LMM Engineering Inc. | TRAFFIC & PARKING CONSULTANTS

TRAFFIC IMPACT STUDY

NORTH SERVICE ROAD W/ QEW RAMP

Hotel Development
Oakville, Ontario

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EXECUTIVE SUMMARY

LMM Engineering Inc. was retained by API Development Consultants to undertake a traffic impact study to evaluate the traffic impacts of the proposed hotel development located on the southwest corner of North Service Road / Kerr Street / Queen Elizabeth Way (QEW) ramp intersection in the Town of Oakville, Halton Region, Ontario.

The proposed development consists of a seven-storey hotel with a total gross floor area of 5,145.9 m^2 or 55,390 s.f. GFA with 114 hotel rooms. It is proposed to provide 98 surface parking spaces. Access is proposed from a new right-in/right-out driveway on North Service Road W. It is also proposed to obtain access to the existing signalized commercial plaza driveway on North Service Road W.

Based on the intersection capacity analysis methodology in this report, the North Service Road W / Dorval Drive intersection currently operates with some movements at LOS F and exceeding capacity and is expected to continue to do so with the future background and future total conditions. The intersection is already fully developed with dual left-turn bays on each approach and right-turn bays on three approaches. Additional improvements are not recommended.

The analysis also indicates that at the North Service Road W / Kerr Street / QEW ramp intersection is expected to operate with the northbound left-turn movement at LOS E or F and exceeding the critical v/c ratio at the 2028 future background and future total conditions. Traffic signal warrant analysis based on the available four-hour traffic volumes indicates that traffic signals are 95% warranted currently and will be warranted with the 2028 future background traffic volumes. Traffic signals are recommended as a result of future background conditions for the 2028 horizon. The analysis in the study indicates that traffic signals may be warranted at the North Service Road W / Kerr Street / QEW Ramp intersection by the 2028 horizon as a result of future background conditions (and not as a result of site traffic). A preliminary review of the roundabout option indicates that there will likely not be adequate setback from existing buildings and Sixteen Mile Creek with a roundabout that can accommodate heavy vehicles. It is recommended that the traffic signal option be considered by MTO in the future.

Otherwise, the study area intersections are expected to operate at acceptable levels of service. The addition of site traffic is expected to have a minimal impact on traffic operations in the study area.

The proposed right-turn driveway on North Service Road is expected to operate at acceptable levels of service and not to cause any queuing issues on North Service Road W. The driveway will be spaced over 80 m from the QEW ramp and 60 m from the existing traffic signals at the North Service Road W / Commercial Plaza driveway. The spacing is expected to be adequate and provide minimum stopping sight distance on North Service Road W for a speed of 60 km/h.

Truck turning analysis indicates that buses, garbage trucks, and medium single-unit trucks can maneuver through the site including the bus/truck parking space at the south end of the site.

It is also recommended that the site entrances be stop sign controlled with a stop sign and stop bar for exiting traffic. Appropriate traffic signage and traffic control should be implemented to provide pedestrian / vehicular accessibility safety and manoeuvrability with minimum conflicts throughout the site.

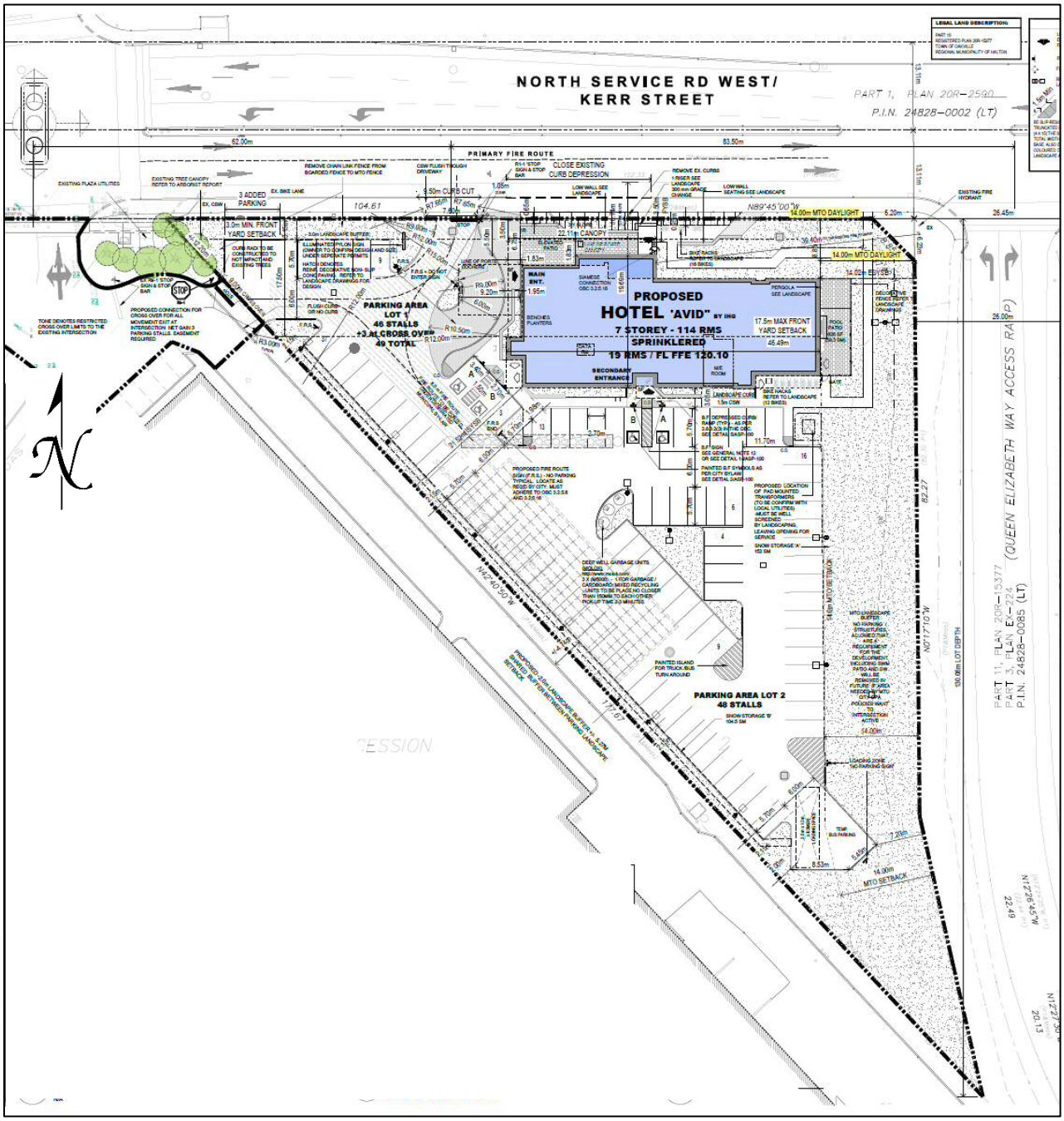
1.0 INTRODUCTION

LMM Engineering Inc. was retained by API Development Consultants to undertake a traffic impact study to evaluate the traffic impacts of the proposed hotel development located on the southwest corner of North Service Road / Kerr Street / Queen Elizabeth Way (QEW) ramp intersection in Town of Oakville, Halton Region, Ontario. The traffic impact study was originally submitted in March 2018 and has been revised to address comments from the Town of Oakville and the Ministry of Transportation of Ontario (MTO).

The proposed development consists of a seven-storey hotel with a total gross floor area of 5,145.9 m^2 or 55,390 s.f. GFA with 114 hotel rooms. It is proposed to provide 98 surface parking spaces. Access is proposed from a new right-in/right-out driveway on North Service Road W. It is also proposed to provide a connection to the existing signalized commercial plaza driveway on North Service Road W. The site location map is shown in **Figure 1-1** and the proposed site plan is shown in **Figure 1-2**.

Figure 1-1 Site Location Map

Figure 1-2 Proposed Site Plan



2.0 EXISTING CONDITIONS

The subject site located on the southwest corner of the intersection of Kerr Street, North Service Road W, and the Queen Elizabeth Way (QEW) ramp intersection in the Town of Oakville, Halton Region, Ontario. The site location map is shown in Figure 1-1 and the proposed site plan is shown in Figure 1-2.

An inventory of the surrounding roads and highway facilities in the vicinity of the site was compiled and is summarized as follows:

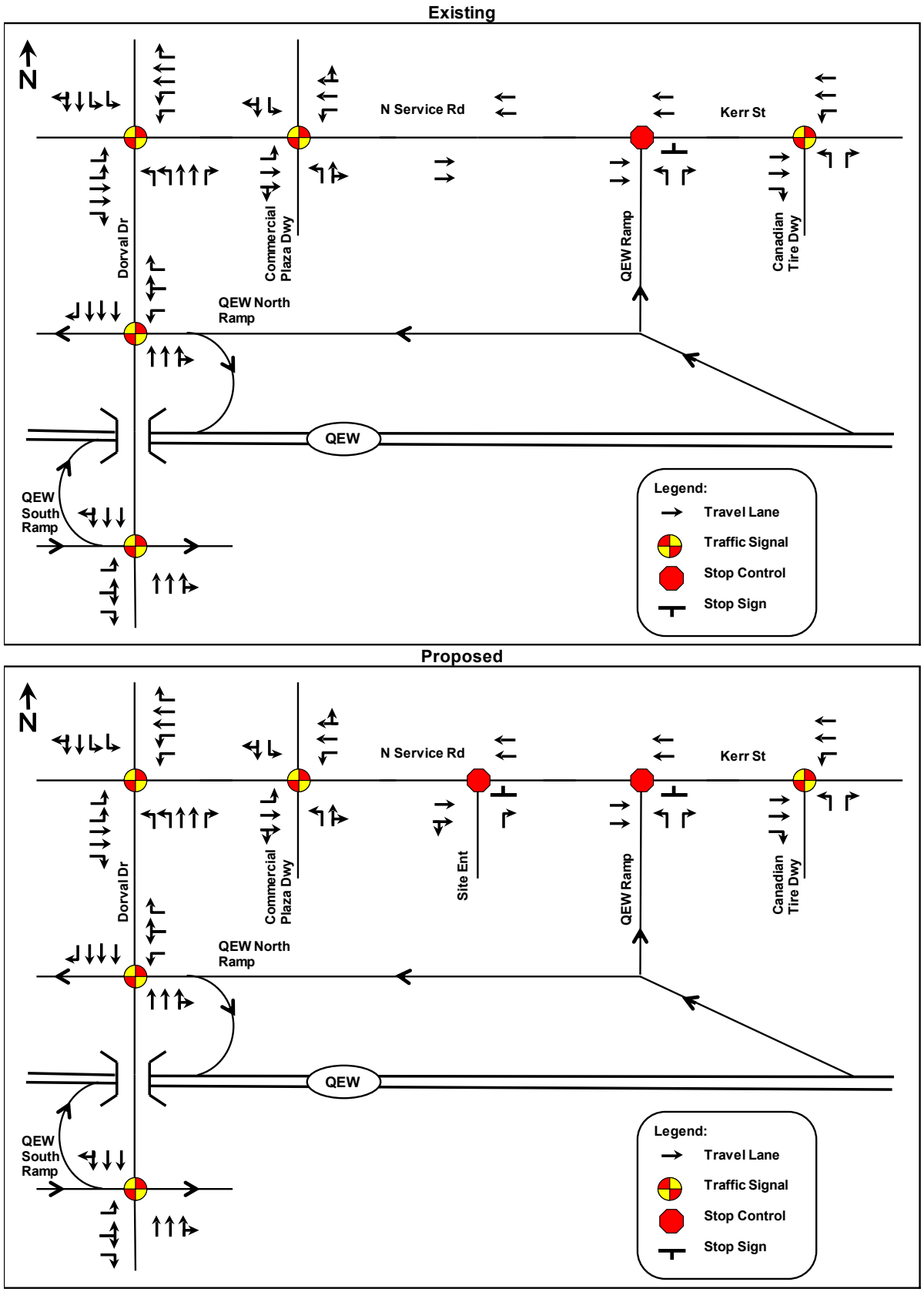
Queen Elizabeth Way (QEW) / Highway 403 is an east-west 400-series provincial highway with eight(8) main lanes (including one high-occupancy lane in each direction). The posted speed limit of 100 km/h on the main lanes and 40 km/h on the exit ramp within the vicinity of the site. The ramp intersections with Dorval Drive are signalized while the ramp intersection with Kerr Street is unsignalized with a stop control on the ramp.

Dorval Drive is a north-south six to eight-lane Halton Region road with a posted speed limit of 60 km/h within the vicinity of the site. There are northbound and southbound dual left-turn lanes at the signalized intersection with North Service Road.

North Service Road / Kerr Street is an east-west four to five lane major road under the Town's jurisdiction with a posted speed limit of 60 km/h within the vicinity of the site. The driveways on North Service Road and Kerr Street for the commercial plaza to the west of the subject site and the Canadian Tire to the east of the site are signalized.

The intersection controls and geometric lane configuration of the study area intersections are shown in **Figure 2-1**.

Figure 2-1 Lane Configuration (N.T.S.)



3.0 STUDY AREA

In order to assess the traffic impacts of the proposed development, the following intersections were included in the Existing, Future Background, and Future Total conditions traffic operation evaluation:

a) North Service Road W at Dorval Drive
b) North Service Road W at Queen Elizabeth Way ramp intersections (north and south)
c) Kerr Street at QEW ramp intersection
d) Kerr Street at signalized Canadian Tire driveway
e) North Service Road W at signalized commercial plaza driveway

The proposed entrance intersections are included in the future total evaluation.

4.0 DEVELOPMENT PROPOSAL

As mentioned in Section *1.0 Introduction*, the proposed development will consist of a seven-storey hotel with a total gross floor area of 5,145.9 m^2 or 55,390 s.f. GFA with 114 hotel rooms. It is proposed to provide 98 surface parking spaces.

The hotel is expected to function as a business hotel with an anticipated split of 70% corporate travellers and 30% leisure travelers. This hotel type typically has a 70% occupancy.

The site location map is shown in Figure 1-1 and the proposed site plan is shown in Figure 1-2.

5.0 STUDY METHODOLOGY

5.1 STUDY HORIZONS

As per the MTO traffic impact study(TIS) guidelines, the typical five year and ten year horizons from the time of build out, year 2023 and 2028 were selected for the study horizon years for the future background and future total conditions analyses.

5.2 INTERSECTION CAPACITY EVALUATION METHODOLOGY

In this study, the methodology used for evaluating traffic operations at each of the subject intersections was based on the criteria set forth in the Transportation Research Board's Highway Capacity Manual, 2000 edition (HCM 2000). Synchro 9 software, which utilizes the HCM 2000 methodology, was used for the analysis. The following is a description of the methodology employed for the analysis of unsignalized and signalized intersections.

5.2.1 Unsignalized Intersections

For unsignalized intersections at which the side street or minor street is controlled by a stop sign, the criteria for evaluating traffic operations are the level of service (LOS) for the turning movements at the intersection and the level of service for the overall intersection. Level of service is based on the average controlled delay incurred at the intersection. Controlled delay for unsignalized intersections includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Several factors affect

the controlled delay for unsignalized intersections, such as the availability and distribution of gaps in the conflicting traffic stream, critical gaps, and follow-up time for a vehicle in the queue.

Level of service is assigned a letter designation from A through F. Level of service A indicates excellent operations with little delay to motorists, while level of service F exists when there are insufficient gaps of acceptable size to allow vehicles on the side street to cross freely, resulting long total delays and long queues. The level of service criteria for two-way stop-controlled and all-way stop-controlled (unsignalized) intersections is given in **Table 2-1**.

Table 5-1 Level of Service Criteria for Unsignalized Intersections.

Level of Service	Average Control Delay (sec/veh)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

For unsignalized intersections, the intersection operations are stated for each of the stop-controlled movements. The MTO guidelines do not indicate a critical v/c ratio for unsignalized intersections. For signalized intersections, the guidelines indicate a critical v/c ratio of 0.75 for ramp movements and 0.85 for all other movements.

5.2.2 Signalized Intersections

For signalized intersections, it is necessary to evaluate both capacity and level of service in order to evaluate the overall operation of the intersection. The capacity analysis of an intersection is performed by comparing the volume of traffic using the various lane groups at the intersection to the capacity of those lane groups. This results in a volume/capacity (v/c) ratio for each lane group. A v/c ratio greater than 1.0 indicates that the volume of traffic has exceeded the capacity available, resulting in a temporary excess of demand. Although the capacity of the entire intersection is not defined, a composite v/c ratio for the sum of the critical lane groups within the intersection is computed. This composite v/c ratio is an indication of the overall intersection efficiency.

Level of service for a signalized intersection is defined in terms of average controlled delay per vehicle, which is composed of initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The levels of service criteria for signalized intersections, based on average controlled delay, are shown in **Table 2-2**. Level of service A indicates operations with very low controlled delay, while level of service F describes operations with extremely high average controlled delay. Level of service E is typically considered to be the limit of acceptable delay, and level of service F is considered unacceptable by most drivers.

Table 5-2 Level of Service Criteria for Signalized Intersections.

Level of Service	Average Control Delay (sec/veh)
A	≤ 10
B	> 10 and ≤20
C	> 20 and ≤35
D	> 35 and ≤55
E	> 55 and ≤80
F	> 80

At congested arterial signalized intersections, movements with a level of service (LOS) of 'F', with average controlled delay greater than 80 seconds. For signalized intersections, the MTO guidelines indicate a critical v/c ratio of 0.75 for ramp movements and 0.85 for all other movements.

6.0 TRAFFIC ANALYSIS

6.1 EXISTING TRAFFIC ANALYSIS

6.1.1 Existing Traffic Volumes

Weekday peak hour traffic counts were commissioned by LMM Engineering Inc. and were conducted on December 14, 2017. The existing weekday peak hour traffic volumes are shown in **Figure 6-1.** The detailed turning movement count summaries are included in Appendix A.

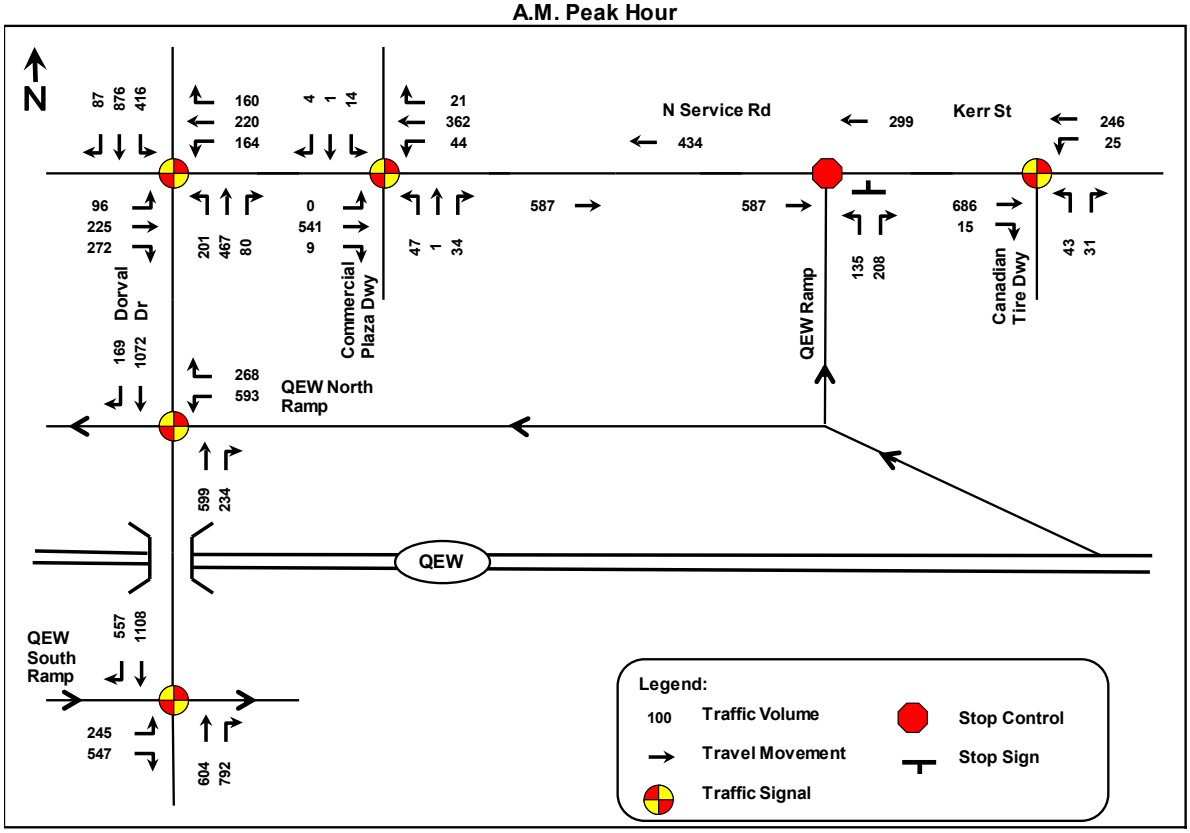
6.1.2 Existing Intersection Capacity Analysis

Existing morning and afternoon peak hour traffic volumes shown in Figure 6-1 were used to analyze the key existing study intersection according to the methodology outlined in Section 5.2 *Intersection Capacity Evaluation* for unsignalized and signalized intersections. The Town of Oakville provided the traffic signal timing plans for North Service Road W and the Commercial Plaza driveway, and Kerr Street and the Canadian Tire driveway.

The existing intersection capacity analysis results for the key study intersections are summarized in **Table 6-2** below. Detailed existing intersection capacity analysis output is included in *Appendix B*.

Figure 6-1 Existing Peak Hour Traffic Volumes

A.M. Peak Hour



P.M. Peak Hour

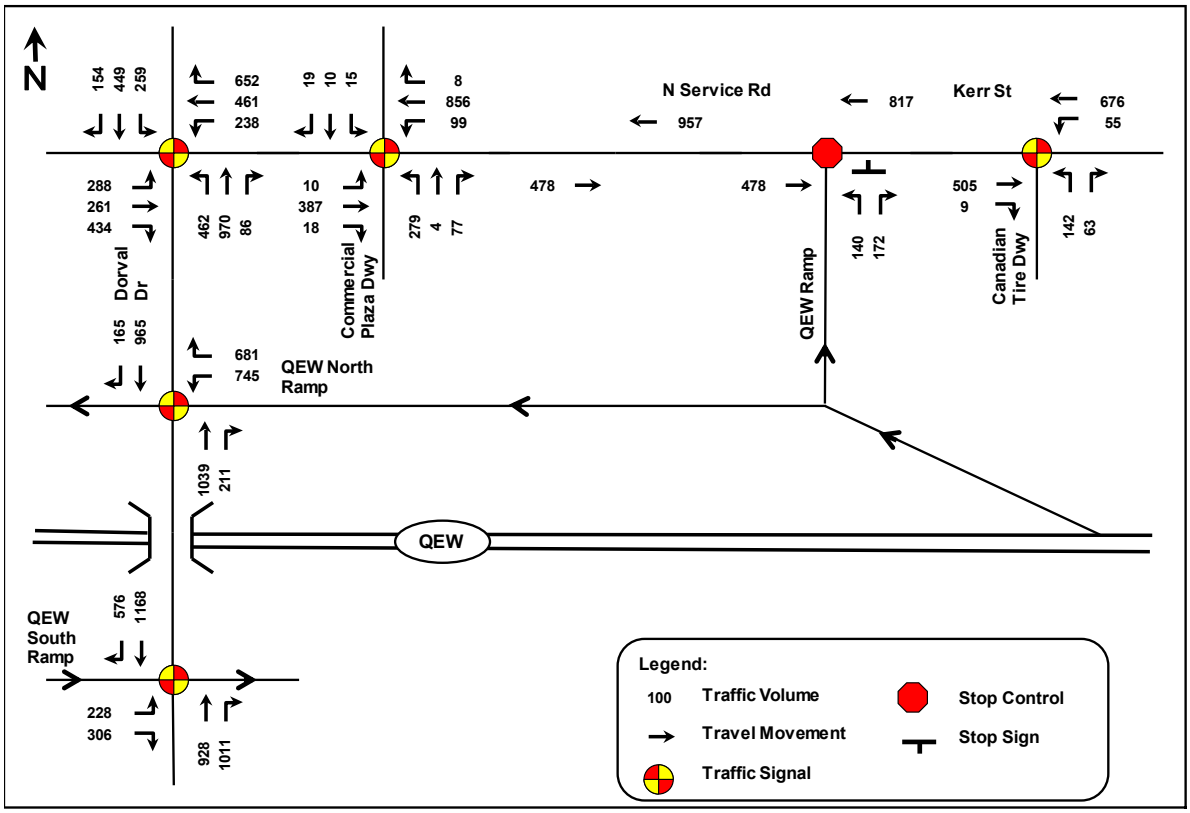


Table 6-1 Existing Condition Intersection Capacity Analysis Summary

Intersection	Overall / Critical Movement	Traffic Operations (LOS, Delay (sec's), V/C Ratio)	
		A.M. Peak Hour	P.M. Peak Hour
Dorval Drive / North Service Road W	Intersection	E, 69.9, 0.72	E, 76.3, 1.09
	Critical Movement	SBT/R – F, 145.3, 1.20	EBL – F, 118.9, 1.04 WBL – F, 81.3, 0.89 WBR – F, 114.9, 1.11 NBL – F, 122.1, 1.09 NBT – F, 96.9, 1.09
Dorval Drive / QEW Westbound Ramp (North)	Intersection	B, 18.8, 0.54	C, 20.3, 0.64
	Critical Movement	-	-
Dorval Drive / QEW Eastbound Ramp (South)	Intersection	B, 16.3, 0.54	B, 12.7, 0.47
	Critical Movement	-	-
QEW Ramp / Kerr Street North Service Road W	Northbound Left-Turn	D, 26.9, 0.55	C, 23.4, 0.49
	Northbound Right-Turn	B, 11.6, 0.32	B, 10.3, 0.23
Kerr Street / Canadian Tire Driveway	Intersection	A, 7.0, 0.28	B, 11.1, 0.34
	Critical Movement	-	-
North Service Road W / Commercial Plaza Driveway	Intersection	A, 9.3, 0.27	B, 18.7, 0.60
	Critical Movement	-	-

The results of the existing condition intersection capacity analysis indicate that the North Service Road W / Dorval Drive intersection currently operates with some movements at a failing level of service and exceeding capacity. The other existing study intersections currently operate well with no critical movements.

6.2 Future Background Condition

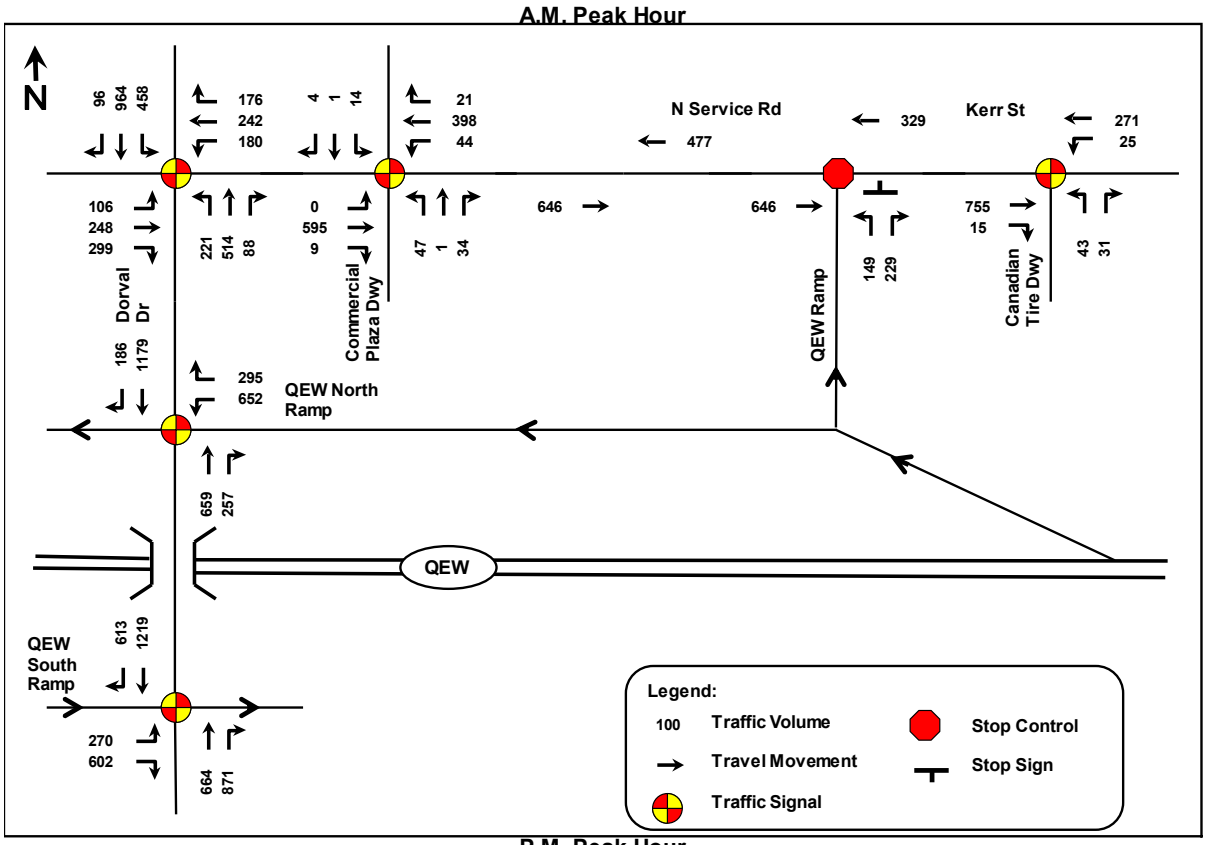
6.2.1 Future Background Traffic Volumes - 2023

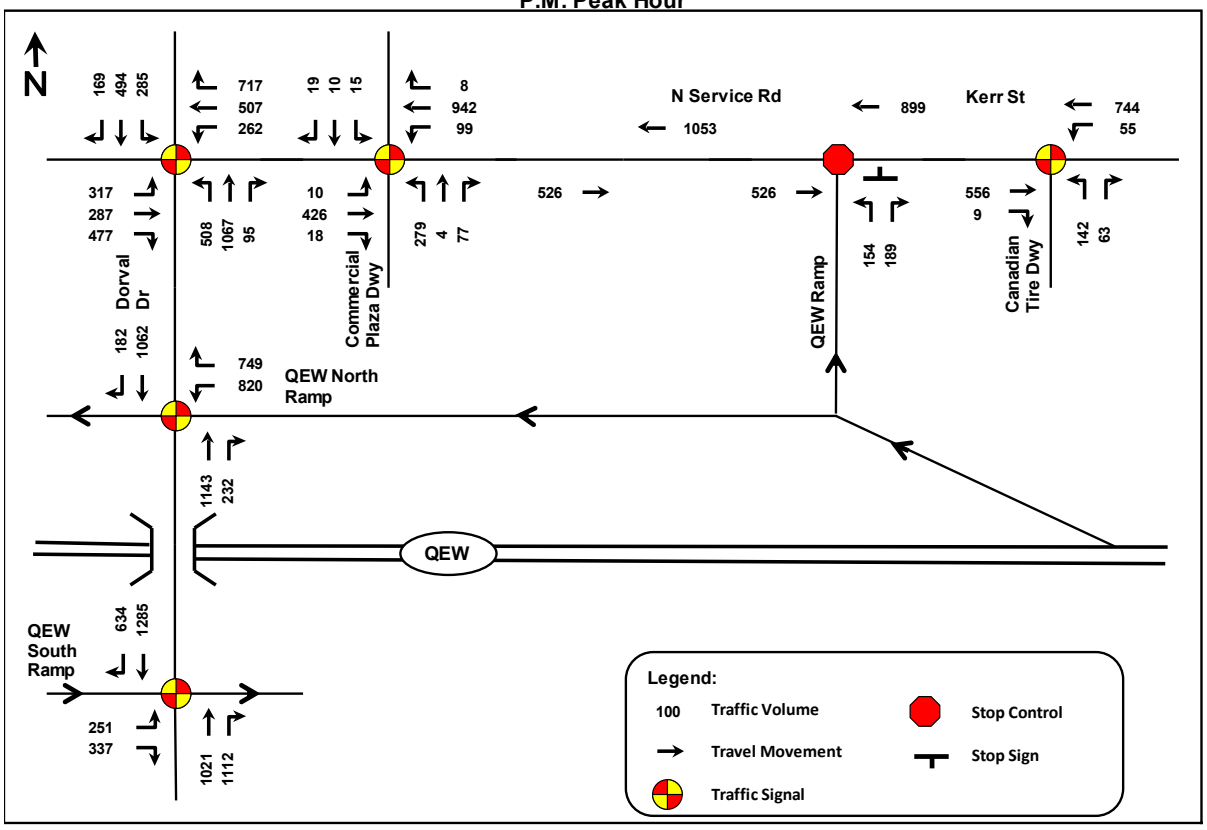
In order to study the traffic conditions during the horizon, traffic volume growth projections for the year 2023 are needed. Annual growth rates applied to existing arterial traffic volumes to estimate horizon year future background arterial traffic volumes are typically used.

The Town of Oakville indicated that an annual growth factor of 2% should be applied to the existing through arterial volumes for five years to estimate 2023 horizon year future background conditions.

The resultant 2023 Future Background peak hour traffic volumes during the morning and afternoon peak hours are shown in **Figure 6-2**.

Figure 6-2 Future Background Peak Hour Traffic Volumes - 2023





6.2.2 Future Background Intersection Capacity Analysis - 2023

The future background morning and afternoon peak hour traffic volumes shown in Figure 6-2 were used to analyze the study intersections according to the methodology outlined in Section 5.2 *Intersection Capacity Evaluation* for unsignalized and signalized intersections.

