Caledon Terra Investments (Mayfield West)

Town of Caledon

Draft Plan of Subdivision

TRANSPORTATION IMPACT STUDY

17161/200 October 2016

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October 14, 2016 Our Ref.: 17161/200

Mr. Paulo Da Silva
Caledon Terra Investments
c/o Melrose Investments Inc.
145 Reynolds Street, Suite 400
Oakville, ON
L6J 0A7

Dear Mr. Da Silva:

Re: Transportation Impact Study
Draft Plan of Subdivision, Caledon Terra (Mayfield West)
2256 Mayfield Road, Town of Caledon

LEA Consulting Ltd. is pleased to present the findings of our Transportation Impact Study for the proposed draft plan of subdivision for the Caledon Terra Investments Property in the Mayfield West area of the Town of Caledon. This report concludes that the traffic associated with the proposed development will have minimal traffic impact to surrounding road network.

Should you have any question regarding this Transportation Impact Study, please do not hesitate to contact the undersigned.

Yours very truly,

LEA Consulting Ltd.

Nixon Chan, M.A.Sc., P.Eng., PTOE, PMP
Senior Project Manager

Jillian Britto, B.A.Sc., EIT
Transportation EIT

Encl.: Transportation Impact Study – Caledon Terra Investments (Mayfield West)

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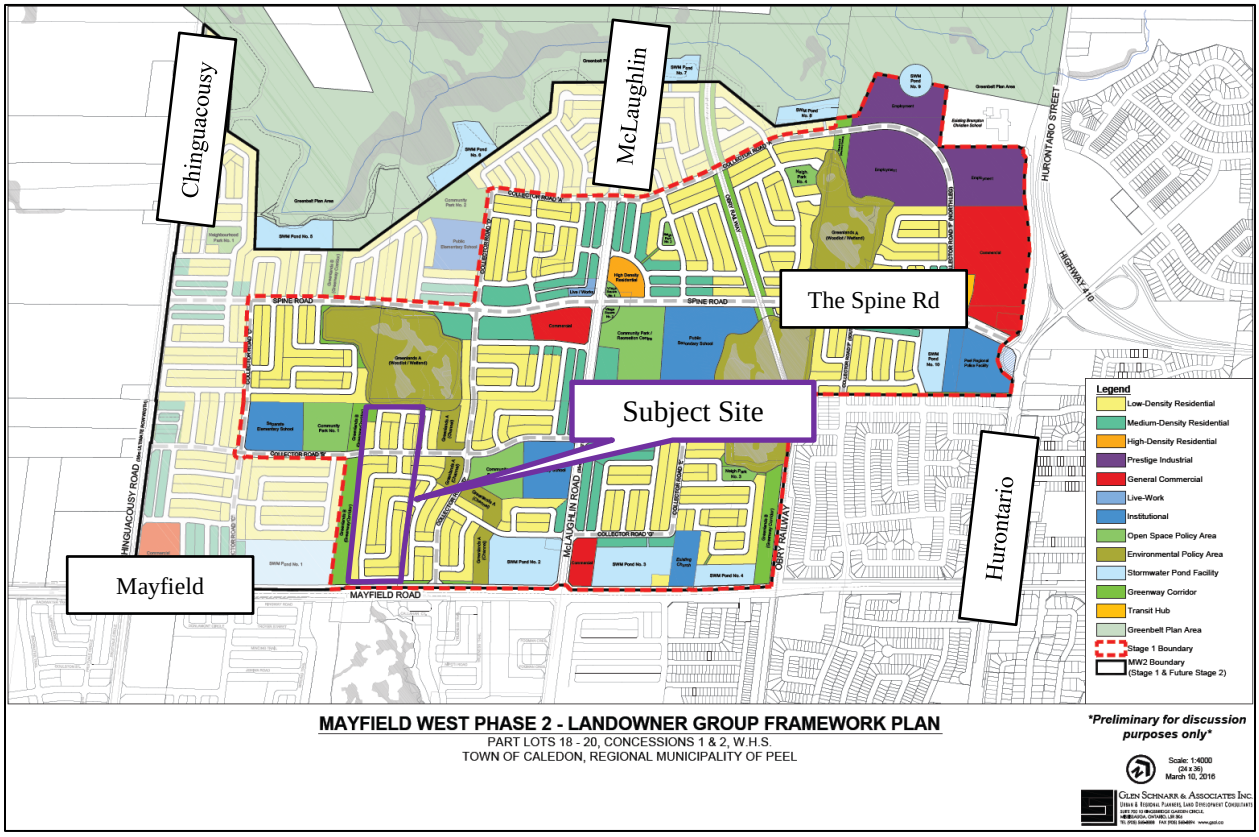
1.0 INTRODUCTION

LEA Consulting Ltd. (LEA) has been retained by Caledon Terra Investments to prepare a Transportation Impact Study (TIS) in support of a Draft Plan of Subdivision application for the property known as Caledon Terra (Mayfield West) in the Mayfield West Phase 2 (MW2) Secondary Plan Area. **Figure 1.1** illustrates the Landowner Group Framework Plan (compiled draft plans) for MW2 with roads intersecting at right angles, which is good roadway design. The development is to occur within the approved Stage 1 area of the MW 2 Secondary Plan.



