Permitted Phases	8					2						
Actuated Green, G (s)	12.1	12.1		1.6	38.3	38.3	9.5	46.2			4.8	
Effective Green, g (s)	12.1	12.1		1.1	38.8	38.8	9.0	46.7			4.3	
Actuated g/C Ratio	0.15	0.15		0.01	0.48	0.48	0.11	0.58			0.05	
Clearance Time (s)	4.6	4.6		3.5	4.7	4.7	3.5	4.7			3.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.5	2.5	2.0	2.5			2.0	
Lane Grp Cap (vph)	150	209		20	1606	655	167	1720			74	
v/s Ratio Prot		0.01		0.01	0.18		c0.08	c0.23			c0.00	
v/s Ratio Perm	c0.08					0.05						
v/c Ratio	0.55	0.07		0.85	0.37	0.10	0.72	0.40			0.03	
Uniform Delay, d1	31.9	29.6		39.9	13.4	11.6	34.8	9.5			36.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	2.2	0.0		126.4	0.7	0.3	11.6	0.7			0.1	
Delay (s)	34.1	29.7		166.3	14.0	11.9	46.4	10.2			36.4	
Level of Service	C	C		F	B	B	D	B			D	
Approach Delay (s)	31.7				17.1			15.5			36.4	
Approach LOS	C				B			B			D	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	81.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	58	43	711	121	38	729
Future Volume (vph)	58	43	711	121	38	729
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	12	9	11
Total Lost time (s)	4.0	4.0	4.2		4.0	4.2
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1621	1450	3142		1509	3189
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1621	1450	3142		1509	3189
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	58	43	711	121	38	729
RTOR Reduction (vph)	0	36	10	0	0	0
Lane Group Flow (vph)	58	7	822	0	38	729
Confl. Peds. (#/hr)	24			18		
Confl. Bikes (#/hr)				18		
Bus Blockages (#/hr)	0	0	0	0	0	8
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8	2			
Actuated Green, G (s)	14.4	14.4	48.9		5.0	57.4
Effective Green, g (s)	13.9	13.9	49.4		4.5	57.9
Actuated g/C Ratio	0.17	0.17	0.62		0.06	0.72
Clearance Time (s)	3.5	3.5	4.7		3.5	4.7
Vehicle Extension (s)	2.0	2.0	2.5		2.0	2.5
Lane Grp Cap (vph)	281	251	1940		84	2308
v/s Ratio Prot	c0.04		c0.26		c0.03	0.23
v/s Ratio Perm		0.01				
v/c Ratio	0.21	0.03	0.42		0.45	0.32
Uniform Delay, d1	28.3	27.4	7.9		36.6	4.0
Progression Factor	1.00	1.00	1.41		1.00	1.00
Incremental Delay, d2	0.1	0.0	0.7		1.4	0.4
Delay (s)	28.5	27.5	11.9		38.0	4.3
Level of Service	C	C	B		D	A
Approach Delay (s)	28.0		11.9			6.0
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

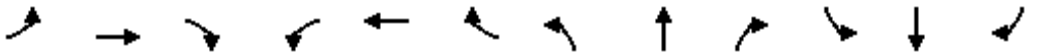


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	64	73	759	0	0	787
Future Volume (vph)	64	73	759	0	0	787
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	11	12	12	10
Total Lost time (s)	5.1	5.1	4.2			4.2
Lane Util. Factor	1.00	1.00	0.95			0.95
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1732	1550	3241			3129
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1732	1550	3241			3129
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	64	73	759	0	0	787
RTOR Reduction (vph)	0	64	0	0	0	0
Lane Group Flow (vph)	64	9	759	0	0	787
Confl. Peds. (#/hr)				15		
Confl. Bikes (#/hr)				19		
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	5.4	5.4	25.3			25.3
Effective Green, g (s)	4.9	4.9	25.8			25.8
Actuated g/C Ratio	0.12	0.12	0.65			0.65
Clearance Time (s)	4.6	4.6	4.7			4.7
Vehicle Extension (s)	2.5	2.5	3.0			3.0
Lane Grp Cap (vph)	212	189	2090			2018
v/s Ratio Prot	c0.04		0.23			c0.25
v/s Ratio Perm		0.01				
v/c Ratio	0.30	0.05	0.36			0.39
Uniform Delay, d1	16.0	15.5	3.3			3.4
Progression Factor	1.00	1.00	1.00			1.20
Incremental Delay, d2	0.6	0.1	0.5			0.6
Delay (s)	16.6	15.6	3.8			4.6
Level of Service	B	B	A			A
Approach Delay (s)	16.0		3.8			4.6
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	9.3
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	17	18	741	91	87	764
Future Volume (vph)	17	18	741	91	87	764
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	10	12	9	10
Total Lost time (s)	4.1	4.1	4.2		3.5	4.2
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1732	1550	3066		1509	3129
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1732	1550	3066		1509	3129
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	17	18	741	91	87	764
RTOR Reduction (vph)	0	14	7	0	0	0
Lane Group Flow (vph)	17	4	825	0	87	764
Confl. Peds. (#/hr)	2			19		
Confl. Bikes (#/hr)				20		
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	8	8 1	2		1	6
Permitted Phases						
Actuated Green, G (s)	8.6	20.6	52.3		8.4	63.7
Effective Green, g (s)	8.1	20.1	52.8		7.9	64.2
Actuated g/C Ratio	0.10	0.25	0.66		0.10	0.80
Clearance Time (s)	3.6		4.7		3.0	4.7
Vehicle Extension (s)	3.6		3.6		2.0	3.6
Lane Grp Cap (vph)	174	386	2008		147	2492
v/s Ratio Prot	c0.01	0.00	c0.27		c0.06	0.24
v/s Ratio Perm						
v/c Ratio	0.10	0.01	0.41		0.59	0.31
Uniform Delay, d1	32.9	22.8	6.6		34.8	2.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.3	0.0	0.6		4.2	0.3
Delay (s)	33.2	22.8	7.2		39.0	2.5
Level of Service	C	C	A		D	A
Approach Delay (s)	27.9		7.2			6.3
Approach LOS	C		A			A

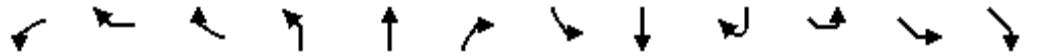
Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	80.6	Sum of lost time (s)	11.8
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	229	842	71	0	129	0	789	100	0	176	0
Future Volume (vph)	107	229	842	71	0	129	0	789	100	0	176	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	10	12	11	12	9	12	12	11	12
Total Lost time (s)		4.6	4.6	4.6		4.6		4.7			4.6	
Lane Util. Factor		0.95	*0.75	1.00		1.00		0.95			0.95	
Frpb, ped/bikes		1.00	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	
Frt		1.00	0.85	1.00		0.85		0.98			1.00	
Flt Protected		0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)		3333	2197	1580		1464		2992			3273	
Flt Permitted		0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)		3333	2197	1580		1464		2992			3273	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	107	229	842	71	0	129	0	789	100	0	176	0
RTOR Reduction (vph)	0	0	534	0	0	117	0	7	0	0	0	0
Lane Group Flow (vph)	0	336	308	71	0	12	0	882	0	0	176	0
Confl. Bikes (#/hr)			7						2			2
Turn Type	Split	NA	custom	Prot		Perm		NA			NA	
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)		16.3	44.9	11.4		11.4		59.4			31.5	
Effective Green, g (s)		15.3	43.9	10.9		10.9		58.9			31.0	
Actuated g/C Ratio		0.13	0.37	0.09		0.09		0.49			0.26	
Clearance Time (s)		3.6		4.1		4.1		4.2			4.1	
Vehicle Extension (s)		2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)		424	803	143		132		1468			845	
v/s Ratio Prot		c0.10	0.14	c0.04				c0.29			0.05	
v/s Ratio Perm						0.01						
v/c Ratio		0.79	0.38	0.50		0.09		0.60			0.21	
Uniform Delay, d1		50.8	28.1	51.9		50.0		22.1			34.9	
Progression Factor		1.14	3.05	1.00		1.00		0.24			0.44	
Incremental Delay, d2		8.5	0.2	2.0		0.2		1.6			0.6	
Delay (s)		66.5	85.9	53.9		50.2		6.9			16.1	
Level of Service		E	F	D		D		A			B	
Approach Delay (s)		80.4			51.5			6.9			16.1	
Approach LOS		F			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	46.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations												
Traffic Volume (vph)	99	3	119	12	738	126	189	865	35	32	3	11
Future Volume (vph)	99	3	119	12	738	126	189	865	35	32	3	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	10	12	9	12	11	9	9	12	12	12	12
Total Lost time (s)	4.6	4.6		4.0	4.2	4.2	4.0	4.2			4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	1.00	1.00	0.95			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.93	1.00	0.99			0.90	
Flpb, ped/bikes	0.75	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	0.99			0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.96	
Satd. Flow (prot)	1145	1414		1524	3386	1359	1524	2993			1491	
Flt Permitted	0.73	1.00		0.95	1.00	1.00	0.95	1.00			0.96	
Satd. Flow (perm)	876	1414		1524	3386	1359	1524	2993			1491	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	99	3	119	12	738	126	189	865	35	32	3	11
RTOR Reduction (vph)	0	101	0	0	0	59	0	2	0	0	44	0
Lane Group Flow (vph)	99	21	0	12	738	67	189	898	0	0	2	0
Confl. Peds. (#/hr)	151					22			121			151
Confl. Bikes (#/hr)									10			1
Turn Type	Perm	Prot		Prot	NA	Perm	Prot	NA		Prot	Prot	
Protected Phases		8		5	2		1	6		7	7	
Permitted Phases	8					2						
Actuated Green, G (s)	20.5	20.5		3.2	47.2	47.2	29.6	73.6			6.4	
Effective Green, g (s)	20.5	20.5		2.7	47.7	47.7	29.1	74.1			5.9	
Actuated g/C Ratio	0.17	0.17		0.02	0.40	0.40	0.24	0.62			0.05	
Clearance Time (s)	4.6	4.6		3.5	4.7	4.7	3.5	4.7			3.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.5	2.5	2.0	2.5			2.0	
Lane Grp Cap (vph)	149	241		34	1345	540	369	1848			73	
v/s Ratio Prot		0.01		0.01	c0.22		0.12	c0.30			c0.00	
v/s Ratio Perm	c0.11					0.05						
v/c Ratio	0.66	0.09		0.35	0.55	0.12	0.51	0.49			0.03	
Uniform Delay, d1	46.5	41.9		57.8	27.9	22.9	39.3	12.5			54.3	
Progression Factor	1.00	1.00		0.78	0.67	0.53	0.80	0.60			1.00	
Incremental Delay, d2	8.3	0.1		2.1	1.5	0.4	0.4	0.8			0.1	
Delay (s)	54.9	41.9		47.4	20.2	12.6	31.8	8.2			54.4	
Level of Service	D	D		D	C	B	C	A			D	
Approach Delay (s)	47.7				19.5			12.3			54.4	
Approach LOS	D				B			B			D	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	99	107	769	177	92	883
Future Volume (vph)	99	107	769	177	92	883
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	12	9	11
Total Lost time (s)	4.0	4.0	4.2		4.0	4.2
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.97		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1637	1464	3124		1524	3221
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1637	1464	3124		1524	3221
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	99	107	769	177	92	883
RTOR Reduction (vph)	0	90	11	0	0	0
Lane Group Flow (vph)	99	17	935	0	92	883
Confl. Peds. (#/hr)	41			26		
Confl. Bikes (#/hr)				18		
Bus Blockages (#/hr)	0	0	0	0	0	8
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8	2			
Actuated Green, G (s)	19.6	19.6	76.8		11.9	92.2
Effective Green, g (s)	19.1	19.1	77.3		11.4	92.7
Actuated g/C Ratio	0.16	0.16	0.64		0.10	0.77
Clearance Time (s)	3.5	3.5	4.7		3.5	4.7
Vehicle Extension (s)	2.0	2.0	2.5		2.0	2.5
Lane Grp Cap (vph)	260	233	2012		144	2488
v/s Ratio Prot	c0.06		c0.30		c0.06	0.27
v/s Ratio Perm		0.01				
v/c Ratio	0.38	0.07	0.46		0.64	0.35
Uniform Delay, d1	45.2	42.9	10.8		52.3	4.3
Progression Factor	1.00	1.00	0.56		0.75	1.67
Incremental Delay, d2	0.3	0.0	0.7		5.9	0.4
Delay (s)	45.5	43.0	6.8		45.0	7.5
Level of Service	D	D	A		D	A
Approach Delay (s)	44.2		6.8			11.1
Approach LOS	D		A			B

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

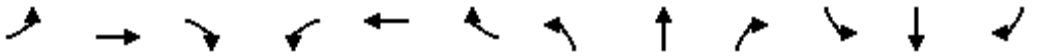
c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	155	192	754	0	0	982
Future Volume (vph)	155	192	754	0	0	982
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	11	12	12	10
Total Lost time (s)	5.1	5.1	4.2			4.2
Lane Util. Factor	1.00	1.00	0.95			0.95
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	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1750	1565	3273			3160
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1750	1565	3273			3160
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	155	192	754	0	0	982
RTOR Reduction (vph)	0	108	0	0	0	0
Lane Group Flow (vph)	155	84	754	0	0	982
Confl. Peds. (#/hr)				35		
Confl. Bikes (#/hr)				19		
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	10.9	10.9	39.8			39.8
Effective Green, g (s)	10.4	10.4	40.3			40.3
Actuated g/C Ratio	0.17	0.17	0.67			0.67
Clearance Time (s)	4.6	4.6	4.7			4.7
Vehicle Extension (s)	2.5	2.5	3.0			3.0
Lane Grp Cap (vph)	303	271	2198			2122
v/s Ratio Prot	c0.09		0.23			c0.31
v/s Ratio Perm		0.05				
v/c Ratio	0.51	0.31	0.34			0.46
Uniform Delay, d1	22.5	21.7	4.2			4.7
Progression Factor	1.00	1.00	1.60			0.76
Incremental Delay, d2	1.1	0.5	0.4			0.7
Delay (s)	23.6	22.1	7.1			4.3
Level of Service	C	C	A			A
Approach Delay (s)	22.8		7.1			4.3
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.3
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	34	64	690	259	319	818
Future Volume (vph)	34	64	690	259	319	818
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	10	12	9	10
Total Lost time (s)	4.1	4.1	4.2		3.5	4.2
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.96		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1750	1565	2963		1524	3160
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1750	1565	2963		1524	3160
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	34	64	690	259	319	818
RTOR Reduction (vph)	0	27	20	0	0	0
Lane Group Flow (vph)	34	37	929	0	319	818
Confl. Peds. (#/hr)	6			47		
Confl. Bikes (#/hr)				20		
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	8	8 1	2		1	6
Permitted Phases						
Actuated Green, G (s)	10.5	44.0	68.3		29.9	101.2
Effective Green, g (s)	10.0	43.5	68.8		29.4	101.7
Actuated g/C Ratio	0.08	0.36	0.57		0.24	0.85
Clearance Time (s)	3.6		4.7		3.0	4.7
Vehicle Extension (s)	3.6		3.6		2.0	3.6
Lane Grp Cap (vph)	145	567	1698		373	2678
v/s Ratio Prot	c0.02	0.02	c0.31		c0.21	0.26
v/s Ratio Perm						
v/c Ratio	0.23	0.07	0.55		0.86	0.31
Uniform Delay, d1	51.4	25.0	15.9		43.3	1.9
Progression Factor	1.00	1.00	1.00		1.03	0.66
Incremental Delay, d2	1.0	0.1	1.3		15.4	0.3
Delay (s)	52.4	25.0	17.2		60.0	1.5
Level of Service	D	C	B		E	A
Approach Delay (s)	34.5		17.2			17.9
Approach LOS	C		B			B