The 2023 future background intersection capacity analysis results for the study intersections are summarized in **Table 6-2** below. Detailed 2023 future background intersection capacity analysis output is included in *Appendix C*.

Table 6-2 Future Background Condition Intersection Capacity Analysis Summary - 2023

Intersection	Overall / Critical Movement	Traffic Operations (LOS, Delay (sec's), V/C Ratio)	
		A.M. Peak Hour	P.M. Peak Hour
Dorval Drive / North Service Road W	Intersection	D, 50.7, 0.80	F, 108.7, 1.21
	Critical Movement	WBL – F, 97.9, 0.94 SBL – E, 61.9, 0.88 SBT/R – E, 59.6, 0.98	EBL – F, 199.8, 1.26 WBL – F, 133.4, 1.08 WBR – F, 123.7, 1.15 NBL – F, 161.8, 1.20 NBT – F, 187.0, 1.30
Dorval Drive / QEW Westbound Ramp (North)	Intersection	B, 17.8, 0.61	C, 27.6, 0.67
	Critical Movement	-	-
Dorval Drive / QEW Eastbound Ramp (South)	Intersection	B, 15.0, 0.61	B, 18.2, 0.52
	Critical Movement	-	-
QEW Ramp / Kerr Street North Service Road W	Northbound Left-Turn	E, 36.5, 0.67	D, 28.1, 0.57
	Northbound Right-Turn	B, 12.1, 0.36	B, 10.5, 0.26
Kerr Street / Canadian Tire Driveway	Intersection	A, 6.8, 0.30	B, 10.7, 0.37
	Critical Movement	-	-
North Service Road W / Commercial Plaza Driveway	Intersection	A, 9.0, 0.29	B, 18.7, 0.63
	Critical Movement	-	-

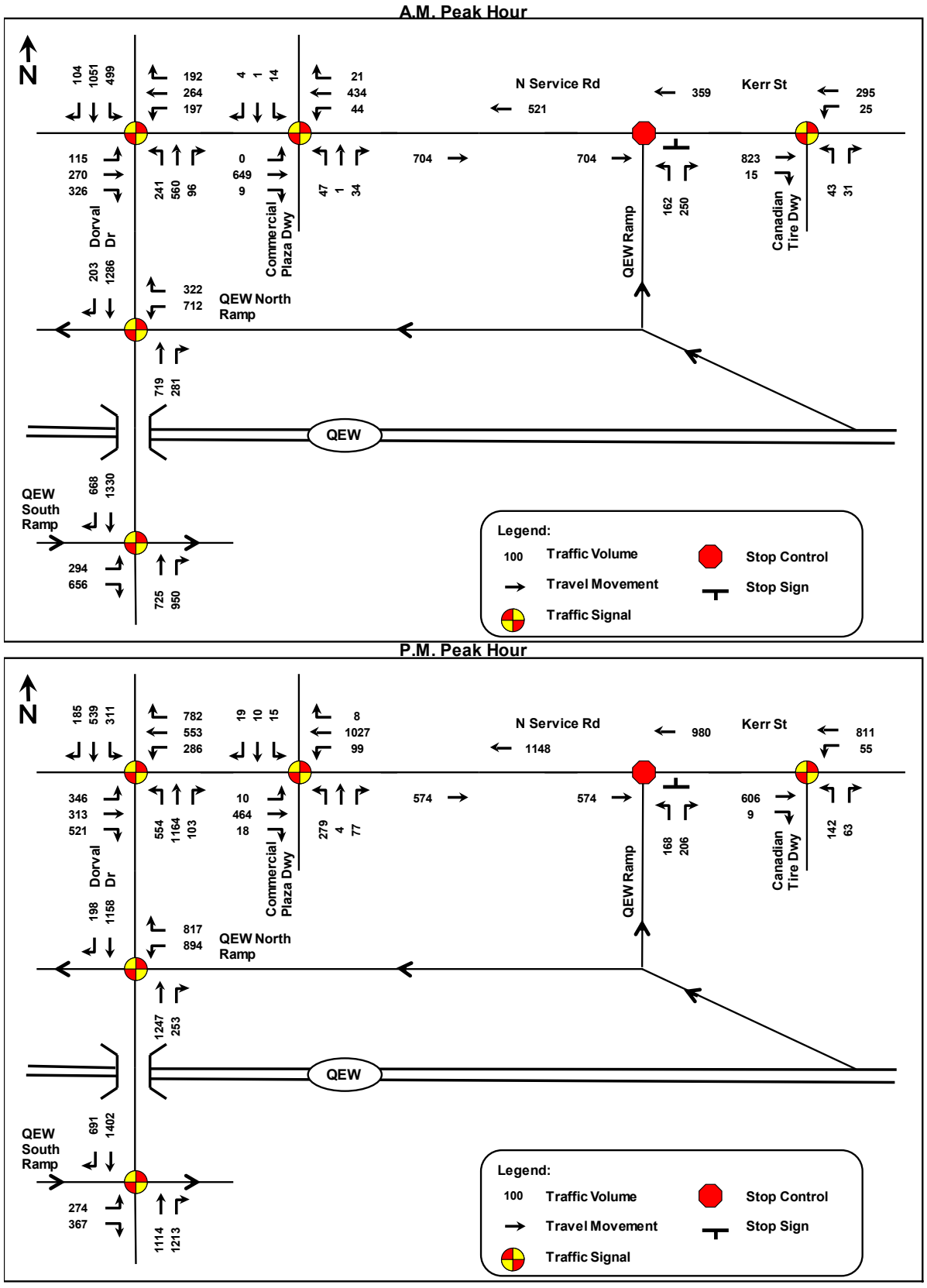
The results of the 2023 future background condition intersection capacity analysis indicate that similar to the existing conditions, the Dorval Drive / North Service Road intersection will operate with various movements at LOS F and exceeding capacity. Otherwise, the existing study intersections will continue to operate well by 2023.

6.2.3 Future Background Traffic Volumes - 2028

In order to study the traffic conditions during the horizon the same annual growth rate of 2% was applied to the existing traffic volumes for 10 years to estimate 2028 horizon year future background conditions.

The resultant 2028 Future Background peak hour traffic volumes during the morning and afternoon peak hours are shown in **Figure 6-3**.

Figure 6-3 Future Background Peak Hour Traffic Volumes - 2028



6.2.4 Future Background Intersection Capacity Analysis - 2028

The future background morning and afternoon peak hour traffic volumes shown in Figure 6-3 were used to analyze the study intersections according to the methodology outlined in Section 5.2 *Intersection Capacity Evaluation* for unsignalized and signalized intersections.

The 2028 future background intersection capacity analysis results for the study intersections are summarized in **Table 6-3** below. Detailed 2028 future background intersection capacity analysis output is included in *Appendix D*.

Table 6-3 Future Background Condition Intersection Capacity Analysis Summary - 2028

Intersection	Overall / Critical Movement	Traffic Operations (LOS, Delay (sec's), V/C Ratio)	
		A.M. Peak Hour	P.M. Peak Hour
Dorval Drive / North Service Road W	Intersection	E, 62.6, 0.87	F, 127.0, 1.32
	Critical Movement	WBL – F, 122.9, 1.04 SBL – E, 77.0, 0.96 SBT – F, 89.6, 1.08	EBL – F, 151.0, 1.15 EBR – E, 79.2, 0.95 WBL – F, 99.9, 0.99 WBR – F, 411.0, 1.79 NBL – F, 121.4, 1.10 NBT – F, 105.3, 1.12
Dorval Drive / QEW Westbound Ramp (North)	Intersection	C, 21.1, 0.66	C, 29.2, 0.74
	Critical Movement	-	-
Dorval Drive / QEW Eastbound Ramp (South)	Intersection	B, 16.9, 0.66	C, 20.7, 0.59
	Critical Movement	-	-
QEW Ramp / Kerr Street North Service Road W	Northbound Left-Turn	F, 54.5, 0.81	E, 36.0, 0.67
	Northbound Right-Turn	B, 12.7, 0.40	B, 10.8, 0.29
Kerr Street / Canadian Tire Driveway	Intersection	A, 6.7, 0.33	B, 10.5, 0.39
	Critical Movement	-	-
North Service Road W / Commercial Plaza Driveway	Intersection	A, 8.9, 0.31	B, 18.8, 0.66
	Critical Movement	-	-

The results of the 2028 future background condition intersection capacity analysis indicate that similar to the existing conditions, the Dorval Drive / North Service Road intersection will operate with various movements at LOS F and exceeding capacity. The need for improvements will be further reviewed in Section 7.1

The unsignalized QEW / Kerr Street ramp intersection is expected to operate at LOS F in the AM peak hour with a v/c ratio of 0.86. The requirement for traffic signals at the intersection will be reviewed in Section 7.2.

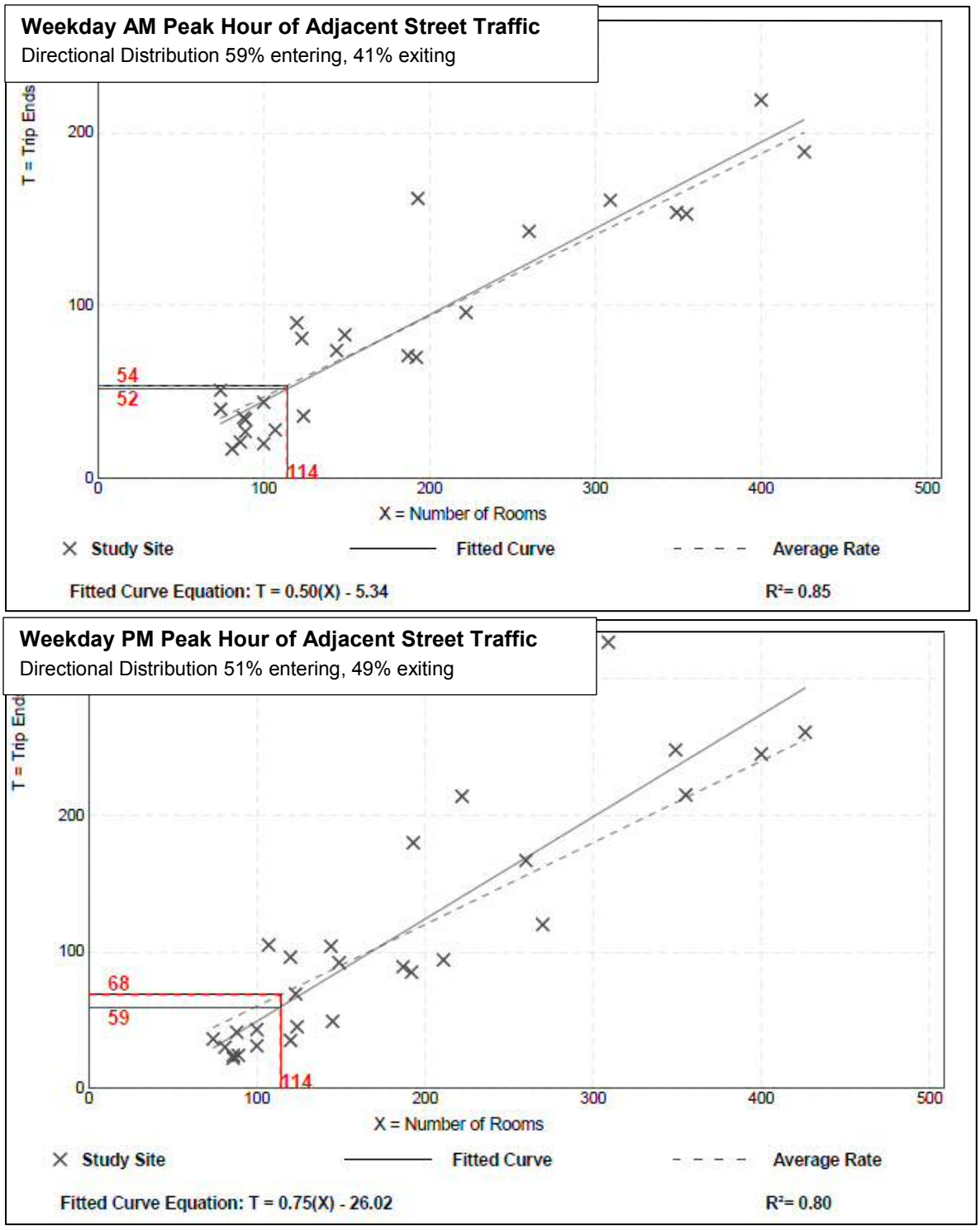
Otherwise, the existing study intersections will continue to operate well by 2028.

6.3 Trip Generation

In order to estimate the new vehicular trips that would be generated by the proposed facility, trip generation rates in the Institute of Transportation Engineers (ITE) Trip Generation Manual (version 10) for Land Use

310 – Hotel were applied to the proposed development. As per the Town's comments, the fitted curve equation was applied.

Figure 6-4 Trip Generation by Fitted Curve Equation



Source Trip Generation Manual, 10th Edition, Institute of Transportation Engineers

Traffic generation associated with commercial establishments is often derived from two sources, namely new (primary) trips and pass-by trips. Primary trips are those trips to a commercial development that are destination oriented and are new to the boundary road network. Pass-by trips are derived from the existing traffic that is already passing by the subject development site. Therefore, pass-by trips are not new trips on the boundary road network. However, pass-by trips impact the turning movements at the site entrances. Thus, the diversion of pass-by trips to the site would result in an increase of turns and a reduction of the major street through volume at the site entrances. It was assumed that 100% of the trips would be primary trips. The resultant total trip generation for the traffic associated with the proposed development uses is summarized in **Table 6-4**.

Table 6-4 Trip Generation Summary

Land Use	Size	Weekday A.M. Peak Hour			Weekday P.M. Peak Hour		
		In	Out	Total	In	Out	Total
Hotel	114 Rooms	32	22	**54**	35	33	**68**

6.4 Trip Distribution / Assignment

In order to analyze the future total conditions, the estimated new peak hour vehicular trips summarized in Table 5-1 were assigned to the site driveways and study intersections. The directional route distribution of site generated traffic was based on locations of residential and business concentrations in the vicinity of the site, a review of competing retail opportunities to identify trip paths and destinations, orientation of the site with respect to road network as well as existing traffic volumes and patterns.

Based on the abovementioned trip distribution the estimated new trips associated with the proposed development summarized in Table 6-4 were assigned at the site driveways and study intersections accordingly. The total peak hour site generated traffic volumes are shown in **Figure 6-5**. These volumes are based on obtaining the connection to the signalized commercial plaza driveway.

6.5 Evaluation of Impacts

6.5.1 Future Total Traffic Volumes - 2023

The site generated traffic volumes in Figure 6-5 were superimposed onto the 2023 Future Background Peak Hour Traffic Volumes in Figure 6-2 to obtain the 2023 Future Total Peak Hour Traffic Volumes shown in **Figure 6-6**.

Figure 6-5 Total Peak Hour Proposed Site Development Related Trips

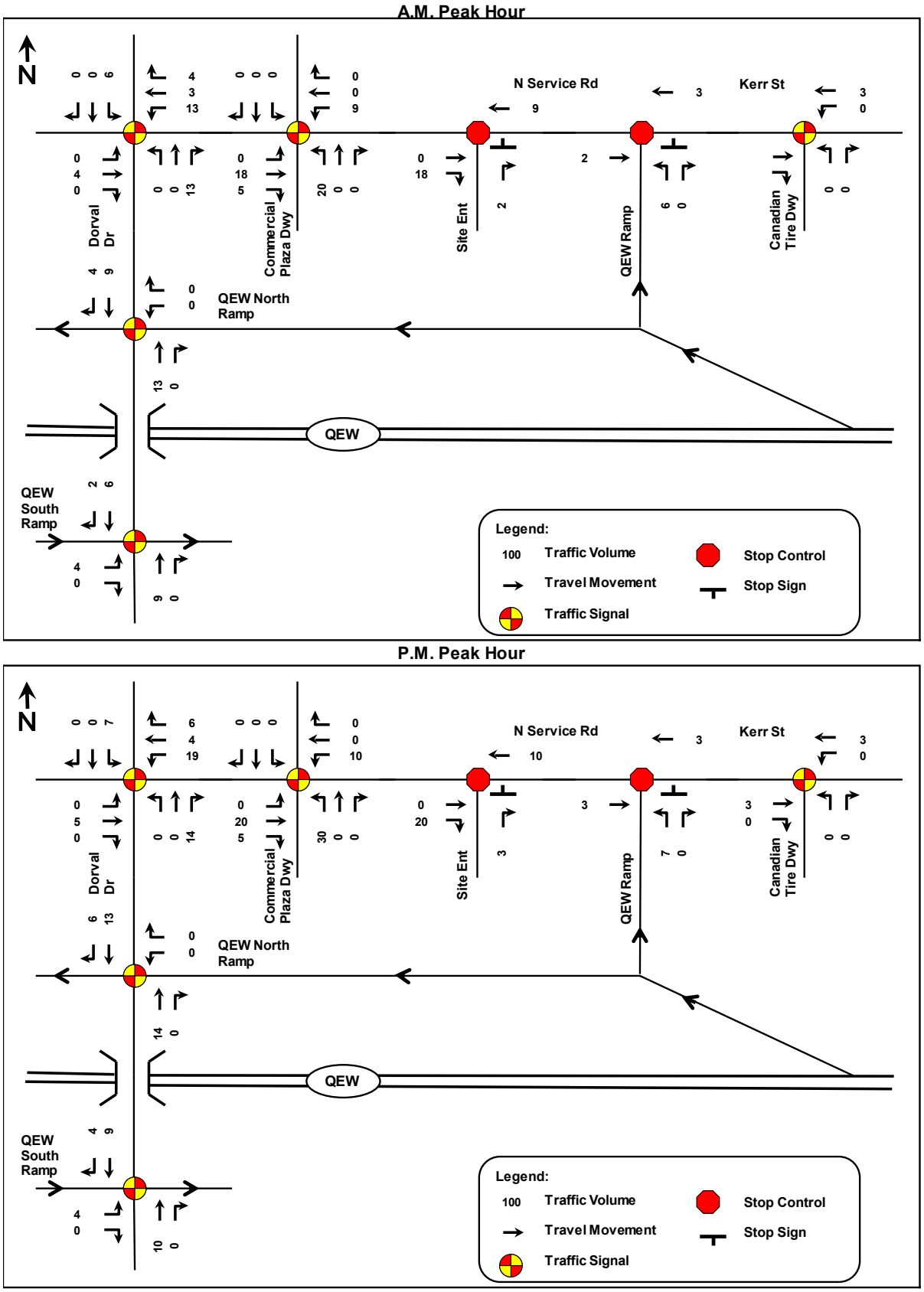
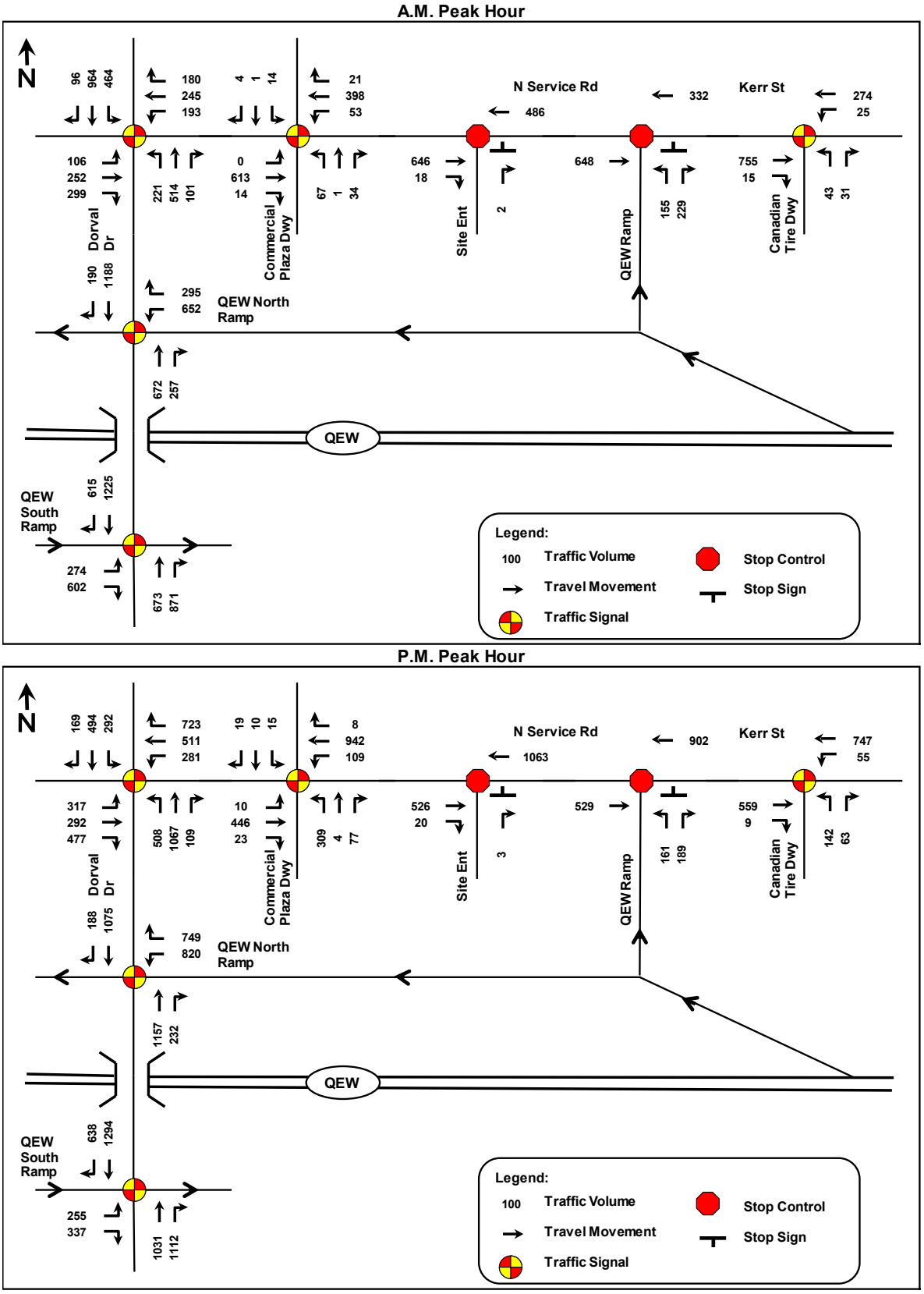


Figure 6-6 Future Total Peak Hour Traffic Volumes – 2023



6.5.2 Future Total Intersection Capacity Analysis - 2023

The 2023 future total morning and afternoon peak hour traffic volumes shown in Figure 6-6 were used to analyze the study intersections according to the methodology outlined in Section 5.2 *Intersection Capacity Evaluation* for unsignalized and signalized intersections. The 2023 future total intersection capacity analysis results for the study intersections are summarized in **Table 6-5.** Detailed 2023 future total intersection capacity analysis output is included in *Appendix E.*

Table 6-5 Future Total Condition Intersection Capacity Analysis Summary - 2023

Intersection	Overall / Critical Movement	Traffic Operations (LOS, Delay (sec's), V/C Ratio)	
		A.M. Peak Hour	P.M. Peak Hour
Dorval Drive / North Service Road W	Intersection	D, 52.3, 0.81	F, 113.3, 1.23
	Critical Movement	WBL – F, 116.4, 1.01 SBL – E, 62.7, 0.88 SBTR – E, 61.0, 0.98	EBL - F, 153.9, 1.15 WBL – F, 128.1, 1.07 WBR – F, 124.5, 1.15 NBL – F, 196.3, 1.28 NBT – F, 204.8, 1.34 SBL – E, 67.9, 0.85 SBTR – D, 50.1, 0.85
Dorval Drive / QEW Westbound Ramp (North)	Intersection	B, 17.8, 0.62	C, 27.1, 0.68
	Critical Movement	-	-
Dorval Drive / QEW Eastbound Ramp (South)	Intersection	B, 15.0, 0.61	B, 19.0, 0.54
	Critical Movement	-	-
QEW Ramp / Kerr Street North Service Road W	Northbound Left-Turn	E, 38.5, 0.70	D, 27.6, 0.58
	Northbound Right-Turn	B, 12.0, 0.36	B, 10.3, 0.25
Kerr Street / Canadian Tire Driveway	Intersection	A, 6.8, 0.30	B, 10.7, 0.37
	Critical Movement	-	-
North Service Road W / Commercial Plaza Driveway	Intersection	B, 10.0, 0.32	C, 20.1, 0.66
	Critical Movement	-	-
North Service Road W / Kerr Street / Proposed Driveway	Northbound Right-Turn	A, 9.5, 0.01	A, 8.9, 0.00

The results of the 2023 future total condition intersection capacity analysis indicate similar levels of service and volume to capacity ratios as the future background 2023 conditions. Comparison of the analysis indicates that overall v/c ratios at the QEW intersections would increase by only 0.00 to 0.03 over the 2023 future background conditions.

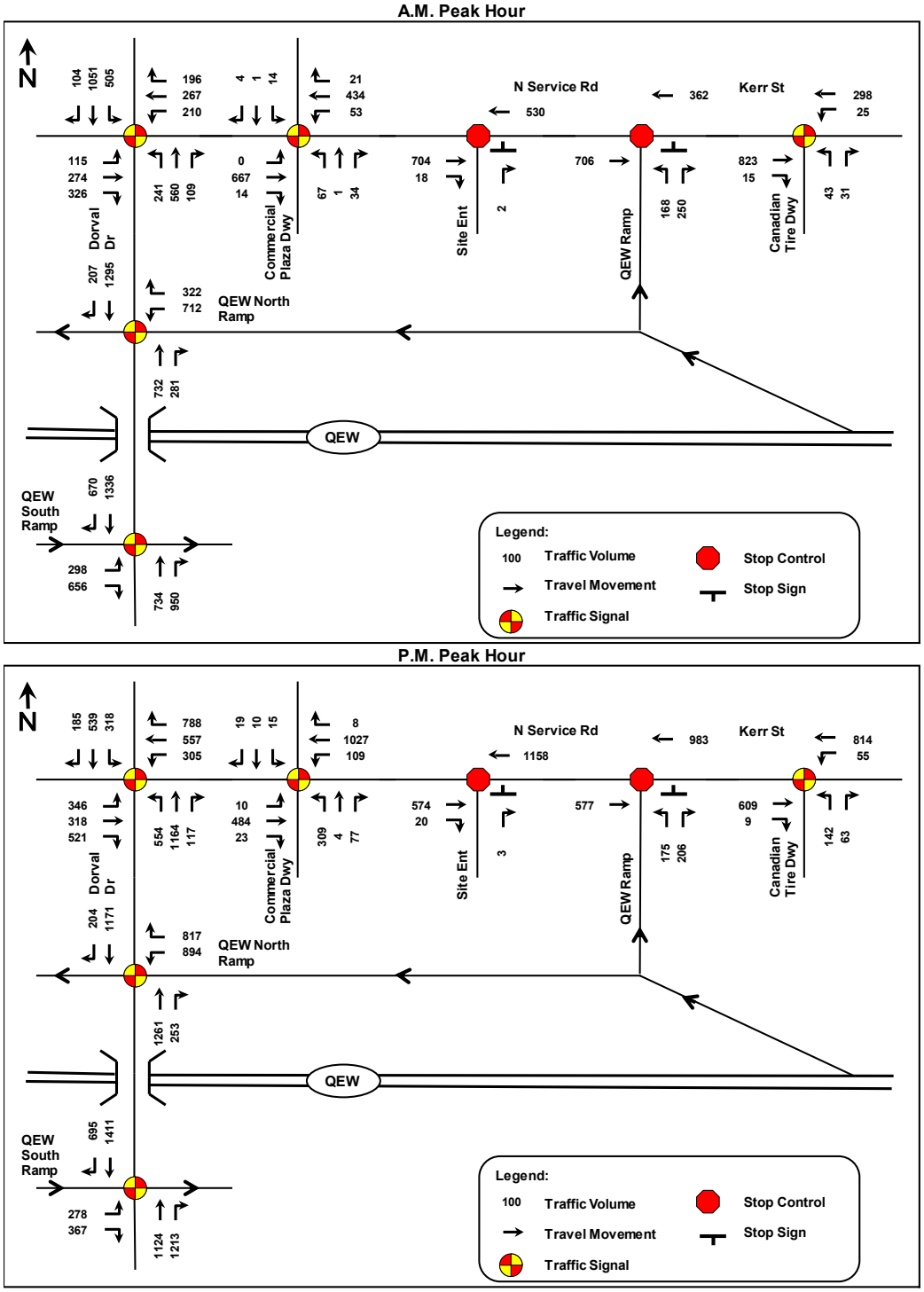
As with the existing and future background conditions, the 2023 future total traffic analysis indicates that the North Service Road W / Dorval Drive intersection will continue to operate with some movements at LOS F and exceeding capacity. Potential improvements as required by pre-existing conditions are further reviewed in Section 7.1.

The analysis indicates that with the additional site traffic at the proposed shared North Service Road W / Commercial Plaza Driveway, the signalized driveway would still operate acceptable levels of service. The analysis also indicates that the proposed site entrance will operate well by 2023.

6.5.3 Future Total Traffic Volumes - 2028

The site generated traffic volumes in Figure 6-5 were superimposed onto the 2028 Future Background Peak Hour Traffic Volumes in Figure 6-3 to obtain the 2028 Future Total Peak Hour Traffic Volumes shown in **Figure 6-7**.

Figure 6-7 Future Total Peak Hour Traffic Volumes – 2028



6.5.4 Future Total Intersection Capacity Analysis - 2028

The 2028 future total morning and afternoon peak hour traffic volumes shown in Figure 6-7 were used to analyze the study intersections according to the methodology outlined in Section *5.2 Intersection Capacity Evaluation* for unsignalized and signalized intersections.

The 2028 future total intersection capacity analysis results for the study intersections are summarized in **Table 6-6** below. Detailed 2028 future total intersection capacity analysis output is included in *Appendix F*.

Table 6-6 Future Total Condition Intersection Capacity Analysis Summary - 2028

Intersection	Overall / Critical Movement	Traffic Operations (LOS, Delay (sec's), V/C Ratio)	
		A.M. Peak Hour	P.M. Peak Hour
Dorval Drive / North Service Road W	Intersection	E, 63.8, 0.88	F, 142.4, 1.35
	Critical Movement	WBL – F, 143.5, 1.10 SBL – F, 80.7, 0.98 SBTR – F, 87.6, 1.07	EBL – F, 194.4, 1.26 WBL – F, 152.3, 1.15 WBR – F, 177.5, 1.28 NBL – F, 245.8, 1.40 NBT – F, 257.9, 1.46 SBL – F, 80.6, 0.93 SBTR – E, 59.7, 0.93
Dorval Drive / QEW Westbound Ramp (North)	Intersection	B, 19.2, 0.67	C, 29.2, 0.74
	Critical Movement	-	-
Dorval Drive / QEW Eastbound Ramp (South)	Intersection	B, 18.0, 0.69	B, 20.0, 0.59
	Critical Movement	-	-
QEW Ramp / Kerr Street North Service Road W	Northbound Left-Turn	F, 57.9, 0.84	D, 33.7, 0.66
	Northbound Right-Turn	B, 12.5, 0.40	B, 10.5, 0.27
Kerr Street / Canadian Tire Driveway	Intersection	A, 6.7, 0.33	B, 10.5, 0.39
	Critical Movement	-	-
North Service Road W / Commercial Plaza Driveway	Intersection	A, 9.8, 0.34	C, 20.3, 0.69
	Critical Movement	-	-
North Service Road W / Kerr Street / Proposed Driveway	Northbound Right-Turn	A, 9.6, 0.01	A, 8.9, 0.00

The results of the 2028 future total condition intersection capacity analysis indicate similar levels of service and volume to capacity ratios as the future background 2028 conditions. Comparison of the analysis indicates that overall v/c ratios at the would increase only slightly, indicating minimal impact from the proposed development. As with the existing and future background conditions, the 2028 future total traffic analysis indicates that the North Service Road W / Dorval Drive intersection will continue to operate with some movements at LOS F and exceeding capacity. Potential improvements as required by pre-existing conditions are further reviewed in Section 7.1.

As with the 2028 future background conditions, the future total analysis indicates that in the AM peak hour, the stop-controlled movement at the QEW ramp / Kerr Street intersection, the northbound left-turn from the QEW ramp would operate at LOS F and with a v/c ratio greater than 0.75. Traffic signal warrant analysis for the intersection was conducted as further discussed in Section 7.2

The analysis indicates that with the additional site traffic at the proposed shared North Service Road W / Commercial Plaza Driveway, the signalized driveway would still operate acceptable levels of service.

The analysis also indicates that the proposed site entrance will operate well by 2028. The proposed right-in/right-out driveway would not result in any queuing on North Service Road.

7.0 REQUIREMENT FOR IMPROVEMENTS

The traffic analysis in Section 6.0 indicates that there are operational issues at the North Service Road W / Dorval Drive with the existing, future background, and future total traffic conditions. The analysis also indicated that with the future 2028 background and total conditions at the North Service Road W / QEW ramp indicate that the northbound left-turn movement from the QEW ramp would operate at LOS E or F and exceed the critical v/c ratio of 0.75.

The requirement for improvements at these intersections as a result of existing or future background conditions is reviewed in the following sections.

7.1 NORTH SERVICE ROAD W/ DORVAL DRIVE INTERSECTION

The North Service Road W / Dorval Drive intersection is already a fully developed intersection with dual left-turn lanes in all four approaches and right-turn bays on the eastbound, westbound, and northbound approaches. It would be difficult to determine other improvements that would be realistic to construct and would result in all movements operating at acceptable levels of service. The only other improvement to consider would be a southbound right-turn bay. Analysis with a southbound right-turn lane is included in Appendix F. The analysis indicates the improvement would result in a decrease in overall vehicle delay at the intersection but there would still be several movements over capacity. It is also unlikely that this improvement is feasible due to development on the northwest corner of the intersection.