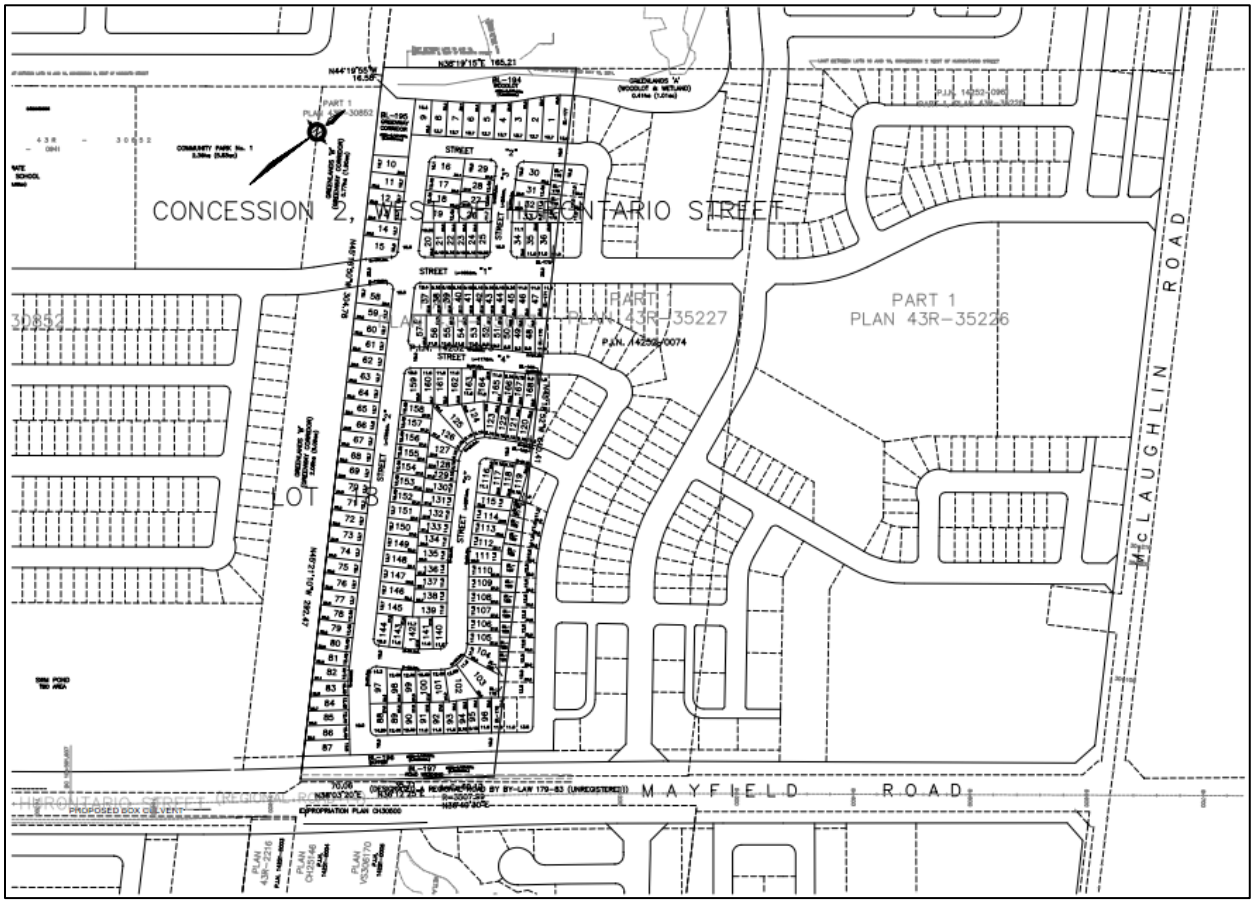
Source: Glen Schnarr, March 10, 2016

Figure 1.1: Subject Site

LEA completed the development of a mesoscopic transportation model in the Aimsun traffic modeling software in March 2015, for the purposes of assessing the impacts of the MW2 Secondary Area Plan development on the surrounding road network and the Hwy10/Hwy410 interchange. The results of that analysis have been utilized as a supplement to the MW2 Transportation Master Plan (MW2 TMP), recently presented to the Town of Caledon Council. This supplemental work demonstrated that MW2 Stage 1 could proceed without the need for any additional road network improvements beyond those planned for 2031 in the MW2 TMP. The road network improvements prescribed in the MW2 TMP includes the planned widening of Mayfield Road from two to four lanes. The analysis showed that further development could also occur beyond Stage 1, with critical movements remaining within the planned capacity of the road network, and with a future connection from The Spine Road to the Hwy10/Hwy410 interchange operating well.

Since the March 2015 analysis supplement to the MW2 TMP demonstrated that all key intersections in the study area surrounding MW2 operated well, the purpose of the present study is to assess in further detail the operations of existing and future intersections directly affected by the development of the Caledon Terra (Mayfield West) property. This detailed assessment will therefore focus on McLaughlin Road, north of Mayfield Road, and Mayfield Road east of Chinguacousy Road.

The proposed development, as illustrated in **Figure 1.2**, will include an approximate total of 180 single-detached residential units.