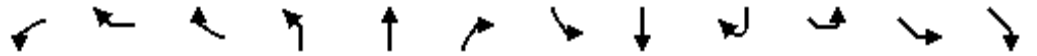
Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	265	812	91	0	193	0	860	95	0	219	0
Future Volume (vph)	118	265	812	91	0	193	0	860	95	0	219	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	10	12	11	12	9	12	12	11	12
Total Lost time (s)		4.6	4.6	4.6		4.6		4.7			4.6	
Lane Util. Factor		0.95	*0.75	1.00		1.00		0.95			0.95	
Frpb, ped/bikes		1.00	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	
Frt		1.00	0.85	1.00		0.85		0.99			1.00	
Flt Protected		0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)		3335	2197	1580		1464		2998			3273	
Flt Permitted		0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)		3335	2197	1580		1464		2998			3273	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	118	265	812	91	0	193	0	860	95	0	219	0
RTOR Reduction (vph)	0	0	507	0	0	174	0	6	0	0	0	0
Lane Group Flow (vph)	0	383	305	91	0	19	0	949	0	0	219	0
Confl. Bikes (#/hr)			7						2			2
Turn Type	Split	NA	custom	Prot		Perm		NA			NA	
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)		17.5	46.1	12.3		12.3		57.3			29.4	
Effective Green, g (s)		16.5	45.1	11.8		11.8		56.8			28.9	
Actuated g/C Ratio		0.14	0.38	0.10		0.10		0.47			0.24	
Clearance Time (s)		3.6		4.1		4.1		4.2			4.1	
Vehicle Extension (s)		2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)		458	825	155		143		1419			788	
v/s Ratio Prot		c0.11	0.14	c0.06				c0.32			0.07	
v/s Ratio Perm						0.01						
v/c Ratio		0.84	0.37	0.59		0.13		0.67			0.28	
Uniform Delay, d1		50.4	27.1	51.8		49.4		24.4			37.1	
Progression Factor		1.07	2.94	1.00		1.00		1.00			0.42	
Incremental Delay, d2		11.0	0.2	4.6		0.3		2.5			0.9	
Delay (s)		65.1	80.0	56.4		49.7		26.9			16.3	
Level of Service		E	E	E		D		C			B	
Approach Delay (s)		75.2			51.9			26.9			16.3	
Approach LOS		E			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	50.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



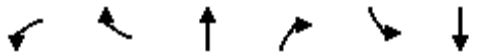
Movement	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations												
Traffic Volume (vph)	100	3	185	32	736	108	216	865	41	34	3	46
Future Volume (vph)	100	3	185	32	736	108	216	865	41	34	3	46
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	10	12	9	12	11	9	9	12	12	12	12
Total Lost time (s)	4.6	4.6		4.0	4.2	4.2	4.0	4.2			4.0	
Lane Util. Factor	1.00	1.00		1.00	0.95	1.00	1.00	0.95			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.94	1.00	0.98			0.75	
Flpb, ped/bikes	0.72	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	0.99			0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1101	1414		1524	3386	1378	1524	2977			1205	
Flt Permitted	0.70	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	815	1414		1524	3386	1378	1524	2977			1205	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	3	185	32	736	108	216	865	41	34	3	46
RTOR Reduction (vph)	0	156	0	0	0	60	0	2	0	0	79	0
Lane Group Flow (vph)	100	32	0	32	736	48	216	904	0	0	4	0
Confl. Peds. (#/hr)	190					18			158			190
Confl. Bikes (#/hr)									10			1
Turn Type	Perm	Prot		Prot	NA	Perm	Prot	NA		Prot	Prot	
Protected Phases		8		5	2		1	6		7	7	
Permitted Phases	8					2						
Actuated Green, G (s)	17.5	17.5		5.1	41.0	41.0	28.8	64.7			6.4	
Effective Green, g (s)	17.5	17.5		4.6	41.5	41.5	28.3	65.2			5.9	
Actuated g/C Ratio	0.16	0.16		0.04	0.38	0.38	0.26	0.59			0.05	
Clearance Time (s)	4.6	4.6		3.5	4.7	4.7	3.5	4.7			3.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.5	2.5	2.0	2.5			2.0	
Lane Grp Cap (vph)	129	224		63	1277	519	392	1764			64	
v/s Ratio Prot		0.02		0.02	c0.22		0.14	c0.30			c0.00	
v/s Ratio Perm	c0.12					0.03						
v/c Ratio	0.78	0.14		0.51	0.58	0.09	0.55	0.51			0.07	
Uniform Delay, d1	44.4	39.8		51.6	27.3	22.1	35.4	13.1			49.4	
Progression Factor	1.00	1.00		0.69	0.67	0.83	1.00	1.00			1.00	
Incremental Delay, d2	22.8	0.1		2.2	1.8	0.3	1.0	1.1			0.2	
Delay (s)	67.1	39.9		37.6	19.9	18.6	36.3	14.2			49.6	
Level of Service	E	D		D	B	B	D	B			D	
Approach Delay (s)	49.4				20.4			18.4			49.6	
Approach LOS	D				C			B			D	

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	123	141	735	129	84	927
Future Volume (vph)	123	141	735	129	84	927
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	12	9	11
Total Lost time (s)	4.0	4.0	4.2		4.0	4.2
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1637	1464	3128		1524	3221
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1637	1464	3128		1524	3221
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	123	141	735	129	84	927
RTOR Reduction (vph)	0	116	8	0	0	0
Lane Group Flow (vph)	123	25	856	0	84	927
Confl. Peds. (#/hr)	65			52		
Confl. Bikes (#/hr)				18		
Bus Blockages (#/hr)	0	0	0	0	0	8
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8	2			
Actuated Green, G (s)	19.7	19.7	69.3		9.3	82.1
Effective Green, g (s)	19.2	19.2	69.8		8.8	82.6
Actuated g/C Ratio	0.17	0.17	0.63		0.08	0.75
Clearance Time (s)	3.5	3.5	4.7		3.5	4.7
Vehicle Extension (s)	2.0	2.0	2.5		2.0	2.5
Lane Grp Cap (vph)	285	255	1984		121	2418
v/s Ratio Prot	c0.08		c0.27		c0.06	0.29
v/s Ratio Perm		0.02				
v/c Ratio	0.43	0.10	0.43		0.69	0.38
Uniform Delay, d1	40.5	38.1	10.1		49.3	4.8
Progression Factor	1.00	1.00	0.48		0.73	2.54
Incremental Delay, d2	0.4	0.1	0.7		11.5	0.4
Delay (s)	40.9	38.2	5.5		47.4	12.6
Level of Service	D	D	A		D	B
Approach Delay (s)	39.5		5.5			15.5
Approach LOS	D		A			B

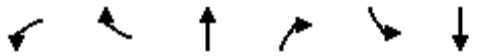
Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	175	209	655	0	0	1050
Future Volume (vph)	175	209	655	0	0	1050
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	11	12	12	10
Total Lost time (s)	5.1	5.1	4.2			4.2
Lane Util. Factor	1.00	1.00	0.95			0.95
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	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1750	1565	3273			3160
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1750	1565	3273			3160
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	175	209	655	0	0	1050
RTOR Reduction (vph)	0	72	0	0	0	0
Lane Group Flow (vph)	175	137	655	0	0	1050
Confl. Peds. (#/hr)				28		
Confl. Bikes (#/hr)				19		
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	11.1	11.1	34.6			34.6
Effective Green, g (s)	10.6	10.6	35.1			35.1
Actuated g/C Ratio	0.19	0.19	0.64			0.64
Clearance Time (s)	4.6	4.6	4.7			4.7
Vehicle Extension (s)	2.5	2.5	3.0			3.0
Lane Grp Cap (vph)	337	301	2088			2016
v/s Ratio Prot	c0.10		0.20			c0.33
v/s Ratio Perm		0.09				
v/c Ratio	0.52	0.46	0.31			0.52
Uniform Delay, d1	19.9	19.6	4.5			5.4
Progression Factor	1.00	1.00	1.42			0.77
Incremental Delay, d2	1.0	0.8	0.4			0.9
Delay (s)	20.9	20.4	6.8			5.1
Level of Service	C	C	A			A
Approach Delay (s)	20.7		6.8			5.1
Approach LOS	C		A			A

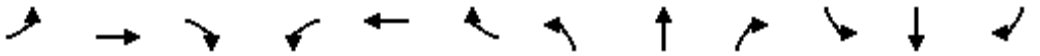
Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	9.3
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	49	43	612	190	230	995
Future Volume (vph)	49	43	612	190	230	995
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	10	12	9	10
Total Lost time (s)	4.1	4.1	4.2		3.5	4.2
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.96		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1750	1565	3008		1524	3160
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1750	1565	3008		1524	3160
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	49	43	612	190	230	995
RTOR Reduction (vph)	0	29	14	0	0	0
Lane Group Flow (vph)	49	14	788	0	230	995
Confl. Peds. (#/hr)	9			30		
Confl. Bikes (#/hr)				20		
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	8	8 1	2		1	6
Permitted Phases						
Actuated Green, G (s)	10.7	35.6	66.7		21.3	91.0
Effective Green, g (s)	10.2	35.1	67.2		20.8	91.5
Actuated g/C Ratio	0.09	0.32	0.61		0.19	0.83
Clearance Time (s)	3.6		4.7		3.0	4.7
Vehicle Extension (s)	3.6		3.6		2.0	3.6
Lane Grp Cap (vph)	162	499	1837		288	2628
v/s Ratio Prot	c0.03	0.01	c0.26		c0.15	0.31
v/s Ratio Perm						
v/c Ratio	0.30	0.03	0.43		0.80	0.38
Uniform Delay, d1	46.6	25.7	11.3		42.6	2.3
Progression Factor	1.00	1.00	1.00		0.95	1.21
Incremental Delay, d2	1.3	0.0	0.7		12.1	0.4
Delay (s)	47.9	25.8	12.0		52.7	3.1
Level of Service	D	C	B		D	A
Approach Delay (s)	37.5		12.0			12.4
Approach LOS	D		B			B

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

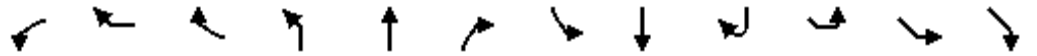
Appendix B-2:
Scenario 2 HCM 2000 Intersection Results



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	30	245	21	0	73	0	287	23	0	57	0
Future Volume (vph)	25	30	245	21	0	73	0	287	23	0	57	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	10	12	9	12	9	12	12	10	12
Total Lost time (s)		4.6	4.6	4.6		4.6		4.7	4.2		4.5	
Lane Util. Factor		0.95	*0.75	1.00		1.00		1.00	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00		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	
Frt		1.00	0.85	1.00		0.85		1.00	0.85		1.00	
Flt Protected		0.98	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)		3278	2175	1565		1350		1588	1481		3129	
Flt Permitted		0.98	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (perm)		3278	2175	1565		1350		1588	1481		3129	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	30	245	21	0	73	0	287	23	0	57	0
RTOR Reduction (vph)	0	0	0	0	0	68	0	0	11	0	0	0
Lane Group Flow (vph)	0	55	245	21	0	5	0	287	12	0	57	0
Confl. Bikes (#/hr)			7						2			2
Turn Type	Split	NA	custom	Prot		Perm		NA	Perm		NA	
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3			2			
Actuated Green, G (s)		16.8	29.4	8.0		8.0		62.3	62.3		50.5	
Effective Green, g (s)		15.8	28.4	7.5		7.5		61.8	62.3		50.0	
Actuated g/C Ratio		0.13	0.24	0.06		0.06		0.51	0.52		0.42	
Clearance Time (s)		3.6		4.1		4.1		4.2	4.2		4.0	
Vehicle Extension (s)		2.5		2.5		2.5		3.0	3.0		3.0	
Lane Grp Cap (vph)		431	514	97		84		817	768		1303	
v/s Ratio Prot		0.02	c0.11	c0.01				c0.18			0.02	
v/s Ratio Perm						0.00			0.01			
v/c Ratio		0.13	0.48	0.22		0.05		0.35	0.02		0.04	
Uniform Delay, d1		46.0	39.4	53.5		52.9		17.2	14.0		20.8	
Progression Factor		0.94	0.96	1.00		1.00		1.00	1.00		0.67	
Incremental Delay, d2		0.1	0.5	0.8		0.2		1.2	0.0		0.1	
Delay (s)		43.5	38.2	54.3		53.1		18.4	14.0		14.0	
Level of Service		D	D	D		D		B	B		B	
Approach Delay (s)		39.1			53.4			18.1			14.0	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations												
Traffic Volume (vph)	15	2	10	9	256	26	16	280	27	44	2	16
Future Volume (vph)	15	2	10	9	256	26	16	280	27	44	2	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	11	12	9	9	11	9	10	12	12	12	12
Total Lost time (s)	4.6	4.6		4.0	5.2	5.2	4.0	5.2	4.7		4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.96		0.97	
Flpb, ped/bikes	0.89	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1339	1450		1509	1588	1426	1509	1647	1433		1590	
Flt Permitted	0.82	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (perm)	1151	1450		1509	1588	1426	1509	1647	1433		1590	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	15	2	10	9	256	26	16	280	27	44	2	16
RTOR Reduction (vph)	0	11	0	0	0	10	0	0	10	0	57	0
Lane Group Flow (vph)	15	1	0	9	256	16	16	280	17	0	5	0
Confl. Peds. (#/hr)	15		1			5			12	1		15
Confl. Bikes (#/hr)									10			1
Turn Type	Perm	Prot		Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	
Protected Phases		8		5	2		1	6		7	7	
Permitted Phases	8					2			6			
Actuated Green, G (s)	4.9	4.9		1.6	50.4	50.4	2.0	50.8	50.8		6.4	
Effective Green, g (s)	4.9	4.9		1.1	49.9	49.9	1.5	50.3	50.8		5.9	
Actuated g/C Ratio	0.06	0.06		0.01	0.62	0.62	0.02	0.63	0.63		0.07	
Clearance Time (s)	4.6	4.6		3.5	4.7	4.7	3.5	4.7	4.7		3.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.5	2.5	2.0	2.5	2.5		2.0	
Lane Grp Cap (vph)	70	88		20	990	889	28	1035	909		117	
v/s Ratio Prot		0.00		0.01	0.16		c0.01	c0.17			c0.00	
v/s Ratio Perm	c0.01					0.01			0.01			
v/c Ratio	0.21	0.01		0.45	0.26	0.02	0.57	0.27	0.02		0.04	
Uniform Delay, d1	35.7	35.3		39.1	6.8	5.7	38.9	6.6	5.4		34.4	
Progression Factor	1.00	1.00		1.35	0.25	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.6	0.0		5.7	0.6	0.0	16.3	0.6	0.0		0.1	
Delay (s)	36.3	35.3		58.7	2.3	5.8	55.2	7.3	5.4		34.5	
Level of Service	D	D		E	A	A	E	A	A		C	
Approach Delay (s)	35.8				4.4			9.5			34.5	
Approach LOS	D				A			A			C	

Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.8
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

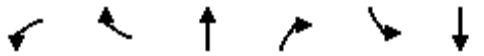
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	4	287	2	2	309
Future Volume (vph)	0	4	287	2	2	309
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	12	9	10
Total Lost time (s)		4.0	5.2	4.7	4.0	5.2
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	0.95	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1400	1647	1432	1509	1594
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1400	1647	1432	1509	1594
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	4	287	2	2	309
RTOR Reduction (vph)	0	4	0	0	0	0
Lane Group Flow (vph)	0	0	287	2	2	309
Confl. Peds. (#/hr)	14			10		
Confl. Bikes (#/hr)				18		
Bus Blockages (#/hr)	0	0	0	0	0	8
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)		5.2	61.5	61.5	1.6	66.6
Effective Green, g (s)		4.7	61.0	61.5	1.1	66.1
Actuated g/C Ratio		0.06	0.76	0.77	0.01	0.83
Clearance Time (s)		3.5	4.7	4.7	3.5	4.7
Vehicle Extension (s)		2.0	2.5	2.5	2.0	2.5
Lane Grp Cap (vph)		82	1255	1100	20	1317
v/s Ratio Prot			0.17		0.00	c0.19
v/s Ratio Perm		c0.00		0.00		
v/c Ratio		0.00	0.23	0.00	0.10	0.23
Uniform Delay, d1		35.4	2.7	2.1	39.0	1.5
Progression Factor		1.00	0.79	1.00	1.13	0.54
Incremental Delay, d2		0.0	0.4	0.0	0.8	0.4
Delay (s)		35.4	2.6	2.1	44.8	1.2
Level of Service		D	A	A	D	A
Approach Delay (s)	35.4		2.6			1.5
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	2.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.2
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