No improvements are recommended at the intersection.

7.2 NORTH SERVICE ROAD W / KERR STREET / QEW RAMP INTERSECTION

MTO has indicated that for the North Service Road W / QEW Ramp / Kerr Street ramp terminal, a roundabout is being considered as well as the future signalization of the ramp intersection. The intersection capacity analysis indicates that with the future total 2028 traffic volumes, the average delay for the left-turn from the QEW ramp would be less than one minute (i.e. 58 seconds or less). However, the v/c ratio would be 0.81 with the future background 2028 AM peak hour and 0.84 with the future total 2028 AM peak hour which exceeds the 0.75 critical v/c ratio prescribed by MTO TIS guidelines.

The requirement and advantages / disadvantages of each of the signalized intersection and roundabout options are discussed in the following sections.

7.2.1 Signalized Intersection Requirements

Since the ramp volume to capacity ratio is expected to exceed the critical level of 0.75 with the future background 2028 conditions, traffic signal warrant analysis was conducted for the unsignalized

intersection. The warrant analysis was based on Ontario Traffic Manual (OTM) Book 12 methodology and considered the four-hour traffic volumes. The existing hourly volumes from the turning movement count were increased by the annual growth rate for 11 years to determine the 2028 future background traffic volumes.

The warrant analysis is included in Appendix G. With the existing traffic volumes, the traffic signal warrant analysis indicates 95% warrant for Section 1 and 79% warrant for Section 2 which is just under the values at which traffic signals would be warranted. The analysis indicates that traffic signals would be warranted at the intersection with the 2028 future background traffic.

It is recommended that traffic signals be installed prior to the 2028 horizon as a result of existing traffic and anticipated future background traffic growth.

7.2.2 Roundabout Option

MTO has indicated that a roundabout would also be considered at this location. To provide a preliminary review of roundabout options, LMM Engineering prepared roundabout concepts. The concept based on the Federal Highway Administration Two-Lane Roundabout accommodating a WB-67 vehicle (approximately equivalent to TAC-1999 WB-20) and is shown in **Figure 7-1**. The roundabout concept has an Inner Circle Diameter (ICD) of approximately 61 m.

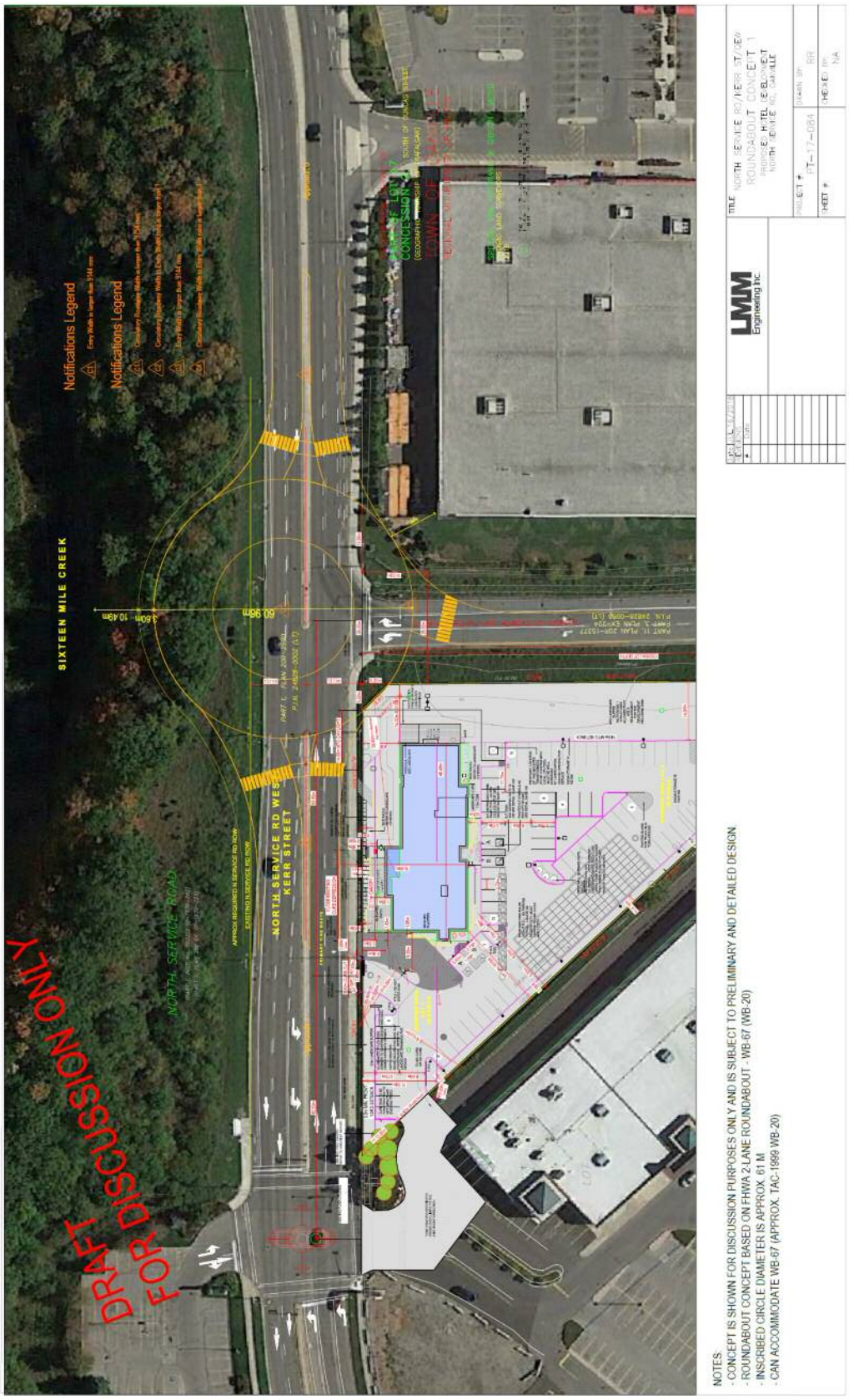
Generally, roundabouts are found to have several benefits including:

- Reduced speed resulting in a reduction in collisions and increased safety.
- Decreased vehicle-vehicle conflict points and vehicle-pedestrian conflict points resulting in a reduction in collisions and increased safety.
- Potential for improved life-cycle costs compared to a signalized intersection (electricity costs, traffic signal equipment costs over the life-span of the traffic signals).

However, in this particular location, there are certain disadvantages to a roundabout over a signalized intersection, especially since the traffic signals could be accommodated within the existing lanes and right-of-way. These disadvantages include:

- Inadequate spacing to the Sixteen Mile Creek. The concept indicates the spacing from the roundabout right-of-way to the top of bank would be approximately 11 m. According to the Halton Conservation Authority, any development is not permitted within a minimum of 15 m of the stable top of a bank for a major watercourse such as Sixteen Mile Creek.
- Inadequate spacing to the existing and proposed buildings. MTO requires a 14-m setback from the MTO right-of-way to any buildings. As shown on the preliminary concept, the setback to the existing Canadian Tire building is estimated to be 11 m.
- Design notifications from TORUS as shown on the concept plan indicate that the circulatory roadway width, the entry widths, and the circulatory roadway width to entry width ratio are larger than ideal.

Figure 7-1 Preliminary Roundabout Concept (FHWA 2-Lane WB-67)



8.0 PROPOSED DRIVEWAY

The Town of Oakville requested that the traffic impact study review the appropriateness of the proposed right-in/right-out driveway on North Service Road W. The driveway was reviewed with respect to spacing and sight distance.

The proposed right-in/right-out driveway would be located approximately 60 m east of the existing traffic signals at North Service Road W and the adjacent commercial plaza. The proposed driveway would be approximately 80 m from the QEW ramp / North Service Road W / Kerr Street intersection. The TAC Geometric Design Guide for Canadian Roads suggests a minimum corner clearance of 70 m on an arterial roadway or 55 m on a collector roadway for a driveway downstream from traffic signals with a median. The design guide also suggests a minimum distance of 25-35 m on an arterial roadway for a driveway upstream from a stop-controlled intersection. Where these are suggested spacing distances and the proposed driveway will be right-turn movements only, it is expected that the existing driveway will operate in a sufficient manner as indicated by the traffic analysis.

The minimum required stopping sight distance for a 60 km/h speed limit road would therefore be 85 m as per the Ontario Geometric Design Manual methodology.

As such, the available sight distance was estimated to be 100m to the west of the proposed driveway. Therefore, the sight distance is expected to be enough to allow for vehicles on North Service Road W to stop if any vehicles turn from the driveway unexpectantly. (Sight distance to the east of the proposed driveway was not relevant since the driveway is right-turn only.)

9.0 SITE CIRCULATION

The site circulation was reviewed to determine if tour buses or large vehicles (such as delivery vans) can maneuver through the site. AutoTURN analysis was conducted with a Transportation Association of Canada (TAC-1999) Bus (B-12) vehicle. The analysis is illustrated in **Figure 9-1.** The analysis indicated that a bus can maneuver through the site. The bus can maneuver under the canopy but the overhang of the bus may extend over the curb.

The site circulation was also reviewed with respect to a TAC-1999 Medium Single Unit (MSU) vehicle. The analysis indicates that this type of delivery vehicle can maneuver through the site through either driveway. The AutoTURN analysis for the MSU vehicle is shown in **Figure 9-2**.

Garbage truck movements based on a custom template from a City of Toronto standard was also assessed as shown in **Figure 9-3**. Similar to the bus turning analysis, the garbage truck can enter the site through the commercial plaza driveway and can exit through the proposed right-turn only driveway.

The Town of Oakville also inquired about emergency access into the site. Comparison to other templates indicate that an ambulance and fire truck would typically be shorter than the MSU or the garbage truck vehicle template. Therefore, emergency vehicles should be able to adequately maneuver through the site. The proposed second access provides a secondary access which can be used for additional emergency vehicles or hotel guests or staff to exit the site in the event of emergency.

Figure 9-1 AutoTURN Analysis for Bus (TAC-1999 B-12)

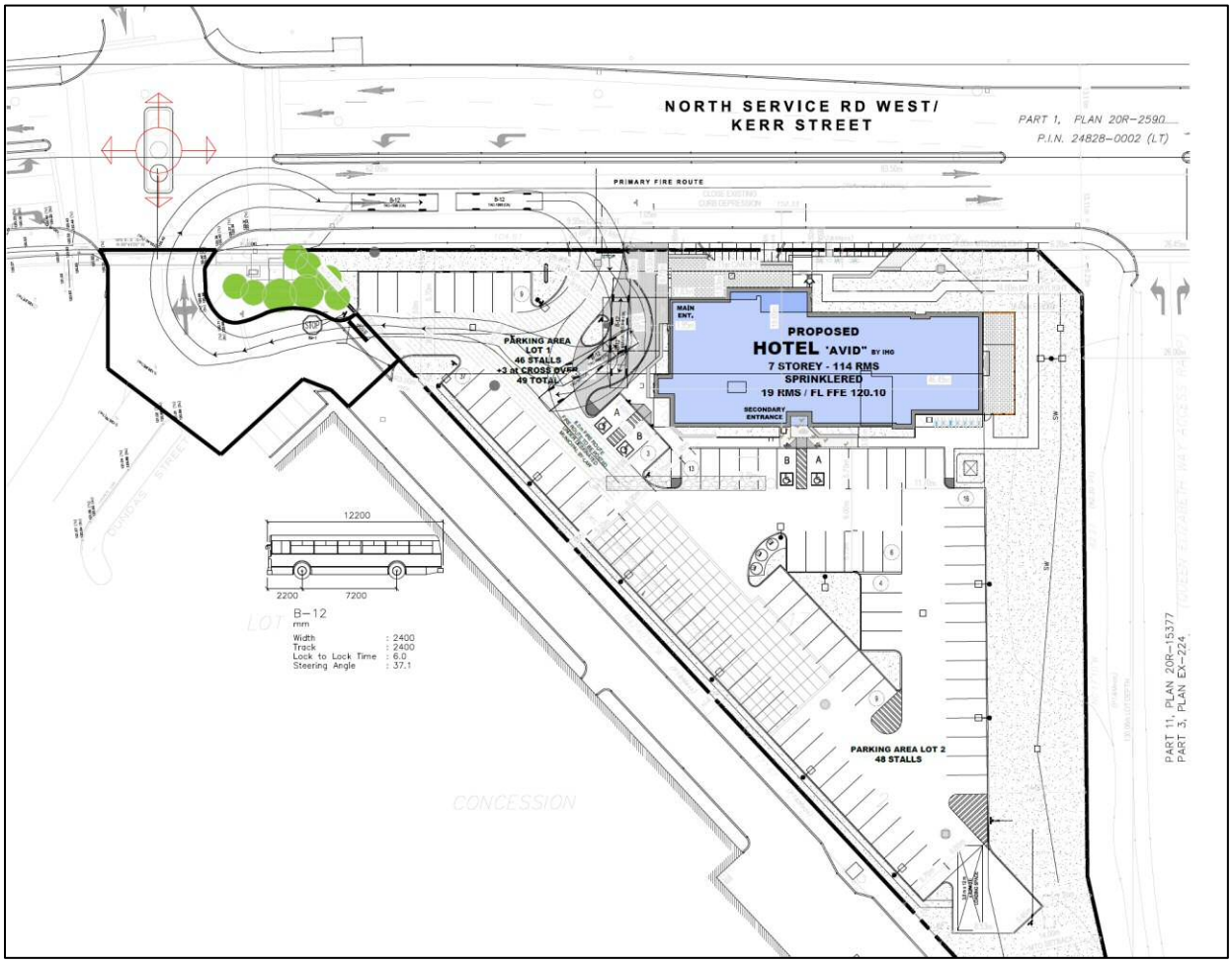


Figure 9-2 AutoTURN Analysis for Medium Single Unit Vehicle (TAC-1999 MSU)

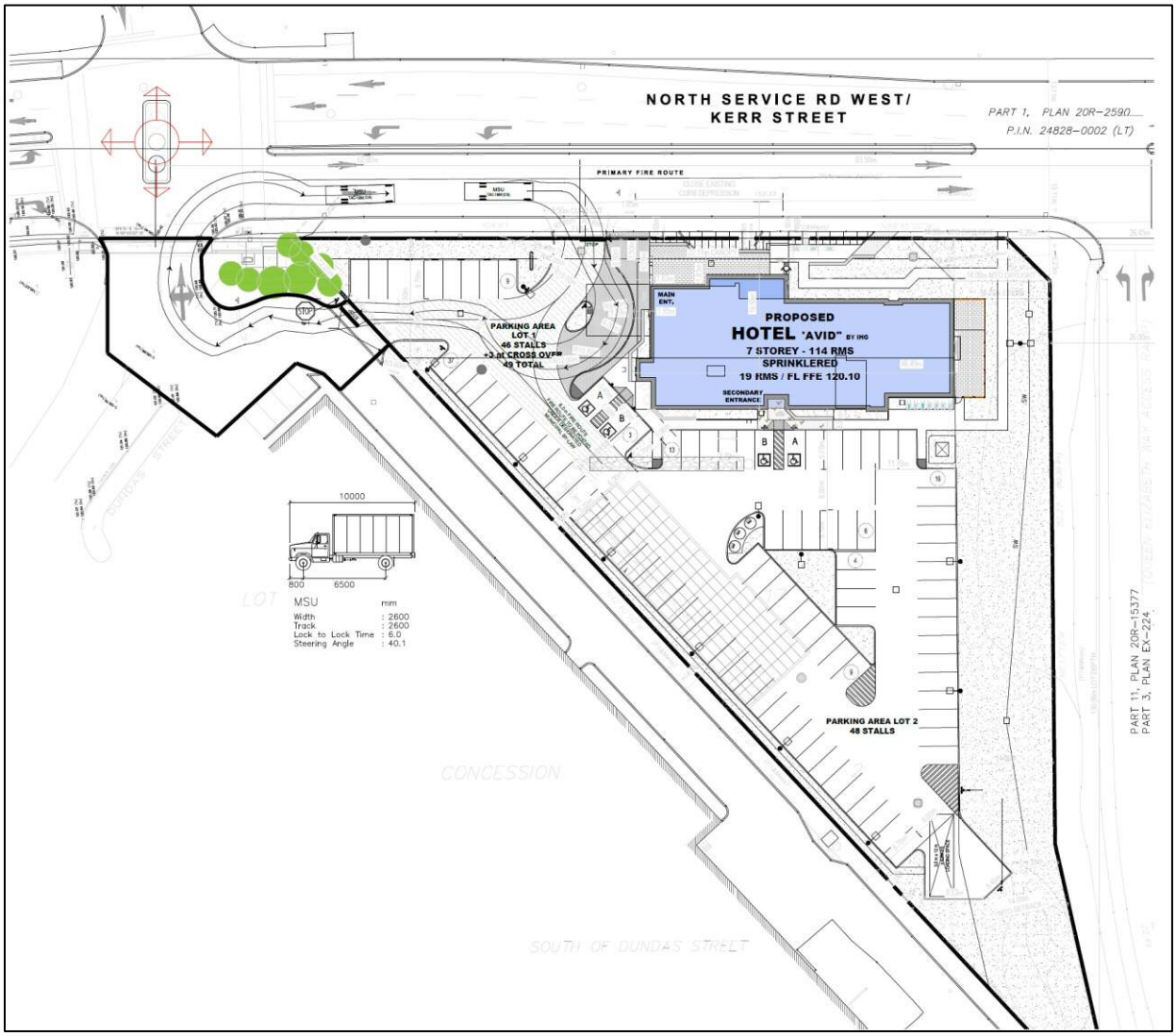
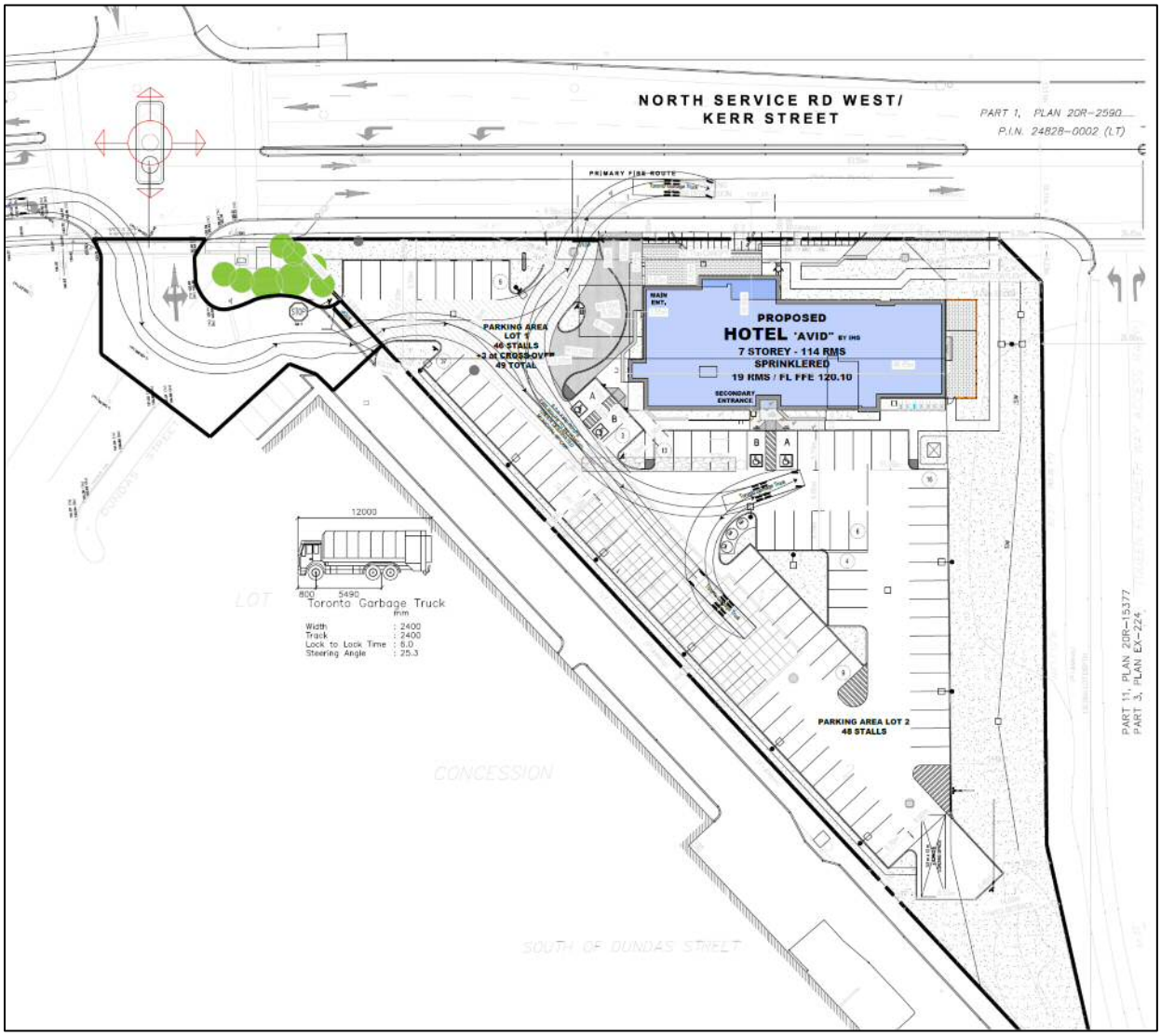


Figure 9-3 AutoTURN Analysis for Garbage Truck Vehicle (Custom)



10.0 CONCLUSIONS AND RECOMMENDATIONS

LMM Engineering Inc. was retained by API Development Consultants to undertake a traffic impact study to evaluate the traffic impacts of the proposed hotel development located on the southwest corner of North Service Road / Kerr Street / Queen Elizabeth Way (QEW) ramp intersection in the Town of Oakville, Halton Region, Ontario.

The proposed development consists of a seven-storey hotel with a total gross floor area of 5,145.9 m^2 or 55,390 s.f. GFA with 114 hotel rooms. It is proposed to provide 98 surface parking spaces. Access is proposed from the existing signalized commercial plaza driveway on North Service Road W and from a new right-in/right-out driveway on North Service Road W.

10.1 Conclusions

Based on the intersection capacity analysis methodology in this report, the North Service Road W / Dorval Drive intersection currently operates with some movements at LOS F and exceeding capacity and is expected to continue to do so with the future background and future total conditions. The intersection is already fully developed with dual left-turn bays on each approach and right-turn bays on three approaches. Additional improvements are not recommended.

The analysis also indicates that at the North Service Road W / Kerr Street / QEW ramp intersection is expected to operate with the northbound left-turn movement at LOS E or F and exceeding the critical v/c ratio at the 2028 future background and future total conditions. Traffic signal warrant analysis based on the available four-hour traffic volumes indicates that traffic signals are 95% warranted currently and will be warranted with the 2028 future background traffic volumes. It is recommended that traffic signals be reviewed in the future. The alternative roundabout option was also reviewed but due to right-of-way constraints, and lack of adequate setbacks to Sixteen Mile Creek and the existing building, traffic signals are the recommended option.

Otherwise, the study area intersections are expected to operate at acceptable levels of service. The addition of site traffic is expected to have a minimal impact on traffic operations in the study area.

The proposed right-turn driveway on North Service Road is expected to operate at acceptable levels of service and not to cause any queuing issues on North Service Road W. The driveway will be spaced over 80 m from the QEW ramp and 60 m from the existing traffic signals at the North Service Road W / Commercial Plaza driveway. The spacing is expected to be adequate and provide minimum stopping sight distance on North Service Road W for a speed of 60 km/h.

Truck turning analysis indicates that buses and garbage trucks can enter the site from the commercial plaza driveway. If access to the commercial plaza driveway is not obtained, the site driveway may need to be shifted or widened to accommodate buses or garbage trucks. Otherwise buses, medium single-unit trucks, and garbage trucks can maneuver through the site including the bus/truck parking space at the south end of the site.

10.2 Recommendations

The analysis in the study indicates that traffic signals may be warranted at the North Service Road W / Kerr Street / QEW Ramp intersection by the 2028 horizon as a result of future background conditions (and not as a result of site traffic). It is recommended that this improvement be reviewed by MTO in the future.

It is also recommended that the site entrances be stop sign controlled with a stop sign and stop bar for exiting traffic. Appropriate traffic signage and traffic control should be implemented to provide pedestrian / vehicular accessibility safety and manoeuvrability with minimum conflicts throughout the site.

Appendix A

Turning Movement Count Data

NORTH SERVICE ROAD / DORVAL DRIVE - TURNING MOVEMENT COUNT - DETAILS

File: 1
Site: 1738900001
Facing: NORTH

DATE	TIME	NORTH APPROACH										EAST APPROACH										SOUTH APPROACH										WEST APPROACH									
		CAR			TRUCK			TOTAL			Peds	CAR			TRUCK			TOTAL			Peds	CAR			TRUCK			TOTAL			Peds	CAR			TRUCK			TOTAL			Peds
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
********** Recording started at:06:57:40																																									
14/12/2017	7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	7:15:00	68	156	9	0	0	0	68	156	9	1	19	16	18	0	0	0	19	16	18	1	10	21	6	2	0	1	12	21	7	0	6	11	46	0	0	0	6	11	46	0
14/12/2017	7:30:00	84	168	10	0	0	0	84	168	10	0	35	28	40	2	2	0	37	30	40	0	36	38	4	3	4	0	39	42	4	0	5	24	45	0	0	0	5	24	45	0
14/12/2017	7:45:00	65	209	6	0	3	0	65	212	6	0	43	30	22	1	2	1	44	32	23	0	34	37	8	2	0	1	36	37	9	0	7	24	70	2	0	1	9	24	71	0
14/12/2017	8:00:00	105	244	12	0	7	1	105	251	13	0	29	27	39	1	1	0	30	28	39	0	35	48	6	5	2	0	40	50	6	0	8	37	74	0	1	0	8	38	74	1
14/12/2017	8:15:00	86	236	13	0	1	1	86	237	14	1	35	34	33	0	0	1	35	34	34	1	23	84	7	0	2	0	23	86	7	0	23	44	72	0	0	0	23	44	72	0
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14/12/2017	9:00:00	117	197	21	0	4	0	117	201	21	1	54	83	43	1	3	0	55	86	43	1	81	114	23	1	4	2	82	118	25	0	18	68	65	1	0	0	19	68	65	1
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	AM PEAK	**416**	**867**	**86**	**0**	**9**	**1**	**416**	**876**	**87**	**3**	**163**	**212**	**157**	**1**	**8**	**3**	**164**	**220**	**160**	**2**	**199**	**454**	**75**	**2**	**13**	**5**	**201**	**467**	**80**	**1**	**93**	**222**	**270**	**3**	**3**	**2**	**96**	**225**	**272**	**3**
	HV% / PHF				**0%**	**1%**	**1%**	**0.83**	**0.88**	**0.78**					**1%**	**4%**	**2%**	**0.75**	**0.64**	**0.87**					**1%**	**3%**	**6%**	**0.61**	**0.86**	**0.8**					**3%**	**1%**	**1%**	**0.71**	**0.83**	**0.94**	
********** Recording restarted at:15:56:44																																									
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14/12/2017	18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	PM PEAK	**258**	**442**	**153**	**1**	**7**	**1**	**259**	**449**	**154**	**5**	**236**	**456**	**651**	**2**	**5**	**1**	**238**	**461**	**652**	**5**	**460**	**963**	**86**	**2**	**7**	**0**	**462**	**970**	**86**	**10**	**287**	**258**	**425**	**1**	**3**	**9**	**288**	**261**	**434**	**11**
	HV% / PHF				**0%**	**2%**	**1%**	**0.80**	**0.88**	**0.70**					**1%**	**1%**	**0%**	**0.86**	**0.95**	**0.85**					**0%**	**1%**	**0%**	**0.93**	**0.83**	**0.83**					**0%**	**1%**	**2%**	**0.88**	**0.91**	**0.85**	

QEW WESTBOUND RAMP (NORTH) / DORVAL DRIVE - TURNING MOVEMENT COUNT - DETAILS

File: 1
Site: 1738900002
Facing: SOUTH

DATE	TIME	NORTH APPROACH										EAST APPROACH										SOUTH APPROACH									
		CAR			TRUCK			TOTAL			Peds	CAR			TRUCK			TOTAL			Peds	CAR			TRUCK			TOTAL			Peds
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
********** Recording started at:06:57:34																															
14/12/2017	7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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14/12/2017	7:30:00	0	184	36	0	2	0	0	186	36	0	137	0	54	17	0	3	154	0	57	0	0	43	34	0	2	0	0	45	34	0
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14/12/2017	8:30:00	0	280	44	0	1	0	0	281	44	0	140	0	62	11	0	2	151	0	64	0	0	165	73	0	6	0	0	171	73	0
14/12/2017	8:45:00	0	226	48	0	4	0	0	230	48	0	105	0	63	10	0	3	115	0	66	0	0	183	52	0	2	1	0	185	53	0
14/12/2017	9:00:00	0	269	28	0	4	2	0	273	30	0	165	0	91	26	0	2	191	0	93	1	0	143	51	0	3	0	0	146	51	0
14/12/2017	9:01:32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	AM PEAK	**0**	**1062**	**167**	**0**	**10**	**2**	**0**	**1072**	**169**	**0**	**538**	**0**	**259**	**55**	**0**	**9**	**593**	**0**	**268**	**1**	**0**	**585**	**233**	**0**	**14**	**1**	**0**	**599**	**234**	**0**
	HV% / PHF				**####**	**1%**	**1%**	**####**	**0.93**	**0.88**					**9%**	**####**	**3%**	**0.78**	**####**	**0.72**					**####**	**2%**	**0%**	**####**	**0.81**	**0.8**	
********** Recording restarted at:15:57:05																															
14/12/2017	16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	16:15:00	0	214	27	0	4	1	0	218	28	0	170	0	125	4	0	3	174	0	128	0	0	186	46	0	3	0	0	189	46	0
14/12/2017	16:30:00	0	206	41	0	3	1	0	209	42	0	196	0	146	15	0	4	211	0	150	1	0	182	34	0	2	1	0	184	35	0
14/12/2017	16:45:00	0	211	32	0	7	0	0	218	32	0	166	0	191	12	0	2	178	0	193	0	0	211	42	0	2	2	0	213	44	0
14/12/2017	17:00:00	0	226	20	0	6	0	0	232	20	0	208	0	190	6	0	1	214	0	191	0	0	218	39	0	2	1	0	220	40	0
14/12/2017	17:15:00	0	236	32	0	6	1	0	242	33	0	182	0	173	7	0	0	189	0	173	0	0	259	48	0	5	2	0	264	50	0
14/12/2017	17:30:00	0	263	43	0	2	2	0	265	45	0	197	0	184	13	0	1	210	0	185	0	0	272	53	0	2	0	0	274	53	0
14/12/2017	17:45:00	0	207	42	0	4	0	0	211	42	0	176	0	160	7	0	1	183	0	161	0	0	231	49	0	2	1	0	233	50	0
14/12/2017	18:00:00	0	244	45	0	3	0	0	247	45	0	156	0	161	7	0	1	163	0	162	0	0	268	57	0	0	1	0	268	58	0
14/12/2017	18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	18:15:35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PM PEAK	**0**	**950**	**162**	**0**	**15**	**3**	**0**	**965**	**165**	**0**	**711**	**0**	**678**	**34**	**0**	**3**	**745**	**0**	**681**	**0**	**0**	**1030**	**207**	**0**	**9**	**4**	**0**	**1039**	**211**	**0**
	HV% / PHF				**####**	**2%**	**2%**	**####**	**0.91**	**0.92**					**5%**	**####**	**0%**	**0.89**	**####**	**0.92**					**####**	**1%**	**2%**	**####**	**0.95**	**0.91**	