Source: KLM Planning Partners Inc., August 9, 2016

Figure 1.2: Proposed Draft Plan

2.0 EXISTING TRAFFIC CONDITIONS

2.1 ROAD NETWORK

The MW2 Secondary Plan Area is bounded by Chinguacousy Road, Mayfield Road, Hurontario Road/Hwy 10, and the Etobicoke Creek. These roads and the future MW2 internal road network will form the basis of this analysis. They are described as follows:

- Mayfield Road is a regional road which has a two-lane cross-section west of Heart Lake Road with a posted speed of 60 km/h, and has a four-lane cross-section east of Heart Lake Road with a posted speed of 70 km/h;
- McLaughlin Road, is a major arterial road under the jurisdiction of the Town of Caledon with a two-lane cross-section and a posted speed of 60 km/h; and
- Chinguacousy Road is an arterial road under the jurisdiction of the Town of Caledon with a two-lane cross-section and a posted speed of 70 km/h. South of Wanless Drive, the road widens to a four-lane cross-section.

The study area includes the following existing intersections, with the existing lane configurations illustrated in **Figure 2.1**:

- Old School Road and McLaughlin Road;
- Mayfield Road and Chinguacousy Road; and
- Mayfield Road and McLaughlin Road.

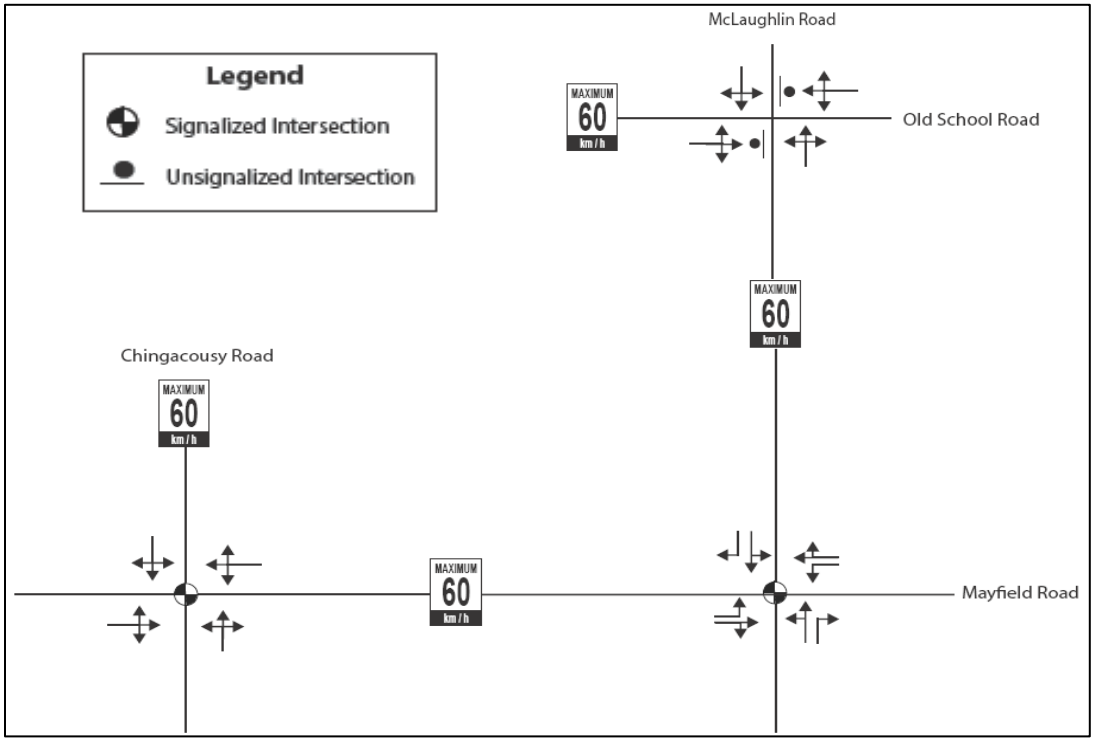


Figure 2.1: Existing Lane Configurations

2.2 TRANSIT

The study area is currently serviced by the Brampton Transit route 24, which extends north of Mayfield Road on Robertson Davies Drive, and loops back south on Hurontario Street via Collingwood Avenue. Additionally, GO Transit operates the Orangeville-Brampton GO Bus along Hurontario Street/Hwy 10, with a stop at Heart Lake Town Centre. The extent of this coverage is illustrated in **Figure 2.2**.