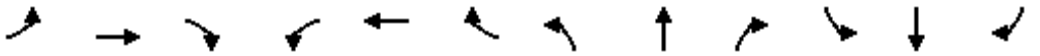
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	2	287	0	0	309
Future Volume (vph)	4	2	287	0	0	309
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	10	12	12	9
Total Lost time (s)	5.1	5.1	5.2			5.2
Lane Util. Factor	1.00	1.00	1.00			1.00
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1732	1550	1647			1588
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1732	1550	1647			1588
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	4	2	287	0	0	309
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	4	0	287	0	0	309
Confl. Peds. (#/hr)				5		
Confl. Bikes (#/hr)				19		
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	1.8	1.8	28.9			28.9
Effective Green, g (s)	1.3	1.3	28.4			28.4
Actuated g/C Ratio	0.03	0.03	0.71			0.71
Clearance Time (s)	4.6	4.6	4.7			4.7
Vehicle Extension (s)	2.5	2.5	3.0			3.0
Lane Grp Cap (vph)	56	50	1169			1127
v/s Ratio Prot	c0.00		0.17			c0.19
v/s Ratio Perm		0.00				
v/c Ratio	0.07	0.00	0.25			0.27
Uniform Delay, d1	18.8	18.7	2.0			2.1
Progression Factor	1.00	1.00	0.51			0.63
Incremental Delay, d2	0.4	0.0	0.5			0.6
Delay (s)	19.2	18.7	1.5			1.9
Level of Service	B	B	A			A
Approach Delay (s)	19.0		1.5			1.9
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	1.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	1	286	20	11	302
Future Volume (vph)	2	1	286	20	11	302
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	12	10	12	9	10
Total Lost time (s)	4.1	4.1	5.2		3.5	5.2
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1732	1500	1630		1509	1647
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1732	1500	1630		1509	1647
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2	1	286	20	11	302
RTOR Reduction (vph)	0	1	1	0	0	0
Lane Group Flow (vph)	2	0	305	0	11	302
Confl. Peds. (#/hr)				4		
Confl. Bikes (#/hr)				20		
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	8	8 1	2		1	6
Permitted Phases						
Actuated Green, G (s)	1.8	7.2	65.1		1.8	69.9
Effective Green, g (s)	1.3	6.7	64.6		1.3	69.4
Actuated g/C Ratio	0.02	0.08	0.81		0.02	0.87
Clearance Time (s)	3.6		4.7		3.0	4.7
Vehicle Extension (s)	3.6		3.6		2.0	3.6
Lane Grp Cap (vph)	28	125	1316		24	1428
v/s Ratio Prot	c0.00	0.00	c0.19		c0.01	0.18
v/s Ratio Perm						
v/c Ratio	0.07	0.00	0.23		0.46	0.21
Uniform Delay, d1	38.8	33.6	1.8		39.0	0.9
Progression Factor	1.00	1.00	1.00		1.00	0.04
Incremental Delay, d2	1.3	0.0	0.4		4.9	0.3
Delay (s)	40.1	33.6	2.2		43.8	0.4
Level of Service	D	C	A		D	A
Approach Delay (s)	37.9		2.2			1.9
Approach LOS	D		A			A

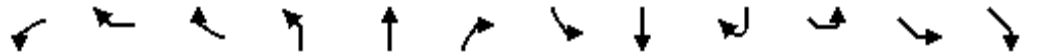
Intersection Summary			
HCM 2000 Control Delay	2.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.8
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	154	578	26	0	89	0	518	28	0	76	0
Future Volume (vph)	87	154	578	26	0	89	0	518	28	0	76	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	10	12	9	12	9	12	12	10	12
Total Lost time (s)		4.6	4.6	4.6		4.6		4.7	4.2		4.5	
Lane Util. Factor		0.95	*0.75	1.00		1.00		1.00	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00		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	
Frt		1.00	0.85	1.00		0.85		1.00	0.85		1.00	
Flt Protected		0.98	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)		3293	2175	1565		1350		1588	1480		3129	
Flt Permitted		0.98	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (perm)		3293	2175	1565		1350		1588	1480		3129	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	87	154	578	26	0	89	0	518	28	0	76	0
RTOR Reduction (vph)	0	0	0	0	0	82	0	0	18	0	0	0
Lane Group Flow (vph)	0	241	578	26	0	7	0	518	10	0	76	0
Confl. Bikes (#/hr)			7						2			2
Turn Type	Split	NA	custom	Prot		Perm		NA	Perm		NA	
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3			2			
Actuated Green, G (s)		32.4	40.0	10.1		10.1		44.6	44.6		37.8	
Effective Green, g (s)		31.4	39.0	9.6		9.6		44.1	44.6		37.3	
Actuated g/C Ratio		0.26	0.32	0.08		0.08		0.37	0.37		0.31	
Clearance Time (s)		3.6		4.1		4.1		4.2	4.2		4.0	
Vehicle Extension (s)		2.5		2.5		2.5		3.0	3.0		3.0	
Lane Grp Cap (vph)		861	706	125		108		583	550		972	
v/s Ratio Prot		0.07	c0.27	c0.02				c0.33			0.02	
v/s Ratio Perm						0.01			0.01			
v/c Ratio		0.28	0.82	0.21		0.07		0.89	0.02		0.08	
Uniform Delay, d1		35.3	37.2	51.6		51.1		35.6	23.9		29.2	
Progression Factor		0.91	0.91	1.00		1.00		1.00	1.00		0.48	
Incremental Delay, d2		0.1	6.9	0.6		0.2		18.1	0.1		0.2	
Delay (s)		32.2	40.7	52.2		51.2		53.7	23.9		14.2	
Level of Service		C	D	D		D		D	C		B	
Approach Delay (s)		38.2			51.5			52.2			14.2	
Approach LOS		D			D			D			B	

Intersection Summary			
HCM 2000 Control Delay	42.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations												
Traffic Volume (vph)	74	4	80	11	449	61	97	565	18	17	1	16
Future Volume (vph)	74	4	80	11	449	61	97	565	18	17	1	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	11	12	9	9	11	9	10	12	12	12	12
Total Lost time (s)	4.6	4.6		4.0	5.2	5.2	4.0	5.2	4.7		4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.96	1.00	1.00	0.90		0.74	
Flpb, ped/bikes	0.77	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (prot)	1168	1450		1509	1588	1398	1509	1647	1343		1197	
Flt Permitted	0.73	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (perm)	904	1450		1509	1588	1398	1509	1647	1343		1197	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	74	4	80	11	449	61	97	565	18	17	1	16
RTOR Reduction (vph)	0	71	0	0	0	32	0	0	8	0	32	0
Lane Group Flow (vph)	74	13	0	11	449	29	97	565	10	0	2	0
Confl. Peds. (#/hr)	71		3			25			50	3		71
Confl. Bikes (#/hr)									10			1
Turn Type	Perm	Prot		Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	
Protected Phases		8		5	2		1	6		7	7	
Permitted Phases	8					2			6			
Actuated Green, G (s)	12.0	12.0		1.6	38.9	38.9	8.0	45.3	45.3		4.8	
Effective Green, g (s)	12.0	12.0		1.1	38.4	38.4	7.5	44.8	45.3		4.3	
Actuated g/C Ratio	0.15	0.15		0.01	0.48	0.48	0.09	0.56	0.57		0.05	
Clearance Time (s)	4.6	4.6		3.5	4.7	4.7	3.5	4.7	4.7		3.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.5	2.5	2.0	2.5	2.5		2.0	
Lane Grp Cap (vph)	135	217		20	762	671	141	922	760		64	
v/s Ratio Prot		0.01		0.01	0.28		c0.06	c0.34			c0.00	
v/s Ratio Perm	c0.08					0.02			0.01			
v/c Ratio	0.55	0.06		0.55	0.59	0.04	0.69	0.61	0.01		0.03	
Uniform Delay, d1	31.5	29.2		39.2	15.1	11.0	35.1	11.8	7.6		35.9	
Progression Factor	1.00	1.00		1.38	0.48	2.13	1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.4	0.0		16.0	3.1	0.1	10.6	3.0	0.0		0.1	
Delay (s)	33.9	29.2		70.0	10.4	23.6	45.7	14.8	7.6		35.9	
Level of Service	C	C		E	B	C	D	B	A		D	
Approach Delay (s)	31.4				13.2			19.0			35.9	
Approach LOS	C				B			B			D	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.8
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

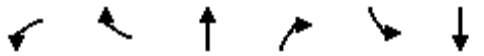
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	44	46	475	62	46	609
Future Volume (vph)	44	46	475	62	46	609
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	12	9	10
Total Lost time (s)	4.0	4.0	5.2	4.7	4.0	5.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.94	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1565	1400	1647	1411	1509	1594
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1565	1400	1647	1411	1509	1594
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	44	46	475	62	46	609
RTOR Reduction (vph)	0	38	0	19	0	0
Lane Group Flow (vph)	44	8	475	43	46	609
Confl. Peds. (#/hr)	20			17		
Confl. Bikes (#/hr)				18		
Bus Blockages (#/hr)	0	0	0	0	0	8
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8	2	2		
Actuated Green, G (s)	14.4	14.4	48.9	48.9	5.0	57.4
Effective Green, g (s)	13.9	13.9	48.4	48.9	4.5	56.9
Actuated g/C Ratio	0.17	0.17	0.60	0.61	0.06	0.71
Clearance Time (s)	3.5	3.5	4.7	4.7	3.5	4.7
Vehicle Extension (s)	2.0	2.0	2.5	2.5	2.0	2.5
Lane Grp Cap (vph)	271	243	996	862	84	1133
v/s Ratio Prot	c0.03		0.29		0.03	c0.38
v/s Ratio Perm		0.01		0.03		
v/c Ratio	0.16	0.03	0.48	0.05	0.55	0.54
Uniform Delay, d1	28.1	27.5	8.8	6.2	36.8	5.4
Progression Factor	1.00	1.00	0.71	0.73	1.20	0.82
Incremental Delay, d2	0.1	0.0	1.6	0.1	3.4	1.6
Delay (s)	28.2	27.5	7.8	4.7	47.5	6.0
Level of Service	C	C	A	A	D	A
Approach Delay (s)	27.8		7.5			8.9
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.2
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

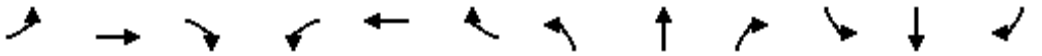
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	67	87	450	0	0	653
Future Volume (vph)	67	87	450	0	0	653
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	10	12	12	9
Total Lost time (s)	5.1	5.1	5.2			5.2
Lane Util. Factor	1.00	1.00	1.00			1.00
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1732	1550	1647			1588
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1732	1550	1647			1588
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	67	87	450	0	0	653
RTOR Reduction (vph)	0	76	0	0	0	0
Lane Group Flow (vph)	67	11	450	0	0	653
Confl. Peds. (#/hr)				11		
Confl. Bikes (#/hr)				19		
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	5.4	5.4	25.3			25.3
Effective Green, g (s)	4.9	4.9	24.8			24.8
Actuated g/C Ratio	0.12	0.12	0.62			0.62
Clearance Time (s)	4.6	4.6	4.7			4.7
Vehicle Extension (s)	2.5	2.5	3.0			3.0
Lane Grp Cap (vph)	212	189	1021			984
v/s Ratio Prot	c0.04		0.27			c0.41
v/s Ratio Perm		0.01				
v/c Ratio	0.32	0.06	0.44			0.66
Uniform Delay, d1	16.0	15.5	4.0			4.9
Progression Factor	1.00	1.00	1.46			1.15
Incremental Delay, d2	0.6	0.1	1.2			3.1
Delay (s)	16.6	15.6	7.0			8.8
Level of Service	B	B	A			A
Approach Delay (s)	16.1		7.0			8.8
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	26	20	430	78	160	560
Future Volume (vph)	26	20	430	78	160	560
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	12	10	12	9	10
Total Lost time (s)	4.1	4.1	5.2		3.5	5.2
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1732	1500	1605		1509	1647
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1732	1500	1605		1509	1647
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	26	20	430	78	160	560
RTOR Reduction (vph)	0	14	5	0	0	0
Lane Group Flow (vph)	26	6	503	0	160	560
Confl. Peds. (#/hr)	2			14		
Confl. Bikes (#/hr)				20		
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	8	8 1	2		1	6
Permitted Phases						
Actuated Green, G (s)	8.6	24.5	47.8		12.3	63.1
Effective Green, g (s)	8.1	24.0	47.3		11.8	62.6
Actuated g/C Ratio	0.10	0.30	0.59		0.15	0.78
Clearance Time (s)	3.6		4.7		3.0	4.7
Vehicle Extension (s)	3.6		3.6		2.0	3.6
Lane Grp Cap (vph)	175	450	948		222	1288
v/s Ratio Prot	c0.02	0.00	c0.31		c0.11	0.34
v/s Ratio Perm						
v/c Ratio	0.15	0.01	0.53		0.72	0.43
Uniform Delay, d1	32.8	19.7	9.7		32.5	2.9
Progression Factor	1.00	1.00	1.00		0.95	0.63
Incremental Delay, d2	0.5	0.0	2.1		8.1	0.9
Delay (s)	33.3	19.7	11.9		39.0	2.7
Level of Service	C	B	B		D	A
Approach Delay (s)	27.4		11.9			10.8
Approach LOS	C		B			B

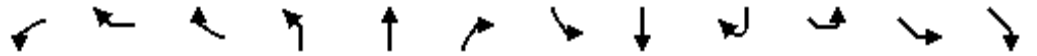
Intersection Summary			
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.8
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	220	587	57	0	118	0	656	48	0	175	0
Future Volume (vph)	73	220	587	57	0	118	0	656	48	0	175	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	10	12	9	12	9	12	12	10	12
Total Lost time (s)		4.6	4.6	4.6		4.6		4.7	4.2		4.6	
Lane Util. Factor		0.95	*0.75	1.00		1.00		1.00	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00		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	
Frt		1.00	0.85	1.00		0.85		1.00	0.85		1.00	
Flt Protected		0.99	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)		3312	2175	1565		1350		1588	1480		3129	
Flt Permitted		0.99	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (perm)		3312	2175	1565		1350		1588	1480		3129	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	220	587	57	0	118	0	656	48	0	175	0
RTOR Reduction (vph)	0	0	0	0	0	108	0	0	27	0	0	0
Lane Group Flow (vph)	0	293	587	57	0	10	0	656	21	0	175	0
Confl. Bikes (#/hr)			7						2			2
Turn Type	Split	NA	custom	Prot		Perm		NA	Perm		NA	
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3			2			
Actuated Green, G (s)		24.0	44.6	10.8		10.8		52.3	52.3		32.4	
Effective Green, g (s)		23.0	43.6	10.3		10.3		51.8	52.3		31.9	
Actuated g/C Ratio		0.19	0.36	0.09		0.09		0.43	0.44		0.27	
Clearance Time (s)		3.6		4.1		4.1		4.2	4.2		4.1	
Vehicle Extension (s)		2.5		2.5		2.5		3.0	3.0		3.0	
Lane Grp Cap (vph)		634	790	134		115		685	645		831	
v/s Ratio Prot		0.09	c0.27	c0.04				c0.41			0.06	
v/s Ratio Perm						0.01			0.01			
v/c Ratio		0.46	0.74	0.43		0.09		0.96	0.03		0.21	
Uniform Delay, d1		43.0	33.3	52.0		50.5		33.0	19.4		34.3	
Progression Factor		1.01	0.90	1.00		1.00		1.00	1.00		0.32	
Incremental Delay, d2		0.4	3.4	1.6		0.2		25.4	0.1		0.6	
Delay (s)		43.8	33.5	53.6		50.8		58.5	19.5		11.7	
Level of Service		D	C	D		D		E	B		B	
Approach Delay (s)		36.9			51.7			55.8			11.7	
Approach LOS		D			D			E			B	