QEW EASTBOUND RAMP (SOUTH) / DORVAL DRIVE - TURNING MOVEMENT COUNT - DETAILS

File: 1
Site: 1738900003
Facing: NORTH

DATE	TIME	NORTH APPROACH										SOUTH APPROACH										WEST APPROACH									
		CAR			TRUCK			TOTAL			Peds	CAR			TRUCK			TOTAL			Peds	CAR			TRUCK			TOTAL			Peds
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
********** Recording started at:06:56:45																															
14/12/2017	7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	7:15:00	0	137	142	0	24	1	0	161	143	0	0	61	114	0	3	14	0	64	128	0	11	0	43	1	0	1	12	0	44	0
14/12/2017	7:30:00	0	160	130	0	17	2	0	177	132	0	0	61	125	0	2	13	0	63	138	0	18	0	55	0	0	1	18	0	56	0
14/12/2017	7:45:00	0	214	165	0	15	1	0	229	166	0	0	92	151	0	4	12	0	96	163	0	10	0	65	1	0	2	11	0	67	0
14/12/2017	8:00:00	0	273	159	0	15	3	0	288	162	0	0	113	179	0	2	11	0	115	190	0	13	0	82	0	0	0	13	0	82	1
14/12/2017	8:15:00	0	265	173	0	12	1	0	277	174	0	0	128	172	0	2	20	0	130	192	0	30	0	118	0	0	0	30	0	118	0
14/12/2017	8:30:00	0	236	151	0	11	0	0	247	151	0	0	178	210	0	6	10	0	184	220	0	71	0	153	0	0	0	71	0	153	0
14/12/2017	8:45:00	0	242	103	0	12	1	0	254	104	0	0	149	166	0	2	9	0	151	175	0	87	0	157	1	0	4	88	0	161	0
14/12/2017	9:00:00	0	302	127	0	28	1	0	330	128	0	0	137	195	0	2	10	0	139	205	0	56	0	113	0	0	2	56	0	115	0
14/12/2017	9:01:25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	AM PEAK	**0**	**1045**	**554**	**0**	**63**	**3**	**0**	**1108**	**557**	**0**	**0**	**592**	**743**	**0**	**12**	**49**	**0**	**604**	**792**	**0**	**244**	**0**	**541**	**1**	**0**	**6**	**245**	**0**	**547**	**0**
	HV% / PHF				**####**	**6%**	**1%**	**####**	**0.84**	**0.8**					**####**	**2%**	**6%**	**####**	**0.82**	**0.9**					**0%**	**####**	**1%**	**0.7**	**####**	**0.85**	
********** Recording restarted at:15:56:43																															
14/12/2017	16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	16:15:00	0	273	113	0	9	1	0	282	114	0	0	188	220	0	3	17	0	191	237	0	44	0	59	0	0	2	44	0	61	1
14/12/2017	16:30:00	0	305	97	0	13	2	0	318	99	0	0	178	191	0	3	18	0	181	209	0	35	0	62	0	0	0	35	0	62	2
14/12/2017	16:45:00	0	226	150	0	15	6	0	241	156	0	0	206	235	0	3	16	0	209	251	0	47	0	66	0	0	2	47	0	68	4
14/12/2017	17:00:00	0	325	105	0	6	4	0	331	109	0	0	201	230	0	2	19	0	203	249	0	59	0	89	1	0	1	60	0	90	0
14/12/2017	17:15:00	0	272	152	0	12	3	0	284	155	0	0	255	252	0	5	7	0	260	259	0	55	0	79	1	0	0	56	0	79	1
14/12/2017	17:30:00	0	300	154	0	12	2	0	312	156	0	0	255	242	0	1	10	0	256	252	0	64	0	69	1	0	0	65	0	69	0
14/12/2017	17:45:00	0	235	149	0	8	2	0	243	151	0	0	234	205	0	1	5	0	235	210	0	55	0	73	0	0	0	55	0	73	2
14/12/2017	18:00:00	0	271	128	0	10	0	0	281	128	0	0	220	188	0	0	7	0	220	195	0	98	0	86	0	0	3	98	0	89	1
14/12/2017	18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	18:16:24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PM PEAK	**0**	**1123**	**561**	**0**	**45**	**15**	**0**	**1168**	**576**	**0**	**0**	**917**	**959**	**0**	**11**	**52**	**0**	**928**	**1011**	**0**	**225**	**0**	**303**	**3**	**0**	**3**	**228**	**0**	**306**	**5**
	HV% / PHF				**####**	**4%**	**3%**	**####**	**0.88**	**0.92**					**####**	**1%**	**5%**	**####**	**0.89**	**0.98**					**1%**	**####**	**1%**	**0.58**	**####**	**0.85**	

QEW RAMP / KERR STREET / NORTH SERVICE ROAD - TURNING MOVEMENT COUNT - DETAILS

File: 1
Site: 1738900004
Facing: EAST

DATE	TIME	EAST APPROACH										SOUTH APPROACH										WEST APPROACH									
		CAR			TRUCK			TOTAL			Peds	CAR			TRUCK			TOTAL			Peds	CAR			TRUCK			TOTAL			Peds
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
********** Recording started at:06:57:43																															
14/12/2017	7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	7:15:00	0	25	0	0	0	0	0	25	0	0	12	0	31	0	0	2	12	0	33	0	0	75	0	0	1	0	0	76	0	0
14/12/2017	7:30:00	0	53	0	0	1	0	0	54	0	0	22	0	32	1	0	1	23	0	33	0	0	94	0	0	1	0	0	95	0	0
14/12/2017	7:45:00	0	34	0	0	1	0	0	35	0	0	12	0	34	0	0	1	12	0	35	0	0	91	0	0	2	0	0	93	0	0
14/12/2017	8:00:00	0	47	0	0	1	0	0	48	0	0	21	0	51	0	0	3	21	0	54	0	0	124	0	0	1	0	0	125	0	0
14/12/2017	8:15:00	0	62	0	0	1	0	0	63	0	0	25	0	34	1	0	0	26	0	34	0	0	118	0	0	1	0	0	119	0	0
14/12/2017	8:30:00	0	54	0	0	1	0	0	55	0	0	23	0	49	1	0	0	24	0	49	0	0	157	0	0	0	0	0	157	0	0
14/12/2017	8:45:00	0	83	0	0	4	0	0	87	0	0	36	0	57	0	0	3	36	0	60	0	0	152	0	0	5	0	0	157	0	0
14/12/2017	9:00:00	0	93	0	0	1	0	0	94	0	0	49	0	65	0	0	0	49	0	65	0	0	152	0	0	2	0	0	154	0	0
14/12/2017	9:02:20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	AM PEAK	**0**	**292**	**0**	**0**	**7**	**0**	**0**	**299**	**0**	**0**	**133**	**0**	**205**	**2**	**0**	**3**	**135**	**0**	**208**	**0**	**0**	**579**	**0**	**0**	**8**	**0**	**0**	**587**	**0**	**0**
	HV% / PHF				**####**	**2%**	**####**	**####**	**0.8**	**####**					**1%**	**####**	**1%**	**0.69**	**####**	**0.8**					**####**	**1%**	**####**	**####**	**0.93**	**####**	
********** Recording restarted at:15:57:54																															
14/12/2017	16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	16:15:00	0	175	0	0	1	0	0	176	0	0	26	0	40	0	0	2	26	0	42	0	0	117	0	0	1	0	0	118	0	0
14/12/2017	16:30:00	0	159	0	0	3	0	0	162	0	0	22	0	40	1	0	0	23	0	40	0	0	121	0	0	0	0	0	121	0	0
14/12/2017	16:45:00	0	199	0	0	0	0	0	199	0	0	28	0	45	3	0	0	31	0	45	0	0	109	0	0	2	0	0	111	0	0
14/12/2017	17:00:00	0	186	0	0	1	0	0	187	0	0	34	0	40	1	0	2	35	0	42	0	0	135	0	0	0	0	0	135	0	0
14/12/2017	17:15:00	0	194	0	0	1	0	0	195	0	0	46	0	52	0	0	0	46	0	52	0	0	106	0	0	1	0	0	107	0	0
14/12/2017	17:30:00	0	235	0	0	1	0	0	236	0	0	28	0	33	0	0	0	28	0	33	0	0	125	0	0	0	0	0	125	0	0
14/12/2017	17:45:00	0	193	0	0	1	0	0	194	0	0	38	0	48	0	0	0	38	0	48	0	0	95	0	0	1	0	0	96	0	0
14/12/2017	18:00:00	0	171	0	0	1	0	0	172	0	0	33	0	55	0	0	0	33	0	55	0	0	118	0	0	0	0	0	118	0	0
14/12/2017	18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	18:16:10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PM PEAK	**0**	**814**	**0**	**0**	**3**	**0**	**0**	**817**	**0**	**0**	**136**	**0**	**170**	**4**	**0**	**2**	**140**	**0**	**172**	**0**	**0**	**475**	**0**	**0**	**3**	**0**	**0**	**478**	**0**	**0**
	HV% / PHF				**####**	**0%**	**####**	**####**	**0.87**	**####**					**3%**	**####**	**1%**	**0.76**	**####**	**0.83**					**####**	**1%**	**####**	**####**	**0.89**	**####**	

7:00 AM	**8:00 AM**	0	159	0	0	3	0	0	162	0	0	67	0	148	1	0	7	68	0	155	0	0	384	0	0	5	0	0	389	0	
8:00 AM	**9:00 AM**	0	292	0	0	7	0	0	299	0	0	133	0	205	2	0	3	135	0	208	0	0	579	0	0	8	0	0	587	0	
4:00 PM	**5:00 PM**	0	719	0	0	5	0	0	724	0	0	110	0	165	5	0	4	115	0	169	0	0	482	0	0	3	0	0	485	0	
5:00 PM	**6:00 PM**	0	793	0	0	4	0	0	797	0	0	145	0	188	0	0	0	145	0	188	0	0	444	0	0	2	0	0	446	0	

KERR STREET / CANADIAN TIRE DRIVEWAY - TURNING MOVEMENT COUNT - DETAILS

File: 1
Site: 1738900005
Facing: EAST

DATE	TIME	EAST APPROACH										SOUTH APPROACH										WEST APPROACH									
		CAR			TRUCK			TOTAL			Peds	CAR			TRUCK			TOTAL			Peds	CAR			TRUCK			TOTAL			Peds
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
********** Recording started at:06:57:32																															
14/12/2017	7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	7:15:00	2	23	0	0	1	0	2	24	0	0	1	0	1	0	0	0	1	0	1	2	0	99	3	0	2	0	0	101	3	0
14/12/2017	7:30:00	1	47	0	0	0	0	1	47	0	0	4	0	3	0	0	0	4	0	3	0	0	118	2	0	3	0	0	121	2	1
14/12/2017	7:45:00	0	32	0	0	0	0	0	32	0	0	3	0	6	1	0	0	4	0	6	0	0	107	1	0	3	0	0	110	1	0
14/12/2017	8:00:00	5	42	0	0	2	0	5	44	0	0	3	0	0	0	0	0	3	0	0	0	0	171	1	0	4	0	0	175	1	0
14/12/2017	8:15:00	5	54	0	0	0	0	5	54	0	0	9	0	3	0	0	0	9	0	3	0	0	145	0	0	1	0	0	146	0	0
14/12/2017	8:30:00	4	55	0	0	1	0	4	56	0	0	3	0	9	0	0	0	3	0	9	0	0	183	2	0	0	0	0	183	2	0
14/12/2017	8:45:00	7	62	0	0	4	0	7	66	0	0	16	0	11	0	0	0	16	0	11	0	0	162	11	0	7	1	0	169	12	0
14/12/2017	9:00:00	9	68	0	0	2	0	9	70	0	0	15	0	8	0	0	0	15	0	8	0	0	187	1	0	1	0	0	188	1	0
14/12/2017	9:02:18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	AM PEAK	**25**	**239**	**0**	**0**	**7**	**0**	**25**	**246**	**0**	**0**	**43**	**0**	**31**	**0**	**0**	**0**	**43**	**0**	**31**	**0**	**0**	**677**	**14**	**0**	**9**	**1**	**0**	**686**	**15**	**0**
	HV% / PHF				**0%**	**3%**	**#####**	**0.694**	**0.879**	**#####**					**0%**	**#####**	**0%**	**0.672**	**#####**	**0.705**					**#####**	**1%**	**7%**	**#####**	**0.912**	**0.313**	
********** Recording restarted at:15:57:22																															
14/12/2017	16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	16:15:00	17	148	0	0	0	0	17	148	0	0	27	0	25	0	0	0	27	0	25	0	0	124	5	0	3	0	0	127	5	0
14/12/2017	16:30:00	9	120	0	0	2	0	9	122	0	0	43	0	24	1	0	0	44	0	24	1	0	131	3	0	0	0	0	131	3	0
14/12/2017	16:45:00	17	165	0	0	0	0	17	165	0	0	28	0	20	0	0	0	28	0	20	2	0	116	2	0	1	0	0	117	2	0
14/12/2017	17:00:00	14	147	0	0	1	0	14	148	0	0	43	0	20	0	0	0	43	0	20	1	0	137	2	0	2	0	0	139	2	0
14/12/2017	17:15:00	15	168	0	0	1	0	15	169	0	0	23	0	14	0	0	1	23	0	15	1	0	121	5	0	1	0	0	122	5	0
14/12/2017	17:30:00	13	185	0	0	1	0	13	186	0	0	42	0	14	0	0	0	42	0	14	2	0	119	1	0	0	0	0	119	1	0
14/12/2017	17:45:00	13	173	0	0	0	0	13	173	0	0	33	0	14	1	0	0	34	0	14	0	0	124	1	0	1	0	0	125	1	0
14/12/2017	18:00:00	7	134	0	0	1	0	7	135	0	0	43	0	13	0	0	0	43	0	13	0	0	135	1	0	0	0	0	135	1	0
14/12/2017	18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	18:16:04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PM PEAK	**55**	**673**	**0**	**0**	**3**	**0**	**55**	**676**	**0**	**0**	**141**	**0**	**62**	**1**	**0**	**1**	**142**	**0**	**63**	**4**	**0**	**501**	**9**	**0**	**4**	**0**	**0**	**505**	**9**	**0**
	HV% / PHF				**0%**	**0%**	**#####**	**0.92**	**0.91**	**#####**					**1%**	**#####**	**2%**	**0.83**	**#####**	**0.79**					**#####**	**1%**	**0%**	**#####**	**0.91**	**0.45**	

NORTH SERVICE ROAD W / PLAZA DRIVEWAY - TURNING MOVEMENT COUNT - DETAILS

File: 1
Site: 1738900006
Facing: SOUTH

DATE	TIME	NORTH APPROACH										EAST APPROACH									
		CAR			TRUCK			TOTAL			PEDS	CAR			TRUCK			TOTAL			PEDS
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
********** Recording started at:06:56:07																					
14/12/2017	7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	7:15:00	0	0	0	0	0	0	0	0	0	1	4	32	2	0	0	0	4	32	2	1
14/12/2017	7:30:00	1	1	0	0	0	0	1	1	0	0	5	65	2	0	1	0	5	66	2	1
14/12/2017	7:45:00	3	0	0	0	0	0	3	0	0	0	6	37	2	0	3	0	6	40	2	0
14/12/2017	8:00:00	1	0	0	0	0	0	1	0	0	0	1	67	1	0	1	0	1	68	1	0
14/12/2017	8:15:00	2	0	0	0	0	0	2	0	0	0	13	68	4	1	0	0	14	68	4	0
14/12/2017	8:30:00	5	0	0	0	0	0	5	0	0	0	10	66	4	0	3	0	10	69	4	0
14/12/2017	8:45:00	3	0	2	0	0	0	3	0	2	1	10	103	9	0	1	0	10	104	9	0
14/12/2017	9:00:00	4	1	2	0	0	0	4	1	2	0	10	120	4	0	1	0	10	121	4	3
14/12/2017	9:02:21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	AM PEAK	**14**	**1**	**4**	**0**	**0**	**0**	**14**	**1**	**4**	**1**	**43**	**357**	**21**	**1**	**5**	**0**	**44**	**362**	**21**	**3**
	HV% / PHF				**0%**	**0%**	**0%**	**0.7**	**0.25**	**0.5**					**2%**	**1%**	**0%**	**0.79**	**0.75**	**0.58**	
********** Recording restarted at:15:57:53																					
14/12/2017	16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	16:15:00	2	2	4	0	0	0	2	2	4	0	30	169	4	0	1	0	30	170	4	1
14/12/2017	16:30:00	7	2	6	0	0	0	7	2	6	1	31	151	6	0	4	0	31	155	6	1
14/12/2017	16:45:00	2	2	3	0	0	0	2	2	3	0	28	198	5	0	2	0	28	200	5	0
14/12/2017	17:00:00	5	3	4	0	0	0	5	3	4	0	22	186	3	0	2	0	22	188	3	0
14/12/2017	17:15:00	4	3	8	0	0	0	4	3	8	0	29	206	0	0	1	0	29	207	0	0
14/12/2017	17:30:00	4	2	4	0	0	0	4	2	4	1	20	260	0	0	1	0	20	261	0	0
14/12/2017	17:45:00	3	0	6	0	0	0	3	0	6	0	17	226	0	1	0	0	18	226	0	0
14/12/2017	18:00:00	6	1	4	0	0	0	6	1	4	0	19	185	7	0	1	0	19	186	7	0
14/12/2017	18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	18:16:31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PM PEAK	**15**	**10**	**19**	**0**	**0**	**0**	**15**	**10**	**19**	**1**	**99**	**850**	**8**	**0**	**6**	**0**	**99**	**856**	**8**	**0**
	HV% / PHF				**0%**	**0%**	**0%**	**0.75**	**0.83**	**0.59**					**0%**	**1%**	**0%**	**0.85**	**0.82**	**0.40**	

DATE	TIME	SOUTH APPROACH										WEST APPROACH									
		CAR			TRUCK			TOTAL			PEDS	CAR			TRUCK			TOTAL			PEDS
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
********** Recording started at:06:56:07																					
14/12/2017	7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	7:15:00	2	0	5	0	0	0	2	0	5	0	0	68	1	0	1	0	0	69	1	0
14/12/2017	7:30:00	7	0	9	0	0	0	7	0	9	1	0	82	2	0	1	0	0	83	2	0
14/12/2017	7:45:00	7	1	6	2	0	0	9	1	6	0	0	83	0	0	2	0	0	85	0	0
14/12/2017	8:00:00	7	0	8	0	0	0	7	0	8	2	0	111	2	0	1	0	0	112	2	0
14/12/2017	8:15:00	7	1	7	1	0	0	8	1	7	0	0	112	0	0	1	0	0	113	0	0
14/12/2017	8:30:00	9	0	5	0	0	0	9	0	5	0	0	151	2	0	0	1	0	151	3	0
14/12/2017	8:45:00	15	0	12	0	0	1	15	0	13	0	0	134	2	0	4	0	0	138	2	0
14/12/2017	9:00:00	13	0	9	2	0	0	15	0	9	0	0	139	4	0	0	0	0	139	4	0
14/12/2017	9:02:21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	AM PEAK	**44**	**1**	**33**	**3**	**0**	**1**	**47**	**1**	**34**	**0**	**0**	**536**	**8**	**0**	**5**	**1**	**0**	**541**	**9**	**0**
	HV% / PHF				**6%**	**0%**	**3%**	**0.78**	**0.25**	**0.65**					**####**	**1%**	**11%**	**####**	**0.9**	**0.56**	
********** Recording restarted at:15:57:53																					
14/12/2017	16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	16:15:00	70	2	28	0	0	0	70	2	28	0	1	86	8	0	1	0	1	87	8	0
14/12/2017	16:30:00	71	3	27	0	0	0	71	3	27	0	3	84	10	0	0	0	3	84	10	0
14/12/2017	16:45:00	68	1	16	0	0	1	68	1	17	1	4	91	2	0	1	0	4	92	2	0
14/12/2017	17:00:00	68	1	23	1	0	0	69	1	23	0	1	107	9	0	0	0	1	107	9	1
14/12/2017	17:15:00	70	0	16	0	0	0	70	0	16	0	4	86	4	0	1	0	4	87	4	0
14/12/2017	17:30:00	72	2	21	0	0	0	72	2	21	0	1	100	3	0	1	0	1	101	3	0
14/12/2017	17:45:00	64	1	16	1	0	0	65	1	16	0	1	80	5	0	1	0	1	81	5	0
14/12/2017	18:00:00	66	2	16	0	0	1	66	2	17	1	1	93	11	0	0	0	1	93	11	0
14/12/2017	18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/12/2017	18:16:31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PM PEAK	**278**	**4**	**76**	**1**	**0**	**1**	**279**	**4**	**77**	**1**	**10**	**384**	**18**	**0**	**3**	**0**	**10**	**387**	**18**	**1**
	HV% / PHF				**0%**	**0%**	**1%**	**0.97**	**0.50**	**0.84**					**0%**	**1%**	**0%**	**0.63**	**0.90**	**0.50**	

Appendix B

Intersection Capacity Analysis Output
Existing Condition

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	135	271	289	219	344	184	330	543	100	501	1107
v/c Ratio	0.40	0.28	0.45	0.63	0.36	0.34	0.43	0.59	0.22	0.65	1.20
Control Delay	54.7	36.4	6.4	61.1	37.7	9.0	43.6	42.8	8.4	48.3	138.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	36.4	6.4	61.1	37.7	9.0	43.6	42.8	8.4	48.3	138.4
Queue Length 50th (m)	16.8	28.9	0.0	27.8	37.7	3.6	37.8	62.2	0.4	60.7	~171.6
Queue Length 95th (m)	20.7	37.3	21.3	33.1	35.0	19.8	34.0	80.4	10.6	72.1	#223.7
Internal Link Dist (m)		140.9			161.1			292.7			175.8
Turn Bay Length (m)	50.0		50.0	45.0		20.0	50.0		50.0	40.0	
Base Capacity (vph)	415	1309	758	423	1271	673	766	916	464	774	925
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.21	0.38	0.52	0.27	0.27	0.43	0.59	0.22	0.65	1.20

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	225	272	164	220	160	201	467	80	416	876	87
Future Volume (vph)	96	225	272	164	220	160	201	467	80	416	876	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3400	3574	1570	3467	3471	1552	3467	3505	1499	3502	3513	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3400	3574	1570	3467	3471	1552	3467	3505	1499	3502	3513	
Peak-hour factor, PHF	0.71	0.83	0.94	0.75	0.64	0.87	0.61	0.86	0.80	0.83	0.88	0.78
Adj. Flow (vph)	135	271	289	219	344	184	330	543	100	501	995	112
RTOR Reduction (vph)	0	0	210	0	0	120	0	0	72	0	7	0
Lane Group Flow (vph)	135	271	79	219	344	64	330	543	28	501	1100	0
Confl. Peds. (#/hr)	6		4	3		5	4		3	5		6
Heavy Vehicles (%)	3%	1%	1%	1%	4%	2%	1%	3%	6%	0%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	2		1	2		3	4		3	4	
Permitted Phases			2			2			4			
Actuated Green, G (s)	12.3	33.5	33.5	12.3	33.5	33.5	27.1	32.1	32.1	27.1	32.1	
Effective Green, g (s)	12.3	33.5	33.5	12.3	33.5	33.5	27.1	32.1	32.1	27.1	32.1	
Actuated g/C Ratio	0.10	0.27	0.27	0.10	0.27	0.27	0.22	0.26	0.26	0.22	0.26	
Clearance Time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5	4.5	2.5	3.5	3.5	2.5	3.5	
Lane Grp Cap (vph)	340	974	428	347	946	423	765	916	391	772	918	
v/s Ratio Prot	0.04	0.08		c0.06	c0.10		0.10	0.15		c0.14	c0.31	
v/s Ratio Perm			0.05			0.04			0.02			
v/c Ratio	0.40	0.28	0.18	0.63	0.36	0.15	0.43	0.59	0.07	0.65	1.20	
Uniform Delay, d1	51.8	35.1	34.2	53.1	36.0	33.9	41.2	39.6	34.1	43.5	45.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	0.7	0.9	3.3	1.1	0.8	0.3	1.1	0.1	1.7	100.0	
Delay (s)	52.3	35.8	35.1	56.3	37.1	34.6	41.5	40.7	34.2	45.2	145.3	
Level of Service	D	D	D	E	D	C	D	D	C	D	F	
Approach Delay (s)		38.8			42.1			40.3			114.1	
Approach LOS		D			D			D			F	

Intersection Summary

HCM 2000 Control Delay	69.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	122.8	Sum of lost time (s)	17.8
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	797	335	1033	1153
v/c Ratio	0.74	0.67	0.39	0.42
Control Delay	33.0	31.1	9.5	15.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	33.0	31.1	9.5	15.1
Queue Length 50th (m)	72.3	56.0	34.2	48.6
Queue Length 95th (m)	66.3	55.8	34.7	72.1
Internal Link Dist (m)	51.0		299.5	292.7
Turn Bay Length (m)		160.0		
Base Capacity (vph)	1832	820	2675	2776
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.44	0.41	0.39	0.42

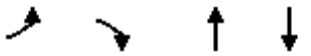
Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	593	268	599	234	0	1072
Future Volume (vph)	593	268	599	234	0	1072
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.5			6.5
Lane Util. Factor	0.97	0.91	0.91			0.91
Frpb, ped/bikes	1.00	0.99	0.99			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	0.99	0.85	0.96			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3210	1408	4864			5136
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3210	1408	4864			5136
Peak-hour factor, PHF	0.78	0.72	0.81	0.80	0.92	0.93
Adj. Flow (vph)	760	372	740	292	0	1153
RTOR Reduction (vph)	5	27	47	0	0	0
Lane Group Flow (vph)	792	308	986	0	0	1153
Confl. Peds. (#/hr)	1	1		1	1	
Heavy Vehicles (%)	9%	3%	2%	0%	2%	1%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	33.4	33.4	54.1			54.1
Effective Green, g (s)	33.4	33.4	54.1			54.1
Actuated g/C Ratio	0.33	0.33	0.54			0.54
Clearance Time (s)	6.0	6.0	6.5			6.5
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	1072	470	2631			2778
v/s Ratio Prot	c0.25		0.20			c0.22
v/s Ratio Perm		0.22				
v/c Ratio	0.74	0.65	0.37			0.42
Uniform Delay, d1	29.4	28.4	13.2			13.6
Progression Factor	1.00	1.00	0.71			1.00
Incremental Delay, d2	2.7	3.3	0.4			0.5
Delay (s)	32.1	31.7	9.8			14.0
Level of Service	C	C	A			B
Approach Delay (s)	32.0		9.8			14.0
Approach LOS	C		A			B

Intersection Summary

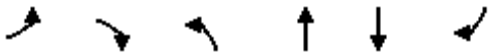
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	672	322	737	1319
v/c Ratio	0.67	0.73	0.24	0.44
Control Delay	33.1	39.7	10.2	7.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	33.1	39.7	10.2	7.6
Queue Length 50th (m)	61.7	63.7	22.7	35.6
Queue Length 95th (m)	48.7	76.3	35.1	55.2
Internal Link Dist (m)	49.5		444.3	299.5
Turn Bay Length (m)	150.0			
Base Capacity (vph)	1812	796	3102	2985
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.37	0.40	0.24	0.44

Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	245	547	0	604	1108	0
Future Volume (vph)	245	547	0	604	1108	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frt	0.93	0.85		1.00	1.00	
Flt Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3318	1455		5085	4893	
Flt Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3318	1455		5085	4893	
Peak-hour factor, PHF	0.70	0.85	0.92	0.82	0.84	0.92
Adj. Flow (vph)	350	644	0	737	1319	0
RTOR Reduction (vph)	5	5	0	0	0	0
Lane Group Flow (vph)	667	317	0	737	1319	0
Heavy Vehicles (%)	0%	1%	2%	2%	6%	2%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	30.0	30.0		61.0	61.0	
Effective Green, g (s)	30.0	30.0		61.0	61.0	
Actuated g/C Ratio	0.30	0.30		0.61	0.61	
Clearance Time (s)	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	995	436		3101	2984	
v/s Ratio Prot	0.20			0.14	c0.27	
v/s Ratio Perm		c0.22				
v/c Ratio	0.67	0.73		0.24	0.44	
Uniform Delay, d1	30.7	31.3		8.9	10.4	
Progression Factor	1.00	1.00		1.00	0.62	
Incremental Delay, d2	1.8	6.0		0.2	0.4	
Delay (s)	32.5	37.3		9.1	6.9	
Level of Service	C	D		A	A	
Approach Delay (s)	34.0			9.1	6.9	
Approach LOS	C			A	A	

Intersection Summary

HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	587	0	0	299	135	208
Future Volume (Veh/h)	587	0	0	299	135	208
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.92	0.92	0.80	0.69	0.80
Hourly flow rate (vph)	631	0	0	374	196	260
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	148			218		
pX, platoon unblocked			0.95		0.95	0.95
vC, conflicting volume			631		818	316
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			506		703	174
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		45	68
cM capacity (veh/h)			1002		355	800

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	316	316	187	187	196	260
Volume Left	0	0	0	0	196	0
Volume Right	0	0	0	0	0	260
cSH	1700	1700	1700	1700	355	800
Volume to Capacity	0.19	0.19	0.11	0.11	0.55	0.32
Queue Length 95th (m)	0.0	0.0	0.0	0.0	25.5	11.3
Control Delay (s)	0.0	0.0	0.0	0.0	26.9	11.6
Lane LOS					D	B
Approach Delay (s)	0.0		0.0		18.2	
Approach LOS					C	

Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	754	48	36	283	64	44
v/c Ratio	0.26	0.04	0.06	0.10	0.29	0.19
Control Delay	4.4	2.1	4.9	3.8	43.7	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.4	2.1	4.9	3.8	43.7	12.7
Queue Length 50th (m)	18.7	0.4	1.4	6.1	13.2	0.0
Queue Length 95th (m)	44.4	0.0	4.9	15.6	16.7	5.5
Internal Link Dist (m)	72.4			151.3	35.3	
Turn Bay Length (m)		25.0	25.0			
Base Capacity (vph)	2856	1213	554	2800	577	546
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.04	0.06	0.10	0.11	0.08

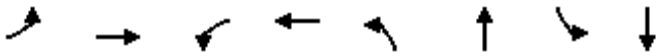
Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	686	15	25	246	43	31
Future Volume (vph)	686	15	25	246	43	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1509	1805	3505	1805	1615
Flt Permitted	1.00	1.00	0.36	1.00	0.95	1.00
Satd. Flow (perm)	3574	1509	693	3505	1805	1615
Peak-hour factor, PHF	0.91	0.31	0.69	0.87	0.67	0.70
Adj. Flow (vph)	754	48	36	283	64	44
RTOR Reduction (vph)	0	9	0	0	0	39
Lane Group Flow (vph)	754	39	36	283	64	5
Heavy Vehicles (%)	1%	7%	0%	3%	0%	0%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	81.9	81.9	81.9	81.9	11.0	11.0
Effective Green, g (s)	81.9	81.9	81.9	81.9	11.0	11.0
Actuated g/C Ratio	0.77	0.77	0.77	0.77	0.10	0.10
Clearance Time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.5	3.5
Lane Grp Cap (vph)	2769	1169	536	2715	187	168
v/s Ratio Prot	c0.21			0.08	c0.04	
v/s Ratio Perm		0.03	0.05			0.00
v/c Ratio	0.27	0.03	0.07	0.10	0.34	0.03
Uniform Delay, d1	3.4	2.8	2.8	2.9	44.0	42.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1	0.2	0.1	1.3	0.1
Delay (s)	3.6	2.8	3.1	3.0	45.3	42.6
Level of Service	A	A	A	A	D	D
Approach Delay (s)	3.6			3.0	44.2	
Approach LOS	A			A	D	

Intersection Summary

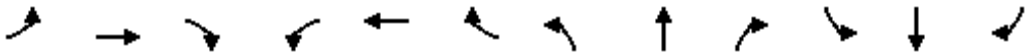
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	105.7	Sum of lost time (s)	12.8
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	4	617	56	519	60	56	20	12
v/c Ratio	0.01	0.24	0.08	0.18	0.35	0.23	0.12	0.05
Control Delay	9.0	7.6	3.7	4.1	46.3	13.9	39.6	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	7.6	3.7	4.1	46.3	13.9	39.6	24.2
Queue Length 50th (m)	0.3	23.7	1.8	12.0	12.5	0.8	4.0	0.8
Queue Length 95th (m)	0.6	47.0	6.5	23.0	19.2	0.0	7.7	0.5
Internal Link Dist (m)		92.6		124.1		50.7		14.6
Turn Bay Length (m)	35.0		35.0					
Base Capacity (vph)	628	2556	750	2813	381	481	385	486
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.24	0.07	0.18	0.16	0.12	0.05	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	541	9	44	362	21	47	1	34	14	1	4
Future Volume (vph)	1	541	9	44	362	21	47	1	34	14	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.86		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1802	3551		1767	3532		1703	1568		1796	1695	
Flt Permitted	0.46	1.00		0.40	1.00		0.75	1.00		0.72	1.00	
Satd. Flow (perm)	873	3551		741	3532		1344	1568		1362	1695	
Peak-hour factor, PHF	0.25	0.90	0.56	0.79	0.75	0.58	0.78	0.25	0.65	0.70	0.25	0.50
Adj. Flow (vph)	4	601	16	56	483	36	60	4	52	20	4	8
RTOR Reduction (vph)	0	1	0	0	3	0	0	46	0	0	7	0
Lane Group Flow (vph)	4	616	0	56	516	0	60	10	0	20	5	0
Confl. Peds. (#/hr)	1			3		4			3	4		1
Heavy Vehicles (%)	0%	1%	11%	2%	1%	0%	6%	0%	3%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	73.0	73.0		81.6	81.6		11.4	11.4		11.4	11.4	
Effective Green, g (s)	73.0	73.0		81.6	81.6		11.4	11.4		11.4	11.4	
Actuated g/C Ratio	0.69	0.69		0.77	0.77		0.11	0.11		0.11	0.11	
Clearance Time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	4.5	4.5		2.5	4.5		3.5	3.5		3.5	3.5	
Lane Grp Cap (vph)	602	2450		625	2724		144	168		146	182	
v/s Ratio Prot		c0.17		0.00	c0.15			0.01			0.00	
v/s Ratio Perm	0.00			0.06			c0.04			0.01		
v/c Ratio	0.01	0.25		0.09	0.19		0.42	0.06		0.14	0.03	
Uniform Delay, d1	5.1	6.2		2.9	3.2		44.1	42.4		42.7	42.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.2		0.0	0.2		2.3	0.2		0.5	0.1	
Delay (s)	5.1	6.4		3.0	3.4		46.4	42.5		43.3	42.3	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		6.4			3.4			44.5			42.9	
Approach LOS		A			A			D			D	

Intersection Summary

HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	105.8	Sum of lost time (s)	15.8
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	327	287	511	277	485	767	497	1169	104	324	730
v/c Ratio	1.04	0.24	0.70	0.89	0.41	1.08	1.09	1.09	0.20	0.71	0.70
Control Delay	116.7	30.3	17.6	85.5	32.8	84.4	118.2	94.8	11.7	60.6	39.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	116.7	30.3	17.6	85.5	32.8	84.4	118.2	94.8	11.7	60.6	39.0
Queue Length 50th (m)	~46.3	27.6	38.4	36.4	49.7	~168.4	~73.1	~175.3	4.7	41.2	79.8
Queue Length 95th (m)	#74.1	39.2	68.6	#57.3	65.6	#219.4	#108.3	#190.3	15.8	50.2	99.4
Internal Link Dist (m)		140.9			161.1			292.7			175.8
Turn Bay Length (m)	50.0		50.0	45.0		20.0	50.0		50.0	40.0	
Base Capacity (vph)	313	1193	727	310	1193	708	456	1076	522	456	1050
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.24	0.70	0.89	0.41	1.08	1.09	1.09	0.20	0.71	0.70