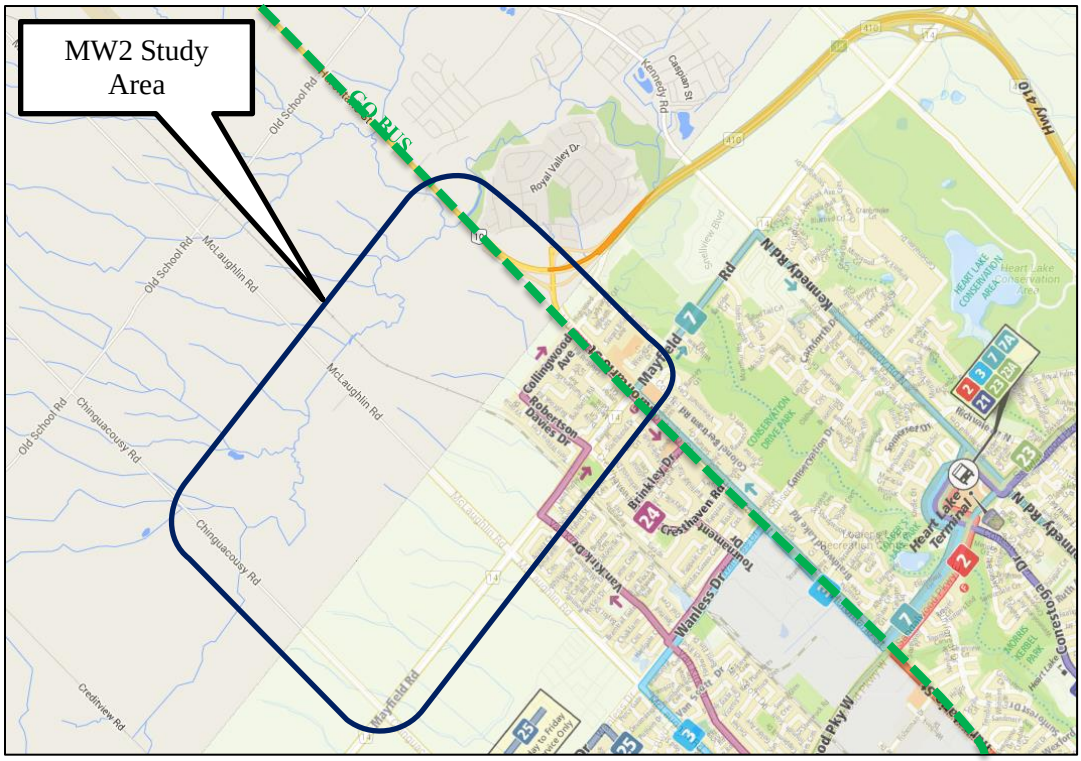


Figure 2.2: Existing Transit Services

2.3 INTERSECTION CAPACITY ANALYSIS

As part of the supplemental work to the MW2 TMP, LEA collected updated turning movement counts (TMC) and produced a comprehensive analysis of existing travel patterns in the extended study area of that study. Intersection capacity analyses at the signalized intersections within the extended study area of that work had demonstrated that there is some residual capacity in the study area road network around MW2.

The 2016 traffic volumes at the intersections within the existing study area of this study are presented in **Figure 2.3**.