Intersection Summary			
HCM 2000 Control Delay	42.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations												
Traffic Volume (vph)	82	3	91	17	597	140	120	670	29	16	5	15
Future Volume (vph)	82	3	91	17	597	140	120	670	29	16	5	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	11	12	9	9	11	9	10	12	12	12	12
Total Lost time (s)	4.6	4.6		4.0	4.2	4.2	4.0	4.2	4.7		4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.89		0.77	
Flpb, ped/bikes	0.78	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (prot)	1177	1450		1509	1588	1401	1509	1647	1339		1252	
Flt Permitted	0.73	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (perm)	909	1450		1509	1588	1401	1509	1647	1339		1252	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	82	3	91	17	597	140	120	670	29	16	5	15
RTOR Reduction (vph)	0	80	0	0	0	61	0	0	13	0	34	0
Lane Group Flow (vph)	82	14	0	17	597	79	120	670	16	0	2	0
Confl. Peds. (#/hr)	70		11			23			52	11		70
Confl. Bikes (#/hr)									10			1
Turn Type	Perm	Prot		Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	
Protected Phases		8		5	2		1	6		7	7	
Permitted Phases	8					2			6			
Actuated Green, G (s)	12.1	12.1		1.6	37.5	37.5	9.3	45.2	45.2		4.8	
Effective Green, g (s)	12.1	12.1		1.1	38.0	38.0	8.8	45.7	45.2		4.3	
Actuated g/C Ratio	0.15	0.15		0.01	0.48	0.48	0.11	0.57	0.57		0.05	
Clearance Time (s)	4.6	4.6		3.5	4.7	4.7	3.5	4.7	4.7		3.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.5	2.5	2.0	2.5	2.5		2.0	
Lane Grp Cap (vph)	137	219		20	754	665	165	940	756		67	
v/s Ratio Prot		0.01		0.01	c0.38		c0.08	0.41			c0.00	
v/s Ratio Perm	c0.09					0.06			0.01			
v/c Ratio	0.60	0.06		0.85	0.79	0.12	0.73	0.71	0.02		0.03	
Uniform Delay, d1	31.7	29.1		39.4	17.7	11.7	34.4	12.4	7.7		35.9	
Progression Factor	1.00	1.00		1.29	0.78	1.06	1.00	1.00	1.00		1.00	
Incremental Delay, d2	4.6	0.0		108.3	6.6	0.3	12.7	4.6	0.1		0.1	
Delay (s)	36.3	29.1		159.0	20.4	12.7	47.1	17.0	7.7		35.9	
Level of Service	D	C		F	C	B	D	B	A		D	
Approach Delay (s)	32.5				22.1			21.1			35.9	
Approach LOS	C				C			C			D	

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

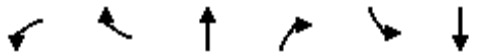
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	58	43	711	121	38	729
Future Volume (vph)	58	43	711	121	38	729
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	12	9	10
Total Lost time (s)	4.0	4.0	4.2	4.7	4.0	4.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.94	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1565	1400	1647	1408	1509	1594
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1565	1400	1647	1408	1509	1594
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	58	43	711	121	38	729
RTOR Reduction (vph)	0	36	0	24	0	0
Lane Group Flow (vph)	58	7	711	97	38	729
Confl. Peds. (#/hr)	24			18		
Confl. Bikes (#/hr)				18		
Bus Blockages (#/hr)	0	0	0	0	0	8
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8	2	2		
Actuated Green, G (s)	14.4	14.4	48.9	48.9	5.0	57.4
Effective Green, g (s)	13.9	13.9	49.4	48.9	4.5	57.9
Actuated g/C Ratio	0.17	0.17	0.62	0.61	0.06	0.72
Clearance Time (s)	3.5	3.5	4.7	4.7	3.5	4.7
Vehicle Extension (s)	2.0	2.0	2.5	2.5	2.0	2.5
Lane Grp Cap (vph)	271	243	1017	860	84	1153
v/s Ratio Prot	c0.04		c0.43		0.03	c0.46
v/s Ratio Perm		0.01		0.07		
v/c Ratio	0.21	0.03	0.70	0.11	0.45	0.63
Uniform Delay, d1	28.4	27.5	10.3	6.5	36.6	5.6
Progression Factor	1.00	1.00	0.75	0.71	1.26	0.70
Incremental Delay, d2	0.1	0.0	3.3	0.2	1.1	2.1
Delay (s)	28.5	27.5	10.9	4.8	47.2	6.1
Level of Service	C	C	B	A	D	A
Approach Delay (s)	28.1		10.0			8.1
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

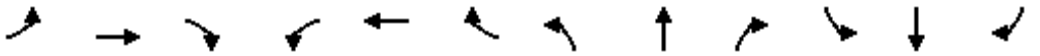
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	64	73	759	0	0	787
Future Volume (vph)	64	73	759	0	0	787
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	10	12	12	9
Total Lost time (s)	5.1	5.1	4.2			4.2
Lane Util. Factor	1.00	1.00	1.00			1.00
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1732	1550	1647			1588
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1732	1550	1647			1588
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	64	73	759	0	0	787
RTOR Reduction (vph)	0	64	0	0	0	0
Lane Group Flow (vph)	64	9	759	0	0	787
Confl. Peds. (#/hr)				15		
Confl. Bikes (#/hr)				19		
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	5.4	5.4	25.3			25.3
Effective Green, g (s)	4.9	4.9	25.8			25.8
Actuated g/C Ratio	0.12	0.12	0.65			0.65
Clearance Time (s)	4.6	4.6	4.7			4.7
Vehicle Extension (s)	2.5	2.5	3.0			3.0
Lane Grp Cap (vph)	212	189	1062			1024
v/s Ratio Prot	c0.04		0.46			c0.50
v/s Ratio Perm		0.01				
v/c Ratio	0.30	0.05	0.71			0.77
Uniform Delay, d1	16.0	15.5	4.7			5.0
Progression Factor	1.00	1.00	1.83			1.06
Incremental Delay, d2	0.6	0.1	2.8			4.6
Delay (s)	16.6	15.6	11.3			9.9
Level of Service	B	B	B			A
Approach Delay (s)	16.0		11.3			9.9
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	9.3
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	17	18	741	91	87	764
Future Volume (vph)	17	18	741	91	87	764
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	12	10	12	9	10
Total Lost time (s)	4.1	4.1	4.2		3.5	4.2
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1732	1500	1616		1509	1647
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1732	1500	1616		1509	1647
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	17	18	741	91	87	764
RTOR Reduction (vph)	0	14	3	0	0	0
Lane Group Flow (vph)	17	5	829	0	87	764
Confl. Peds. (#/hr)	2			19		
Confl. Bikes (#/hr)				20		
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	8	8 1	2		1	6
Permitted Phases						
Actuated Green, G (s)	8.6	20.5	51.8		8.3	63.1
Effective Green, g (s)	8.1	20.0	52.3		7.8	63.6
Actuated g/C Ratio	0.10	0.25	0.65		0.10	0.80
Clearance Time (s)	3.6		4.7		3.0	4.7
Vehicle Extension (s)	3.6		3.6		2.0	3.6
Lane Grp Cap (vph)	175	375	1056		147	1309
v/s Ratio Prot	c0.01	0.00	c0.51		0.06	c0.46
v/s Ratio Perm						
v/c Ratio	0.10	0.01	0.78		0.59	0.58
Uniform Delay, d1	32.6	22.6	9.9		34.6	3.1
Progression Factor	1.00	1.00	1.00		1.00	0.57
Incremental Delay, d2	0.3	0.0	5.9		3.2	1.5
Delay (s)	32.9	22.6	15.7		38.0	3.3
Level of Service	C	C	B		D	A
Approach Delay (s)	27.6		15.7			6.8
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	229	842	71	0	129	0	789	100	0	176	0
Future Volume (vph)	107	229	842	71	0	129	0	789	100	0	176	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	10	12	9	12	9	12	12	10	12
Total Lost time (s)		4.6	4.6	4.6		4.6		4.7	4.2		4.5	
Lane Util. Factor		0.95	*0.75	1.00		1.00		1.00	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00		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	
Frt		1.00	0.85	1.00		0.85		1.00	0.85		1.00	
Flt Protected		0.98	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)		3333	2197	1580		1363		1604	1495		3160	
Flt Permitted		0.98	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (perm)		3333	2197	1580		1363		1604	1495		3160	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	107	229	842	71	0	129	0	789	100	0	176	0
RTOR Reduction (vph)	0	0	0	0	0	118	0	0	44	0	0	0
Lane Group Flow (vph)	0	336	842	71	0	11	0	789	56	0	176	0
Confl. Bikes (#/hr)			7						2			2
Turn Type	Split	NA	custom	Prot		Perm		NA	Perm		NA	
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3			2			
Actuated Green, G (s)		31.5	52.1	11.0		11.0		44.6	44.6		24.8	
Effective Green, g (s)		30.5	51.1	10.5		10.5		44.1	44.6		24.3	
Actuated g/C Ratio		0.25	0.43	0.09		0.09		0.37	0.37		0.20	
Clearance Time (s)		3.6		4.1		4.1		4.2	4.2		4.0	
Vehicle Extension (s)		2.5		2.5		2.5		3.0	3.0		3.0	
Lane Grp Cap (vph)		847	935	138		119		589	555		639	
v/s Ratio Prot		0.10	c0.38	c0.04				c0.49			0.06	
v/s Ratio Perm						0.01			0.04			
v/c Ratio		0.40	0.90	0.51		0.09		1.34	0.10		0.28	
Uniform Delay, d1		37.1	32.1	52.3		50.4		37.9	24.6		40.4	
Progression Factor		1.03	0.89	1.00		1.00		0.72	0.90		0.32	
Incremental Delay, d2		0.2	10.5	2.4		0.3		159.1	0.2		1.0	
Delay (s)		38.3	39.0	54.7		50.6		186.5	22.2		14.2	
Level of Service		D	D	D		D		F	C		B	
Approach Delay (s)		38.8			52.1			168.0			14.2	
Approach LOS		D			D			F			B	

Intersection Summary			
HCM 2000 Control Delay	85.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

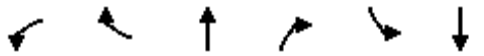
Movement	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations												
Traffic Volume (vph)	99	3	119	12	738	126	189	865	35	32	3	11
Future Volume (vph)	99	3	119	12	738	126	189	865	35	32	3	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	11	12	9	9	11	9	10	12	12	12	12
Total Lost time (s)	4.6	4.6		4.0	4.2	4.2	4.0	4.2	4.7		4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.96	1.00	1.00	0.69		0.83	
Flpb, ped/bikes	0.62	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	951	1464		1524	1604	1401	1524	1663	1047		1377	
Flt Permitted	0.73	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (perm)	728	1464		1524	1604	1401	1524	1663	1047		1377	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	99	3	119	12	738	126	189	865	35	32	3	11
RTOR Reduction (vph)	0	99	0	0	0	47	0	0	14	0	44	0
Lane Group Flow (vph)	99	23	0	12	738	79	189	865	21	0	2	0
Confl. Peds. (#/hr)	151					22			121			151
Confl. Bikes (#/hr)									10			1
Turn Type	Perm	Prot		Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	
Protected Phases		8		5	2		1	6		7	7	
Permitted Phases	8					2			6			
Actuated Green, G (s)	22.6	22.6		3.2	56.1	56.1	18.6	71.5	71.5		6.4	
Effective Green, g (s)	22.6	22.6		2.7	56.6	56.6	18.1	72.0	71.5		5.9	
Actuated g/C Ratio	0.19	0.19		0.02	0.47	0.47	0.15	0.60	0.60		0.05	
Clearance Time (s)	4.6	4.6		3.5	4.7	4.7	3.5	4.7	4.7		3.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.5	2.5	2.0	2.5	2.5		2.0	
Lane Grp Cap (vph)	137	275		34	756	660	229	997	623		67	
v/s Ratio Prot		0.02		0.01	c0.46		0.12	c0.52			c0.00	
v/s Ratio Perm	c0.14					0.06			0.02			
v/c Ratio	0.72	0.08		0.35	0.98	0.12	0.83	0.87	0.03		0.03	
Uniform Delay, d1	45.8	40.2		57.8	31.0	17.8	49.4	20.0	10.0		54.3	
Progression Factor	1.00	1.00		1.29	0.71	1.24	0.80	0.53	1.00		1.00	
Incremental Delay, d2	14.7	0.0		1.7	23.0	0.3	13.0	6.4	0.1		0.1	
Delay (s)	60.5	40.2		76.5	45.1	22.3	52.7	17.1	10.1		54.4	
Level of Service	E	D		E	D	C	D	B	B		D	
Approach Delay (s)	49.3				42.2			23.1			54.4	
Approach LOS	D				D			C			D	

Intersection Summary			
HCM 2000 Control Delay	33.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	99	107	769	177	92	883
Future Volume (vph)	99	107	769	177	92	883
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	12	9	10
Total Lost time (s)	4.0	4.0	4.2	4.7	4.0	4.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.90	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1580	1414	1663	1369	1524	1610
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1580	1414	1663	1369	1524	1610
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	99	107	769	177	92	883
RTOR Reduction (vph)	0	90	0	28	0	0
Lane Group Flow (vph)	99	17	769	149	92	883
Confl. Peds. (#/hr)	41			26		
Confl. Bikes (#/hr)				18		
Bus Blockages (#/hr)	0	0	0	0	0	8
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8	2	2		
Actuated Green, G (s)	19.6	19.6	77.0	77.0	11.7	92.2
Effective Green, g (s)	19.1	19.1	77.5	77.0	11.2	92.7
Actuated g/C Ratio	0.16	0.16	0.65	0.64	0.09	0.77
Clearance Time (s)	3.5	3.5	4.7	4.7	3.5	4.7
Vehicle Extension (s)	2.0	2.0	2.5	2.5	2.0	2.5
Lane Grp Cap (vph)	251	225	1074	878	142	1243
v/s Ratio Prot	c0.06		0.46		0.06	c0.55
v/s Ratio Perm		0.01		0.11		
v/c Ratio	0.39	0.08	0.72	0.17	0.65	0.71
Uniform Delay, d1	45.3	42.9	14.0	8.6	52.5	6.9
Progression Factor	1.00	1.00	0.69	0.55	1.11	0.53
Incremental Delay, d2	0.4	0.1	3.2	0.3	4.0	1.9
Delay (s)	45.6	43.0	12.9	5.1	62.4	5.5
Level of Service	D	D	B	A	E	A
Approach Delay (s)	44.3		11.5			10.9
Approach LOS	D		B			B

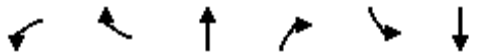
Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