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	261	434	238	461	652	462	970	86	259	449	154
Future Volume (vph)	288	261	434	238	461	652	462	970	86	259	449	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	1.00	0.96	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3502	3574	1514	3467	3574	1571	3502	3574	1552	3502	3356	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3502	3574	1514	3467	3574	1571	3502	3574	1552	3502	3356	
Peak-hour factor, PHF	0.88	0.91	0.85	0.86	0.95	0.85	0.93	0.83	0.83	0.80	0.88	0.70
Adj. Flow (vph)	327	287	511	277	485	767	497	1169	104	324	510	220
RTOR Reduction (vph)	0	0	222	0	0	184	0	0	54	0	39	0
Lane Group Flow (vph)	327	287	289	277	485	583	497	1169	50	324	691	0
Confl. Peds. (#/hr)	16		21	15		10	15		21	10		16
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	0%	1%	0%	0%	2%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	2		1	2		3	4		3	4	
Permitted Phases			2			2			4			
Actuated Green, G (s)	11.0	41.0	41.0	11.0	41.0	41.0	16.0	37.0	37.0	16.0	37.0	
Effective Green, g (s)	11.0	41.0	41.0	11.0	41.0	41.0	16.0	37.0	37.0	16.0	37.0	
Actuated g/C Ratio	0.09	0.33	0.33	0.09	0.33	0.33	0.13	0.30	0.30	0.13	0.30	
Clearance Time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5	4.5	2.5	3.5	3.5	2.5	3.5	
Lane Grp Cap (vph)	313	1193	505	310	1193	524	456	1076	467	456	1011	
v/s Ratio Prot	c0.09	0.08		0.08	0.14		c0.14	c0.33		0.09	0.21	
v/s Ratio Perm			0.19			c0.37			0.03			
v/c Ratio	1.04	0.24	0.57	0.89	0.41	1.11	1.09	1.09	0.11	0.71	0.68	
Uniform Delay, d1	55.9	29.6	33.7	55.3	31.5	40.9	53.4	42.9	31.0	51.2	37.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	63.0	0.5	4.6	26.0	1.0	74.0	68.7	54.0	0.1	4.8	2.0	
Delay (s)	118.9	30.1	38.3	81.3	32.6	114.9	122.1	96.9	31.1	56.0	39.7	
Level of Service	F	C	D	F	C	F	F	F	C	E	D	
Approach Delay (s)		59.6			82.7			100.1			44.7	
Approach LOS		E			F			F			D	

Intersection Summary

HCM 2000 Control Delay	76.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	122.8	Sum of lost time (s)	17.8
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1081	496	1094	1060
v/c Ratio	0.72	0.74	0.52	0.51
Control Delay	22.2	26.4	18.0	22.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	22.2	26.4	18.0	22.6
Queue Length 50th (m)	79.6	78.6	42.7	51.2
Queue Length 95th (m)	77.3	94.5	66.3	78.2
Internal Link Dist (m)	51.0		299.5	292.7
Turn Bay Length (m)		160.0		
Base Capacity (vph)	1909	851	2091	2070
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.57	0.58	0.52	0.51

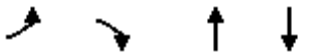
Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	745	681	1039	0	0	965
Future Volume (vph)	745	681	1039	0	0	965
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.5			6.5
Lane Util. Factor	0.97	0.91	0.91			0.91
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	0.97	0.85	1.00			1.00
Flt Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3301	1470	5136			5085
Flt Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3301	1470	5136			5085
Peak-hour factor, PHF	0.89	0.92	0.95	0.80	0.92	0.91
Adj. Flow (vph)	837	740	1094	0	0	1060
RTOR Reduction (vph)	3	3	0	0	0	0
Lane Group Flow (vph)	1078	493	1094	0	0	1060
Confl. Peds. (#/hr)					1	
Heavy Vehicles (%)	5%	0%	1%	0%	2%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	40.9	40.9	36.6			36.6
Effective Green, g (s)	40.9	40.9	36.6			36.6
Actuated g/C Ratio	0.45	0.45	0.41			0.41
Clearance Time (s)	6.0	6.0	6.5			6.5
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	1500	668	2088			2067
v/s Ratio Prot	0.33		c0.21			0.21
v/s Ratio Perm		c0.34				
v/c Ratio	0.72	0.74	0.52			0.51
Uniform Delay, d1	19.9	20.2	20.1			20.0
Progression Factor	1.00	1.00	0.78			1.00
Incremental Delay, d2	1.7	4.3	0.9			0.9
Delay (s)	21.6	24.4	16.7			20.9
Level of Service	C	C	B			C
Approach Delay (s)	22.5		16.7			20.9
Approach LOS	C		B			C

Intersection Summary

HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	515	238	1043	1327
v/c Ratio	0.67	0.70	0.30	0.40
Control Delay	33.7	38.3	6.7	5.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	33.7	38.3	6.7	5.6
Queue Length 50th (m)	42.0	38.4	23.2	32.5
Queue Length 95th (m)	29.5	54.5	40.2	39.5
Internal Link Dist (m)	49.5		444.3	299.5
Turn Bay Length (m)	150.0			
Base Capacity (vph)	1323	567	3462	3331
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.42	0.30	0.40

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	228	306	0	928	1168	0
Future Volume (vph)	228	306	0	928	1168	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	0.96	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3401	1427		5085	4893	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3401	1427		5085	4893	
Peak-hour factor, PHF	0.58	0.85	0.92	0.89	0.88	0.92
Adj. Flow (vph)	393	360	0	1043	1327	0
RTOR Reduction (vph)	27	27	0	0	0	0
Lane Group Flow (vph)	488	211	0	1043	1327	0
Confl. Peds. (#/hr)	5	5				
Heavy Vehicles (%)	0%	1%	2%	2%	6%	2%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	19.7	19.7		61.3	61.3	
Effective Green, g (s)	19.7	19.7		61.3	61.3	
Actuated g/C Ratio	0.22	0.22		0.68	0.68	
Clearance Time (s)	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	744	312		3463	3332	
v/s Ratio Prot	0.14			0.21	c0.27	
v/s Ratio Perm		c0.15				
v/c Ratio	0.66	0.68		0.30	0.40	
Uniform Delay, d1	32.1	32.2		5.8	6.3	
Progression Factor	1.00	1.00		1.00	0.75	
Incremental Delay, d2	2.1	5.7		0.2	0.3	
Delay (s)	34.2	38.0		6.0	5.0	
Level of Service	C	D		A	A	
Approach Delay (s)	35.4			6.0	5.0	
Approach LOS	D			A	A	

Intersection Summary

HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	478	0	0	817	140	172
Future Volume (Veh/h)	478	0	0	817	140	172
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.92	0.92	0.87	0.76	0.83
Hourly flow rate (vph)	537	0	0	939	184	207
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	148			218		
pX, platoon unblocked			0.94		0.97	0.94
vC, conflicting volume			537		1006	268
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			384		670	99
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		51	77
cM capacity (veh/h)			1103		376	886

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	268	268	470	470	184	207
Volume Left	0	0	0	0	184	0
Volume Right	0	0	0	0	0	207
cSH	1700	1700	1700	1700	376	886
Volume to Capacity	0.16	0.16	0.28	0.28	0.49	0.23
Queue Length 95th (m)	0.0	0.0	0.0	0.0	20.8	7.2
Control Delay (s)	0.0	0.0	0.0	0.0	23.4	10.3
Lane LOS					C	B
Approach Delay (s)	0.0		0.0		16.5	
Approach LOS					C	

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	555	20	60	743	171	80
v/c Ratio	0.21	0.02	0.10	0.28	0.62	0.26
Control Delay	5.5	2.6	5.9	5.9	50.7	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.5	2.6	5.9	5.9	50.7	10.0
Queue Length 50th (m)	17.4	0.0	3.3	24.8	35.3	0.0
Queue Length 95th (m)	31.5	0.6	9.7	43.5	48.2	8.9
Internal Link Dist (m)	72.4			151.3	35.3	
Turn Bay Length (m)		25.0	25.0			
Base Capacity (vph)	2587	1105	607	2613	571	551
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.02	0.10	0.28	0.30	0.15

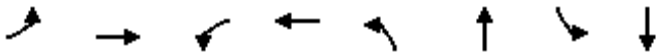
Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	505	9	55	676	142	63
Future Volume (vph)	505	9	55	676	142	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.94	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1519	1795	3610	1787	1556
Flt Permitted	1.00	1.00	0.44	1.00	0.95	1.00
Satd. Flow (perm)	3574	1519	839	3610	1787	1556
Peak-hour factor, PHF	0.91	0.45	0.92	0.91	0.83	0.79
Adj. Flow (vph)	555	20	60	743	171	80
RTOR Reduction (vph)	0	6	0	0	0	68
Lane Group Flow (vph)	555	14	60	743	171	12
Confl. Peds. (#/hr)		13	4		13	4
Heavy Vehicles (%)	1%	0%	0%	0%	1%	2%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	76.5	76.5	76.5	76.5	16.4	16.4
Effective Green, g (s)	76.5	76.5	76.5	76.5	16.4	16.4
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.16	0.16
Clearance Time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.5	3.5
Lane Grp Cap (vph)	2586	1099	607	2612	277	241
v/s Ratio Prot	0.16			c0.21	c0.10	
v/s Ratio Perm		0.01	0.07			0.01
v/c Ratio	0.21	0.01	0.10	0.28	0.62	0.05
Uniform Delay, d1	4.8	4.1	4.3	5.1	41.7	38.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	0.3	0.3	4.3	0.1
Delay (s)	5.0	4.1	4.7	5.4	46.0	38.1
Level of Service	A	A	A	A	D	D
Approach Delay (s)	4.9			5.3	43.5	
Approach LOS	A			A	D	

Intersection Summary

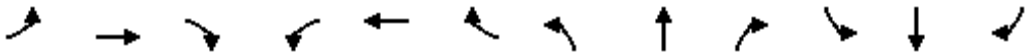
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	105.7	Sum of lost time (s)	12.8
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	466	116	1064	288	100	20	44
v/c Ratio	0.06	0.26	0.19	0.48	0.80	0.21	0.06	0.10
Control Delay	17.4	15.9	8.8	12.8	53.0	7.6	26.7	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	15.9	8.8	12.8	53.0	7.6	26.7	12.4
Queue Length 50th (m)	1.7	27.7	8.6	61.3	58.2	1.3	3.2	1.9
Queue Length 95th (m)	4.5	46.7	17.8	81.6	82.2	0.9	7.0	8.6
Internal Link Dist (m)		92.6		124.1		50.7		14.6
Turn Bay Length (m)	35.0		35.0					
Base Capacity (vph)	260	1823	688	2252	409	540	389	519
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.26	0.17	0.47	0.70	0.19	0.05	0.08

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	387	18	99	856	8	279	4	77	15	10	19
Future Volume (vph)	10	387	18	99	856	8	279	4	77	15	10	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.86		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1802	3528		1804	3563		1801	1603		1803	1675	
Flt Permitted	0.27	1.00		0.45	1.00		0.73	1.00		0.69	1.00	
Satd. Flow (perm)	506	3528		848	3563		1380	1603		1314	1675	
Peak-hour factor, PHF	0.63	0.90	0.50	0.85	0.82	0.40	0.97	0.50	0.84	0.75	0.83	0.59
Adj. Flow (vph)	16	430	36	116	1044	20	288	8	92	20	12	32
RTOR Reduction (vph)	0	5	0	0	1	0	0	68	0	0	24	0
Lane Group Flow (vph)	16	461	0	116	1063	0	288	32	0	20	20	0
Confl. Peds. (#/hr)	2		2	1		1	2		1	1		2
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	54.4	54.4		65.5	65.5		27.5	27.5		27.5	27.5	
Effective Green, g (s)	54.4	54.4		65.5	65.5		27.5	27.5		27.5	27.5	
Actuated g/C Ratio	0.51	0.51		0.62	0.62		0.26	0.26		0.26	0.26	
Clearance Time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	4.5	4.5		2.5	4.5		3.5	3.5		3.5	3.5	
Lane Grp Cap (vph)	260	1814		598	2205		358	416		341	435	
v/s Ratio Prot		0.13		0.01	c0.30			0.02			0.01	
v/s Ratio Perm	0.03			0.11			c0.21			0.02		
v/c Ratio	0.06	0.25		0.19	0.48		0.80	0.08		0.06	0.05	
Uniform Delay, d1	12.9	14.4		8.3	10.9		36.6	29.6		29.4	29.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.3		0.1	0.8		12.7	0.1		0.1	0.1	
Delay (s)	13.3	14.7		8.4	11.7		49.3	29.7		29.5	29.4	
Level of Service	B	B		A	B		D	C		C	C	
Approach Delay (s)		14.7			11.4			44.2			29.4	
Approach LOS		B			B			D			C	

Intersection Summary

HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	105.8	Sum of lost time (s)	15.8
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Appendix C

Intersection Capacity Analysis Output
Future Background Condition - 2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	149	299	318	240	378	202	362	598	110	552	1218
v/c Ratio	0.60	0.34	0.51	0.94	0.44	0.41	0.58	0.48	0.18	0.88	0.98
Control Delay	65.7	38.8	7.3	100.6	40.6	14.9	50.5	32.7	5.8	65.1	59.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.7	38.8	7.3	100.6	40.6	14.9	50.5	32.7	5.8	65.1	59.9
Queue Length 50th (m)	19.2	33.1	1.0	31.8	43.1	12.1	43.4	62.2	0.0	70.4	159.4
Queue Length 95th (m)	23.8	41.1	24.1	#42.7	38.5	30.6	39.6	75.7	8.8	#94.4	#201.6
Internal Link Dist (m)		140.9			161.1			292.7			175.8
Turn Bay Length (m)	50.0		50.0	45.0		20.0	50.0		50.0	40.0	
Base Capacity (vph)	249	960	650	254	932	520	624	1236	599	630	1246
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.31	0.49	0.94	0.41	0.39	0.58	0.48	0.18	0.88	0.98

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	248	299	180	242	176	221	514	88	458	964	96
Future Volume (vph)	106	248	299	180	242	176	221	514	88	458	964	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3400	3574	1570	3467	3471	1552	3467	3505	1499	3502	3513	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3400	3574	1570	3467	3471	1552	3467	3505	1499	3502	3513	
Peak-hour factor, PHF	0.71	0.83	0.94	0.75	0.64	0.87	0.61	0.86	0.80	0.83	0.88	0.78
Adj. Flow (vph)	149	299	318	240	378	202	362	598	110	552	1095	123
RTOR Reduction (vph)	0	0	235	0	0	107	0	0	71	0	7	0
Lane Group Flow (vph)	149	299	83	240	378	95	362	598	39	552	1211	0
Confl. Peds. (#/hr)	6		4	3		5	4		3	5		6
Heavy Vehicles (%)	3%	1%	1%	1%	4%	2%	1%	3%	6%	0%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	2		1	2		3	4		3	4	
Permitted Phases			2			2			4			
Actuated Green, G (s)	9.0	30.6	30.6	9.0	30.6	30.6	22.1	43.3	43.3	22.1	43.3	
Effective Green, g (s)	9.0	30.6	30.6	9.0	30.6	30.6	22.1	43.3	43.3	22.1	43.3	
Actuated g/C Ratio	0.07	0.25	0.25	0.07	0.25	0.25	0.18	0.35	0.35	0.18	0.35	
Clearance Time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5	4.5	2.5	3.5	3.5	2.5	3.5	
Lane Grp Cap (vph)	249	890	391	254	864	386	623	1235	528	630	1238	
v/s Ratio Prot	0.04	0.08		c0.07	c0.11		0.10	0.17		c0.16	c0.34	
v/s Ratio Perm			0.05			0.06			0.03			
v/c Ratio	0.60	0.34	0.21	0.94	0.44	0.25	0.58	0.48	0.07	0.88	0.98	
Uniform Delay, d1	55.1	37.8	36.5	56.7	38.8	36.9	46.1	31.0	26.4	49.0	39.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.2	1.0	1.2	41.2	1.6	1.5	1.1	0.4	0.1	12.9	20.3	
Delay (s)	58.4	38.8	37.8	97.9	40.5	38.4	47.3	31.4	26.5	61.9	59.6	
Level of Service	E	D	D	F	D	D	D	C	C	E	E	
Approach Delay (s)		42.2			56.8			36.3			60.3	
Approach LOS		D			E			D			E	

Intersection Summary

HCM 2000 Control Delay	50.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	122.8	Sum of lost time (s)	17.8
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	877	369	814	1268
v/c Ratio	0.73	0.67	0.34	0.52
Control Delay	24.6	24.7	12.6	17.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.6	24.7	12.6	17.0
Queue Length 50th (m)	60.4	48.3	20.8	49.8
Queue Length 95th (m)	54.1	47.2	40.3	76.3
Internal Link Dist (m)	51.0		299.5	292.7
Turn Bay Length (m)		160.0		
Base Capacity (vph)	1690	755	2392	2416
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.52	0.49	0.34	0.52

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	652	295	659	0	0	1179
Future Volume (vph)	652	295	659	0	0	1179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.5			6.5
Lane Util. Factor	0.97	0.91	0.91			0.91
Frpb, ped/bikes	1.00	0.99	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	0.99	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3210	1409	5085			5136
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3210	1409	5085			5136
Peak-hour factor, PHF	0.78	0.72	0.81	0.80	0.92	0.93
Adj. Flow (vph)	836	410	814	0	0	1268
RTOR Reduction (vph)	6	21	0	0	0	0
Lane Group Flow (vph)	871	348	814	0	0	1268
Confl. Peds. (#/hr)	1	1		1	1	
Heavy Vehicles (%)	9%	3%	2%	0%	2%	1%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	29.9	29.9	37.6			37.6
Effective Green, g (s)	29.9	29.9	37.6			37.6
Actuated g/C Ratio	0.37	0.37	0.47			0.47
Clearance Time (s)	6.0	6.0	6.5			6.5
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	1199	526	2389			2413
v/s Ratio Prot	c0.27		0.16			c0.25
v/s Ratio Perm		0.25				
v/c Ratio	0.73	0.66	0.34			0.53
Uniform Delay, d1	21.5	20.8	13.4			14.9
Progression Factor	1.00	1.00	0.84			1.00
Incremental Delay, d2	2.2	3.1	0.4			0.8
Delay (s)	23.8	23.9	11.7			15.7
Level of Service	C	C	B			B
Approach Delay (s)	23.8		11.7			15.7
Approach LOS	C		B			B

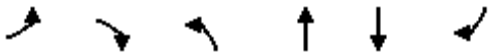
Intersection Summary

HCM 2000 Control Delay	17.8	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)	12.5
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	740	354	810	1451
v/c Ratio	0.67	0.72	0.29	0.54
Control Delay	25.0	30.9	11.0	10.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.0	30.9	11.0	10.9
Queue Length 50th (m)	51.5	53.5	22.9	37.8
Queue Length 95th (m)	39.9	64.7	36.0	71.2
Internal Link Dist (m)	49.5		444.3	299.5
Turn Bay Length (m)	150.0			
Base Capacity (vph)	1683	739	2815	2709
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.44	0.48	0.29	0.54

Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	270	602	0	664	1219	0
Future Volume (vph)	270	602	0	664	1219	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frt	0.93	0.85		1.00	1.00	
Flt Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3319	1455		5085	4893	
Flt Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3319	1455		5085	4893	
Peak-hour factor, PHF	0.70	0.85	0.92	0.82	0.84	0.92
Adj. Flow (vph)	386	708	0	810	1451	0
RTOR Reduction (vph)	4	4	0	0	0	0
Lane Group Flow (vph)	736	350	0	810	1451	0
Heavy Vehicles (%)	0%	1%	2%	2%	6%	2%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	26.7	26.7		44.3	44.3	
Effective Green, g (s)	26.7	26.7		44.3	44.3	
Actuated g/C Ratio	0.33	0.33		0.55	0.55	
Clearance Time (s)	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1107	485		2815	2709	
v/s Ratio Prot	0.22			0.16	c0.30	
v/s Ratio Perm		c0.24				
v/c Ratio	0.66	0.72		0.29	0.54	
Uniform Delay, d1	22.8	23.4		9.5	11.3	
Progression Factor	1.00	1.00		1.00	0.80	
Incremental Delay, d2	1.5	5.2		0.3	0.7	
Delay (s)	24.3	28.6		9.7	9.8	
Level of Service	C	C		A	A	
Approach Delay (s)	25.7			9.7	9.8	
Approach LOS	C			A	A	

Intersection Summary

HCM 2000 Control Delay	15.0	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)	9.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	646	0	0	329	149	229
Future Volume (Veh/h)	646	0	0	329	149	229
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.92	0.92	0.80	0.69	0.80
Hourly flow rate (vph)	695	0	0	411	216	286
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	148			218		
pX, platoon unblocked			0.94		0.94	0.94
vC, conflicting volume			695		900	348
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			546		765	176
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		33	64
cM capacity (veh/h)			958		321	789

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	348	348	206	206	216	286
Volume Left	0	0	0	0	216	0
Volume Right	0	0	0	0	0	286
cSH	1700	1700	1700	1700	321	789
Volume to Capacity	0.20	0.20	0.12	0.12	0.67	0.36
Queue Length 95th (m)	0.0	0.0	0.0	0.0	36.6	13.3
Control Delay (s)	0.0	0.0	0.0	0.0	36.5	12.1
Lane LOS					E	B
Approach Delay (s)	0.0		0.0		22.6	
Approach LOS					C	

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	830	48	36	311	64	44
v/c Ratio	0.29	0.04	0.07	0.11	0.29	0.19
Control Delay	4.5	2.3	5.0	3.8	43.7	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.5	2.3	5.0	3.8	43.7	12.7
Queue Length 50th (m)	21.2	0.5	1.4	6.7	13.2	0.0
Queue Length 95th (m)	49.7	0.1	5.0	17.1	16.7	5.5
Internal Link Dist (m)	72.4			151.3	35.3	
Turn Bay Length (m)		25.0	25.0			
Base Capacity (vph)	2856	1213	508	2800	577	546
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.04	0.07	0.11	0.11	0.08

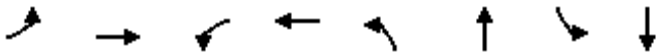
Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	755	15	25	271	43	31
Future Volume (vph)	755	15	25	271	43	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1509	1805	3505	1805	1615
Flt Permitted	1.00	1.00	0.33	1.00	0.95	1.00
Satd. Flow (perm)	3574	1509	636	3505	1805	1615
Peak-hour factor, PHF	0.91	0.31	0.69	0.87	0.67	0.70
Adj. Flow (vph)	830	48	36	311	64	44
RTOR Reduction (vph)	0	8	0	0	0	39
Lane Group Flow (vph)	830	40	36	311	64	5
Heavy Vehicles (%)	1%	7%	0%	3%	0%	0%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	81.9	81.9	81.9	81.9	11.0	11.0
Effective Green, g (s)	81.9	81.9	81.9	81.9	11.0	11.0
Actuated g/C Ratio	0.77	0.77	0.77	0.77	0.10	0.10
Clearance Time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.5	3.5
Lane Grp Cap (vph)	2769	1169	492	2715	187	168
v/s Ratio Prot	c0.23			0.09	c0.04	
v/s Ratio Perm		0.03	0.06			0.00
v/c Ratio	0.30	0.03	0.07	0.11	0.34	0.03
Uniform Delay, d1	3.5	2.8	2.8	2.9	44.0	42.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	0.3	0.1	1.3	0.1
Delay (s)	3.8	2.8	3.1	3.0	45.3	42.6
Level of Service	A	A	A	A	D	D
Approach Delay (s)	3.7			3.0	44.2	
Approach LOS	A			A	D	

Intersection Summary

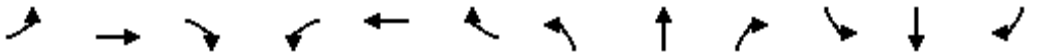
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	105.7	Sum of lost time (s)	12.8
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	4	677	56	567	60	56	20	12
v/c Ratio	0.01	0.26	0.09	0.20	0.35	0.23	0.12	0.05
Control Delay	9.0	7.8	3.7	4.1	46.3	13.9	39.6	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	7.8	3.7	4.1	46.3	13.9	39.6	24.2
Queue Length 50th (m)	0.3	26.6	1.8	13.3	12.5	0.8	4.0	0.8
Queue Length 95th (m)	0.6	52.0	6.5	25.2	19.2	0.0	7.7	0.5
Internal Link Dist (m)		92.6		124.1		50.7		14.6
Turn Bay Length (m)	35.0		35.0					
Base Capacity (vph)	599	2557	716	2814	381	481	385	486
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.26	0.08	0.20	0.16	0.12	0.05	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	595	9	44	398	21	47	1	34	14	1	4
Future Volume (vph)	1	595	9	44	398	21	47	1	34	14	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.86		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1802	3553		1768	3535		1703	1568		1796	1695	
Flt Permitted	0.44	1.00		0.37	1.00		0.75	1.00		0.72	1.00	
Satd. Flow (perm)	833	3553		690	3535		1344	1568		1362	1695	
Peak-hour factor, PHF	0.25	0.90	0.56	0.79	0.75	0.58	0.78	0.25	0.65	0.70	0.25	0.50
Adj. Flow (vph)	4	661	16	56	531	36	60	4	52	20	4	8
RTOR Reduction (vph)	0	1	0	0	3	0	0	46	0	0	7	0
Lane Group Flow (vph)	4	676	0	56	564	0	60	10	0	20	5	0
Confl. Peds. (#/hr)	1			3		4			3	4		1
Heavy Vehicles (%)	0%	1%	11%	2%	1%	0%	6%	0%	3%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	73.0	73.0		81.6	81.6		11.4	11.4		11.4	11.4	
Effective Green, g (s)	73.0	73.0		81.6	81.6		11.4	11.4		11.4	11.4	
Actuated g/C Ratio	0.69	0.69		0.77	0.77		0.11	0.11		0.11	0.11	
Clearance Time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	4.5	4.5		2.5	4.5		3.5	3.5		3.5	3.5	
Lane Grp Cap (vph)	574	2451		589	2726		144	168		146	182	
v/s Ratio Prot		c0.19		0.01	c0.16			0.01			0.00	
v/s Ratio Perm	0.00			0.07			c0.04			0.01		
v/c Ratio	0.01	0.28		0.10	0.21		0.42	0.06		0.14	0.03	
Uniform Delay, d1	5.1	6.3		3.0	3.3		44.1	42.4		42.7	42.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.1	0.2		2.3	0.2		0.5	0.1	
Delay (s)	5.1	6.6		3.0	3.5		46.4	42.5		43.3	42.3	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		6.6			3.4			44.5			42.9	
Approach LOS		A			A			D			D	

Intersection Summary

HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	105.8	Sum of lost time (s)	15.8
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	360	315	561	305	534	844	546	1286	114	356	802
v/c Ratio	1.26	0.24	0.74	1.08	0.41	1.11	1.20	1.30	0.23	0.78	0.83
Control Delay	188.7	27.7	20.0	129.4	30.1	92.3	153.9	179.5	14.1	64.5	47.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	188.7	27.7	20.0	129.4	30.1	92.3	153.9	179.5	14.1	64.5	47.3
Queue Length 50th (m)	~59.2	29.0	52.5	~44.6	52.7	~195.2	~86.5	~219.9	6.8	45.7	94.6
Queue Length 95th (m)	#88.0	40.6	84.9	#69.3	68.7	#245.6	#122.7	#232.7	18.6	55.0	116.4
Internal Link Dist (m)		140.9			161.1			292.7			175.8
Turn Bay Length (m)	50.0		50.0	45.0		20.0	50.0		50.0	40.0	
Base Capacity (vph)	285	1309	761	282	1309	760	456	989	486	456	968
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.26	0.24	0.74	1.08	0.41	1.11	1.20	1.30	0.23	0.78	0.83

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	317	287	477	262	507	717	508	1067	95	285	494	169
Future Volume (vph)	317	287	477	262	507	717	508	1067	95	285	494	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	1.00	0.96	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3502	3574	1514	3467	3574	1571	3502	3574	1552	3502	3356	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3502	3574	1514	3467	3574	1571	3502	3574	1552	3502	3356	
Peak-hour factor, PHF	0.88	0.91	0.85	0.86	0.95	0.85	0.93	0.83	0.83	0.80	0.88	0.70
Adj. Flow (vph)	360	315	561	305	534	844	546	1286	114	356	561	241
RTOR Reduction (vph)	0	0	207	0	0	185	0	0	56	0	39	0
Lane Group Flow (vph)	360	315	354	305	534	659	546	1286	58	356	763	0
Confl. Peds. (#/hr)	16		21	15		10	15		21	10		16
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	0%	1%	0%	0%	2%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	2		1	2		3	4		3	4	
Permitted Phases			2			2			4			
Actuated Green, G (s)	10.0	45.0	45.0	10.0	45.0	45.0	16.0	34.0	34.0	16.0	34.0	
Effective Green, g (s)	10.0	45.0	45.0	10.0	45.0	45.0	16.0	34.0	34.0	16.0	34.0	
Actuated g/C Ratio	0.08	0.37	0.37	0.08	0.37	0.37	0.13	0.28	0.28	0.13	0.28	
Clearance Time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5	4.5	2.5	3.5	3.5	2.5	3.5	
Lane Grp Cap (vph)	285	1309	554	282	1309	575	456	989	429	456	929	
v/s Ratio Prot	c0.10	0.09		0.09	0.15		c0.16	c0.36		0.10	0.23	
v/s Ratio Perm			0.23			c0.42			0.04			
v/c Ratio	1.26	0.24	0.64	1.08	0.41	1.15	1.20	1.30	0.13	0.78	0.82	
Uniform Delay, d1	56.4	27.0	32.2	56.4	29.0	38.9	53.4	44.4	33.3	51.7	41.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	143.4	0.4	5.6	77.0	0.9	84.8	108.4	142.6	0.2	8.2	6.1	
Delay (s)	199.8	27.5	37.7	133.4	29.9	123.7	161.8	187.0	33.5	59.9	47.6	
Level of Service	F	C	D	F	C	F	F	F	C	E	D	
Approach Delay (s)		82.3			95.7			170.9			51.4	
Approach LOS		F			F			F			D	

Intersection Summary

HCM 2000 Control Delay	108.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	122.8	Sum of lost time (s)	17.8
Intersection Capacity Utilization	97.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1190	545	1203	1167
v/c Ratio	0.70	0.72	0.61	0.60
Control Delay	24.2	27.6	31.3	33.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.2	27.6	31.3	33.3
Queue Length 50th (m)	113.1	112.0	96.5	83.0
Queue Length 95th (m)	94.4	113.5	#136.7	#129.6
Internal Link Dist (m)	51.0		299.5	292.7
Turn Bay Length (m)		160.0		
Base Capacity (vph)	2173	968	1972	1952
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.55	0.56	0.61	0.60

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	820	749	1143	0	0	1062
Future Volume (vph)	820	749	1143	0	0	1062
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.5			6.5
Lane Util. Factor	0.97	0.91	0.91			0.91
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	0.97	0.85	1.00			1.00
Flt Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3301	1470	5136			5085
Flt Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3301	1470	5136			5085
Peak-hour factor, PHF	0.89	0.92	0.95	0.80	0.92	0.91
Adj. Flow (vph)	921	814	1203	0	0	1167
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1190	545	1203	0	0	1167
Confl. Peds. (#/hr)					1	
Heavy Vehicles (%)	5%	0%	1%	0%	2%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	61.4	61.4	46.1			46.1
Effective Green, g (s)	61.4	61.4	46.1			46.1
Actuated g/C Ratio	0.51	0.51	0.38			0.38
Clearance Time (s)	6.0	6.0	6.5			6.5
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	1689	752	1973			1953
v/s Ratio Prot	0.36		c0.23			0.23
v/s Ratio Perm		c0.37				
v/c Ratio	0.70	0.72	0.61			0.60
Uniform Delay, d1	22.4	22.7	29.7			29.5
Progression Factor	1.00	1.00	0.93			1.00
Incremental Delay, d2	1.4	3.5	1.4			1.4
Delay (s)	23.7	26.2	29.0			30.9
Level of Service	C	C	C			C
Approach Delay (s)	24.5		29.0			30.9
Approach LOS	C		C			C

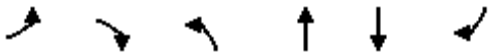
Intersection Summary

HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	568	261	1147	1460
v/c Ratio	0.66	0.72	0.34	0.44
Control Delay	43.1	51.6	9.6	12.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	43.1	51.6	9.6	12.3
Queue Length 50th (m)	65.4	65.2	39.9	32.3
Queue Length 95th (m)	43.1	80.3	63.3	111.8
Internal Link Dist (m)	49.5		444.3	299.5
Turn Bay Length (m)	150.0			
Base Capacity (vph)	2165	907	3417	3288
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.29	0.34	0.44

Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	251	337	0	1021	1285	0
Future Volume (vph)	251	337	0	1021	1285	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frpb, ped/bikes	0.99	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	0.96	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3398	1423		5085	4893	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3398	1423		5085	4893	
Peak-hour factor, PHF	0.58	0.85	0.92	0.89	0.88	0.92
Adj. Flow (vph)	433	396	0	1147	1460	0
RTOR Reduction (vph)	1	1	0	0	0	0
Lane Group Flow (vph)	567	260	0	1147	1460	0
Confl. Peds. (#/hr)	5	5				
Heavy Vehicles (%)	0%	1%	2%	2%	6%	2%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	30.4	30.4		80.6	80.6	
Effective Green, g (s)	30.4	30.4		80.6	80.6	
Actuated g/C Ratio	0.25	0.25		0.67	0.67	
Clearance Time (s)	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	860	360		3415	3286	
v/s Ratio Prot	0.17			0.23	c0.30	
v/s Ratio Perm		c0.18				
v/c Ratio	0.66	0.72		0.34	0.44	
Uniform Delay, d1	40.2	41.0		8.4	9.2	
Progression Factor	1.00	1.00		1.00	1.16	
Incremental Delay, d2	1.8	7.0		0.3	0.4	
Delay (s)	42.0	48.0		8.6	11.1	
Level of Service	D	D		A	B	
Approach Delay (s)	43.9			8.6	11.1	
Approach LOS	D			A	B	