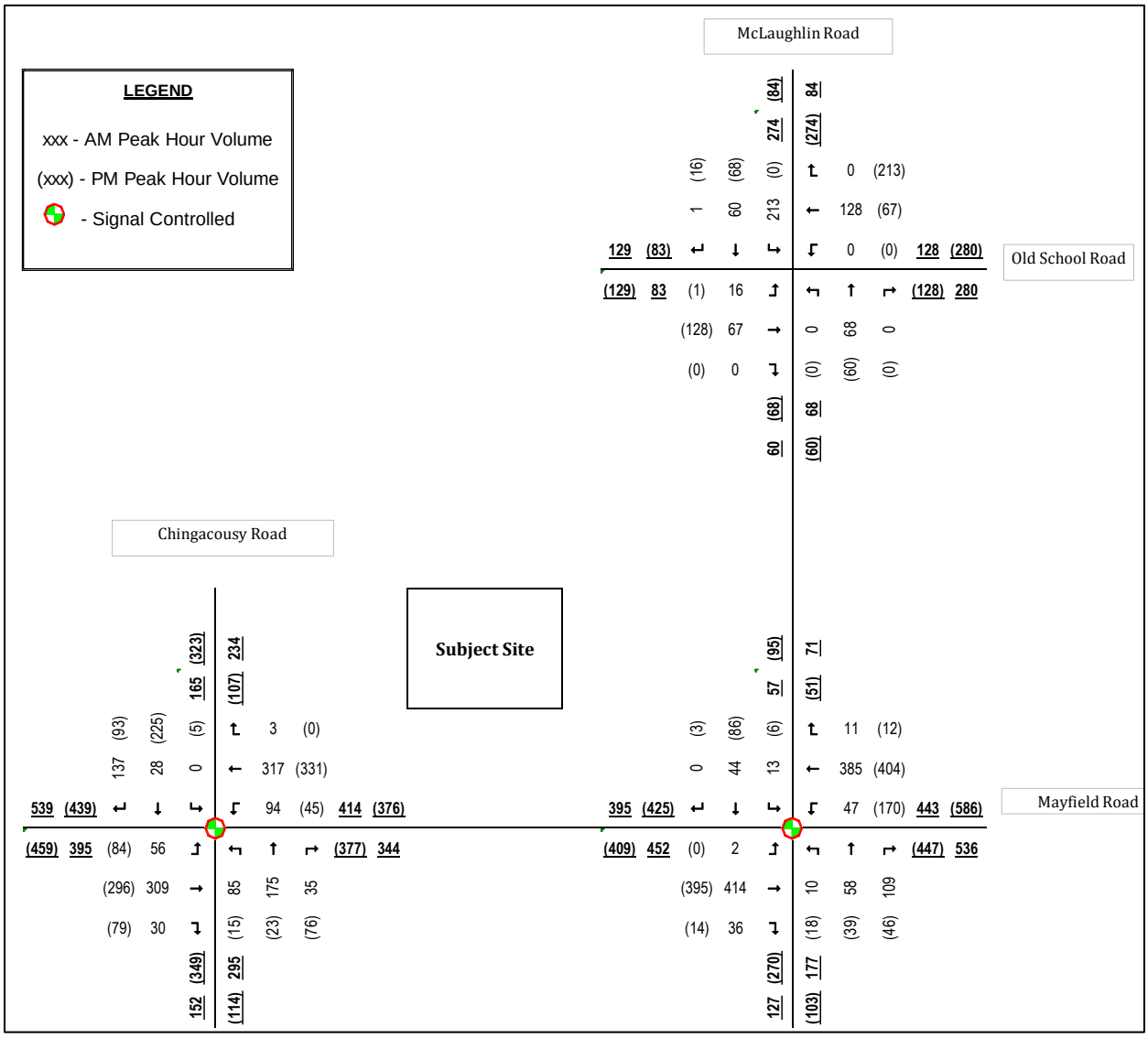


Figure 2.3: Existing Traffic Volumes

Intersection capacity analyses were undertaken for the signalized Chinguacousy/Mayfield and McLaughlin/Mayfield intersections, as the two intersections most likely to be affected by development of the Caledon Terra Lands, with the movements of interest (movements with either a volume-to-capacity (v/c) ratio of 0.85 and higher or a level of service (LOS) of D and higher) summarized in **Table 2.1**. Detailed capacity analysis outputs are provided in **Appendix A**.

Intersection	AM Peak Hour								
	Overall			Movement	V/C	Delay (s)	LOS	Queue (m)	
	V/C	Delay (s)	LOS					50th	95th
Chinguacousy Rd & Mayfield Rd	0.57	38	D	WBLTR	0.86	60	E	70	96
McLaughlin Rd & Mayfield Rd	0.32	18	B	-	-	-	-	-	-
Intersection	**PM Peak Hour**								
	Overall			Movement	V/C	Delay (s)	LOS	Queue (m)	
	V/C	Delay (s)	LOS					50th	95th
Chinguacousy Rd & Mayfield Rd	0.56	37	D	-	-	-	-	-	-
McLaughlin Rd & Mayfield Rd	0.34	18	B	-	-	-	-	-	-

Table 2.1: Existing Signalized Intersection LOS Summary

During both the AM and PM peak hours, the Chinguacousy / Mayfield intersection operates with very good overall level of service (LOS) and with reserve capacity (v/c ratios of below 1.0). We note that the westbound approach may occasionally queue to approximately 70 meters, which is equivalent to approximately 10 vehicles, but these queues clear within one signal cycle. The McLaughlin / Mayfield intersection is observed to operate similarly, with very short overall delays.

These results underscore the significant east-west movement on Mayfield Road through the study area as an established regional travel pattern.

3.0 FUTURE TRAFFIC CONDITIONS

3.1 METHODOLOGICAL APPROACH

In order to ascertain the impacts of developing the subject property, LEA investigated the operation of the MW2 road network under two future total development scenarios:

- 2017 Opening Day: corresponding with the opening day of the Caledon Terra (Mayfield West) property before development of the rest of MW2 Stage 1; and
- 2021 Full Build-Out of MW2 Stage 1.

This study generally follows the methodology set out by LEA in its March 2015 *Transportation Assessment Study: Proposed Interchange Modifications & Responses to MTO/Peel Region Comments*, which developed a mesoscopic Aimsun traffic model to test the proposed road network under Stage 1 and Stage 2 development of the MW2 community, and modifications of the Hwy10/Hwy410 interchange. The present methodology refines the MW2 zonal system used in the earlier model, and expands on the trip generation assumptions.

Subsequent to the Aimsun mesoscopic modeling, the key intersections most likely to be affected by the Caledon Terra (Mayfield West) development were analyzed in the Synchro 8 intersection capacity analysis software. This analysis follows the methodology of the Highway Capacity Manual 2000, and provides microscopic assessment of operations at signalized and unsignalized intersections. This analysis forms the basis of our assessment of the impacts associated with the development of the Caledon Terra (Mayfield West) property.