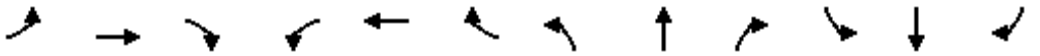
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	155	192	754	0	0	982
Future Volume (vph)	155	192	754	0	0	982
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	10	12	12	9
Total Lost time (s)	5.1	5.1	4.2			4.2
Lane Util. Factor	1.00	1.00	1.00			1.00
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1750	1565	1663			1604
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1750	1565	1663			1604
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	155	192	754	0	0	982
RTOR Reduction (vph)	0	161	0	0	0	0
Lane Group Flow (vph)	155	31	754	0	0	982
Confl. Peds. (#/hr)				35		
Confl. Bikes (#/hr)				19		
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	10.2	10.2	40.5			40.5
Effective Green, g (s)	9.7	9.7	41.0			41.0
Actuated g/C Ratio	0.16	0.16	0.68			0.68
Clearance Time (s)	4.6	4.6	4.7			4.7
Vehicle Extension (s)	2.5	2.5	3.0			3.0
Lane Grp Cap (vph)	282	253	1136			1096
v/s Ratio Prot	c0.09		0.45			c0.61
v/s Ratio Perm		0.02				
v/c Ratio	0.55	0.12	0.66			0.90
Uniform Delay, d1	23.1	21.5	5.5			7.8
Progression Factor	1.00	1.00	1.23			1.48
Incremental Delay, d2	1.7	0.2	0.3			8.8
Delay (s)	24.9	21.7	7.1			20.3
Level of Service	C	C	A			C
Approach Delay (s)	23.1		7.1			20.3
Approach LOS	C		A			C

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.3
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	34	64	690	259	319	818
Future Volume (vph)	34	64	690	259	319	818
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	12	10	12	9	10
Total Lost time (s)	4.1	4.1	4.2		3.5	4.2
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.96		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1750	1515	1566		1524	1663
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1750	1515	1566		1524	1663
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	34	64	690	259	319	818
RTOR Reduction (vph)	0	38	11	0	0	0
Lane Group Flow (vph)	34	26	938	0	319	818
Confl. Peds. (#/hr)	6			47		
Confl. Bikes (#/hr)				20		
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	8	8 1	2		1	6
Permitted Phases						
Actuated Green, G (s)	10.5	49.1	63.2		35.0	101.2
Effective Green, g (s)	10.0	48.6	63.7		34.5	101.7
Actuated g/C Ratio	0.08	0.41	0.53		0.29	0.85
Clearance Time (s)	3.6		4.7		3.0	4.7
Vehicle Extension (s)	3.6		3.6		2.0	3.6
Lane Grp Cap (vph)	145	613	831		438	1409
v/s Ratio Prot	c0.02	0.02	c0.60		c0.21	0.49
v/s Ratio Perm						
v/c Ratio	0.23	0.04	1.13		0.73	0.58
Uniform Delay, d1	51.4	21.6	28.1		38.5	2.7
Progression Factor	1.00	1.00	1.00		0.90	0.63
Incremental Delay, d2	1.0	0.0	73.1		2.7	0.9
Delay (s)	52.4	21.6	101.3		37.4	2.6
Level of Service	D	C	F		D	A
Approach Delay (s)	32.3		101.3			12.4
Approach LOS	C		F			B

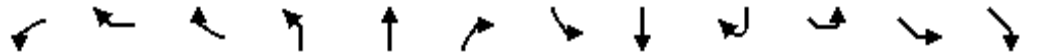
Intersection Summary			
HCM 2000 Control Delay	51.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	265	812	91	0	193	0	860	95	0	219	0
Future Volume (vph)	118	265	812	91	0	193	0	860	95	0	219	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	10	12	9	12	9	12	12	10	12
Total Lost time (s)		4.6	4.6	4.6		4.6		4.7	4.2		4.5	
Lane Util. Factor		0.95	*0.75	1.00		1.00		1.00	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00		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	
Frt		1.00	0.85	1.00		0.85		1.00	0.85		1.00	
Flt Protected		0.98	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)		3335	2197	1580		1363		1604	1495		3160	
Flt Permitted		0.98	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (perm)		3335	2197	1580		1363		1604	1495		3160	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	118	265	812	91	0	193	0	860	95	0	219	0
RTOR Reduction (vph)	0	0	0	0	0	173	0	0	52	0	0	0
Lane Group Flow (vph)	0	383	812	91	0	20	0	860	43	0	219	0
Confl. Bikes (#/hr)			7						2			2
Turn Type	Split	NA	custom	Prot		Perm		NA	Perm		NA	
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3			2			
Actuated Green, G (s)		31.2	51.8	11.8		11.8		34.1	34.1		14.3	
Effective Green, g (s)		30.2	50.8	11.3		11.3		33.6	34.1		13.8	
Actuated g/C Ratio		0.27	0.46	0.10		0.10		0.31	0.31		0.13	
Clearance Time (s)		3.6		4.1		4.1		4.2	4.2		4.0	
Vehicle Extension (s)		2.5		2.5		2.5		3.0	3.0		3.0	
Lane Grp Cap (vph)		915	1014	162		140		489	463		396	
v/s Ratio Prot		0.11	c0.37	c0.06				c0.54			0.07	
v/s Ratio Perm						0.01			0.03			
v/c Ratio		0.42	0.80	0.56		0.14		1.76	0.09		0.55	
Uniform Delay, d1		32.7	25.3	47.0		44.9		38.2	27.0		45.2	
Progression Factor		1.05	0.86	1.00		1.00		1.22	2.27		0.44	
Incremental Delay, d2		0.2	3.9	3.6		0.3		345.1	0.2		5.2	
Delay (s)		34.5	25.6	50.6		45.3		391.8	61.5		25.2	
Level of Service		C	C	D		D		F	E		C	
Approach Delay (s)		28.5			47.0			359.0			25.2	
Approach LOS		C			D			F			C	

Intersection Summary			
HCM 2000 Control Delay	149.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



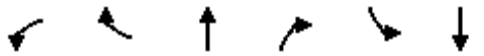
Movement	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations												
Traffic Volume (vph)	100	3	185	32	736	108	216	865	41	34	3	46
Future Volume (vph)	100	3	185	32	736	108	216	865	41	34	3	46
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	11	12	9	9	11	9	10	12	12	12	12
Total Lost time (s)	4.6	4.6		4.0	4.2	4.2	4.0	4.2	4.7		4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.96	1.00	1.00	0.63		0.58	
Flpb, ped/bikes	0.78	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.98	
Satd. Flow (prot)	1182	1464		1524	1604	1413	1524	1663	962		933	
Flt Permitted	0.41	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.98	
Satd. Flow (perm)	512	1464		1524	1604	1413	1524	1663	962		933	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	3	185	32	736	108	216	865	41	34	3	46
RTOR Reduction (vph)	0	151	0	0	0	61	0	0	18	0	79	0
Lane Group Flow (vph)	100	37	0	32	736	47	216	865	23	0	4	0
Confl. Peds. (#/hr)	190					18			158			190
Confl. Bikes (#/hr)									10			1
Turn Type	Perm	Prot		Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	
Protected Phases		8		5	2		1	6		7	7	
Permitted Phases	8					2			6			
Actuated Green, G (s)	20.2	20.2		6.7	47.0	47.0	20.1	60.4	60.4		6.4	
Effective Green, g (s)	20.2	20.2		6.2	47.5	47.5	19.6	60.9	60.4		5.9	
Actuated g/C Ratio	0.18	0.18		0.06	0.43	0.43	0.18	0.55	0.55		0.05	
Clearance Time (s)	4.6	4.6		3.5	4.7	4.7	3.5	4.7	4.7		3.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.5	2.5	2.0	2.5	2.5		2.0	
Lane Grp Cap (vph)	94	268		85	692	610	271	920	528		50	
v/s Ratio Prot		0.03		0.02	c0.46		c0.14	c0.52			c0.00	
v/s Ratio Perm	c0.20					0.03			0.02			
v/c Ratio	1.06	0.14		0.38	1.06	0.08	0.80	0.94	0.04		0.09	
Uniform Delay, d1	44.9	37.6		50.0	31.2	18.4	43.3	22.9	11.5		49.5	
Progression Factor	1.00	1.00		0.80	0.67	0.63	0.97	0.51	0.00		1.00	
Incremental Delay, d2	111.2	0.1		0.8	48.4	0.2	9.8	13.7	0.1		0.3	
Delay (s)	156.1	37.7		40.8	69.4	11.8	51.7	25.3	0.1		49.8	
Level of Service	F	D		D	E	B	D	C	A		D	
Approach Delay (s)	78.8				61.2			29.4			49.8	
Approach LOS	E				E			C			D	

Intersection Summary			
HCM 2000 Control Delay	47.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	123	141	735	129	84	927
Future Volume (vph)	123	141	735	129	84	927
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	12	9	10
Total Lost time (s)	4.0	4.0	4.2	4.7	4.0	4.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.85	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1580	1414	1663	1286	1524	1610
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1580	1414	1663	1286	1524	1610
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	123	141	735	129	84	927
RTOR Reduction (vph)	0	116	0	23	0	0
Lane Group Flow (vph)	123	25	735	106	84	927
Confl. Peds. (#/hr)	65			52		
Confl. Bikes (#/hr)				18		
Bus Blockages (#/hr)	0	0	0	0	0	8
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8	2	2		
Actuated Green, G (s)	19.7	19.7	68.6	68.6	10.0	82.1
Effective Green, g (s)	19.2	19.2	69.1	68.6	9.5	82.6
Actuated g/C Ratio	0.17	0.17	0.63	0.62	0.09	0.75
Clearance Time (s)	3.5	3.5	4.7	4.7	3.5	4.7
Vehicle Extension (s)	2.0	2.0	2.5	2.5	2.0	2.5
Lane Grp Cap (vph)	275	246	1044	801	131	1208
v/s Ratio Prot	c0.08		0.44		0.06	c0.58
v/s Ratio Perm		0.02		0.08		
v/c Ratio	0.45	0.10	0.70	0.13	0.64	0.77
Uniform Delay, d1	40.6	38.1	13.6	8.5	48.6	8.1
Progression Factor	1.00	1.00	0.74	0.80	0.63	0.44
Incremental Delay, d2	0.4	0.1	3.3	0.3	3.3	2.0
Delay (s)	41.1	38.2	13.4	7.1	33.7	5.6
Level of Service	D	D	B	A	C	A
Approach Delay (s)	39.5		12.5			7.9
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



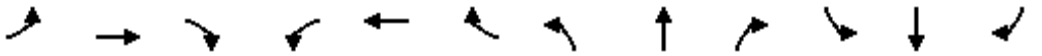
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	175	209	655	0	0	1050
Future Volume (vph)	175	209	655	0	0	1050
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	10	12	12	9
Total Lost time (s)	5.1	5.1	4.2			4.2
Lane Util. Factor	1.00	1.00	1.00			1.00
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1750	1565	1663			1604
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1750	1565	1663			1604
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	175	209	655	0	0	1050
RTOR Reduction (vph)	0	171	0	0	0	0
Lane Group Flow (vph)	175	38	655	0	0	1050
Confl. Peds. (#/hr)				28		
Confl. Bikes (#/hr)				19		
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	10.5	10.5	35.2			35.2
Effective Green, g (s)	10.0	10.0	35.7			35.7
Actuated g/C Ratio	0.18	0.18	0.65			0.65
Clearance Time (s)	4.6	4.6	4.7			4.7
Vehicle Extension (s)	2.5	2.5	3.0			3.0
Lane Grp Cap (vph)	318	284	1079			1041
v/s Ratio Prot	c0.10		0.39			c0.65
v/s Ratio Perm		0.02				
v/c Ratio	0.55	0.13	0.61			1.01
Uniform Delay, d1	20.5	18.9	5.6			9.6
Progression Factor	1.00	1.00	1.16			1.22
Incremental Delay, d2	1.6	0.2	1.7			25.2
Delay (s)	22.1	19.0	8.2			37.0
Level of Service	C	B	A			D
Approach Delay (s)	20.4		8.2			37.0
Approach LOS	C		A			D

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	9.3
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	49	43	612	190	230	995
Future Volume (vph)	49	43	612	190	230	995
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	12	10	12	9	10
Total Lost time (s)	4.1	4.1	4.2		3.5	4.2
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.97		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1750	1515	1589		1524	1663
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1750	1515	1589		1524	1663
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	49	43	612	190	230	995
RTOR Reduction (vph)	0	31	8	0	0	0
Lane Group Flow (vph)	49	12	794	0	230	995
Confl. Peds. (#/hr)	9			30		
Confl. Bikes (#/hr)				20		
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	8	8 1	2		1	6
Permitted Phases						
Actuated Green, G (s)	10.7	32.2	70.1		17.9	91.0
Effective Green, g (s)	10.2	31.7	70.6		17.4	91.5
Actuated g/C Ratio	0.09	0.29	0.64		0.16	0.83
Clearance Time (s)	3.6		4.7		3.0	4.7
Vehicle Extension (s)	3.6		3.6		2.0	3.6
Lane Grp Cap (vph)	162	436	1019		241	1383
v/s Ratio Prot	c0.03	0.01	c0.50		c0.15	0.60
v/s Ratio Perm						
v/c Ratio	0.30	0.03	0.78		0.95	0.72
Uniform Delay, d1	46.6	28.1	14.1		45.9	3.9
Progression Factor	1.00	1.00	1.00		0.99	0.54
Incremental Delay, d2	1.3	0.0	5.9		23.7	1.2
Delay (s)	47.9	28.1	20.0		69.3	3.3
Level of Service	D	C	C		E	A
Approach Delay (s)	38.6		20.0			15.7
Approach LOS	D		C			B

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

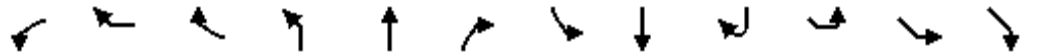
Appendix B-3:
Scenario 3 HCM 2000 Intersection Results



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	30	245	21	0	73	0	287	23	0	57	0
Future Volume (vph)	25	30	245	21	0	73	0	287	23	0	57	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	10	12	9	12	9	12	12	10	12
Total Lost time (s)		4.6	4.6	4.6		4.6		4.7	4.2		4.5	
Lane Util. Factor		0.95	*0.75	1.00		1.00		1.00	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00		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	
Frt		1.00	0.85	1.00		0.85		1.00	0.85		1.00	
Flt Protected		0.98	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)		3278	2175	1565		1350		1588	1481		3129	
Flt Permitted		0.98	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (perm)		3278	2175	1565		1350		1588	1481		3129	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	30	245	21	0	73	0	287	23	0	57	0
RTOR Reduction (vph)	0	0	0	0	0	68	0	0	12	0	0	0
Lane Group Flow (vph)	0	55	245	21	0	5	0	287	11	0	57	0
Confl. Bikes (#/hr)			7						2			2
Turn Type	Split	NA	custom	Prot		Perm		NA	Perm		NA	
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3			2			
Actuated Green, G (s)		15.4	31.0	8.0		8.0		53.7	53.7		38.9	
Effective Green, g (s)		14.4	30.0	7.5		7.5		53.2	53.7		38.4	
Actuated g/C Ratio		0.13	0.27	0.07		0.07		0.48	0.49		0.35	
Clearance Time (s)		3.6		4.1		4.1		4.2	4.2		4.0	
Vehicle Extension (s)		2.5		2.5		2.5		3.0	3.0		3.0	
Lane Grp Cap (vph)		429	593	106		92		768	722		1092	
v/s Ratio Prot		0.02	c0.11	c0.01				c0.18			0.02	
v/s Ratio Perm						0.00			0.01			
v/c Ratio		0.13	0.41	0.20		0.05		0.37	0.02		0.05	
Uniform Delay, d1		42.3	32.8	48.4		47.9		17.9	14.5		23.7	
Progression Factor		0.96	0.97	1.00		1.00		0.87	1.00		0.54	
Incremental Delay, d2		0.1	0.3	0.7		0.2		1.4	0.0		0.1	
Delay (s)		40.6	32.0	49.1		48.1		17.0	14.6		12.9	
Level of Service		D	C	D		D		B	B		B	
Approach Delay (s)		33.6			48.3			16.8			12.9	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