Intersection Summary

HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	526	0	0	899	154	189
Future Volume (Veh/h)	526	0	0	899	154	189
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.92	0.92	0.87	0.76	0.83
Hourly flow rate (vph)	591	0	0	1033	203	228
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	148			218		
pX, platoon unblocked			0.93		0.96	0.93
vC, conflicting volume			591		1108	296
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			412		707	95
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		43	74
cM capacity (veh/h)			1064		353	881

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	296	296	516	516	203	228
Volume Left	0	0	0	0	203	0
Volume Right	0	0	0	0	0	228
cSH	1700	1700	1700	1700	353	881
Volume to Capacity	0.17	0.17	0.30	0.30	0.57	0.26
Queue Length 95th (m)	0.0	0.0	0.0	0.0	27.4	8.3
Control Delay (s)	0.0	0.0	0.0	0.0	28.1	10.5
Lane LOS					D	B
Approach Delay (s)	0.0		0.0		18.8	
Approach LOS					C	

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	611	20	60	818	171	80
v/c Ratio	0.24	0.02	0.10	0.31	0.62	0.26
Control Delay	5.6	2.6	6.0	6.1	50.7	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.6	2.6	6.0	6.1	50.7	10.0
Queue Length 50th (m)	19.6	0.0	3.3	28.1	35.3	0.0
Queue Length 95th (m)	34.9	0.6	9.8	48.7	48.2	8.9
Internal Link Dist (m)	72.4			151.3	35.3	
Turn Bay Length (m)		25.0	25.0			
Base Capacity (vph)	2587	1105	576	2613	571	551
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.02	0.10	0.31	0.30	0.15

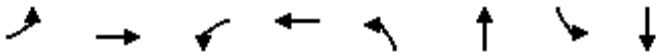
Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	556	9	55	744	142	63
Future Volume (vph)	556	9	55	744	142	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.94	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1519	1795	3610	1787	1556
Flt Permitted	1.00	1.00	0.42	1.00	0.95	1.00
Satd. Flow (perm)	3574	1519	795	3610	1787	1556
Peak-hour factor, PHF	0.91	0.45	0.92	0.91	0.83	0.79
Adj. Flow (vph)	611	20	60	818	171	80
RTOR Reduction (vph)	0	6	0	0	0	68
Lane Group Flow (vph)	611	14	60	818	171	12
Confl. Peds. (#/hr)		13	4		13	4
Heavy Vehicles (%)	1%	0%	0%	0%	1%	2%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	76.5	76.5	76.5	76.5	16.4	16.4
Effective Green, g (s)	76.5	76.5	76.5	76.5	16.4	16.4
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.16	0.16
Clearance Time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.5	3.5
Lane Grp Cap (vph)	2586	1099	575	2612	277	241
v/s Ratio Prot	0.17			c0.23	c0.10	
v/s Ratio Perm		0.01	0.08			0.01
v/c Ratio	0.24	0.01	0.10	0.31	0.62	0.05
Uniform Delay, d1	4.9	4.1	4.4	5.2	41.7	38.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	0.4	0.3	4.3	0.1
Delay (s)	5.1	4.1	4.7	5.5	46.0	38.1
Level of Service	A	A	A	A	D	D
Approach Delay (s)	5.0			5.5	43.5	
Approach LOS	A			A	D	

Intersection Summary

HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	105.7	Sum of lost time (s)	12.8
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	509	116	1169	288	100	20	44
v/c Ratio	0.07	0.28	0.19	0.53	0.80	0.21	0.06	0.10
Control Delay	17.8	16.1	8.9	13.5	53.0	7.6	26.7	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	16.1	8.9	13.5	53.0	7.6	26.7	12.4
Queue Length 50th (m)	1.7	30.7	8.6	70.4	58.2	1.3	3.2	1.9
Queue Length 95th (m)	4.6	51.4	17.8	92.5	82.2	0.9	7.0	8.6
Internal Link Dist (m)		92.6		124.1		50.7		14.6
Turn Bay Length (m)	35.0		35.0					
Base Capacity (vph)	223	1825	664	2252	409	540	389	519
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.28	0.17	0.52	0.70	0.19	0.05	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	426	18	99	942	8	279	4	77	15	10	19
Future Volume (vph)	10	426	18	99	942	8	279	4	77	15	10	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.86		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1803	3532		1804	3564		1801	1603		1803	1675	
Flt Permitted	0.23	1.00		0.42	1.00		0.73	1.00		0.69	1.00	
Satd. Flow (perm)	432	3532		799	3564		1380	1603		1314	1675	
Peak-hour factor, PHF	0.63	0.90	0.50	0.85	0.82	0.40	0.97	0.50	0.84	0.75	0.83	0.59
Adj. Flow (vph)	16	473	36	116	1149	20	288	8	92	20	12	32
RTOR Reduction (vph)	0	4	0	0	1	0	0	68	0	0	24	0
Lane Group Flow (vph)	16	505	0	116	1168	0	288	32	0	20	20	0
Confl. Peds. (#/hr)	2		2	1		1	2		1	1		2
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	54.4	54.4		65.5	65.5		27.5	27.5		27.5	27.5	
Effective Green, g (s)	54.4	54.4		65.5	65.5		27.5	27.5		27.5	27.5	
Actuated g/C Ratio	0.51	0.51		0.62	0.62		0.26	0.26		0.26	0.26	
Clearance Time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	4.5	4.5		2.5	4.5		3.5	3.5		3.5	3.5	
Lane Grp Cap (vph)	222	1816		571	2206		358	416		341	435	
v/s Ratio Prot		0.14		0.02	c0.33			0.02			0.01	
v/s Ratio Perm	0.04			0.11			c0.21			0.02		
v/c Ratio	0.07	0.28		0.20	0.53		0.80	0.08		0.06	0.05	
Uniform Delay, d1	13.0	14.6		8.4	11.4		36.6	29.6		29.4	29.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.4		0.1	0.9		12.7	0.1		0.1	0.1	
Delay (s)	13.6	14.9		8.5	12.3		49.3	29.7		29.5	29.4	
Level of Service	B	B		A	B		D	C		C	C	
Approach Delay (s)		14.9			12.0			44.2			29.4	
Approach LOS		B			B			D			C	

Intersection Summary

HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	105.8	Sum of lost time (s)	15.8
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Appendix D

Intersection Capacity Analysis Output
Future Background Condition - 2028

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	162	325	347	263	413	221	395	651	120	601	1327
v/c Ratio	0.65	0.36	0.55	1.04	0.47	0.44	0.64	0.53	0.20	0.96	1.08
Control Delay	68.2	38.6	9.6	121.0	40.5	16.6	52.5	34.0	6.4	78.1	87.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	38.6	9.6	121.0	40.5	16.6	52.5	34.0	6.4	78.1	87.6
Queue Length 50th (m)	20.9	36.3	7.3	~37.0	47.6	15.9	47.8	69.1	1.0	77.8	~197.1
Queue Length 95th (m)	25.5	44.3	34.1	#48.4	41.7	35.6	43.0	83.3	10.3	#107.5	#232.6
Internal Link Dist (m)		140.9			161.1			292.7			175.8
Turn Bay Length (m)	50.0		50.0	45.0		20.0	50.0		50.0	40.0	
Base Capacity (vph)	249	966	650	254	938	523	619	1221	596	625	1231
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.34	0.53	1.04	0.44	0.42	0.64	0.53	0.20	0.96	1.08

Intersection Summary

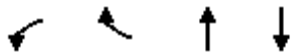
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	270	326	197	264	192	241	560	96	499	1051	104
Future Volume (vph)	115	270	326	197	264	192	241	560	96	499	1051	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3400	3574	1570	3467	3471	1552	3467	3505	1499	3502	3514	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3400	3574	1570	3467	3471	1552	3467	3505	1499	3502	3514	
Peak-hour factor, PHF	0.71	0.83	0.94	0.75	0.64	0.87	0.61	0.86	0.80	0.83	0.88	0.78
Adj. Flow (vph)	162	325	347	263	412	221	395	651	120	601	1194	133
RTOR Reduction (vph)	0	0	231	0	0	107	0	0	74	0	7	0
Lane Group Flow (vph)	162	325	116	263	413	114	395	651	46	601	1320	0
Confl. Peds. (#/hr)	6		4	3		5	4		3	5		6
Heavy Vehicles (%)	3%	1%	1%	1%	4%	2%	1%	3%	6%	0%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	2		1	2		3	4		3	4	
Permitted Phases			2			2			4			
Actuated Green, G (s)	9.0	31.3	31.3	9.0	31.3	31.3	21.9	42.8	42.8	21.9	42.8	
Effective Green, g (s)	9.0	31.3	31.3	9.0	31.3	31.3	21.9	42.8	42.8	21.9	42.8	
Actuated g/C Ratio	0.07	0.25	0.25	0.07	0.25	0.25	0.18	0.35	0.35	0.18	0.35	
Clearance Time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5	4.5	2.5	3.5	3.5	2.5	3.5	
Lane Grp Cap (vph)	249	910	400	254	884	395	618	1221	522	624	1224	
v/s Ratio Prot	0.05	0.09		c0.08	c0.12		0.11	0.19		c0.17	c0.38	
v/s Ratio Perm			0.07			0.07			0.03			
v/c Ratio	0.65	0.36	0.29	1.04	0.47	0.29	0.64	0.53	0.09	0.96	1.08	
Uniform Delay, d1	55.4	37.5	36.8	56.9	38.7	36.8	46.8	32.0	26.9	50.0	40.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.3	1.1	1.8	66.0	1.8	1.8	1.9	0.5	0.1	26.9	49.6	
Delay (s)	60.7	38.6	38.6	122.9	40.5	38.7	48.7	32.5	27.0	77.0	89.6	
Level of Service	E	D	D	F	D	D	D	C	C	E	F	
Approach Delay (s)		42.9			64.2			37.4			85.7	
Approach LOS		D			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	62.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	122.8	Sum of lost time (s)	17.8
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	958	402	1239	1383
v/c Ratio	0.73	0.69	0.55	0.59
Control Delay	25.1	27.1	18.5	21.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.1	27.1	18.5	21.1
Queue Length 50th (m)	73.9	63.5	52.0	65.7
Queue Length 95th (m)	60.8	56.1	69.9	100.4
Internal Link Dist (m)	51.0		299.5	292.7
Turn Bay Length (m)		160.0		
Base Capacity (vph)	1895	834	2267	2329
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.51	0.48	0.55	0.59

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	712	322	719	281	0	1286
Future Volume (vph)	712	322	719	281	0	1286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.5			6.5
Lane Util. Factor	0.97	0.91	0.91			0.91
Frpb, ped/bikes	1.00	0.99	0.99			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	0.99	0.85	0.96			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3210	1409	4865			5136
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3210	1409	4865			5136
Peak-hour factor, PHF	0.78	0.72	0.81	0.80	0.92	0.93
Adj. Flow (vph)	913	447	888	351	0	1383
RTOR Reduction (vph)	6	7	60	0	0	0
Lane Group Flow (vph)	952	395	1179	0	0	1383
Confl. Peds. (#/hr)	1	1		1	1	
Heavy Vehicles (%)	9%	3%	2%	0%	2%	1%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	36.7	36.7	40.8			40.8
Effective Green, g (s)	36.7	36.7	40.8			40.8
Actuated g/C Ratio	0.41	0.41	0.45			0.45
Clearance Time (s)	6.0	6.0	6.5			6.5
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	1308	574	2205			2328
v/s Ratio Prot	c0.30		0.24			c0.27
v/s Ratio Perm		0.28				
v/c Ratio	0.73	0.69	0.53			0.59
Uniform Delay, d1	22.4	21.9	17.8			18.4
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	2.1	3.4	0.9			1.1
Delay (s)	24.5	25.4	18.7			19.5
Level of Service	C	C	B			B
Approach Delay (s)	24.8		18.7			19.5
Approach LOS	C		B			B

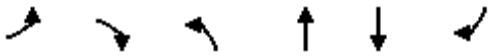
Intersection Summary

HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	806	386	884	1583
v/c Ratio	0.66	0.73	0.33	0.62
Control Delay	23.3	29.1	12.8	16.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.3	29.1	12.8	16.3
Queue Length 50th (m)	54.2	56.9	28.2	61.6
Queue Length 95th (m)	40.7	67.1	42.4	89.4
Internal Link Dist (m)	49.5		444.3	299.5
Turn Bay Length (m)	150.0			
Base Capacity (vph)	1805	792	2655	2555
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.49	0.33	0.62

Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	294	656	0	725	1330	0
Future Volume (vph)	294	656	0	725	1330	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frt	0.93	0.85		1.00	1.00	
Flt Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3318	1455		5085	4893	
Flt Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3318	1455		5085	4893	
Peak-hour factor, PHF	0.70	0.85	0.92	0.82	0.84	0.92
Adj. Flow (vph)	420	772	0	884	1583	0
RTOR Reduction (vph)	1	1	0	0	0	0
Lane Group Flow (vph)	805	385	0	884	1583	0
Heavy Vehicles (%)	0%	1%	2%	2%	6%	2%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	29.2	29.2		41.8	41.8	
Effective Green, g (s)	29.2	29.2		41.8	41.8	
Actuated g/C Ratio	0.36	0.36		0.52	0.52	
Clearance Time (s)	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1211	531		2656	2556	
v/s Ratio Prot	0.24			0.17	c0.32	
v/s Ratio Perm		c0.26				
v/c Ratio	0.66	0.72		0.33	0.62	
Uniform Delay, d1	21.3	21.9		11.0	13.5	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	4.9		0.3	1.1	
Delay (s)	22.7	26.8		11.4	14.6	
Level of Service	C	C		B	B	
Approach Delay (s)	24.0			11.4	14.6	
Approach LOS	C			B	B	

Intersection Summary

HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	704	0	0	359	162	250
Future Volume (Veh/h)	704	0	0	359	162	250
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.92	0.92	0.80	0.69	0.80
Hourly flow rate (vph)	757	0	0	449	235	313
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	148			218		
pX, platoon unblocked			0.93		0.93	0.93
vC, conflicting volume			757		982	378
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			585		827	177
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		19	60
cM capacity (veh/h)			916		290	778

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	378	378	224	224	235	313
Volume Left	0	0	0	0	235	0
Volume Right	0	0	0	0	0	313
cSH	1700	1700	1700	1700	290	778
Volume to Capacity	0.22	0.22	0.13	0.13	0.81	0.40
Queue Length 95th (m)	0.0	0.0	0.0	0.0	52.5	15.6
Control Delay (s)	0.0	0.0	0.0	0.0	54.5	12.7
Lane LOS					F	B
Approach Delay (s)	0.0		0.0		30.6	
Approach LOS					D	

Intersection Summary			
Average Delay	9.6		
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	904	48	36	339	64	44
v/c Ratio	0.32	0.04	0.08	0.12	0.29	0.19
Control Delay	4.7	2.5	5.1	3.9	43.7	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.7	2.5	5.1	3.9	43.7	12.7
Queue Length 50th (m)	23.8	0.6	1.4	7.3	13.2	0.0
Queue Length 95th (m)	55.4	0.3	5.0	18.5	16.7	5.5
Internal Link Dist (m)	72.4			151.3	35.3	
Turn Bay Length (m)		25.0	25.0			
Base Capacity (vph)	2856	1212	467	2800	577	546
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.04	0.08	0.12	0.11	0.08

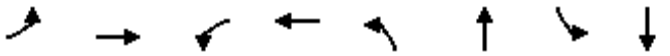
Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	823	15	25	295	43	31
Future Volume (vph)	823	15	25	295	43	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1509	1805	3505	1805	1615
Flt Permitted	1.00	1.00	0.31	1.00	0.95	1.00
Satd. Flow (perm)	3574	1509	585	3505	1805	1615
Peak-hour factor, PHF	0.91	0.31	0.69	0.87	0.67	0.70
Adj. Flow (vph)	904	48	36	339	64	44
RTOR Reduction (vph)	0	7	0	0	0	39
Lane Group Flow (vph)	904	41	36	339	64	5
Heavy Vehicles (%)	1%	7%	0%	3%	0%	0%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	81.9	81.9	81.9	81.9	11.0	11.0
Effective Green, g (s)	81.9	81.9	81.9	81.9	11.0	11.0
Actuated g/C Ratio	0.77	0.77	0.77	0.77	0.10	0.10
Clearance Time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.5	3.5
Lane Grp Cap (vph)	2769	1169	453	2715	187	168
v/s Ratio Prot	c0.25			0.10	c0.04	
v/s Ratio Perm		0.03	0.06			0.00
v/c Ratio	0.33	0.03	0.08	0.12	0.34	0.03
Uniform Delay, d1	3.6	2.8	2.9	3.0	44.0	42.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	0.3	0.1	1.3	0.1
Delay (s)	3.9	2.8	3.2	3.1	45.3	42.6
Level of Service	A	A	A	A	D	D
Approach Delay (s)	3.8			3.1	44.2	
Approach LOS	A			A	D	

Intersection Summary

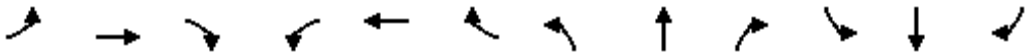
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	105.7	Sum of lost time (s)	12.8
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	4	737	56	615	60	56	20	12
v/c Ratio	0.01	0.29	0.09	0.22	0.35	0.23	0.12	0.05
Control Delay	9.0	8.0	3.8	4.2	46.3	13.9	39.6	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	8.0	3.8	4.2	46.3	13.9	39.6	24.2
Queue Length 50th (m)	0.3	29.5	1.8	14.7	12.5	0.8	4.0	0.8
Queue Length 95th (m)	0.6	57.4	6.5	27.5	19.2	0.0	7.7	0.5
Internal Link Dist (m)		92.6		124.1		50.7		14.6
Turn Bay Length (m)	35.0		35.0					
Base Capacity (vph)	572	2559	683	2816	381	481	385	486
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.29	0.08	0.22	0.16	0.12	0.05	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	649	9	44	434	21	47	1	34	14	1	4
Future Volume (vph)	1	649	9	44	434	21	47	1	34	14	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.86		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1803	3555		1768	3538		1703	1568		1796	1695	
Flt Permitted	0.42	1.00		0.35	1.00		0.75	1.00		0.72	1.00	
Satd. Flow (perm)	795	3555		643	3538		1344	1568		1362	1695	
Peak-hour factor, PHF	0.25	0.90	0.56	0.79	0.75	0.58	0.78	0.25	0.65	0.70	0.25	0.50
Adj. Flow (vph)	4	721	16	56	579	36	60	4	52	20	4	8
RTOR Reduction (vph)	0	1	0	0	3	0	0	46	0	0	7	0
Lane Group Flow (vph)	4	736	0	56	612	0	60	10	0	20	5	0
Confl. Peds. (#/hr)	1			3		4			3	4		1
Heavy Vehicles (%)	0%	1%	11%	2%	1%	0%	6%	0%	3%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	73.0	73.0		81.6	81.6		11.4	11.4		11.4	11.4	
Effective Green, g (s)	73.0	73.0		81.6	81.6		11.4	11.4		11.4	11.4	
Actuated g/C Ratio	0.69	0.69		0.77	0.77		0.11	0.11		0.11	0.11	
Clearance Time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	4.5	4.5		2.5	4.5		3.5	3.5		3.5	3.5	
Lane Grp Cap (vph)	548	2452		555	2728		144	168		146	182	
v/s Ratio Prot		c0.21		0.01	c0.17			0.01			0.00	
v/s Ratio Perm	0.01			0.07			c0.04			0.01		
v/c Ratio	0.01	0.30		0.10	0.22		0.42	0.06		0.14	0.03	
Uniform Delay, d1	5.1	6.4		3.0	3.3		44.1	42.4		42.7	42.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.1	0.2		2.3	0.2		0.5	0.1	
Delay (s)	5.1	6.7		3.1	3.5		46.4	42.5		43.3	42.3	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		6.7			3.5			44.5			42.9	
Approach LOS		A			A			D			D	

Intersection Summary

HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	105.8	Sum of lost time (s)	15.8
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

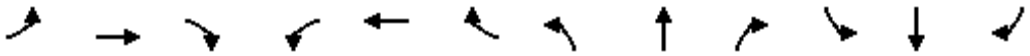
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	393	344	613	333	582	920	596	1402	124	389	877
v/c Ratio	1.15	0.38	0.97	0.99	0.65	1.51	1.10	1.12	0.21	0.72	0.72
Control Delay	144.3	39.5	49.4	100.7	44.9	263.5	117.3	102.9	12.4	57.7	36.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	144.3	39.5	49.4	100.7	44.9	263.5	117.3	102.9	12.4	57.7	36.3
Queue Length 50th (m)	~60.4	38.2	81.0	44.2	69.7	~270.4	~88.5	~215.7	7.8	49.0	94.8
Queue Length 95th (m)	#90.1	52.6	#138.9	#70.1	90.0	#319.8	#125.5	#226.3	18.9	58.1	115.7
Internal Link Dist (m)		140.9			161.1			292.7			175.8
Turn Bay Length (m)	50.0		50.0	45.0		20.0	50.0		50.0	40.0	
Base Capacity (vph)	342	902	634	338	902	608	541	1251	594	541	1214
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.15	0.38	0.97	0.99	0.65	1.51	1.10	1.12	0.21	0.72	0.72

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	346	313	521	286	553	782	554	1164	103	311	539	185
Future Volume (vph)	346	313	521	286	553	782	554	1164	103	311	539	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	1.00	0.96	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3502	3574	1514	3467	3574	1571	3502	3574	1552	3502	3356	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3502	3574	1514	3467	3574	1571	3502	3574	1552	3502	3356	
Peak-hour factor, PHF	0.88	0.91	0.85	0.86	0.95	0.85	0.93	0.83	0.83	0.80	0.88	0.70
Adj. Flow (vph)	393	344	613	333	582	920	596	1402	124	389	612	264
RTOR Reduction (vph)	0	0	252	0	0	212	0	0	51	0	39	0
Lane Group Flow (vph)	393	344	361	333	582	708	596	1402	73	389	838	0
Confl. Peds. (#/hr)	16		21	15		10	15		21	10		16
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	0%	1%	0%	0%	2%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	2		1	2		3	4		3	4	
Permitted Phases			2			2			4			
Actuated Green, G (s)	12.0	31.0	31.0	12.0	31.0	31.0	19.0	43.0	43.0	19.0	43.0	
Effective Green, g (s)	12.0	31.0	31.0	12.0	31.0	31.0	19.0	43.0	43.0	19.0	43.0	
Actuated g/C Ratio	0.10	0.25	0.25	0.10	0.25	0.25	0.15	0.35	0.35	0.15	0.35	
Clearance Time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5	4.5	2.5	3.5	3.5	2.5	3.5	
Lane Grp Cap (vph)	342	902	382	338	902	396	541	1251	543	541	1175	
v/s Ratio Prot	c0.11	0.10		0.10	0.16		c0.17	c0.39		0.11	0.25	
v/s Ratio Perm			0.24			c0.45			0.05			
v/c Ratio	1.15	0.38	0.95	0.99	0.65	1.79	1.10	1.12	0.14	0.72	0.71	
Uniform Delay, d1	55.4	38.0	45.1	55.3	41.0	45.9	51.9	39.9	27.2	49.4	34.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	95.6	1.2	34.1	44.6	3.6	365.1	69.5	65.4	0.1	4.3	2.2	
Delay (s)	151.0	39.2	79.2	99.9	44.5	411.0	121.4	105.3	27.3	53.6	36.7	
Level of Service	F	D	E	F	D	F	F	F	C	D	D	
Approach Delay (s)		89.9			238.3			105.3			41.9	
Approach LOS		F			F			F			D	

Intersection Summary

HCM 2000 Control Delay	127.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	122.8	Sum of lost time (s)	17.8
Intersection Capacity Utilization	104.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1297	595	1313	1273
v/c Ratio	0.71	0.74	0.74	0.73
Control Delay	21.8	25.4	34.1	39.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.8	25.4	34.1	39.0
Queue Length 50th (m)	116.1	115.8	112.8	101.0
Queue Length 95th (m)	102.8	125.3	#165.6	#157.0
Internal Link Dist (m)	51.0		299.5	292.7
Turn Bay Length (m)		160.0		
Base Capacity (vph)	2173	967	1771	1754
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	0.62	0.74	0.73

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	894	817	1247	0	0	1158
Future Volume (vph)	894	817	1247	0	0	1158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.5			6.5
Lane Util. Factor	0.97	0.91	0.91			0.91
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	0.97	0.85	1.00			1.00
Flt Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3301	1470	5136			5085
Flt Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3301	1470	5136			5085
Peak-hour factor, PHF	0.89	0.92	0.95	0.80	0.92	0.91
Adj. Flow (vph)	1004	888	1313	0	0	1273
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1297	595	1313	0	0	1273
Confl. Peds. (#/hr)					1	
Heavy Vehicles (%)	5%	0%	1%	0%	2%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	66.1	66.1	41.4			41.4
Effective Green, g (s)	66.1	66.1	41.4			41.4
Actuated g/C Ratio	0.55	0.55	0.34			0.34
Clearance Time (s)	6.0	6.0	6.5			6.5
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	1818	809	1771			1754
v/s Ratio Prot	0.39		c0.26			0.25
v/s Ratio Perm		c0.40				
v/c Ratio	0.71	0.74	0.74			0.73
Uniform Delay, d1	19.9	20.3	34.6			34.3
Progression Factor	1.00	1.00	0.85			1.00
Incremental Delay, d2	1.4	3.5	2.7			2.7
Delay (s)	21.3	23.8	31.9			37.0
Level of Service	C	C	C			D
Approach Delay (s)	22.1		31.9			37.0
Approach LOS	C		C			D

Intersection Summary

HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	619	285	1252	1593
v/c Ratio	0.68	0.74	0.40	0.52
Control Delay	42.3	50.9	12.8	16.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	42.3	50.9	12.8	16.5
Queue Length 50th (m)	72.3	72.4	50.9	63.4
Queue Length 95th (m)	45.1	84.2	81.6	121.1
Internal Link Dist (m)	49.5		444.3	299.5
Turn Bay Length (m)	150.0			
Base Capacity (vph)	2083	878	3163	3044
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.30	0.32	0.40	0.52

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	274	367	0	1114	1402	0
Future Volume (vph)	274	367	0	1114	1402	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		6.5	6.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	0.96	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3402	1430		5085	4893	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3402	1430		5085	4893	
Peak-hour factor, PHF	0.58	0.85	0.92	0.89	0.88	0.92
Adj. Flow (vph)	472	432	0	1252	1593	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	619	285	0	1252	1593	0
Confl. Peds. (#/hr)	5	5				
Heavy Vehicles (%)	0%	1%	2%	2%	6%	2%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	32.3	32.3		74.7	74.7	
Effective Green, g (s)	32.3	32.3		74.7	74.7	
Actuated g/C Ratio	0.27	0.27		0.62	0.62	
Clearance Time (s)	6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	915	384		3165	3045	
v/s Ratio Prot	0.18			0.25	c0.33	
v/s Ratio Perm		c0.20				
v/c Ratio	0.68	0.74		0.40	0.52	
Uniform Delay, d1	39.2	40.0		11.3	12.7	
Progression Factor	1.00	1.00		1.00	1.15	
Incremental Delay, d2	2.0	7.6		0.4	0.5	
Delay (s)	41.2	47.6		11.7	15.0	
Level of Service	D	D		B	B	
Approach Delay (s)	43.2			11.7	15.0	
Approach LOS	D			B	B	

Intersection Summary

HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	574	0	0	980	168	206
Future Volume (Veh/h)	574	0	0	980	168	206
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.92	0.92	0.87	0.76	0.83
Hourly flow rate (vph)	645	0	0	1126	221	248
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	148			218		
pX, platoon unblocked			0.92		0.95	0.92
vC, conflicting volume			645		1208	322
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			447		751	98
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		33	71
cM capacity (veh/h)			1023		328	869

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	322	322	563	563	221	248
Volume Left	0	0	0	0	221	0
Volume Right	0	0	0	0	0	248
cSH	1700	1700	1700	1700	328	869
Volume to Capacity	0.19	0.19	0.33	0.33	0.67	0.29
Queue Length 95th (m)	0.0	0.0	0.0	0.0	36.9	9.4
Control Delay (s)	0.0	0.0	0.0	0.0	36.0	10.8
Lane LOS					E	B
Approach Delay (s)	0.0		0.0		22.7	
Approach LOS					C	

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	666	20	60	891	171	80
v/c Ratio	0.26	0.02	0.11	0.34	0.62	0.26
Control Delay	5.8	2.8	6.1	6.3	50.7	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.8	2.8	6.1	6.3	50.7	10.0
Queue Length 50th (m)	21.7	0.1	3.3	31.5	35.3	0.0
Queue Length 95th (m)	38.5	0.7	9.9	54.0	48.2	8.9
Internal Link Dist (m)	72.4			151.3	35.3	
Turn Bay Length (m)		25.0	25.0			
Base Capacity (vph)	2587	1104	542	2613	571	551
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.02	0.11	0.34	0.30	0.15

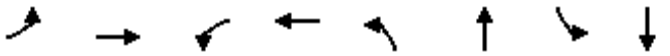
Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	606	9	55	811	142	63
Future Volume (vph)	606	9	55	811	142	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.94	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1519	1796	3610	1787	1556
Flt Permitted	1.00	1.00	0.40	1.00	0.95	1.00
Satd. Flow (perm)	3574	1519	749	3610	1787	1556
Peak-hour factor, PHF	0.91	0.45	0.92	0.91	0.83	0.79
Adj. Flow (vph)	666	20	60	891	171	80
RTOR Reduction (vph)	0	5	0	0	0	68
Lane Group Flow (vph)	666	15	60	891	171	12
Confl. Peds. (#/hr)		13	4		13	4
Heavy Vehicles (%)	1%	0%	0%	0%	1%	2%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	76.5	76.5	76.5	76.5	16.4	16.4
Effective Green, g (s)	76.5	76.5	76.5	76.5	16.4	16.4
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.16	0.16
Clearance Time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.5	3.5
Lane Grp Cap (vph)	2586	1099	542	2612	277	241
v/s Ratio Prot	0.19			c0.25	c0.10	
v/s Ratio Perm		0.01	0.08			0.01
v/c Ratio	0.26	0.01	0.11	0.34	0.62	0.05
Uniform Delay, d1	5.0	4.1	4.4	5.4	41.7	38.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	0.4	0.4	4.3	0.1
Delay (s)	5.2	4.1	4.8	5.7	46.0	38.1
Level of Service	A	A	A	A	D	D
Approach Delay (s)	5.2			5.7	43.5	
Approach LOS	A			A	D	

Intersection Summary

HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	105.7	Sum of lost time (s)	12.8
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	552	116	1272	288	100	20	44
v/c Ratio	0.08	0.30	0.20	0.57	0.82	0.21	0.06	0.10
Control Delay	17.2	15.8	8.5	13.6	55.9	8.0	27.7	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	15.8	8.5	13.6	55.9	8.0	27.7	13.0
Queue Length 50th (m)	1.7	34.0	8.6	80.1	58.2	1.3	3.2	1.9
Queue Length 95th (m)	4.3	52.4	16.4	96.3	86.1	0.9	7.3	9.0
Internal Link Dist (m)		92.6		124.1		50.7		14.6
Turn Bay Length (m)	35.0		35.0					
Base Capacity (vph)	192	1844	646	2254	401	531	381	509
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.30	0.18	0.56	0.72	0.19	0.05	0.09

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	464	18	99	1027	8	279	4	77	15	10	19
Future Volume (vph)	10	464	18	99	1027	8	279	4	77	15	10	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.86		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1803	3536		1804	3565		1801	1603		1803	1675	
Flt Permitted	0.19	1.00		0.40	1.00		0.73	1.00		0.69	1.00	
Satd. Flow (perm)	370	3536		756	3565		1380	1603		1314	1675	
Peak-hour factor, PHF	0.63	0.90	0.50	0.85	0.82	0.40	0.97	0.50	0.84	0.75	0.83	0.59
Adj. Flow (vph)	16	516	36	116	1252	20	288	8	92	20	12	32
RTOR Reduction (vph)	0	4	0	0	1	0	0	69	0	0	24	0
Lane Group Flow (vph)	16	548	0	116	1271	0	288	31	0	20	20	0
Confl. Peds. (#/hr)	2		2	1		1	2		1	1		2
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	55.1	55.1		66.1	66.1		26.9	26.9		26.9	26.9	
Effective Green, g (s)	55.1	55.1		66.1	66.1		26.9	26.9		26.9	26.9	
Actuated g/C Ratio	0.52	0.52		0.62	0.62		0.25	0.25		0.25	0.25	
Clearance Time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	4.5	4.5		2.5	4.5		3.5	3.5		3.5	3.5	
Lane Grp Cap (vph)	192	1841		551	2227		350	407		334	425	
v/s Ratio Prot		0.16		0.02	c0.36			0.02			0.01	
v/s Ratio Perm	0.04			0.12			c0.21			0.02		
v/c Ratio	0.08	0.30		0.21	0.57		0.82	0.08		0.06	0.05	
Uniform Delay, d1	12.7	14.4		8.2	11.6		37.2	30.0		29.9	29.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.4		0.1	1.1		14.8	0.1		0.1	0.1	
Delay (s)	13.5	14.8		8.3	12.6		52.0	30.1		30.0	29.8	
Level of Service	B	B		A	B		D	C		C	C	
Approach Delay (s)		14.8			12.3			46.3			29.9	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	105.8	Sum of lost time (s)	15.8
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Appendix E