3.2 ROAD IMPROVEMENTS

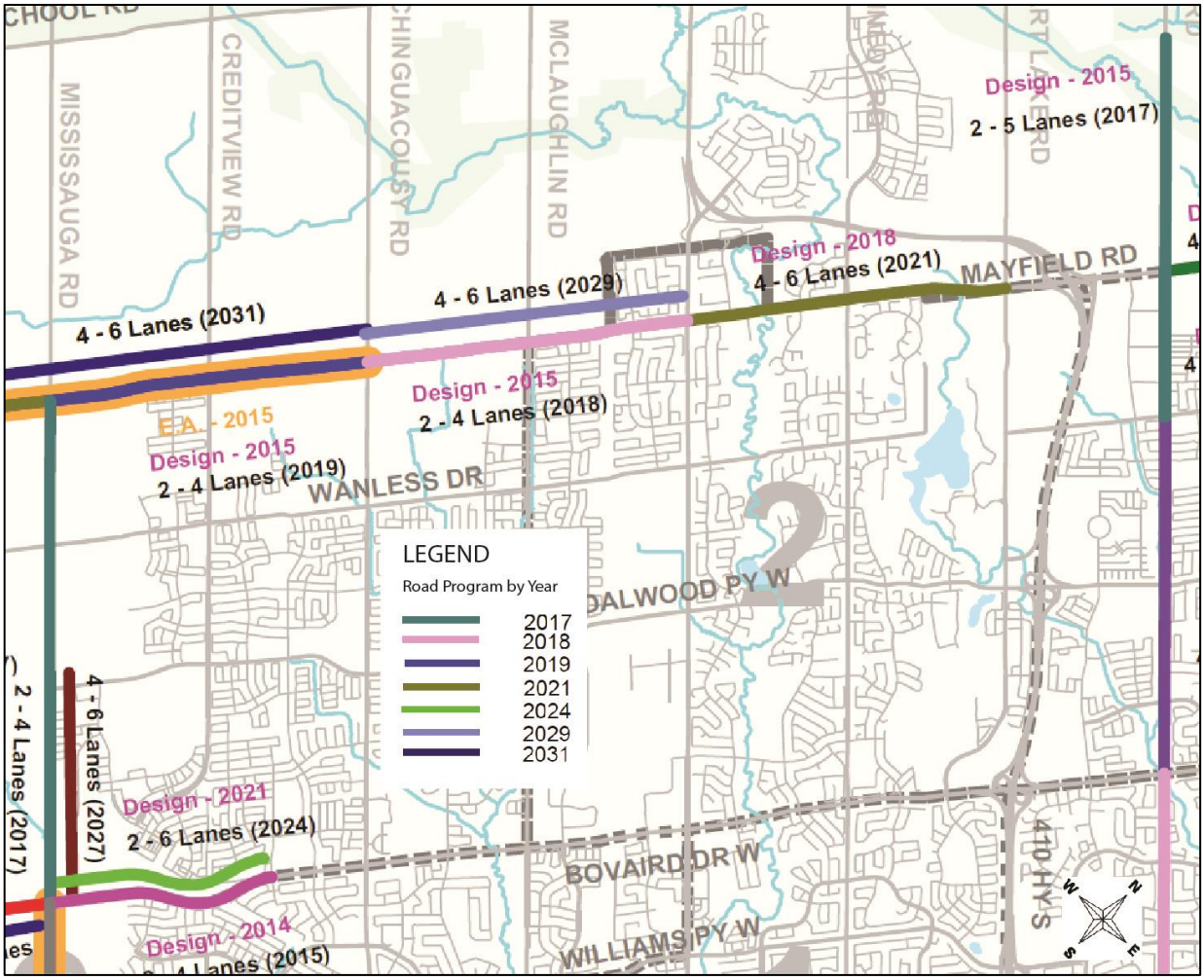
3.2.1 2017 Opening Day

Mayfield Road is currently being widened from two to four lanes between Hurontario Street and McLaughlin Road, and is expected to be completed by 2017.

Currently, the intersection of Chinguacousy Road and Mayfield Road does not have turning lanes. While the intersection capacity analysis may reveal capacity constraints on left and right-turning movements with this existing configuration, it is expected that the introduction of any auxiliary turning lanes would only be carried out as part of the completion of the planned widening of Mayfield Road from Mississauga Road to McLaughlin Road by 2019.

3.2.2 2021 Full Build-Out of MW2 Stage 1

Review of planned road improvements suggests that by 2021 Mayfield Road is planned for widening from four to six lanes east of Hurontario Street. At the same time, widening from two to four lanes will continue west of McLaughlin Road to Chinguacousy Road (see **Figure 3.1**).



Source: Region of Peel Funding Program, January 2015

Figure 3.1: Planned Road Improvements

The timing of an additional widening planned for *Chinguacousy Road* from two to four lanes between Wanless Drive and Mayfield Road is unknown at this time but has been assumed to be completed by 2021. While an Environmental Assessment (EA) process has been recommended for the future widening of Chinguacousy Road north of Mayfield Road to The Spine Road, no timeline for that study has been put forth to-date, due to uncertainty of future development on the west side of the road. This present analysis has therefore left out future widening of Chinguacousy Road north of Mayfield Road.

LEA's March 2015 supplemental work to the MW2 TMP assumed that the proposed east-west The Spine Road through the MW2 community would terminate at an intersection with Hurontario Street/Hwy 10 and the Highway 410 interchange. A design concept for that intersection was produced (see **Figure 3.2**). The present analysis has been carried out under the assumption that this intersection would be completed by the 2021 horizon year.