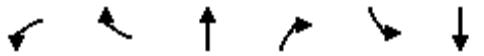
Movement	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations												
Traffic Volume (vph)	15	0	10	9	256	26	16	280	27	44	0	16
Future Volume (vph)	15	0	10	9	256	26	16	280	27	44	0	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	11	12	9	9	11	9	10	12	12	12	12
Total Lost time (s)	4.6	4.6		4.0	5.2	5.2	4.0	5.2	4.7		4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.93	1.00	1.00	0.87		0.85	
Flpb, ped/bikes	0.57	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85		0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	863	1450		1509	1588	1343	1509	1647	1301		1403	
Flt Permitted	0.72	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (perm)	653	1450		1509	1588	1343	1509	1647	1301		1403	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	15	0	10	9	256	26	16	280	27	44	0	16
RTOR Reduction (vph)	0	9	0	0	0	8	0	0	8	0	57	0
Lane Group Flow (vph)	15	1	0	9	256	18	16	280	19	0	3	0
Confl. Peds. (#/hr)	71		3			25			50	3		71
Confl. Bikes (#/hr)									10			1
Turn Type	Perm	Prot		Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	
Protected Phases		8		5	2		1	6		7	7	
Permitted Phases	8					2			6			
Actuated Green, G (s)	8.4	8.4		1.6	74.9	74.9	4.0	77.3	77.3		6.4	
Effective Green, g (s)	8.4	8.4		1.1	74.4	74.4	3.5	76.8	77.3		5.9	
Actuated g/C Ratio	0.08	0.08		0.01	0.68	0.68	0.03	0.70	0.70		0.05	
Clearance Time (s)	4.6	4.6		3.5	4.7	4.7	3.5	4.7	4.7		3.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.5	2.5	2.0	2.5	2.5		2.0	
Lane Grp Cap (vph)	49	110		15	1074	908	48	1149	914		75	
v/s Ratio Prot		0.00		0.01	0.16		c0.01	c0.17			c0.00	
v/s Ratio Perm	c0.02					0.01			0.01			
v/c Ratio	0.31	0.01		0.60	0.24	0.02	0.33	0.24	0.02		0.04	
Uniform Delay, d1	48.0	46.9		54.2	6.9	5.8	52.1	6.0	4.9		49.4	
Progression Factor	1.00	1.00		0.87	0.82	1.00	1.53	0.11	1.00		1.00	
Incremental Delay, d2	1.3	0.0		36.0	0.5	0.0	1.4	0.5	0.0		0.1	
Delay (s)	49.3	47.0		83.1	6.1	5.9	81.2	1.1	5.0		49.5	
Level of Service	D	D		F	A	A	F	A	A		D	
Approach Delay (s)	48.4				8.5			5.4			49.5	
Approach LOS	D				A			A			D	

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.8
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	4	287	2	2	309
Future Volume (vph)	0	4	287	2	2	309
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	12	9	10
Total Lost time (s)		4.0	5.2	4.7	4.0	5.2
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	0.95	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1400	1647	1427	1509	1594
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1400	1647	1427	1509	1594
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	4	287	2	2	309
RTOR Reduction (vph)	0	4	0	1	0	0
Lane Group Flow (vph)	0	0	287	1	2	309
Confl. Peds. (#/hr)	20			17		
Confl. Bikes (#/hr)				18		
Bus Blockages (#/hr)	0	0	0	0	0	8
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8	2	2		
Actuated Green, G (s)		2.0	39.7	39.7	1.6	44.8
Effective Green, g (s)		1.5	39.2	39.7	1.1	44.3
Actuated g/C Ratio		0.03	0.71	0.72	0.02	0.81
Clearance Time (s)		3.5	4.7	4.7	3.5	4.7
Vehicle Extension (s)		2.0	2.5	2.5	2.0	2.5
Lane Grp Cap (vph)		38	1173	1030	30	1283
v/s Ratio Prot			0.17		0.00	c0.19
v/s Ratio Perm		c0.00		0.00		
v/c Ratio		0.00	0.24	0.00	0.07	0.24
Uniform Delay, d1		26.0	2.7	2.1	26.4	1.3
Progression Factor		1.00	0.34	0.40	1.30	0.74
Incremental Delay, d2		0.0	0.5	0.0	0.3	0.4
Delay (s)		26.0	1.4	0.8	34.7	1.4
Level of Service		C	A	A	C	A
Approach Delay (s)	26.0		1.4			1.6
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	1.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	13.2
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

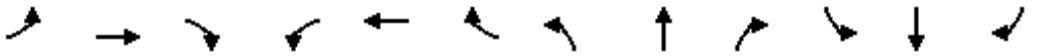


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	2	287	0	0	309
Future Volume (vph)	4	2	287	0	0	309
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	10	12	12	9
Total Lost time (s)	5.1	5.1	5.2			5.2
Lane Util. Factor	1.00	1.00	1.00			1.00
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1732	1550	1647			1588
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1732	1550	1647			1588
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	4	2	287	0	0	309
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	4	0	287	0	0	309
Confl. Peds. (#/hr)				11		
Confl. Bikes (#/hr)				19		
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	1.8	1.8	43.9			43.9
Effective Green, g (s)	1.3	1.3	43.4			43.4
Actuated g/C Ratio	0.02	0.02	0.79			0.79
Clearance Time (s)	4.6	4.6	4.7			4.7
Vehicle Extension (s)	2.5	2.5	3.0			3.0
Lane Grp Cap (vph)	40	36	1299			1253
v/s Ratio Prot	c0.00		0.17			c0.19
v/s Ratio Perm		0.00				
v/c Ratio	0.10	0.00	0.22			0.25
Uniform Delay, d1	26.3	26.2	1.5			1.5
Progression Factor	1.00	1.00	0.87			0.21
Incremental Delay, d2	0.8	0.0	0.4			0.5
Delay (s)	27.1	26.2	1.7			0.8
Level of Service	C	C	A			A
Approach Delay (s)	26.8		1.7			0.8
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	1.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	1	286	20	11	302
Future Volume (vph)	2	1	286	20	11	302
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	12	10	12	9	10
Total Lost time (s)	4.1	4.1	5.2		3.5	5.2
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1732	1500	1629		1509	1647
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1732	1500	1629		1509	1647
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2	1	286	20	11	302
RTOR Reduction (vph)	0	1	1	0	0	0
Lane Group Flow (vph)	2	0	305	0	11	302
Confl. Peds. (#/hr)	2			14		
Confl. Bikes (#/hr)				20		
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	8	8 1	2		1	6
Permitted Phases						
Actuated Green, G (s)	1.8	9.0	93.3		3.6	99.9
Effective Green, g (s)	1.3	8.5	92.8		3.1	99.4
Actuated g/C Ratio	0.01	0.08	0.84		0.03	0.90
Clearance Time (s)	3.6		4.7		3.0	4.7
Vehicle Extension (s)	3.6		3.6		2.0	3.6
Lane Grp Cap (vph)	20	115	1374		42	1488
v/s Ratio Prot	c0.00	0.00	c0.19		0.01	c0.18
v/s Ratio Perm						
v/c Ratio	0.10	0.00	0.22		0.26	0.20
Uniform Delay, d1	53.8	46.8	1.7		52.3	0.6
Progression Factor	1.00	1.00	1.00		0.81	0.45
Incremental Delay, d2	2.7	0.0	0.4		1.2	0.3
Delay (s)	56.4	46.8	2.0		43.5	0.6
Level of Service	E	D	A		D	A
Approach Delay (s)	53.2		2.0			2.1
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	2.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.8
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	154	578	26	0	89	0	518	28	0	76	0
Future Volume (vph)	87	154	578	26	0	89	0	518	28	0	76	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	10	12	9	12	9	12	12	10	12
Total Lost time (s)		4.6	4.6	4.6		4.6		4.7	4.2		4.5	
Lane Util. Factor		0.95	*0.75	1.00		1.00		1.00	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00		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	
Frt		1.00	0.85	1.00		0.85		1.00	0.85		1.00	
Flt Protected		0.98	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)		3293	2175	1565		1350		1588	1480		3129	
Flt Permitted		0.98	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (perm)		3293	2175	1565		1350		1588	1480		3129	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	87	154	578	26	0	89	0	518	28	0	76	0
RTOR Reduction (vph)	0	0	0	0	0	82	0	0	16	0	0	0
Lane Group Flow (vph)	0	241	578	26	0	7	0	518	12	0	76	0
Confl. Bikes (#/hr)			7						2			2
Turn Type	Split	NA	custom	Prot		Perm		NA	Perm		NA	
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3			2			
Actuated Green, G (s)		24.4	51.0	10.1		10.1		52.6	52.6		26.8	
Effective Green, g (s)		23.4	50.0	9.6		9.6		52.1	52.6		26.3	
Actuated g/C Ratio		0.19	0.42	0.08		0.08		0.43	0.44		0.22	
Clearance Time (s)		3.6		4.1		4.1		4.2	4.2		4.0	
Vehicle Extension (s)		2.5		2.5		2.5		3.0	3.0		3.0	
Lane Grp Cap (vph)		642	906	125		108		689	648		685	
v/s Ratio Prot		0.07	c0.27	c0.02				c0.33			0.02	
v/s Ratio Perm						0.01			0.01			
v/c Ratio		0.38	0.64	0.21		0.07		0.75	0.02		0.11	
Uniform Delay, d1		42.0	27.8	51.6		51.1		28.5	19.1		37.5	
Progression Factor		0.98	0.88	1.00		1.00		0.62	1.00		0.53	
Incremental Delay, d2		0.3	1.2	0.6		0.2		6.8	0.0		0.3	
Delay (s)		41.4	25.8	52.2		51.2		24.5	19.1		20.4	
Level of Service		D	C	D		D		C	B		C	
Approach Delay (s)		30.4			51.5			24.2			20.4	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

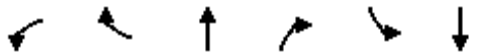
Movement	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations												
Traffic Volume (vph)	74	4	80	11	449	61	97	565	18	17	1	16
Future Volume (vph)	74	4	80	11	449	61	97	565	18	17	1	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	11	12	9	9	11	9	10	12	12	12	12
Total Lost time (s)	4.6	4.6		4.0	4.2	4.2	4.0	4.2	4.7		4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.92	1.00	1.00	0.86		0.71	
Flpb, ped/bikes	0.78	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (prot)	1179	1450		1509	1588	1336	1509	1647	1286		1148	
Flt Permitted	0.73	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (perm)	912	1450		1509	1588	1336	1509	1647	1286		1148	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	74	4	80	11	449	61	97	565	18	17	1	16
RTOR Reduction (vph)	0	71	0	0	0	26	0	0	6	0	33	0
Lane Group Flow (vph)	74	13	0	11	449	35	97	565	12	0	1	0
Confl. Peds. (#/hr)	71		3			25			50	3		71
Confl. Bikes (#/hr)									10			1
Turn Type	Perm	Prot		Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	
Protected Phases		8		5	2		1	6		7	7	
Permitted Phases	8					2			6			
Actuated Green, G (s)	18.6	18.6		1.6	67.5	67.5	12.8	78.7	78.7		4.8	
Effective Green, g (s)	18.6	18.6		1.1	68.0	68.0	12.3	79.2	78.7		4.3	
Actuated g/C Ratio	0.16	0.16		0.01	0.57	0.57	0.10	0.66	0.66		0.04	
Clearance Time (s)	4.6	4.6		3.5	4.7	4.7	3.5	4.7	4.7		3.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.5	2.5	2.0	2.5	2.5		2.0	
Lane Grp Cap (vph)	141	224		13	899	757	154	1087	843		41	
v/s Ratio Prot		0.01		0.01	0.28		c0.06	c0.34			c0.00	
v/s Ratio Perm	c0.08					0.03			0.01			
v/c Ratio	0.52	0.06		0.85	0.50	0.05	0.63	0.52	0.01		0.03	
Uniform Delay, d1	46.6	43.2		59.4	15.7	11.6	51.7	10.6	7.2		55.8	
Progression Factor	1.00	1.00		0.94	0.67	8.23	1.35	0.41	1.00		1.00	
Incremental Delay, d2	1.6	0.0		157.0	1.9	0.1	4.8	1.5	0.0		0.1	
Delay (s)	48.3	43.3		212.6	12.5	95.3	74.4	5.8	7.2		55.9	
Level of Service	D	D		F	B	F	E	A	A		E	
Approach Delay (s)	45.6				26.4			15.6			55.9	
Approach LOS	D				C			B			E	

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	44	46	475	62	46	609
Future Volume (vph)	44	46	475	62	46	609
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	12	9	10
Total Lost time (s)	4.0	4.0	4.2	4.7	4.0	4.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.95	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1565	1400	1647	1422	1509	1594
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1565	1400	1647	1422	1509	1594
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	44	46	475	62	46	609
RTOR Reduction (vph)	0	42	0	22	0	0
Lane Group Flow (vph)	44	4	475	40	46	609
Confl. Peds. (#/hr)	20			17		
Confl. Bikes (#/hr)				18		
Bus Blockages (#/hr)	0	0	0	0	0	8
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8	2	2		
Actuated Green, G (s)	6.0	6.0	39.0	39.0	3.3	45.8
Effective Green, g (s)	5.5	5.5	39.5	39.0	2.8	46.3
Actuated g/C Ratio	0.09	0.09	0.66	0.65	0.05	0.77
Clearance Time (s)	3.5	3.5	4.7	4.7	3.5	4.7
Vehicle Extension (s)	2.0	2.0	2.5	2.5	2.0	2.5
Lane Grp Cap (vph)	143	128	1084	924	70	1230
v/s Ratio Prot	c0.03		0.29		0.03	c0.38
v/s Ratio Perm		0.00		0.03		
v/c Ratio	0.31	0.03	0.44	0.04	0.66	0.50
Uniform Delay, d1	25.5	24.8	4.9	3.8	28.1	2.5
Progression Factor	1.00	1.00	0.71	0.51	0.89	1.60
Incremental Delay, d2	0.4	0.0	1.2	0.1	14.1	1.3
Delay (s)	25.9	24.9	4.7	2.0	39.2	5.3
Level of Service	C	C	A	A	D	A
Approach Delay (s)	25.4		4.4			7.7
Approach LOS	C		A			A

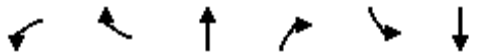
Intersection Summary			
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



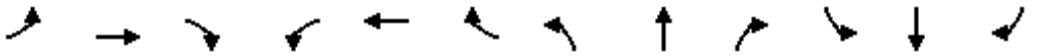
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	67	87	450	0	0	653
Future Volume (vph)	67	87	450	0	0	653
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	10	12	12	9
Total Lost time (s)	5.1	5.1	4.2			4.2
Lane Util. Factor	1.00	1.00	1.00			1.00
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1732	1550	1647			1588
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1732	1550	1647			1588
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	67	87	450	0	0	653
RTOR Reduction (vph)	0	77	0	0	0	0
Lane Group Flow (vph)	67	10	450	0	0	653
Confl. Peds. (#/hr)				11		
Confl. Bikes (#/hr)				19		
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	7.3	7.3	43.4			43.4
Effective Green, g (s)	6.8	6.8	43.9			43.9
Actuated g/C Ratio	0.11	0.11	0.73			0.73
Clearance Time (s)	4.6	4.6	4.7			4.7
Vehicle Extension (s)	2.5	2.5	3.0			3.0
Lane Grp Cap (vph)	196	175	1205			1161
v/s Ratio Prot	c0.04		0.27			c0.41
v/s Ratio Perm		0.01				
v/c Ratio	0.34	0.06	0.37			0.56
Uniform Delay, d1	24.5	23.7	3.0			3.7
Progression Factor	1.00	1.00	1.41			1.17
Incremental Delay, d2	0.8	0.1	0.8			1.8
Delay (s)	25.3	23.8	5.0			6.1
Level of Service	C	C	A			A
Approach Delay (s)	24.5		5.0			6.1
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.3
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	26	20	430	78	160	560
Future Volume (vph)	26	20	430	78	160	560
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	12	10	12	9	10
Total Lost time (s)	4.1	4.1	4.2		3.5	4.2
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1732	1500	1604		1509	1647
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1732	1500	1604		1509	1647
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	26	20	430	78	160	560
RTOR Reduction (vph)	0	15	3	0	0	0
Lane Group Flow (vph)	26	5	505	0	160	560
Confl. Peds. (#/hr)	2			14		
Confl. Bikes (#/hr)				20		
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	8	8 1	2		1	6
Permitted Phases						
Actuated Green, G (s)	8.6	29.2	83.1		17.0	103.1
Effective Green, g (s)	8.1	28.7	83.6		16.5	103.6
Actuated g/C Ratio	0.07	0.24	0.70		0.14	0.86
Clearance Time (s)	3.6		4.7		3.0	4.7
Vehicle Extension (s)	3.6		3.6		2.0	3.6
Lane Grp Cap (vph)	116	358	1117		207	1421
v/s Ratio Prot	c0.02	0.00	c0.31		c0.11	0.34
v/s Ratio Perm						
v/c Ratio	0.22	0.01	0.45		0.77	0.39
Uniform Delay, d1	53.0	34.8	8.1		49.9	1.7
Progression Factor	1.00	1.00	1.00		0.96	0.67
Incremental Delay, d2	1.2	0.0	1.3		13.2	0.7
Delay (s)	54.2	34.9	9.4		61.3	1.9
Level of Service	D	C	A		E	A
Approach Delay (s)	45.8		9.4			15.1
Approach LOS	D		A			B