Intersection Capacity Analysis Output
Future Total Condition – 2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	149	304	318	257	383	207	362	598	126	559	1218
v/c Ratio	0.60	0.34	0.51	1.01	0.44	0.42	0.58	0.49	0.21	0.88	0.98
Control Delay	65.7	38.8	7.3	115.8	40.5	15.2	50.5	32.9	5.5	65.9	61.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.7	38.8	7.3	115.8	40.5	15.2	50.5	32.9	5.5	65.9	61.3
Queue Length 50th (m)	19.2	33.7	1.0	~34.6	43.7	12.7	43.4	62.2	0.0	71.4	159.4
Queue Length 95th (m)	23.8	41.8	24.1	#47.1	38.8	31.3	39.6	75.7	9.4	#96.3	#201.6
Internal Link Dist (m)		140.9			161.1			292.7			175.8
Turn Bay Length (m)	50.0		50.0	45.0		20.0	50.0		50.0	40.0	
Base Capacity (vph)	249	960	650	254	932	522	626	1229	607	632	1239
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.32	0.49	1.01	0.41	0.40	0.58	0.49	0.21	0.88	0.98

Intersection Summary

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

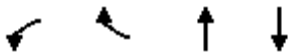
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	252	299	193	245	180	221	514	101	464	964	96
Future Volume (vph)	106	252	299	193	245	180	221	514	101	464	964	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3400	3574	1570	3467	3471	1552	3467	3505	1499	3502	3513	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3400	3574	1570	3467	3471	1552	3467	3505	1499	3502	3513	
Peak-hour factor, PHF	0.71	0.83	0.94	0.75	0.64	0.87	0.61	0.86	0.80	0.83	0.88	0.78
Adj. Flow (vph)	149	304	318	257	383	207	362	598	126	559	1095	123
RTOR Reduction (vph)	0	0	235	0	0	108	0	0	82	0	7	0
Lane Group Flow (vph)	149	304	83	257	383	99	362	598	44	559	1211	0
Confl. Peds. (#/hr)	6		4	3		5	4		3	5		6
Heavy Vehicles (%)	3%	1%	1%	1%	4%	2%	1%	3%	6%	0%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	2		1	2		3	4		3	4	
Permitted Phases			2			2			4			
Actuated Green, G (s)	9.0	30.7	30.7	9.0	30.7	30.7	22.2	43.1	43.1	22.2	43.1	
Effective Green, g (s)	9.0	30.7	30.7	9.0	30.7	30.7	22.2	43.1	43.1	22.2	43.1	
Actuated g/C Ratio	0.07	0.25	0.25	0.07	0.25	0.25	0.18	0.35	0.35	0.18	0.35	
Clearance Time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5	4.5	2.5	3.5	3.5	2.5	3.5	
Lane Grp Cap (vph)	249	893	392	254	867	388	626	1230	526	633	1232	
v/s Ratio Prot	0.04	0.09		c0.07	c0.11		0.10	0.17		c0.16	c0.34	
v/s Ratio Perm			0.05			0.06			0.03			
v/c Ratio	0.60	0.34	0.21	1.01	0.44	0.26	0.58	0.49	0.08	0.88	0.98	
Uniform Delay, d1	55.1	37.8	36.5	56.9	38.8	36.9	46.0	31.2	26.6	49.0	39.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.2	1.0	1.2	59.5	1.6	1.6	1.1	0.4	0.1	13.7	21.5	
Delay (s)	58.4	38.8	37.7	116.4	40.5	38.5	47.1	31.5	26.7	62.7	61.0	
Level of Service	E	D	D	F	D	D	D	C	C	E	E	
Approach Delay (s)		42.1			63.0			36.2			61.5	
Approach LOS		D			E			D			E	

Intersection Summary

HCM 2000 Control Delay	52.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	122.8	Sum of lost time (s)	17.8
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	877	369	830	1277
v/c Ratio	0.73	0.68	0.35	0.53
Control Delay	24.6	24.9	12.7	17.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.6	24.9	12.7	17.0
Queue Length 50th (m)	60.4	48.6	21.2	50.2
Queue Length 95th (m)	54.1	47.5	41.3	77.0
Internal Link Dist (m)	51.0		299.5	292.7
Turn Bay Length (m)		160.0		
Base Capacity (vph)	1690	754	2392	2416
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.52	0.49	0.35	0.53

Intersection Summary

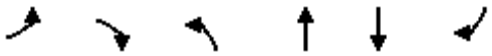
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	652	295	672	0	0	1188
Future Volume (vph)	652	295	672	0	0	1188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.5			6.5
Lane Util. Factor	0.97	0.91	0.91			0.91
Frpb, ped/bikes	1.00	0.99	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	0.99	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3210	1409	5085			5136
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3210	1409	5085			5136
Peak-hour factor, PHF	0.78	0.72	0.81	0.80	0.92	0.93
Adj. Flow (vph)	836	410	830	0	0	1277
RTOR Reduction (vph)	6	20	0	0	0	0
Lane Group Flow (vph)	871	349	830	0	0	1277
Confl. Peds. (#/hr)	1	1		1	1	
Heavy Vehicles (%)	9%	3%	2%	0%	2%	1%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	29.9	29.9	37.6			37.6
Effective Green, g (s)	29.9	29.9	37.6			37.6
Actuated g/C Ratio	0.37	0.37	0.47			0.47
Clearance Time (s)	6.0	6.0	6.5			6.5
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	1199	526	2389			2413
v/s Ratio Prot	c0.27		0.16			c0.25
v/s Ratio Perm		0.25				
v/c Ratio	0.73	0.66	0.35			0.53
Uniform Delay, d1	21.5	20.9	13.4			15.0
Progression Factor	1.00	1.00	0.85			1.00
Incremental Delay, d2	2.2	3.1	0.4			0.8
Delay (s)	23.8	24.0	11.7			15.8
Level of Service	C	C	B			B
Approach Delay (s)	23.8		11.7			15.8
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	745	354	821	1458
v/c Ratio	0.67	0.72	0.29	0.54
Control Delay	25.1	31.0	11.0	11.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.1	31.0	11.0	11.0
Queue Length 50th (m)	52.1	53.7	23.3	38.0
Queue Length 95th (m)	40.2	64.8	36.5	71.6
Internal Link Dist (m)	49.5		444.3	299.5
Turn Bay Length (m)	150.0			
Base Capacity (vph)	1682	739	2813	2706
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.44	0.48	0.29	0.54

Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	274	602	0	673	1225	0
Future Volume (vph)	274	602	0	673	1225	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frt	0.93	0.85		1.00	1.00	
Flt Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3320	1455		5085	4893	
Flt Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3320	1455		5085	4893	
Peak-hour factor, PHF	0.70	0.85	0.92	0.82	0.84	0.92
Adj. Flow (vph)	391	708	0	821	1458	0
RTOR Reduction (vph)	3	3	0	0	0	0
Lane Group Flow (vph)	742	351	0	821	1458	0
Heavy Vehicles (%)	0%	1%	2%	2%	6%	2%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	26.7	26.7		44.3	44.3	
Effective Green, g (s)	26.7	26.7		44.3	44.3	
Actuated g/C Ratio	0.33	0.33		0.55	0.55	
Clearance Time (s)	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1108	485		2815	2709	
v/s Ratio Prot	0.22			0.16	c0.30	
v/s Ratio Perm		c0.24				
v/c Ratio	0.67	0.72		0.29	0.54	
Uniform Delay, d1	22.9	23.4		9.5	11.3	
Progression Factor	1.00	1.00		1.00	0.81	
Incremental Delay, d2	1.5	5.3		0.3	0.7	
Delay (s)	24.4	28.7		9.8	9.8	
Level of Service	C	C		A	A	
Approach Delay (s)	25.8			9.8	9.8	
Approach LOS	C			A	A	

Intersection Summary

HCM 2000 Control Delay	15.0	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)	9.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	648	0	0	332	155	229
Future Volume (Veh/h)	648	0	0	332	155	229
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.92	0.92	0.80	0.69	0.80
Hourly flow rate (vph)	697	0	0	415	225	286
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	148			218		
pX, platoon unblocked			0.94		0.94	0.94
vC, conflicting volume			697		904	348
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			538		760	166
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		30	64
cM capacity (veh/h)			960		322	798

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	348	348	208	208	225	286
Volume Left	0	0	0	0	225	0
Volume Right	0	0	0	0	0	286
cSH	1700	1700	1700	1700	322	798
Volume to Capacity	0.20	0.20	0.12	0.12	0.70	0.36
Queue Length 95th (m)	0.0	0.0	0.0	0.0	39.6	13.1
Control Delay (s)	0.0	0.0	0.0	0.0	38.5	12.0
Lane LOS					E	B
Approach Delay (s)	0.0		0.0		23.7	
Approach LOS					C	

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	38.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	830	48	36	315	64	44
v/c Ratio	0.29	0.04	0.07	0.11	0.29	0.19
Control Delay	4.5	2.3	5.0	3.8	43.7	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.5	2.3	5.0	3.8	43.7	12.7
Queue Length 50th (m)	21.2	0.5	1.4	6.7	13.2	0.0
Queue Length 95th (m)	49.7	0.1	5.0	17.3	16.7	5.5
Internal Link Dist (m)	72.4			151.3	35.3	
Turn Bay Length (m)		25.0	25.0			
Base Capacity (vph)	2856	1213	508	2800	577	546
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.04	0.07	0.11	0.11	0.08

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	755	15	25	274	43	31
Future Volume (vph)	755	15	25	274	43	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1509	1805	3505	1805	1615
Flt Permitted	1.00	1.00	0.33	1.00	0.95	1.00
Satd. Flow (perm)	3574	1509	636	3505	1805	1615
Peak-hour factor, PHF	0.91	0.31	0.69	0.87	0.67	0.70
Adj. Flow (vph)	830	48	36	315	64	44
RTOR Reduction (vph)	0	8	0	0	0	39
Lane Group Flow (vph)	830	40	36	315	64	5
Heavy Vehicles (%)	1%	7%	0%	3%	0%	0%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	81.9	81.9	81.9	81.9	11.0	11.0
Effective Green, g (s)	81.9	81.9	81.9	81.9	11.0	11.0
Actuated g/C Ratio	0.77	0.77	0.77	0.77	0.10	0.10
Clearance Time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.5	3.5
Lane Grp Cap (vph)	2769	1169	492	2715	187	168
v/s Ratio Prot	c0.23			0.09	c0.04	
v/s Ratio Perm		0.03	0.06			0.00
v/c Ratio	0.30	0.03	0.07	0.12	0.34	0.03
Uniform Delay, d1	3.5	2.8	2.8	2.9	44.0	42.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	0.3	0.1	1.3	0.1
Delay (s)	3.8	2.8	3.1	3.0	45.3	42.6
Level of Service	A	A	A	A	D	D
Approach Delay (s)	3.7			3.0	44.2	
Approach LOS	A			A	D	

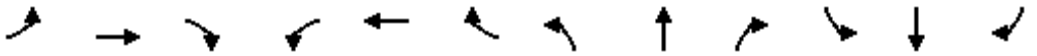
Intersection Summary

HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	105.7	Sum of lost time (s)	12.8
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	4	706	67	567	86	56	20	12
v/c Ratio	0.01	0.28	0.11	0.20	0.47	0.22	0.11	0.05
Control Delay	9.0	8.4	4.0	4.4	49.3	13.4	38.4	23.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	8.4	4.0	4.4	49.3	13.4	38.4	23.6
Queue Length 50th (m)	0.3	30.1	2.5	14.9	17.8	0.8	3.9	0.8
Queue Length 95th (m)	0.6	55.0	7.4	25.2	25.7	0.0	7.7	0.5
Internal Link Dist (m)		92.6		44.4		50.7		14.6
Turn Bay Length (m)	35.0		35.0					
Base Capacity (vph)	591	2516	693	2781	381	481	385	486
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.28	0.10	0.20	0.23	0.12	0.05	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	613	14	53	398	21	67	1	34	14	1	4
Future Volume (vph)	1	613	14	53	398	21	67	1	34	14	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.86		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1802	3543		1768	3535		1703	1568		1796	1695	
Flt Permitted	0.44	1.00		0.36	1.00		0.75	1.00		0.72	1.00	
Satd. Flow (perm)	833	3543		663	3535		1344	1568		1362	1695	
Peak-hour factor, PHF	0.25	0.90	0.56	0.79	0.75	0.58	0.78	0.25	0.65	0.70	0.25	0.50
Adj. Flow (vph)	4	681	25	67	531	36	86	4	52	20	4	8
RTOR Reduction (vph)	0	1	0	0	3	0	0	46	0	0	7	0
Lane Group Flow (vph)	4	705	0	67	564	0	86	10	0	20	5	0
Confl. Peds. (#/hr)	1			3		4			3	4		1
Heavy Vehicles (%)	0%	1%	11%	2%	1%	0%	6%	0%	3%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	71.9	71.9		80.6	80.6		12.4	12.4		12.4	12.4	
Effective Green, g (s)	71.9	71.9		80.6	80.6		12.4	12.4		12.4	12.4	
Actuated g/C Ratio	0.68	0.68		0.76	0.76		0.12	0.12		0.12	0.12	
Clearance Time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	4.5	4.5		2.5	4.5		3.5	3.5		3.5	3.5	
Lane Grp Cap (vph)	566	2407		564	2693		157	183		159	198	
v/s Ratio Prot		c0.20		0.01	c0.16			0.01			0.00	
v/s Ratio Perm	0.00			0.08			c0.06			0.01		
v/c Ratio	0.01	0.29		0.12	0.21		0.55	0.06		0.13	0.02	
Uniform Delay, d1	5.5	6.8		3.3	3.6		44.1	41.5		41.8	41.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.1	0.2		4.3	0.1		0.4	0.1	
Delay (s)	5.5	7.1		3.3	3.7		48.4	41.6		42.3	41.4	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		7.1			3.7			45.7			41.9	
Approach LOS		A			A			D			D	

Intersection Summary

HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	105.8	Sum of lost time (s)	15.8
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	646	25	0	489	0	3
Future Volume (Veh/h)	646	25	0	489	0	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.75	0.92	0.75	0.92	0.75
Hourly flow rate (vph)	718	33	0	652	0	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	68			297		
pX, platoon unblocked			0.92		0.92	0.92
vC, conflicting volume			751		1060	376
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			563		899	157
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			933		259	798

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	479	272	326	326	4
Volume Left	0	0	0	0	0
Volume Right	0	33	0	0	4
cSH	1700	1700	1700	1700	798
Volume to Capacity	0.28	0.16	0.19	0.19	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	0.0	0.0	9.5
Lane LOS					A
Approach Delay (s)	0.0		0.0		9.5
Approach LOS					A

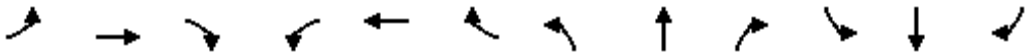
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	28.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	360	321	561	333	538	851	546	1286	131	365	802
v/c Ratio	1.15	0.24	0.74	1.07	0.40	1.12	1.28	1.34	0.28	0.85	0.85
Control Delay	147.0	27.0	20.8	124.5	29.4	94.9	185.6	196.2	17.1	72.3	49.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	147.0	27.0	20.8	124.5	29.4	94.9	185.6	196.2	17.1	72.3	49.8
Queue Length 50th (m)	~55.3	29.2	56.2	~48.4	52.5	~201.2	~90.4	~224.0	10.2	47.5	96.0
Queue Length 95th (m)	#84.1	40.7	88.7	#73.9	68.4	#251.1	#126.6	#236.7	23.3	#56.9	118.0
Internal Link Dist (m)		140.9			161.1			292.7			175.8
Turn Bay Length (m)	50.0		50.0	45.0		20.0	50.0		50.0	40.0	
Base Capacity (vph)	313	1338	761	310	1338	762	427	960	474	427	940
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.15	0.24	0.74	1.07	0.40	1.12	1.28	1.34	0.28	0.85	0.85

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	317	292	477	286	511	723	508	1067	109	292	494	169
Future Volume (vph)	317	292	477	286	511	723	508	1067	109	292	494	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	1.00	0.96	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3502	3574	1514	3467	3574	1571	3502	3574	1552	3502	3356	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3502	3574	1514	3467	3574	1571	3502	3574	1552	3502	3356	
Peak-hour factor, PHF	0.88	0.91	0.85	0.86	0.95	0.85	0.93	0.83	0.83	0.80	0.88	0.70
Adj. Flow (vph)	360	321	561	333	538	851	546	1286	131	365	561	241
RTOR Reduction (vph)	0	0	194	0	0	174	0	0	57	0	39	0
Lane Group Flow (vph)	360	321	367	333	538	677	546	1286	74	365	763	0
Confl. Peds. (#/hr)	16		21	15		10	15		21	10		16
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	0%	1%	0%	0%	2%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	2		1	2		3	4		3	4	
Permitted Phases			2			2			4			
Actuated Green, G (s)	11.0	46.0	46.0	11.0	46.0	46.0	15.0	33.0	33.0	15.0	33.0	
Effective Green, g (s)	11.0	46.0	46.0	11.0	46.0	46.0	15.0	33.0	33.0	15.0	33.0	
Actuated g/C Ratio	0.09	0.37	0.37	0.09	0.37	0.37	0.12	0.27	0.27	0.12	0.27	
Clearance Time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5	4.5	2.5	3.5	3.5	2.5	3.5	
Lane Grp Cap (vph)	313	1338	567	310	1338	588	427	960	417	427	901	
v/s Ratio Prot	c0.10	0.09		0.10	0.15		c0.16	c0.36		0.10	0.23	
v/s Ratio Perm			0.24			c0.43			0.05			
v/c Ratio	1.15	0.24	0.65	1.07	0.40	1.15	1.28	1.34	0.18	0.85	0.85	
Uniform Delay, d1	55.9	26.4	31.7	55.9	28.3	38.4	53.9	44.9	34.5	52.8	42.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	98.0	0.4	5.6	72.2	0.9	86.1	142.4	159.9	0.2	15.1	7.6	
Delay (s)	153.9	26.8	37.3	128.1	29.2	124.5	196.3	204.8	34.7	67.9	50.1	
Level of Service	F	C	D	F	C	F	F	F	C	E	D	
Approach Delay (s)		68.4			95.4			191.1			55.7	
Approach LOS		E			F			F			E	

Intersection Summary

HCM 2000 Control Delay	113.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	122.8	Sum of lost time (s)	17.8
Intersection Capacity Utilization	97.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1190	545	1218	1181
v/c Ratio	0.70	0.72	0.61	0.60
Control Delay	24.2	27.6	29.5	32.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.2	27.6	29.5	32.9
Queue Length 50th (m)	113.1	112.0	97.6	83.7
Queue Length 95th (m)	94.4	113.5	#137.6	#130.2
Internal Link Dist (m)	51.0		299.5	292.7
Turn Bay Length (m)		160.0		
Base Capacity (vph)	2173	968	1993	1973
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.55	0.56	0.61	0.60

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	820	749	1157	0	0	1075
Future Volume (vph)	820	749	1157	0	0	1075
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0			6.0
Lane Util. Factor	0.97	0.91	0.91			0.91
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	0.97	0.85	1.00			1.00
Flt Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3301	1470	5136			5085
Flt Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3301	1470	5136			5085
Peak-hour factor, PHF	0.89	0.92	0.95	0.80	0.92	0.91
Adj. Flow (vph)	921	814	1218	0	0	1181
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1190	545	1218	0	0	1181
Confl. Peds. (#/hr)					1	
Heavy Vehicles (%)	5%	0%	1%	0%	2%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	61.4	61.4	46.6			46.6
Effective Green, g (s)	61.4	61.4	46.6			46.6
Actuated g/C Ratio	0.51	0.51	0.39			0.39
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	1689	752	1994			1974
v/s Ratio Prot	0.36		c0.24			0.23
v/s Ratio Perm		c0.37				
v/c Ratio	0.70	0.72	0.61			0.60
Uniform Delay, d1	22.4	22.7	29.4			29.2
Progression Factor	1.00	1.00	0.88			1.00
Incremental Delay, d2	1.4	3.5	1.3			1.3
Delay (s)	23.7	26.2	27.3			30.6
Level of Service	C	C	C			C
Approach Delay (s)	24.5		27.3			30.6
Approach LOS	C		C			C

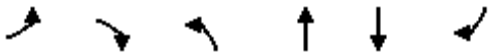
Intersection Summary

HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	575	261	1158	1470
v/c Ratio	0.67	0.72	0.36	0.47
Control Delay	43.8	51.6	11.0	12.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	43.8	51.6	11.0	12.3
Queue Length 50th (m)	67.7	66.1	42.5	37.4
Queue Length 95th (m)	44.6	81.6	66.9	99.0
Internal Link Dist (m)	49.5		444.3	299.5
Turn Bay Length (m)	150.0			
Base Capacity (vph)	1804	760	3260	3137
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.32	0.34	0.36	0.47

Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	255	337	0	1031	1294	0
Future Volume (vph)	255	337	0	1031	1294	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		6.5	6.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	0.96	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3403	1429		5085	4893	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3403	1429		5085	4893	
Peak-hour factor, PHF	0.58	0.85	0.92	0.89	0.88	0.92
Adj. Flow (vph)	440	396	0	1158	1470	0
RTOR Reduction (vph)	3	3	0	0	0	0
Lane Group Flow (vph)	572	258	0	1158	1470	0
Confl. Peds. (#/hr)	5	5				
Heavy Vehicles (%)	0%	1%	2%	2%	6%	2%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	30.1	30.1		76.9	76.9	
Effective Green, g (s)	30.1	30.1		76.9	76.9	
Actuated g/C Ratio	0.25	0.25		0.64	0.64	
Clearance Time (s)	6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	853	358		3258	3135	
v/s Ratio Prot	0.17			0.23	c0.30	
v/s Ratio Perm		c0.18				
v/c Ratio	0.67	0.72		0.36	0.47	
Uniform Delay, d1	40.5	41.1		10.0	11.1	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	7.0		0.3	0.4	
Delay (s)	42.6	48.1		10.3	11.5	
Level of Service	D	D		B	B	
Approach Delay (s)	44.3			10.3	11.5	
Approach LOS	D			B	B	

Intersection Summary

HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	529	0	0	902	161	189
Future Volume (Veh/h)	529	0	0	902	161	189
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.92	0.92	0.87	0.76	0.83
Hourly flow rate (vph)	594	0	0	1037	212	228
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	148			218		
pX, platoon unblocked			0.92		0.96	0.92
vC, conflicting volume			594		1112	297
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			389		682	67
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		42	75
cM capacity (veh/h)			1074		365	909

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	297	297	518	518	212	228
Volume Left	0	0	0	0	212	0
Volume Right	0	0	0	0	0	228
cSH	1700	1700	1700	1700	365	909
Volume to Capacity	0.17	0.17	0.30	0.30	0.58	0.25
Queue Length 95th (m)	0.0	0.0	0.0	0.0	28.0	7.9
Control Delay (s)	0.0	0.0	0.0	0.0	27.6	10.3
Lane LOS					D	B
Approach Delay (s)	0.0		0.0		18.6	
Approach LOS					C	

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	614	20	60	821	171	80
v/c Ratio	0.24	0.02	0.10	0.31	0.62	0.26
Control Delay	5.6	2.6	6.0	6.1	50.7	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.6	2.6	6.0	6.1	50.7	10.0
Queue Length 50th (m)	19.7	0.0	3.3	28.2	35.3	0.0
Queue Length 95th (m)	35.2	0.6	9.8	48.9	48.2	8.9
Internal Link Dist (m)	72.4			151.3	35.3	
Turn Bay Length (m)		25.0	25.0			
Base Capacity (vph)	2587	1105	573	2613	571	551
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.02	0.10	0.31	0.30	0.15

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	559	9	55	747	142	63
Future Volume (vph)	559	9	55	747	142	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.94	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1519	1795	3610	1787	1556
Flt Permitted	1.00	1.00	0.42	1.00	0.95	1.00
Satd. Flow (perm)	3574	1519	793	3610	1787	1556
Peak-hour factor, PHF	0.91	0.45	0.92	0.91	0.83	0.79
Adj. Flow (vph)	614	20	60	821	171	80
RTOR Reduction (vph)	0	6	0	0	0	68
Lane Group Flow (vph)	614	14	60	821	171	12
Confl. Peds. (#/hr)		13	4		13	4
Heavy Vehicles (%)	1%	0%	0%	0%	1%	2%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	76.5	76.5	76.5	76.5	16.4	16.4
Effective Green, g (s)	76.5	76.5	76.5	76.5	16.4	16.4
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.16	0.16
Clearance Time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.5	3.5
Lane Grp Cap (vph)	2586	1099	573	2612	277	241
v/s Ratio Prot	0.17			c0.23	c0.10	
v/s Ratio Perm		0.01	0.08			0.01
v/c Ratio	0.24	0.01	0.10	0.31	0.62	0.05
Uniform Delay, d1	4.9	4.1	4.4	5.2	41.7	38.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	0.4	0.3	4.3	0.1
Delay (s)	5.1	4.1	4.7	5.5	46.0	38.1
Level of Service	A	A	A	A	D	D
Approach Delay (s)	5.1			5.5	43.5	
Approach LOS	A			A	D	

Intersection Summary

HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	105.7	Sum of lost time (s)	12.8
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	542	128	1169	319	100	20	44
v/c Ratio	0.08	0.32	0.23	0.56	0.79	0.19	0.05	0.09
Control Delay	22.0	19.5	11.2	16.3	47.3	6.4	23.1	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	19.5	11.2	16.3	47.3	6.4	23.1	11.5
Queue Length 50th (m)	1.8	35.9	10.5	77.2	63.3	1.2	3.1	2.3
Queue Length 95th (m)	5.3	62.7	22.8	106.7	83.3	0.8	6.3	8.1
Internal Link Dist (m)		92.6		37.5		50.7		14.6
Turn Bay Length (m)	35.0		35.0					
Base Capacity (vph)	198	1676	546	2082	620	771	590	769
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.32	0.23	0.56	0.51	0.13	0.03	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	446	23	109	942	8	309	4	77	15	10	19
Future Volume (vph)	10	446	23	109	942	8	309	4	77	15	10	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.86		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1803	3524		1804	3564		1801	1603		1803	1675	
Flt Permitted	0.22	1.00		0.39	1.00		0.73	1.00		0.69	1.00	
Satd. Flow (perm)	417	3524		744	3564		1380	1603		1314	1675	
Peak-hour factor, PHF	0.63	0.90	0.50	0.85	0.82	0.40	0.97	0.50	0.84	0.75	0.83	0.59
Adj. Flow (vph)	16	496	46	128	1149	20	319	8	92	20	12	32
RTOR Reduction (vph)	0	5	0	0	1	0	0	65	0	0	20	0
Lane Group Flow (vph)	16	537	0	128	1168	0	319	35	0	20	24	0
Confl. Peds. (#/hr)	2		2	1		1	2		1	1		2
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	50.2	50.2		61.8	61.8		31.2	31.2		31.2	31.2	
Effective Green, g (s)	50.2	50.2		61.8	61.8		31.2	31.2		31.2	31.2	
Actuated g/C Ratio	0.47	0.47		0.58	0.58		0.29	0.29		0.29	0.29	
Clearance Time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	4.5	4.5		2.5	4.5		3.5	3.5		3.5	3.5	
Lane Grp Cap (vph)	197	1672		520	2081		406	472		387	493	
v/s Ratio Prot		0.15		0.02	c0.33			0.02			0.01	
v/s Ratio Perm	0.04			0.12			c0.23			0.02		
v/c Ratio	0.08	0.32		0.25	0.56		0.79	0.07		0.05	0.05	
Uniform Delay, d1	15.2	17.2		10.1	13.6		34.2	26.9		26.7	26.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.5		0.2	1.1		9.9	0.1		0.1	0.0	
Delay (s)	16.0	17.7		10.3	14.7		44.1	27.0		26.8	26.7	
Level of Service	B	B		B	B		D	C		C	C	
Approach Delay (s)		17.7			14.3			40.0			26.7	
Approach LOS		B			B			D			C	

Intersection Summary

HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	105.8	Sum of lost time (s)	15.8
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	526	20	0	1063	0	3
Future Volume (Veh/h)	526	20	0	1063	0	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.75	0.92	0.88	0.92	0.75
Hourly flow rate (vph)	584	27	0	1208	0	4
Pedestrians					2	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	62			304		
pX, platoon unblocked			0.91		0.94	0.91
vC, conflicting volume			613		1204	308
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			377		815	41
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1070		295	933

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	389	222	604	604	4
Volume Left	0	0	0	0	0
Volume Right	0	27	0	0	4
cSH	1700	1700	1700	1700	933
Volume to Capacity	0.23	0.13	0.36	0.36	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	0.0	0.0	8.9
Lane LOS					A
Approach Delay (s)	0.0		0.0		8.9
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix F

Intersection Capacity Analysis Output
Future Total Condition – 2028

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	162	330	347	280	417	225	395	651	136	608	1327
v/c Ratio	0.65	0.36	0.55	1.10	0.47	0.45	0.64	0.53	0.22	0.98	1.07
Control Delay	68.2	38.8	9.8	138.5	40.7	17.0	52.7	33.8	6.1	81.8	85.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	38.8	9.8	138.5	40.7	17.0	52.7	33.8	6.1	81.8	85.7
Queue Length 50th (m)	20.9	36.8	7.5	~41.6	48.1	16.5	47.8	69.0	1.0	79.0	~196.2
Queue Length 95th (m)	25.5	45.1	34.5	#53.0	42.2	36.8	43.0	83.1	10.6	#109.4	#231.8
Internal Link Dist (m)		140.9			161.1			292.7			175.8
Turn Bay Length (m)	50.0		50.0	45.0		20.0	50.0		50.0	40.0	
Base Capacity (vph)	249	960	647	254	932	522	615	1227	609	621	1237
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.34	0.54	1.10	0.45	0.43	0.64	0.53	0.22	0.98	1.07

Intersection Summary

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

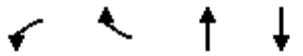
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	274	326	210	267	196	241	560	109	505	1051	104
Future Volume (vph)	115	274	326	210	267	196	241	560	109	505	1051	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3400	3574	1570	3467	3471	1552	3467	3505	1499	3502	3514	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3400	3574	1570	3467	3471	1552	3467	3505	1499	3502	3514	
Peak-hour factor, PHF	0.71	0.83	0.94	0.75	0.64	0.87	0.61	0.86	0.80	0.83	0.88	0.78
Adj. Flow (vph)	162	330	347	280	417	225	395	651	136	608	1194	133
RTOR Reduction (vph)	0	0	230	0	0	107	0	0	84	0	7	0
Lane Group Flow (vph)	162	330	117	280	417	118	395	651	52	608	1320	0
Confl. Peds. (#/hr)	6		4	3		5	4		3	5		6
Heavy Vehicles (%)	3%	1%	1%	1%	4%	2%	1%	3%	6%	0%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	2		1	2		3	4		3	4	
Permitted Phases			2			2			4			
Actuated Green, G (s)	9.0	31.2	31.2	9.0	31.2	31.2	21.8	43.0	43.0	21.8	43.0	
Effective Green, g (s)	9.0	31.2	31.2	9.0	31.2	31.2	21.8	43.0	43.0	21.8	43.0	
Actuated g/C Ratio	0.07	0.25	0.25	0.07	0.25	0.25	0.18	0.35	0.35	0.18	0.35	
Clearance Time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5	4.5	2.5	3.5	3.5	2.5	3.5	
Lane Grp Cap (vph)	249	908	398	254	881	394	615	1227	524	621	1230	
v/s Ratio Prot	0.05	0.09		c0.08	c0.12		0.11	0.19		c0.17	c0.38	
v/s Ratio Perm			0.07			0.08			0.03			
v/c Ratio	0.65	0.36	0.29	1.10	0.47	0.30	0.64	0.53	0.10	0.98	1.07	
Uniform Delay, d1	55.4	37.6	36.9	56.9	38.8	37.0	46.9	31.8	26.9	50.3	39.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.3	1.1	1.9	86.6	1.8	1.9	2.0	0.5	0.1	30.5	47.7	
Delay (s)	60.7	38.8	38.8	143.5	40.7	38.9	48.9	32.3	27.0	80.7	87.6	
Level of Service	E	D	D	F	D	D	D	C	C	F	F	
Approach Delay (s)		43.0			71.5			37.3			85.4	
Approach LOS		D			E			D			F	

Intersection Summary

HCM 2000 Control Delay	63.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	122.8	Sum of lost time (s)	17.8
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	958	402	904	1392
v/c Ratio	0.74	0.70	0.40	0.61
Control Delay	23.6	24.8	16.1	19.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.6	24.8	16.1	19.6
Queue Length 50th (m)	65.2	54.0	24.0	59.7
Queue Length 95th (m)	57.1	51.4	52.4	89.8
Internal Link Dist (m)	51.0		299.5	292.7
Turn Bay Length (m)		160.0		
Base Capacity (vph)	1690	750	2255	2277
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.57	0.54	0.40	0.61