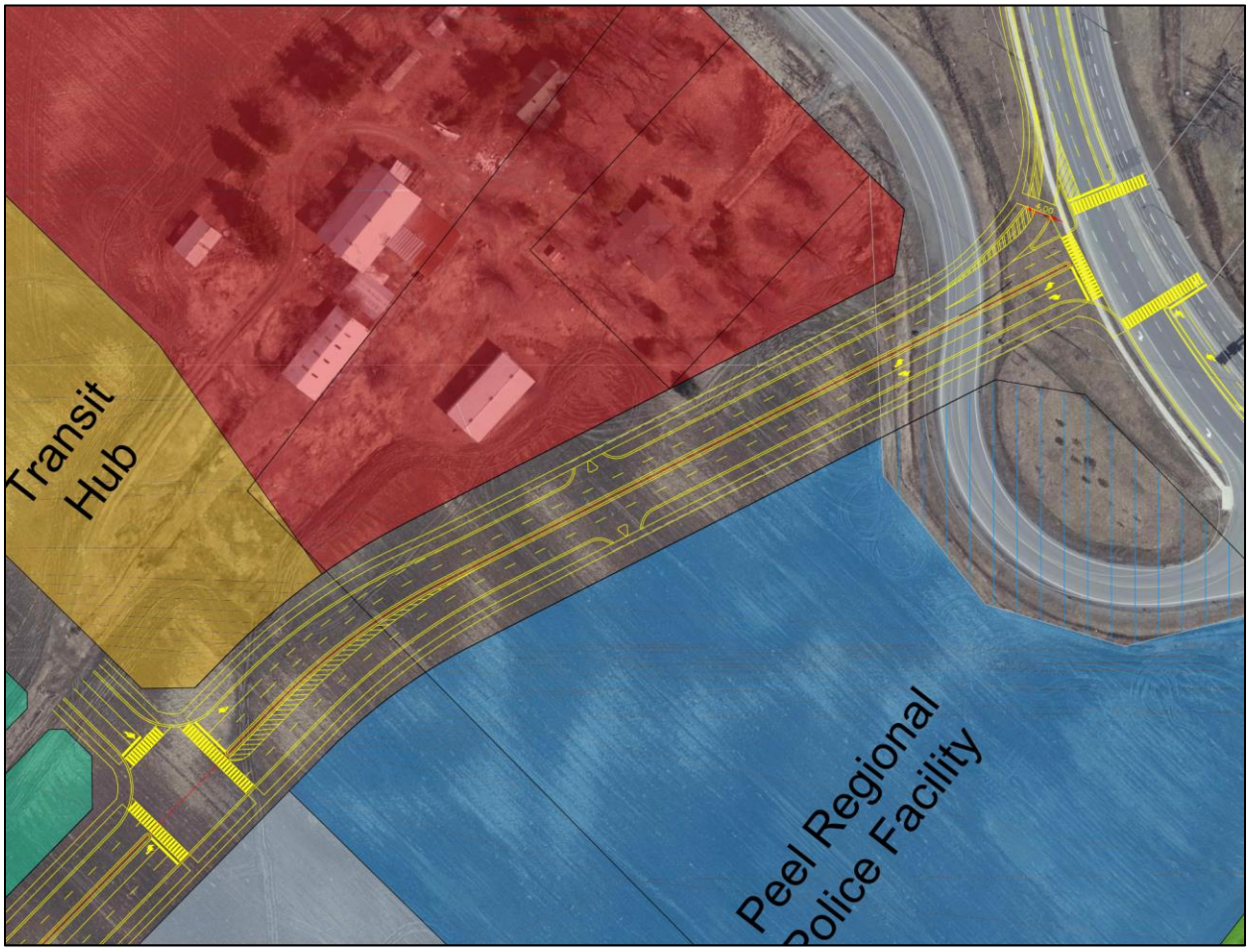


Figure 3.2: Conceptual Spine Road Intersection (2021)

3.3 SITE TRIP GENERATION

3.3.1 Residential Trip Generation

While consistent with LEA's March 2015 supplemental modeling work, this present study deviates from the earlier methodology in that the trip generation is consistent with the trip forecasts presented by Paradigm Consulting in their MW2 TMP.

LEA's March 2015 analysis was based on Peel Region's Regional EMME transportation model. That model uses population and employment forecasts to estimate existing and future travel demand across the Greater Toronto Area (GTA). The model is calibrated to the 2011 Transportation Tomorrow Survey (TTS) travel information data, and its replication of existing travel patterns throughout the GTA is well accepted by Peel Region and other public sector authorities like the Ontario Ministry of Transportation (MTO). It was therefore considered to be the most applicable model for regional transportation analysis.

Paradigm's approach to the MW2 TMP relied on trip generation rates for different land uses, as published by the Institute of Transportation Engineers (ITE) Trip Generation Manual. Those trip generation rates are based on a series of surveys conducted regularly across the United States, which report the number of trips generated to the size of the surveyed land use in terms of units, square footage, or number of employees. While they cover a broad range of different land uses and provide an accepted estimate of their trip generation, the ITE rates are subject to travel patterns and behaviour in parts of the United States with a more suburban, auto-centric character. The results of those surveys cover a very wide range, occasionally with very high standard deviations and relatively poor correlations between the size of the land use and its trip generation.

In comparing the two trip forecasting methods, we found that Paradigm's ITE approach overestimates the number of trips generated by MW2, when compared to LEA's regionally-calibrated model. Specifically, the average ITE auto trip generation rates for residential uses are higher than LEA's auto trip production based on population. The trip forecasting produced for the MW2 TMP may therefore be an overestimation of the actual number of trips likely to be produced in the context of Caledon. Nonetheless, for the purposes of this analysis, we have used Paradigm's ITE trip generation approach, as it represents a worst-case scenario. Furthermore, compliance with the MW2 TMP trip generation method will ensure closer correspondence with past and future studies undertaken in the MW2 context.