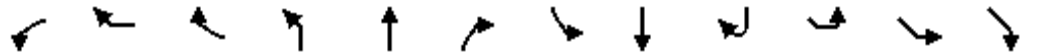
Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	220	587	57	0	118	0	656	48	0	175	0
Future Volume (vph)	73	220	587	57	0	118	0	656	48	0	175	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	10	12	9	12	9	12	12	10	12
Total Lost time (s)		4.6	4.6	4.6		4.6		4.7	4.2		4.5	
Lane Util. Factor		0.95	*0.75	1.00		1.00		1.00	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00		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	
Frt		1.00	0.85	1.00		0.85		1.00	0.85		1.00	
Flt Protected		0.99	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)		3312	2175	1565		1350		1588	1481		3129	
Flt Permitted		0.99	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (perm)		3312	2175	1565		1350		1588	1481		3129	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	220	587	57	0	118	0	656	48	0	175	0
RTOR Reduction (vph)	0	0	0	0	0	108	0	0	26	0	0	0
Lane Group Flow (vph)	0	293	587	57	0	10	0	656	22	0	175	0
Confl. Bikes (#/hr)			7						2			2
Turn Type	Split	NA	custom	Prot		Perm		NA	Perm		NA	
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3			2			
Actuated Green, G (s)		22.4	51.0	10.8		10.8		53.9	53.9		26.1	
Effective Green, g (s)		21.4	50.0	10.3		10.3		53.4	53.9		25.6	
Actuated g/C Ratio		0.18	0.42	0.09		0.09		0.44	0.45		0.21	
Clearance Time (s)		3.6		4.1		4.1		4.2	4.2		4.0	
Vehicle Extension (s)		2.5		2.5		2.5		3.0	3.0		3.0	
Lane Grp Cap (vph)		590	906	134		115		706	665		667	
v/s Ratio Prot		0.09	c0.27	c0.04				c0.41			0.06	
v/s Ratio Perm						0.01			0.01			
v/c Ratio		0.50	0.65	0.43		0.09		0.93	0.03		0.26	
Uniform Delay, d1		44.4	28.0	52.0		50.5		31.5	18.5		39.3	
Progression Factor		1.00	1.00	1.00		1.00		0.58	0.39		0.38	
Incremental Delay, d2		0.5	1.4	1.6		0.2		17.3	0.1		0.9	
Delay (s)		44.9	29.4	53.6		50.8		35.6	7.3		16.0	
Level of Service		D	C	D		D		D	A		B	
Approach Delay (s)		34.6			51.7			33.6			16.0	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations												
Traffic Volume (vph)	82	3	91	17	597	140	120	670	29	16	5	15
Future Volume (vph)	82	3	91	17	597	140	120	670	29	16	5	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	11	12	9	9	11	9	10	12	12	12	12
Total Lost time (s)	4.6	4.6		4.0	4.2	4.2	4.0	4.2	4.7		4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.93	1.00	1.00	0.85		0.75	
Flpb, ped/bikes	0.79	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (prot)	1190	1450		1509	1588	1343	1509	1647	1279		1209	
Flt Permitted	0.73	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (perm)	919	1450		1509	1588	1343	1509	1647	1279		1209	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	82	3	91	17	597	140	120	670	29	16	5	15
RTOR Reduction (vph)	0	79	0	0	0	49	0	0	10	0	35	0
Lane Group Flow (vph)	82	15	0	17	597	91	120	670	19	0	1	0
Confl. Peds. (#/hr)	70		11			23			52	11		70
Confl. Bikes (#/hr)									10			1
Turn Type	Perm	Prot		Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	
Protected Phases		8		5	2		1	6		7	7	
Permitted Phases	8					2			6			
Actuated Green, G (s)	18.9	18.9		3.2	65.7	65.7	14.3	76.8	76.8		4.8	
Effective Green, g (s)	18.9	18.9		2.7	66.2	66.2	13.8	77.3	76.8		4.3	
Actuated g/C Ratio	0.16	0.16		0.02	0.55	0.55	0.12	0.64	0.64		0.04	
Clearance Time (s)	4.6	4.6		3.5	4.7	4.7	3.5	4.7	4.7		3.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.5	2.5	2.0	2.5	2.5		2.0	
Lane Grp Cap (vph)	144	228		33	876	740	173	1060	818		43	
v/s Ratio Prot		0.01		0.01	c0.38		c0.08	0.41			c0.00	
v/s Ratio Perm	c0.09					0.07			0.01			
v/c Ratio	0.57	0.06		0.52	0.68	0.12	0.69	0.63	0.02		0.03	
Uniform Delay, d1	46.8	43.0		58.0	19.3	12.9	51.1	12.8	7.9		55.8	
Progression Factor	1.00	1.00		0.99	0.63	0.94	1.16	0.80	1.00		1.00	
Incremental Delay, d2	3.1	0.0		4.7	3.6	0.3	7.9	2.4	0.0		0.1	
Delay (s)	49.8	43.1		62.1	15.9	12.4	67.1	12.7	7.9		55.9	
Level of Service	D	D		E	B	B	E	B	A		E	
Approach Delay (s)	46.2				16.3			20.5			55.9	
Approach LOS	D				B			C			E	

Intersection Summary			
HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	58	43	711	121	38	729
Future Volume (vph)	58	43	711	121	38	729
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	12	9	10
Total Lost time (s)	4.0	4.0	4.2	4.7	4.0	4.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.95	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1565	1400	1647	1420	1509	1594
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1565	1400	1647	1420	1509	1594
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	58	43	711	121	38	729
RTOR Reduction (vph)	0	39	0	30	0	0
Lane Group Flow (vph)	58	4	711	91	38	729
Confl. Peds. (#/hr)	24			18		
Confl. Bikes (#/hr)				18		
Bus Blockages (#/hr)	0	0	0	0	0	8
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8	2	2		
Actuated Green, G (s)	6.0	6.0	39.0	39.0	3.3	45.8
Effective Green, g (s)	5.5	5.5	39.5	39.0	2.8	46.3
Actuated g/C Ratio	0.09	0.09	0.66	0.65	0.05	0.77
Clearance Time (s)	3.5	3.5	4.7	4.7	3.5	4.7
Vehicle Extension (s)	2.0	2.0	2.5	2.5	2.0	2.5
Lane Grp Cap (vph)	143	128	1084	923	70	1230
v/s Ratio Prot	c0.04		c0.43		0.03	c0.46
v/s Ratio Perm		0.00		0.06		
v/c Ratio	0.41	0.03	0.66	0.10	0.54	0.59
Uniform Delay, d1	25.7	24.8	6.2	3.9	28.0	2.9
Progression Factor	1.00	1.00	0.79	0.28	0.91	1.50
Incremental Delay, d2	0.7	0.0	2.6	0.2	3.7	1.7
Delay (s)	26.4	24.9	7.5	1.3	29.1	6.0
Level of Service	C	C	A	A	C	A
Approach Delay (s)	25.7		6.6			7.2
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

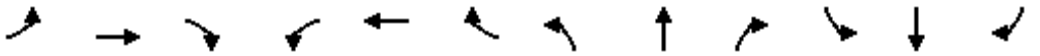
c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	64	73	759	0	0	787
Future Volume (vph)	64	73	759	0	0	787
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	10	12	12	9
Total Lost time (s)	5.1	5.1	4.2			4.2
Lane Util. Factor	1.00	1.00	1.00			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	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1732	1550	1647			1588
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1732	1550	1647			1588
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	64	73	759	0	0	787
RTOR Reduction (vph)	0	65	0	0	0	0
Lane Group Flow (vph)	64	8	759	0	0	787
Confl. Peds. (#/hr)				15		
Confl. Bikes (#/hr)				19		
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	7.2	7.2	43.5			43.5
Effective Green, g (s)	6.7	6.7	44.0			44.0
Actuated g/C Ratio	0.11	0.11	0.73			0.73
Clearance Time (s)	4.6	4.6	4.7			4.7
Vehicle Extension (s)	2.5	2.5	3.0			3.0
Lane Grp Cap (vph)	193	173	1207			1164
v/s Ratio Prot	c0.04		0.46			c0.50
v/s Ratio Perm		0.01				
v/c Ratio	0.33	0.05	0.63			0.68
Uniform Delay, d1	24.6	23.8	4.0			4.2
Progression Factor	1.00	1.00	1.71			0.84
Incremental Delay, d2	0.7	0.1	1.9			2.7
Delay (s)	25.3	23.9	8.7			6.3
Level of Service	C	C	A			A
Approach Delay (s)	24.6		8.7			6.3
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.3
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	17	18	741	91	87	764
Future Volume (vph)	17	18	741	91	87	764
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	12	10	12	9	10
Total Lost time (s)	4.1	4.1	4.2		3.5	4.2
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1732	1500	1615		1509	1647
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1732	1500	1615		1509	1647
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	17	18	741	91	87	764
RTOR Reduction (vph)	0	15	2	0	0	0
Lane Group Flow (vph)	17	3	830	0	87	764
Confl. Peds. (#/hr)	2			19		
Confl. Bikes (#/hr)				20		
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	8	8 1	2		1	6
Permitted Phases						
Actuated Green, G (s)	8.6	21.6	90.7		9.4	103.1
Effective Green, g (s)	8.1	21.1	91.2		8.9	103.6
Actuated g/C Ratio	0.07	0.18	0.76		0.07	0.86
Clearance Time (s)	3.6		4.7		3.0	4.7
Vehicle Extension (s)	3.6		3.6		2.0	3.6
Lane Grp Cap (vph)	116	263	1227		111	1421
v/s Ratio Prot	c0.01	0.00	c0.51		c0.06	0.46
v/s Ratio Perm						
v/c Ratio	0.15	0.01	0.68		0.78	0.54
Uniform Delay, d1	52.7	40.8	7.1		54.6	2.1
Progression Factor	1.00	1.00	1.00		1.01	0.61
Incremental Delay, d2	0.7	0.0	3.0		22.5	1.1
Delay (s)	53.4	40.9	10.1		77.5	2.4
Level of Service	D	D	B		E	A
Approach Delay (s)	47.0		10.1			10.1
Approach LOS	D		B			B

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	229	842	71	0	129	0	789	100	0	176	0
Future Volume (vph)	107	229	842	71	0	129	0	789	100	0	176	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	10	12	9	12	9	12	12	10	12
Total Lost time (s)		4.6	4.6	4.6		4.6		4.7	4.2		4.5	
Lane Util. Factor		0.95	*0.75	1.00		1.00		1.00	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00		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	
Frt		1.00	0.85	1.00		0.85		1.00	0.85		1.00	
Flt Protected		0.98	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)		3333	2197	1580		1363		1604	1495		3160	
Flt Permitted		0.98	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (perm)		3333	2197	1580		1363		1604	1495		3160	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	107	229	842	71	0	129	0	789	100	0	176	0
RTOR Reduction (vph)	0	0	0	0	0	120	0	0	31	0	0	0
Lane Group Flow (vph)	0	336	842	71	0	9	0	789	69	0	176	0
Confl. Bikes (#/hr)			7						2			2
Turn Type	Split	NA	custom	Prot		Perm		NA	Perm		NA	
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3			2			
Actuated Green, G (s)		33.1	63.1	11.5		11.5		66.5	66.5		36.3	
Effective Green, g (s)		32.1	62.1	11.0		11.0		66.0	66.5		35.8	
Actuated g/C Ratio		0.21	0.41	0.07		0.07		0.44	0.44		0.24	
Clearance Time (s)		3.6		4.1		4.1		4.2	4.2		4.0	
Vehicle Extension (s)		2.5		2.5		2.5		3.0	3.0		3.0	
Lane Grp Cap (vph)		713	909	115		99		705	662		754	
v/s Ratio Prot		0.10	c0.38	c0.04				c0.49			0.06	
v/s Ratio Perm						0.01			0.05			
v/c Ratio		0.47	0.93	0.62		0.10		1.12	0.10		0.23	
Uniform Delay, d1		51.5	41.8	67.5		64.9		42.0	24.4		46.0	
Progression Factor		1.00	1.00	1.00		1.00		0.41	0.15		0.74	
Incremental Delay, d2		0.4	15.0	8.2		0.3		65.9	0.2		0.7	
Delay (s)		51.9	56.7	75.6		65.2		83.3	3.7		34.8	
Level of Service		D	E	E		E		F	A		C	
Approach Delay (s)		55.4			68.9			74.4			34.8	
Approach LOS		E			E			E			C	