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	712	322	732	0	0	1295
Future Volume (vph)	712	322	732	0	0	1295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.5			6.5
Lane Util. Factor	0.97	0.91	0.91			0.91
Frpb, ped/bikes	1.00	0.99	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	0.99	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3210	1409	5085			5136
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3210	1409	5085			5136
Peak-hour factor, PHF	0.78	0.72	0.81	0.80	0.92	0.93
Adj. Flow (vph)	913	447	904	0	0	1392
RTOR Reduction (vph)	5	14	0	0	0	0
Lane Group Flow (vph)	953	388	904	0	0	1392
Confl. Peds. (#/hr)	1	1		1	1	
Heavy Vehicles (%)	9%	3%	2%	0%	2%	1%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	32.0	32.0	35.5			35.5
Effective Green, g (s)	32.0	32.0	35.5			35.5
Actuated g/C Ratio	0.40	0.40	0.44			0.44
Clearance Time (s)	6.0	6.0	6.5			6.5
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	1284	563	2256			2279
v/s Ratio Prot	c0.30		0.18			c0.27
v/s Ratio Perm		0.28				
v/c Ratio	0.74	0.69	0.40			0.61
Uniform Delay, d1	20.5	19.9	15.1			17.0
Progression Factor	1.00	1.00	0.96			1.00
Incremental Delay, d2	2.4	3.5	0.5			1.2
Delay (s)	22.8	23.4	14.9			18.2
Level of Service	C	C	B			B
Approach Delay (s)	23.0		14.9			18.2
Approach LOS	C		B			B

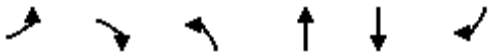
Intersection Summary

HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	812	386	895	1590
v/c Ratio	0.68	0.74	0.36	0.66
Control Delay	24.3	30.6	14.2	17.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.3	30.6	14.2	17.4
Queue Length 50th (m)	55.4	57.5	30.8	52.7
Queue Length 95th (m)	42.9	70.0	44.5	92.8
Internal Link Dist (m)	49.5		444.3	299.5
Turn Bay Length (m)	150.0			
Base Capacity (vph)	1639	719	2505	2411
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.50	0.54	0.36	0.66

Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	298	656	0	734	1336	0
Future Volume (vph)	298	656	0	734	1336	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		6.5	6.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frt	0.93	0.85		1.00	1.00	
Flt Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3320	1455		5085	4893	
Flt Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3320	1455		5085	4893	
Peak-hour factor, PHF	0.70	0.85	0.92	0.82	0.84	0.92
Adj. Flow (vph)	426	772	0	895	1590	0
RTOR Reduction (vph)	1	1	0	0	0	0
Lane Group Flow (vph)	811	385	0	895	1590	0
Heavy Vehicles (%)	0%	1%	2%	2%	6%	2%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	28.6	28.6		39.4	39.4	
Effective Green, g (s)	28.6	28.6		39.4	39.4	
Actuated g/C Ratio	0.36	0.36		0.49	0.49	
Clearance Time (s)	5.5	5.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1186	520		2504	2409	
v/s Ratio Prot	0.24			0.18	c0.32	
v/s Ratio Perm		c0.26				
v/c Ratio	0.68	0.74		0.36	0.66	
Uniform Delay, d1	21.9	22.5		12.5	15.3	
Progression Factor	1.00	1.00		1.00	0.95	
Incremental Delay, d2	1.6	5.5		0.4	1.2	
Delay (s)	23.5	27.9		12.9	15.6	
Level of Service	C	C		B	B	
Approach Delay (s)	24.9			12.9	15.6	
Approach LOS	C			B	B	

Intersection Summary

HCM 2000 Control Delay	18.0	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)	12.0
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	706	0	0	362	168	250
Future Volume (Veh/h)	706	0	0	362	168	250
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.92	0.92	0.80	0.69	0.80
Hourly flow rate (vph)	759	0	0	453	243	313
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	148			218		
pX, platoon unblocked			0.92		0.92	0.92
vC, conflicting volume			759		986	380
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			576		821	165
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		16	60
cM capacity (veh/h)			919		291	789

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	380	380	226	226	243	313
Volume Left	0	0	0	0	243	0
Volume Right	0	0	0	0	0	313
cSH	1700	1700	1700	1700	291	789
Volume to Capacity	0.22	0.22	0.13	0.13	0.84	0.40
Queue Length 95th (m)	0.0	0.0	0.0	0.0	56.1	15.3
Control Delay (s)	0.0	0.0	0.0	0.0	57.9	12.5
Lane LOS					F	B
Approach Delay (s)	0.0		0.0		32.4	
Approach LOS					D	

Intersection Summary			
Average Delay	10.2		
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	904	48	36	343	64	44
v/c Ratio	0.32	0.04	0.08	0.12	0.29	0.19
Control Delay	4.7	2.5	5.1	3.9	43.7	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.7	2.5	5.1	3.9	43.7	12.7
Queue Length 50th (m)	23.8	0.6	1.4	7.4	13.2	0.0
Queue Length 95th (m)	55.4	0.3	5.0	18.7	16.7	5.5
Internal Link Dist (m)	72.4			151.3	35.3	
Turn Bay Length (m)		25.0	25.0			
Base Capacity (vph)	2856	1212	467	2800	577	546
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.04	0.08	0.12	0.11	0.08

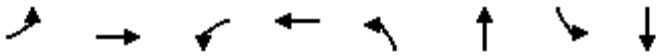
Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	823	15	25	298	43	31
Future Volume (vph)	823	15	25	298	43	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1509	1805	3505	1805	1615
Flt Permitted	1.00	1.00	0.31	1.00	0.95	1.00
Satd. Flow (perm)	3574	1509	585	3505	1805	1615
Peak-hour factor, PHF	0.91	0.31	0.69	0.87	0.67	0.70
Adj. Flow (vph)	904	48	36	343	64	44
RTOR Reduction (vph)	0	7	0	0	0	39
Lane Group Flow (vph)	904	41	36	343	64	5
Heavy Vehicles (%)	1%	7%	0%	3%	0%	0%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	81.9	81.9	81.9	81.9	11.0	11.0
Effective Green, g (s)	81.9	81.9	81.9	81.9	11.0	11.0
Actuated g/C Ratio	0.77	0.77	0.77	0.77	0.10	0.10
Clearance Time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.5	3.5
Lane Grp Cap (vph)	2769	1169	453	2715	187	168
v/s Ratio Prot	c0.25			0.10	c0.04	
v/s Ratio Perm		0.03	0.06			0.00
v/c Ratio	0.33	0.03	0.08	0.13	0.34	0.03
Uniform Delay, d1	3.6	2.8	2.9	3.0	44.0	42.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	0.3	0.1	1.3	0.1
Delay (s)	3.9	2.8	3.2	3.1	45.3	42.6
Level of Service	A	A	A	A	D	D
Approach Delay (s)	3.8			3.1	44.2	
Approach LOS	A			A	D	

Intersection Summary

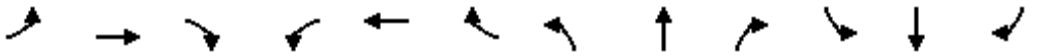
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	105.7	Sum of lost time (s)	12.8
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	4	766	67	615	86	56	20	12
v/c Ratio	0.01	0.30	0.12	0.22	0.47	0.22	0.11	0.05
Control Delay	9.0	8.6	4.0	4.5	49.3	13.4	38.4	23.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	8.6	4.0	4.5	49.3	13.4	38.4	23.6
Queue Length 50th (m)	0.3	33.4	2.5	16.5	17.8	0.8	3.9	0.8
Queue Length 95th (m)	0.6	60.5	7.4	27.5	25.7	0.0	7.7	0.5
Internal Link Dist (m)		92.6		44.4		50.7		14.6
Turn Bay Length (m)	35.0		35.0					
Base Capacity (vph)	564	2517	660	2783	381	481	385	486
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.30	0.10	0.22	0.23	0.12	0.05	0.02

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	667	14	53	434	21	67	1	34	14	1	4
Future Volume (vph)	1	667	14	53	434	21	67	1	34	14	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.86		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1803	3545		1768	3538		1703	1568		1796	1695	
Flt Permitted	0.42	1.00		0.33	1.00		0.75	1.00		0.72	1.00	
Satd. Flow (perm)	795	3545		617	3538		1344	1568		1362	1695	
Peak-hour factor, PHF	0.25	0.90	0.56	0.79	0.75	0.58	0.78	0.25	0.65	0.70	0.25	0.50
Adj. Flow (vph)	4	741	25	67	579	36	86	4	52	20	4	8
RTOR Reduction (vph)	0	1	0	0	3	0	0	46	0	0	7	0
Lane Group Flow (vph)	4	765	0	67	612	0	86	10	0	20	5	0
Confl. Peds. (#/hr)	1			3		4			3	4		1
Heavy Vehicles (%)	0%	1%	11%	2%	1%	0%	6%	0%	3%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	71.9	71.9		80.6	80.6		12.4	12.4		12.4	12.4	
Effective Green, g (s)	71.9	71.9		80.6	80.6		12.4	12.4		12.4	12.4	
Actuated g/C Ratio	0.68	0.68		0.76	0.76		0.12	0.12		0.12	0.12	
Clearance Time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	4.5	4.5		2.5	4.5		3.5	3.5		3.5	3.5	
Lane Grp Cap (vph)	540	2409		532	2695		157	183		159	198	
v/s Ratio Prot		c0.22		0.01	c0.17			0.01			0.00	
v/s Ratio Perm	0.01			0.09			c0.06			0.01		
v/c Ratio	0.01	0.32		0.13	0.23		0.55	0.06		0.13	0.02	
Uniform Delay, d1	5.5	6.9		3.3	3.6		44.1	41.5		41.8	41.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.1	0.2		4.3	0.1		0.4	0.1	
Delay (s)	5.5	7.3		3.4	3.8		48.4	41.6		42.3	41.4	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		7.3			3.8			45.7			41.9	
Approach LOS		A			A			D			D	

Intersection Summary

HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	105.8	Sum of lost time (s)	15.8
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	704	18	0	530	0	3
Future Volume (Veh/h)	704	18	0	530	0	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.75	0.92	0.75	0.92	0.75
Hourly flow rate (vph)	782	24	0	707	0	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	68			297		
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			806		1148	403
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			600		973	159
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			896		230	787

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	521	285	354	354	4
Volume Left	0	0	0	0	0
Volume Right	0	24	0	0	4
cSH	1700	1700	1700	1700	787
Volume to Capacity	0.31	0.17	0.21	0.21	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	0.0	0.0	9.6
Lane LOS					A
Approach Delay (s)	0.0		0.0		9.6
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	30.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	393	349	613	355	586	927	596	1402	141	398	877
v/c Ratio	1.26	0.26	0.81	1.15	0.44	1.22	1.40	1.46	0.30	0.93	0.93
Control Delay	183.6	27.3	26.7	145.6	30.0	134.5	231.7	247.0	18.4	83.0	58.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	183.6	27.3	26.7	145.6	30.0	134.5	231.7	247.0	18.4	83.0	58.5
Queue Length 50th (m)	~64.3	32.0	75.6	~54.3	58.0	~242.3	~104.0	~256.2	12.2	52.3	108.8
Queue Length 95th (m)	#93.9	44.1	113.0	#80.2	74.9	#291.2	#141.0	#266.8	26.1	#67.2	#143.0
Internal Link Dist (m)		140.9			161.1			292.7			175.8
Turn Bay Length (m)	50.0		50.0	45.0		20.0	50.0		50.0	40.0	
Base Capacity (vph)	313	1338	756	310	1338	762	427	960	474	427	940
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.26	0.26	0.81	1.15	0.44	1.22	1.40	1.46	0.30	0.93	0.93

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	346	318	521	305	557	788	554	1164	117	318	539	185
Future Volume (vph)	346	318	521	305	557	788	554	1164	117	318	539	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	1.00	0.96	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3502	3574	1514	3467	3574	1571	3502	3574	1552	3502	3356	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3502	3574	1514	3467	3574	1571	3502	3574	1552	3502	3356	
Peak-hour factor, PHF	0.88	0.91	0.85	0.86	0.95	0.85	0.93	0.83	0.83	0.80	0.88	0.70
Adj. Flow (vph)	393	349	613	355	586	927	596	1402	141	398	612	264
RTOR Reduction (vph)	0	0	189	0	0	174	0	0	57	0	39	0
Lane Group Flow (vph)	393	349	424	355	586	753	596	1402	84	398	838	0
Confl. Peds. (#/hr)	16		21	15		10	15		21	10		16
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	0%	1%	0%	0%	2%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	2		1	2		3	4		3	4	
Permitted Phases			2			2			4			
Actuated Green, G (s)	11.0	46.0	46.0	11.0	46.0	46.0	15.0	33.0	33.0	15.0	33.0	
Effective Green, g (s)	11.0	46.0	46.0	11.0	46.0	46.0	15.0	33.0	33.0	15.0	33.0	
Actuated g/C Ratio	0.09	0.37	0.37	0.09	0.37	0.37	0.12	0.27	0.27	0.12	0.27	
Clearance Time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5	4.5	2.5	3.5	3.5	2.5	3.5	
Lane Grp Cap (vph)	313	1338	567	310	1338	588	427	960	417	427	901	
v/s Ratio Prot	c0.11	0.10		0.10	0.16		c0.17	c0.39		0.11	0.25	
v/s Ratio Perm			0.28			c0.48			0.05			
v/c Ratio	1.26	0.26	0.75	1.15	0.44	1.28	1.40	1.46	0.20	0.93	0.93	
Uniform Delay, d1	55.9	26.6	33.4	55.9	28.7	38.4	53.9	44.9	34.7	53.4	43.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	138.5	0.5	8.7	96.4	1.0	139.1	191.9	213.0	0.3	27.2	16.0	
Delay (s)	194.4	27.1	42.1	152.3	29.8	177.5	245.8	257.9	35.0	80.6	59.7	
Level of Service	F	C	D	F	C	F	F	F	C	F	E	
Approach Delay (s)		82.4			126.3			239.8			66.2	
Approach LOS		F			F			F			E	

Intersection Summary

HCM 2000 Control Delay	142.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	122.8	Sum of lost time (s)	17.8
Intersection Capacity Utilization	105.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1297	595	1327	1287
v/c Ratio	0.71	0.74	0.74	0.73
Control Delay	21.8	25.4	34.2	38.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.8	25.4	34.2	38.7
Queue Length 50th (m)	116.1	115.8	113.8	101.8
Queue Length 95th (m)	102.8	125.3	#164.8	#157.6
Internal Link Dist (m)	51.0		299.5	292.7
Turn Bay Length (m)		160.0		
Base Capacity (vph)	2173	967	1793	1775
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	0.62	0.74	0.73

Intersection Summary

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	894	817	1261	0	0	1171
Future Volume (vph)	894	817	1261	0	0	1171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0			6.0
Lane Util. Factor	0.97	0.91	0.91			0.91
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	0.97	0.85	1.00			1.00
Flt Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3301	1470	5136			5085
Flt Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3301	1470	5136			5085
Peak-hour factor, PHF	0.89	0.92	0.95	0.80	0.92	0.91
Adj. Flow (vph)	1004	888	1327	0	0	1287
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1297	595	1327	0	0	1287
Confl. Peds. (#/hr)					1	
Heavy Vehicles (%)	5%	0%	1%	0%	2%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	66.1	66.1	41.9			41.9
Effective Green, g (s)	66.1	66.1	41.9			41.9
Actuated g/C Ratio	0.55	0.55	0.35			0.35
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	1818	809	1793			1775
v/s Ratio Prot	0.39		c0.26			0.25
v/s Ratio Perm		c0.40				
v/c Ratio	0.71	0.74	0.74			0.73
Uniform Delay, d1	19.9	20.3	34.3			34.0
Progression Factor	1.00	1.00	0.86			1.00
Incremental Delay, d2	1.4	3.5	2.6			2.6
Delay (s)	21.3	23.8	32.1			36.6
Level of Service	C	C	C			D
Approach Delay (s)	22.1		32.1			36.6
Approach LOS	C		C			D

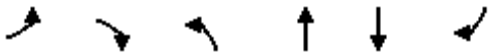
Intersection Summary

HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	626	285	1263	1603
v/c Ratio	0.69	0.74	0.40	0.52
Control Delay	42.9	51.4	12.6	14.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	42.9	51.4	12.6	14.2
Queue Length 50th (m)	73.1	71.9	51.2	69.8
Queue Length 95th (m)	46.5	85.7	80.0	93.7
Internal Link Dist (m)	49.5		444.3	299.5
Turn Bay Length (m)	150.0			
Base Capacity (vph)	1802	759	3179	3059
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.35	0.38	0.40	0.52

Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	278	367	0	1124	1411	0
Future Volume (vph)	278	367	0	1124	1411	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		6.5	6.5	
Lane Util. Factor	0.97	0.91		0.91	0.91	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	0.96	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3403	1430		5085	4893	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3403	1430		5085	4893	
Peak-hour factor, PHF	0.58	0.85	0.92	0.89	0.88	0.92
Adj. Flow (vph)	479	432	0	1263	1603	0
RTOR Reduction (vph)	1	1	0	0	0	0
Lane Group Flow (vph)	625	284	0	1263	1603	0
Confl. Peds. (#/hr)	5	5				
Heavy Vehicles (%)	0%	1%	2%	2%	6%	2%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	32.0	32.0		75.0	75.0	
Effective Green, g (s)	32.0	32.0		75.0	75.0	
Actuated g/C Ratio	0.27	0.27		0.62	0.62	
Clearance Time (s)	6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	907	381		3178	3058	
v/s Ratio Prot	0.18			0.25	c0.33	
v/s Ratio Perm		c0.20				
v/c Ratio	0.69	0.74		0.40	0.52	
Uniform Delay, d1	39.5	40.3		11.2	12.5	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	7.7		0.4	0.5	
Delay (s)	41.7	47.9		11.6	13.1	
Level of Service	D	D		B	B	
Approach Delay (s)	43.7			11.6	13.1	
Approach LOS	D			B	B	

Intersection Summary

HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	577	0	0	983	175	206
Future Volume (Veh/h)	577	0	0	983	175	206
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.92	0.92	0.87	0.76	0.83
Hourly flow rate (vph)	648	0	0	1130	230	248
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	148			218		
pX, platoon unblocked			0.91		0.95	0.91
vC, conflicting volume			648		1213	324
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			418		716	63
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		34	73
cM capacity (veh/h)			1036		346	904

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	324	324	565	565	230	248
Volume Left	0	0	0	0	230	0
Volume Right	0	0	0	0	0	248
cSH	1700	1700	1700	1700	346	904
Volume to Capacity	0.19	0.19	0.33	0.33	0.66	0.27
Queue Length 95th (m)	0.0	0.0	0.0	0.0	36.2	9.0
Control Delay (s)	0.0	0.0	0.0	0.0	33.7	10.5
Lane LOS					D	B
Approach Delay (s)	0.0		0.0		21.7	
Approach LOS					C	

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	669	20	60	895	171	80
v/c Ratio	0.26	0.02	0.11	0.34	0.62	0.26
Control Delay	5.8	2.8	6.1	6.3	50.7	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.8	2.8	6.1	6.3	50.7	10.0
Queue Length 50th (m)	21.8	0.1	3.3	31.6	35.3	0.0
Queue Length 95th (m)	38.6	0.7	9.9	54.3	48.2	8.9
Internal Link Dist (m)	72.4			151.3	35.3	
Turn Bay Length (m)		25.0	25.0			
Base Capacity (vph)	2587	1104	540	2613	571	551
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.02	0.11	0.34	0.30	0.15

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	609	9	55	814	142	63
Future Volume (vph)	609	9	55	814	142	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.94	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1519	1796	3610	1787	1556
Flt Permitted	1.00	1.00	0.39	1.00	0.95	1.00
Satd. Flow (perm)	3574	1519	746	3610	1787	1556
Peak-hour factor, PHF	0.91	0.45	0.92	0.91	0.83	0.79
Adj. Flow (vph)	669	20	60	895	171	80
RTOR Reduction (vph)	0	5	0	0	0	68
Lane Group Flow (vph)	669	15	60	895	171	12
Confl. Peds. (#/hr)		13	4		13	4
Heavy Vehicles (%)	1%	0%	0%	0%	1%	2%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	76.5	76.5	76.5	76.5	16.4	16.4
Effective Green, g (s)	76.5	76.5	76.5	76.5	16.4	16.4
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.16	0.16
Clearance Time (s)	6.6	6.6	6.6	6.6	6.2	6.2
Vehicle Extension (s)	4.5	4.5	4.5	4.5	3.5	3.5
Lane Grp Cap (vph)	2586	1099	539	2612	277	241
v/s Ratio Prot	0.19			c0.25	c0.10	
v/s Ratio Perm		0.01	0.08			0.01
v/c Ratio	0.26	0.01	0.11	0.34	0.62	0.05
Uniform Delay, d1	5.0	4.1	4.4	5.4	41.7	38.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	0.4	0.4	4.3	0.1
Delay (s)	5.2	4.1	4.8	5.7	46.0	38.1
Level of Service	A	A	A	A	D	D
Approach Delay (s)	5.2			5.7	43.5	
Approach LOS	A			A	D	

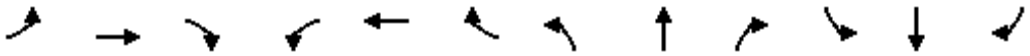
Intersection Summary

HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	105.7	Sum of lost time (s)	12.8
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	584	128	1272	319	100	20	44
v/c Ratio	0.10	0.35	0.25	0.61	0.79	0.19	0.05	0.09
Control Delay	22.8	19.9	11.3	17.3	47.3	6.4	23.1	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	19.9	11.3	17.3	47.3	6.4	23.1	14.9
Queue Length 50th (m)	1.8	39.4	10.5	87.7	63.3	1.2	3.1	3.7
Queue Length 95th (m)	5.3	68.0	22.8	119.8	83.3	0.8	6.3	9.4
Internal Link Dist (m)		92.6		37.5		50.7		14.6
Turn Bay Length (m)	35.0		35.0					
Base Capacity (vph)	165	1677	522	2084	620	771	590	764
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.35	0.25	0.61	0.51	0.13	0.03	0.06

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	484	23	109	1027	8	309	4	77	15	10	19
Future Volume (vph)	10	484	23	109	1027	8	309	4	77	15	10	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.86		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1804	3528		1804	3565		1801	1603		1803	1675	
Flt Permitted	0.18	1.00		0.37	1.00		0.73	1.00		0.69	1.00	
Satd. Flow (perm)	350	3528		699	3565		1380	1603		1314	1675	
Peak-hour factor, PHF	0.63	0.90	0.50	0.85	0.82	0.40	0.97	0.50	0.84	0.75	0.83	0.59
Adj. Flow (vph)	16	538	46	128	1252	20	319	8	92	20	12	32
RTOR Reduction (vph)	0	5	0	0	1	0	0	65	0	0	14	0
Lane Group Flow (vph)	16	579	0	128	1271	0	319	35	0	20	30	0
Confl. Peds. (#/hr)	2		2	1		1	2		1	1		2
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	50.2	50.2		61.8	61.8		31.2	31.2		31.2	31.2	
Effective Green, g (s)	50.2	50.2		61.8	61.8		31.2	31.2		31.2	31.2	
Actuated g/C Ratio	0.47	0.47		0.58	0.58		0.29	0.29		0.29	0.29	
Clearance Time (s)	6.6	6.6		3.0	6.6		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	4.5	4.5		2.5	4.5		3.5	3.5		3.5	3.5	
Lane Grp Cap (vph)	166	1673		498	2082		406	472		387	493	
v/s Ratio Prot		0.16		0.02	c0.36			0.02			0.02	
v/s Ratio Perm	0.05			0.13			c0.23			0.02		
v/c Ratio	0.10	0.35		0.26	0.61		0.79	0.07		0.05	0.06	
Uniform Delay, d1	15.3	17.5		10.2	14.2		34.2	26.9		26.7	26.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.6		0.2	1.3		9.9	0.1		0.1	0.1	
Delay (s)	16.5	18.1		10.4	15.6		44.1	27.0		26.8	26.8	
Level of Service	B	B		B	B		D	C		C	C	
Approach Delay (s)		18.0			15.1			40.0			26.8	
Approach LOS		B			B			D			C	

Intersection Summary

HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	105.8	Sum of lost time (s)	15.8
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	574	20	0	1158	0	3
Future Volume (Veh/h)	574	20	0	1158	0	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.75	0.92	0.88	0.92	0.75
Hourly flow rate (vph)	638	27	0	1316	0	4
Pedestrians					2	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	62			304		
pX, platoon unblocked			0.90		0.94	0.90
vC, conflicting volume			667		1312	334
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			410		853	41
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1030		279	924

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	425	240	658	658	4
Volume Left	0	0	0	0	0
Volume Right	0	27	0	0	4
cSH	1700	1700	1700	1700	924
Volume to Capacity	0.25	0.14	0.39	0.39	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	0.0	0.0	8.9
Lane LOS					A
Approach Delay (s)	0.0		0.0		8.9
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix G

Traffic Signal Warrant Analysis
North Service Road W / Kerr Street / QEW Ramp

TRAFFIC SIGNAL WARRANT ANALYSIS FORM FOR INTERSECTION CONTROL

Minimum warrants for installation of traffic signals for roadways with two or more lanes.

Free Flow Conditions (rural)		Major Stree	**North Service Rd/Kerr St**	No. of Lanes per direction:	2
Restricted Flow Conditions (urba	Y	Minor Stree	**QEW Ramp**	(not including turning lanes)	
Is this a Tee Intersection (Y or ')	Y	Count Date:	**Existing (Dec/2017 TMC)**		

WARRANT 1 - MINIMUM VEHICULAR VOLUME

	YES	NO
100% SATISFIED		No
80% SATISFIED	Yes	

	MINIMUM REQUIREMENTS (80% SHOWN BELOW)				PERCENTAGE WARRANT 900 vph					
APPROACH LANES	1		2 or more		HOUR					
FLOW CONDITION	FREE FLOW	RESTRICTED FLOW	FREE FLOW	RESTRICTED FLOW	07:00-08:00	08:00-09:00	16:00-17:00	17:00-18:00	TOTAL ACROSS	
				1						
A. ALL APPROACHES	480	720	600	900	774	1229	1493	1576		
	385	575	480	720						
100% FULFILLED						**100%**	**100%**	**100%**	300%	SECTIONAL PERCENT (TOTAL/8)
80% FULFILLED					**80%**				80%	
ACTUAL % IF BELOW 80% VALUE									0%	
								TOTAL	380%	**95%**

255 vph

B. MINOR STREET BOTH APPROACHES	180	255	180	255	223	566	627	617	TOTAL ACROSS	
	95*	135*	95*	135*						
100% FULFILLED						**100%**	**100%**	**100%**	300%	SECTIONAL PERCENT (TOTAL/8)
80% FULFILLED					**80%**				80%	
ACTUAL % IF BELOW 80% VALUE									0%	
								TOTAL	380%	**95%**

*FOR 'T' INTERSECTIONS THESE VALUES SHOULD BE INCREASED BY 50%

WARRANT 2- DELAY TO CROSS TRAFFIC

	YES	NO
100% SATISFIED		No
80% SATISFIED		No

	MINIMUM REQUIREMENTS (80% SHOWN BELOW)				PERCENTAGE WARRANT 900 vph					
APPROACH LANES	1		2 or more		HOUR					
FLOW CONDITION	FREE FLOW	RESTRICTED FLOW	FREE FLOW	RESTRICTED FLOW	07:00-8:00	08:00-9:00	16:00-17:00	17:00-18:00	TOTAL ACROSS	
				1						
A. MAJOR STREET BOTH APPROACHES	480	720	600	900	551	663	866	959		
	385	575	480	720						
100% FULFILLED								**100%**	100%	SECTIONAL PERCENT (TOTAL/8)
80% FULFILLED							**80%**		80%	
ACTUAL % IF BELOW 80% VALUE					**61%**	**74%**			135%	
								TOTAL	315%	**79%**

75 vph

B. TRAFFIC CROSSING MAJOR STREET	50	75	50	75	68	135	115	145	TOTAL ACROSS	
	40	60	40	60						
100% FULFILLED						**100%**	**100%**	**100%**	300%	SECTIONAL PERCENT (TOTAL/8)
80% FULFILLED					**80%**				80%	
ACTUAL % IF BELOW 80% VALUE									0%	
								TOTAL	380%	**95%**

Combination Warrant Satisfied		**No**

TRAFFIC SIGNAL WARRANT ANALYSIS FORM FOR INTERSECTION CONTROL

Minimum warrants for installation of traffic signals for roadways with two or more lanes.

Free Flow Conditions (rural)		Major Stree	North Service Rd/Kerr St	No. of Lanes per direction:	2
Restricted Flow Conditions (urba	Y	Minor Stree	QEW Ramp	(not including turning lanes)	
Is this a Tee Intersection (Y or ')	Y	Count Date:	2028 Future Back(		

WARRANT 1 - MINIMUM VEHICULAR VOLUME

	YES	NO
100% SATISFIED	Yes	
80% SATISFIED	Yes	

	MINIMUM REQUIREMENTS (80% SHOWN BELOW)				PERCENTAGE WARRANT 900 vph					
APPROACH LANES	1		2 or more		HOUR					
FLOW CONDITION	FREE FLOW	RESTRICTED FLOW	FREE FLOW	RESTRICTED FLOW	07:00-08:00	08:00-09:00	16:00-17:00	17:00-18:00	TOTAL ACROSS	
				1						
A. ALL APPROACHES	480	720	600	900	929	1475	1792	1891		
	385	575	480	720						
100% FULFILLED					100%	100%	100%	100%	400%	SECTIONAL PERCENT (TOTAL/8)
80% FULFILLED									0%	
ACTUAL % IF BELOW 80% VALUE									0%	
								TOTAL	400%	100%

255 vph

B. MINOR STREET BOTH APPROACHES	180	255	180	255	268	679	752	740	TOTAL ACROSS	
	95*	135*	95*	135*						
100% FULFILLED					100%	100%	100%	100%	400%	SECTIONAL PERCENT (TOTAL/8)
80% FULFILLED									0%	
ACTUAL % IF BELOW 80% VALUE									0%	
								TOTAL	400%	100%

*FOR 'T' INTERSECTIONS THESE VALUES SHOULD BE INCREASED BY 50%

WARRANT 2- DELAY TO CROSS TRAFFIC

	YES	NO
100% SATISFIED		No
80% SATISFIED	Yes	

	MINIMUM REQUIREMENTS (80% SHOWN BELOW)				PERCENTAGE WARRANT 900 vph					
APPROACH LANES	1		2 or more		HOUR					
FLOW CONDITION	FREE FLOW	RESTRICTED FLOW	FREE FLOW	RESTRICTED FLOW	07:00-8:00	08:00-9:00	16:00-17:00	17:00-18:00	TOTAL ACROSS	
				1						
A. MAJOR STREET BOTH APPROACHES	480	720	600	900	661	796	1040	1151		
	385	575	480	720						
100% FULFILLED							100%	100%	200%	SECTIONAL PERCENT (TOTAL/8)
80% FULFILLED						80%			80%	
ACTUAL % IF BELOW 80% VALUE					73%				73%	
								TOTAL	353%	88%

75 vph

B. TRAFFIC CROSSING MAJOR STREET	50	75	50	75	82	162	138	174	TOTAL ACROSS	
	40	60	40	60						
100% FULFILLED					100%	100%	100%	100%	400%	SECTIONAL PERCENT (TOTAL/8)
80% FULFILLED									0%	
ACTUAL % IF BELOW 80% VALUE									0%	
								TOTAL	400%	100%

Combination Warrant Satisfied Yes

EXISTING CONDITIONS

HOUR ENDING	A) All Approaches	B) Minor Approaches	C) Major approaches	D) Crossing Volume	WEST APPROACH EASTBOUND			EAST APPROACH WESTBOUND			SOUTH APPROACH NORTHBOUND		
					TOTAL			TOTAL			TOTAL		
					Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
8:00:00 AM	774	223	551	68	0	389	0	0	162	0	68	0	155
9:00:00 AM	1229	566	663	135	0	587	0	0	299	0	135	0	208
5:00:00 PM	1493	627	866	115	0	485	0	0	724	0	115	0	169
6:00:00 PM	1576	617	959	145	0	446	0	0	797	0	145	0	188

FUTURE BACKGROUND 2028 CONDITIONS

1.2

HOUR ENDING	A) All Approaches	B) Minor Approaches	C) Major approaches	D) Crossing Volume	WEST APPROACH EASTBOUND			EAST APPROACH WESTBOUND			SOUTH APPROACH NORTHBOUND		
					TOTAL			TOTAL			TOTAL		
					Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
8:00:00 AM	929	268	661	82	0	467	0	0	194	0	82	0	186
9:00:00 AM	1475	679	796	162	0	704	0	0	359	0	162	0	250
5:00:00 PM	1792	752	1039	138	0	582	0	0	869	0	138	0	203
6:00:00 PM	1891	740	1151	174	0	535	0	0	956	0	174	0	226

SITE TRAFFIC

HOUR ENDING	A) All Approaches	B) Minor Approaches	C) Major approaches	D) Crossing Volume	WEST APPROACH EASTBOUND			EAST APPROACH WESTBOUND			SOUTH APPROACH NORTHBOUND		
					TOTAL			TOTAL			TOTAL		
					Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
8:00:00 AM	0	0	0	0									
9:00:00 AM	0	0	0	0									
5:00:00 PM	0	0	0	0									
6:00:00 PM	0	0	0	0									

FUTURE TOTAL 2028 CONDITIONS

HOUR ENDING	A) All Approaches	B) Minor Approaches	C) Major approaches	D) Crossing Volume	WEST APPROACH EASTBOUND			EAST APPROACH WESTBOUND			SOUTH APPROACH NORTHBOUND		
					TOTAL			TOTAL			TOTAL		
					Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
8:00:00 AM	929	268	661	82	0	467	0	0	194	0	82	0	186
9:00:00 AM	1475	679	796	162	0	704	0	0	359	0	162	0	250
5:00:00 PM	1792	752	1039	138	0	582	0	0	869	0	138	0	203
6:00:00 PM	1891	740	1151	174	0	535	0	0	956	0	174	0	226