Intersection Summary			
HCM 2000 Control Delay	61.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	21.7
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations												
Traffic Volume (vph)	99	3	119	12	738	126	189	865	35	32	3	11
Future Volume (vph)	99	3	119	12	738	126	189	865	35	32	3	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	11	12	9	9	11	9	10	12	12	12	12
Total Lost time (s)	4.6	4.6		4.0	4.2	4.2	4.0	4.2	4.7		4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.92	1.00	1.00	0.62		0.81	
Flpb, ped/bikes	0.54	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	826	1464		1524	1604	1340	1524	1663	940		1347	
Flt Permitted	0.73	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (perm)	632	1464		1524	1604	1340	1524	1663	940		1347	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	99	3	119	12	738	126	189	865	35	32	3	11
RTOR Reduction (vph)	0	101	0	0	0	34	0	0	11	0	44	0
Lane Group Flow (vph)	99	21	0	12	738	92	189	865	24	0	2	0
Confl. Peds. (#/hr)	151					22			121			151
Confl. Bikes (#/hr)									10			1
Turn Type	Perm	Prot		Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	
Protected Phases		8		5	2		1	6		7	7	
Permitted Phases	8					2			6			
Actuated Green, G (s)	23.2	23.2		3.2	78.5	78.5	25.6	100.9	100.9		6.4	
Effective Green, g (s)	23.2	23.2		2.7	79.0	79.0	25.1	101.4	100.9		5.9	
Actuated g/C Ratio	0.15	0.15		0.02	0.53	0.53	0.17	0.68	0.67		0.04	
Clearance Time (s)	4.6	4.6		3.5	4.7	4.7	3.5	4.7	4.7		3.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.5	2.5	2.0	2.5	2.5		2.0	
Lane Grp Cap (vph)	97	226		27	844	705	255	1124	632		52	
v/s Ratio Prot		0.01		0.01	c0.46		0.12	c0.52			c0.00	
v/s Ratio Perm	c0.16					0.07			0.03			
v/c Ratio	1.02	0.09		0.44	0.87	0.13	0.74	0.77	0.04		0.03	
Uniform Delay, d1	63.4	54.4		72.9	31.1	18.0	59.4	16.4	8.2		69.3	
Progression Factor	1.00	1.00		0.86	0.63	0.68	0.77	0.51	0.84		1.00	
Incremental Delay, d2	97.1	0.1		3.1	9.5	0.3	7.4	3.9	0.1		0.1	
Delay (s)	160.5	54.5		65.5	29.2	12.5	53.4	12.2	7.0		69.4	
Level of Service	F	D		E	C	B	D	B	A		E	
Approach Delay (s)	101.9				27.3			19.2			69.4	
Approach LOS	F				C			B			E	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	99	107	769	177	92	883
Future Volume (vph)	99	107	769	177	92	883
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	12	9	10
Total Lost time (s)	4.0	4.0	4.2	4.7	4.0	4.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.93	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1580	1414	1663	1406	1524	1610
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1580	1414	1663	1406	1524	1610
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	99	107	769	177	92	883
RTOR Reduction (vph)	0	95	0	41	0	0
Lane Group Flow (vph)	99	12	769	136	92	883
Confl. Peds. (#/hr)	41			26		
Confl. Bikes (#/hr)				18		
Bus Blockages (#/hr)	0	0	0	0	0	8
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8	2	2		
Actuated Green, G (s)	8.6	8.6	46.6	46.6	8.1	58.2
Effective Green, g (s)	8.1	8.1	47.1	46.6	7.6	58.7
Actuated g/C Ratio	0.11	0.11	0.63	0.62	0.10	0.78
Clearance Time (s)	3.5	3.5	4.7	4.7	3.5	4.7
Vehicle Extension (s)	2.0	2.0	2.5	2.5	2.0	2.5
Lane Grp Cap (vph)	170	152	1044	873	154	1260
v/s Ratio Prot	c0.06		0.46		0.06	c0.55
v/s Ratio Perm		0.01		0.10		
v/c Ratio	0.58	0.08	0.74	0.16	0.60	0.70
Uniform Delay, d1	31.8	30.1	9.7	6.0	32.2	3.9
Progression Factor	1.00	1.00	1.00	1.11	1.03	1.15
Incremental Delay, d2	3.3	0.1	3.8	0.3	2.5	2.0
Delay (s)	35.1	30.2	13.4	6.9	35.7	6.5
Level of Service	D	C	B	A	D	A
Approach Delay (s)	32.5		12.2			9.3
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

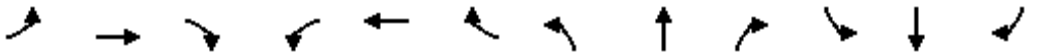
c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	155	192	754	0	0	982
Future Volume (vph)	155	192	754	0	0	982
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	10	12	12	9
Total Lost time (s)	5.1	5.1	4.2			4.2
Lane Util. Factor	1.00	1.00	1.00			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	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1750	1565	1663			1604
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1750	1565	1663			1604
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	155	192	754	0	0	982
RTOR Reduction (vph)	0	166	0	0	0	0
Lane Group Flow (vph)	155	26	754	0	0	982
Confl. Peds. (#/hr)				35		
Confl. Bikes (#/hr)				19		
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	10.6	10.6	55.1			55.1
Effective Green, g (s)	10.1	10.1	55.6			55.6
Actuated g/C Ratio	0.13	0.13	0.74			0.74
Clearance Time (s)	4.6	4.6	4.7			4.7
Vehicle Extension (s)	2.5	2.5	3.0			3.0
Lane Grp Cap (vph)	235	210	1232			1189
v/s Ratio Prot	c0.09		0.45			c0.61
v/s Ratio Perm		0.02				
v/c Ratio	0.66	0.12	0.61			0.83
Uniform Delay, d1	30.8	28.6	4.6			6.5
Progression Factor	1.00	1.00	1.69			0.69
Incremental Delay, d2	5.9	0.2	0.9			5.1
Delay (s)	36.7	28.7	8.7			9.5
Level of Service	D	C	A			A
Approach Delay (s)	32.3		8.7			9.5
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	9.3
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	34	64	690	259	319	818
Future Volume (vph)	34	64	690	259	319	818
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	12	10	12	9	10
Total Lost time (s)	4.1	3.5	4.2		3.5	4.2
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.96		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1750	1515	1559		1524	1663
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1750	1515	1559		1524	1663
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	34	64	690	259	319	818
RTOR Reduction (vph)	0	44	6	0	0	0
Lane Group Flow (vph)	34	20	943	0	319	818
Confl. Peds. (#/hr)	6			47		
Confl. Bikes (#/hr)				20		
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	8	1 8	2		1	6
Permitted Phases						
Actuated Green, G (s)	10.6	50.9	91.4		36.7	131.1
Effective Green, g (s)	10.1	46.3	91.9		36.2	131.6
Actuated g/C Ratio	0.07	0.31	0.61		0.24	0.88
Clearance Time (s)	3.6		4.7		3.0	4.7
Vehicle Extension (s)	3.6		3.6		2.0	3.6
Lane Grp Cap (vph)	117	467	955		367	1459
v/s Ratio Prot	c0.02	0.01	c0.60		c0.21	0.49
v/s Ratio Perm						
v/c Ratio	0.29	0.04	0.99		0.87	0.56
Uniform Delay, d1	66.5	36.3	28.5		54.6	2.2
Progression Factor	1.00	1.00	1.00		1.02	0.88
Incremental Delay, d2	1.7	0.0	26.2		11.8	0.9
Delay (s)	68.2	36.3	54.7		67.3	2.9
Level of Service	E	D	D		E	A
Approach Delay (s)	47.4		54.7			20.9
Approach LOS	D		D			C

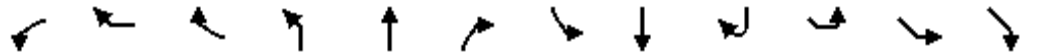
Intersection Summary			
HCM 2000 Control Delay	36.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	265	812	91	0	193	0	860	95	0	219	0
Future Volume (vph)	118	265	812	91	0	193	0	860	95	0	219	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	10	12	9	12	9	12	12	10	12
Total Lost time (s)		4.6	4.6	4.6		4.6		4.7	4.2		4.5	
Lane Util. Factor		0.95	*0.75	1.00		1.00		1.00	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00		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	
Frt		1.00	0.85	1.00		0.85		1.00	0.85		1.00	
Flt Protected		0.98	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)		3335	2197	1580		1363		1604	1495		3160	
Flt Permitted		0.98	1.00	0.95		1.00		1.00	1.00		1.00	
Satd. Flow (perm)		3335	2197	1580		1363		1604	1495		3160	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	118	265	812	91	0	193	0	860	95	0	219	0
RTOR Reduction (vph)	0	0	0	0	0	177	0	0	31	0	0	0
Lane Group Flow (vph)	0	383	812	91	0	16	0	860	64	0	219	0
Confl. Bikes (#/hr)			7						2			2
Turn Type	Split	NA	custom	Prot		Perm		NA	Perm		NA	
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3			2			
Actuated Green, G (s)		31.6	61.5	12.9		12.9		67.4	67.4		37.3	
Effective Green, g (s)		30.6	60.5	12.4		12.4		66.9	67.4		36.8	
Actuated g/C Ratio		0.20	0.40	0.08		0.08		0.45	0.45		0.25	
Clearance Time (s)		3.6		4.1		4.1		4.2	4.2		4.0	
Vehicle Extension (s)		2.5		2.5		2.5		3.0	3.0		3.0	
Lane Grp Cap (vph)		680	886	130		112		715	671		775	
v/s Ratio Prot		0.11	c0.37	c0.06				c0.54			0.07	
v/s Ratio Perm						0.01			0.04			
v/c Ratio		0.56	0.92	0.70		0.14		1.20	0.10		0.28	
Uniform Delay, d1		53.7	42.4	67.0		63.9		41.5	23.8		45.9	
Progression Factor		1.00	1.00	1.00		1.00		0.51	0.43		0.81	
Incremental Delay, d2		0.9	13.9	14.1		0.4		100.0	0.2		0.9	
Delay (s)		54.6	56.3	81.1		64.3		121.2	10.3		38.0	
Level of Service		D	E	F		E		F	B		D	
Approach Delay (s)		55.7			69.7			110.2			38.0	
Approach LOS		E			E			F			D	

Intersection Summary			
HCM 2000 Control Delay	75.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	21.7
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



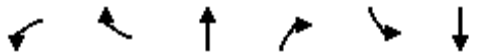
Movement	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations												
Traffic Volume (vph)	100	3	185	32	736	108	216	865	41	34	3	46
Future Volume (vph)	100	3	185	32	736	108	216	865	41	34	3	46
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	11	12	9	9	11	9	10	12	12	12	12
Total Lost time (s)	4.6	4.6		4.0	4.2	4.2	4.0	4.2	4.7		4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.93	1.00	1.00	0.51		0.57	
Flpb, ped/bikes	0.49	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.98	
Satd. Flow (prot)	750	1464		1524	1604	1358	1524	1663	777		915	
Flt Permitted	0.70	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.98	
Satd. Flow (perm)	555	1464		1524	1604	1358	1524	1663	777		915	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	3	185	32	736	108	216	865	41	34	3	46
RTOR Reduction (vph)	0	164	0	0	0	38	0	0	13	0	79	0
Lane Group Flow (vph)	100	24	0	32	736	70	216	865	28	0	4	0
Confl. Peds. (#/hr)	190					18			158			190
Confl. Bikes (#/hr)									10			1
Turn Type	Perm	Prot		Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	
Protected Phases		8		5	2		1	6		7	7	
Permitted Phases	8					2			6			
Actuated Green, G (s)	16.8	16.8		5.6	85.5	85.5	23.3	103.2	103.2		8.1	
Effective Green, g (s)	16.8	16.8		5.1	86.0	86.0	22.8	103.7	103.2		7.6	
Actuated g/C Ratio	0.11	0.11		0.03	0.57	0.57	0.15	0.69	0.69		0.05	
Clearance Time (s)	4.6	4.6		3.5	4.7	4.7	3.5	4.7	4.7		3.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.5	2.5	2.0	2.5	2.5		2.0	
Lane Grp Cap (vph)	62	163		51	919	778	231	1149	534		46	
v/s Ratio Prot		0.02		0.02	c0.46		c0.14	0.52			c0.00	
v/s Ratio Perm	c0.18					0.05			0.04			
v/c Ratio	1.61	0.15		0.63	0.80	0.09	0.94	0.75	0.05		0.09	
Uniform Delay, d1	66.6	60.1		71.5	25.2	14.4	62.9	14.9	7.6		67.9	
Progression Factor	1.00	1.00		0.93	0.91	1.64	1.32	0.60	1.66		1.00	
Incremental Delay, d2	338.1	0.2		12.0	5.4	0.2	34.4	3.5	0.1		0.3	
Delay (s)	404.7	60.3		78.3	28.3	23.7	117.6	12.4	12.7		68.2	
Level of Service	F	E		E	C	C	F	B	B		E	
Approach Delay (s)	179.9				29.6			32.7			68.2	
Approach LOS	F				C			C			E	

Intersection Summary			
HCM 2000 Control Delay	50.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	123	141	735	129	84	927
Future Volume (vph)	123	141	735	129	84	927
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	12	9	10
Total Lost time (s)	4.0	4.0	4.2	4.7	4.0	4.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.89	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1580	1414	1663	1343	1524	1610
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1580	1414	1663	1343	1524	1610
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	123	141	735	129	84	927
RTOR Reduction (vph)	0	121	0	35	0	0
Lane Group Flow (vph)	123	20	735	94	84	927
Confl. Peds. (#/hr)	65			52		
Confl. Bikes (#/hr)				18		
Bus Blockages (#/hr)	0	0	0	0	0	8
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8	2	2		
Actuated Green, G (s)	10.9	10.9	44.6	44.6	7.8	55.9
Effective Green, g (s)	10.4	10.4	45.1	44.6	7.3	56.4
Actuated g/C Ratio	0.14	0.14	0.60	0.59	0.10	0.75
Clearance Time (s)	3.5	3.5	4.7	4.7	3.5	4.7
Vehicle Extension (s)	2.0	2.0	2.5	2.5	2.0	2.5
Lane Grp Cap (vph)	219	196	1000	798	148	1210
v/s Ratio Prot	c0.08		0.44		0.06	c0.58
v/s Ratio Perm		0.01		0.07		
v/c Ratio	0.56	0.10	0.73	0.12	0.57	0.77
Uniform Delay, d1	30.2	28.2	10.7	6.6	32.3	5.4
Progression Factor	1.00	1.00	0.81	0.37	0.92	1.67
Incremental Delay, d2	2.0	0.1	4.2	0.3	1.6	2.6
Delay (s)	32.1	28.3	12.8	2.7	31.4	11.7
Level of Service	C	C	B	A	C	B
Approach Delay (s)	30.1		11.3			13.3
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	175	209	655	0	0	1050
Future Volume (vph)	175	209	655	0	0	1050
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	13	10	12	12	9
Total Lost time (s)	5.1	5.1	4.2			4.2
Lane Util. Factor	1.00	1.00	1.00			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	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1750	1565	1663			1604
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1750	1565	1663			1604
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	175	209	655	0	0	1050
RTOR Reduction (vph)	0	179	0	0	0	0
Lane Group Flow (vph)	175	30	655	0	0	1050
Confl. Peds. (#/hr)				28		
Confl. Bikes (#/hr)				19		
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	11.3	11.3	54.4			54.4
Effective Green, g (s)	10.8	10.8	54.9			54.9
Actuated g/C Ratio	0.14	0.14	0.73			0.73
Clearance Time (s)	4.6	4.6	4.7			4.7
Vehicle Extension (s)	2.5	2.5	3.0			3.0
Lane Grp Cap (vph)	252	225	1217			1174
v/s Ratio Prot	c0.10		0.39			c0.65
v/s Ratio Perm		0.02				
v/c Ratio	0.69	0.13	0.54			0.89
Uniform Delay, d1	30.5	28.0	4.4			7.8
Progression Factor	1.00	1.00	1.35			1.09
Incremental Delay, d2	7.4	0.2	1.2			7.4
Delay (s)	38.0	28.2	7.2			16.0
Level of Service	D	C	A			B
Approach Delay (s)	32.7		7.2			16.0
Approach LOS	C		A			B

Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	9.3
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	49	43	612	190	230	995
Future Volume (vph)	49	43	612	190	230	995
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	13	12	10	12	9	10
Total Lost time (s)	4.1	3.5	4.2		3.5	4.2
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.97		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1750	1515	1584		1524	1663
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1750	1515	1584		1524	1663
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	49	43	612	190	230	995
RTOR Reduction (vph)	0	32	4	0	0	0
Lane Group Flow (vph)	49	11	798	0	230	995
Confl. Peds. (#/hr)	9			30		
Confl. Bikes (#/hr)				20		
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	8	1 8	2		1	6
Permitted Phases						
Actuated Green, G (s)	13.8	44.4	97.9		27.0	127.9
Effective Green, g (s)	13.3	39.8	98.4		26.5	128.4
Actuated g/C Ratio	0.09	0.27	0.66		0.18	0.86
Clearance Time (s)	3.6		4.7		3.0	4.7
Vehicle Extension (s)	3.6		3.6		2.0	3.6
Lane Grp Cap (vph)	155	401	1039		269	1423
v/s Ratio Prot	c0.03	0.01	c0.50		c0.15	0.60
v/s Ratio Perm						
v/c Ratio	0.32	0.03	0.77		0.86	0.70
Uniform Delay, d1	64.1	40.8	17.9		59.9	3.9
Progression Factor	1.00	1.00	1.00		0.92	1.03
Incremental Delay, d2	1.4	0.0	5.4		11.9	1.4
Delay (s)	65.5	40.8	23.3		66.9	5.4
Level of Service	E	D	C		E	A
Approach Delay (s)	54.0		23.3			17.0
Approach LOS	D		C			B

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			