At the same time, the Aimsun model developed by LEA is a weekday AM peak period model. In order to review operations in a future weekday PM peak hour, the "mirror effect" was assumed for the new trips generated in the afternoon compared to the morning, i.e. where the afternoon traffic takes the opposite route of the morning traffic.

As per Paradigm's methodology in the MW2 TMP, the trip rate from ITE Land Use Code 210 (Single Family Detached) was used. A 5% modal split reduction was also applied, accounting for the typically lower auto mode split observed in Ontario. The trip generation for the Caledon Terra property is summarized in **Table 3.1** below.

Land Use		AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Single-Family Detached (180 units)	Trip Rate	0.19	0.57	0.76	0.62	0.37	0.99
	New Trips	34	102	136	112	66	178
	Modal Split (5%)	-2	-5	-7	-6	-3	-9
TOTAL NEW TRIPS	**-**	**32**	**97**	**129**	**106**	**63**	**169**

Table 3.1: Trip Forecasts for Caledon Terra (Mayfield West)

The proposed development is expected to produce a total of 129 new trips (32 in, 97 out) during the weekday AM peak hour, and 169 new trips (106 in, 63 out) during the weekday PM peak hour.

3.3.2 Commercial Trip Generation for 2021 Full Build-Out Horizon

Since a large commercial development (661,000 ft²) is planned under full build-out of Stage 1, additional volumes were added in the 2021 horizon to the volumes initially forecasted. It is assumed that the "mirror effect" assumption described previously underestimates travel demand in an area with significant commercial activities. The added trips consist of the residual trips between the weekday PM peak hour trip generation produced by Paradigm, and the mirrored weekday AM peak hour trips. These added trips are summarized in **Table 3.2**. They were distributed on the road network under the 2021 scenario according to existing turning movement volumes during the weekday PM peak hour.

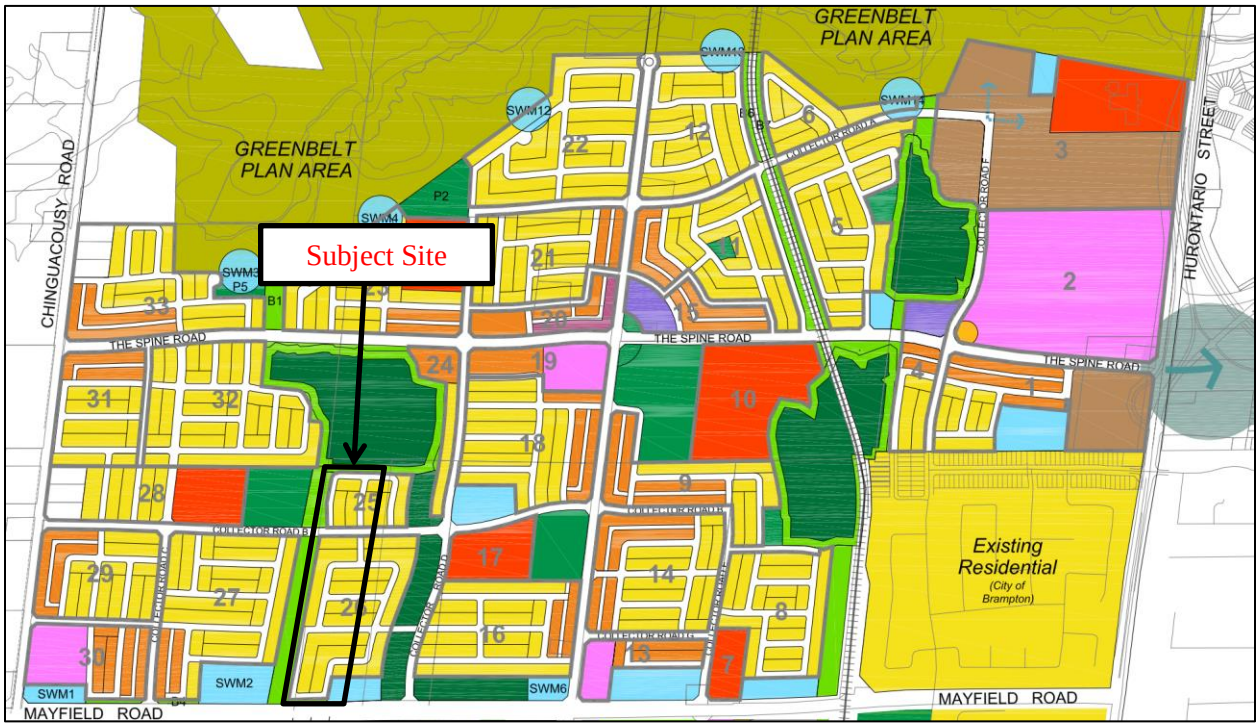
Generator	In	Out	Total
Shopping Centre	401	310	710

Table 3.2: 2021 Commercial Vehicular Trips Generated – PM Peak Hour

The assumptions presented above are considered to be conservative, as the trip generation may overestimate the forecasted travel demand, particularly during the weekday PM peak hour. This overestimation is nonetheless considered acceptable, as it implies assessment of a worst-case scenario.

3.3.3 Zonal System

The model iteration refined for this analysis was developed to assess different development scenarios for MW2. The model's MW2 area was refined to 33 zones, as per Nak Design's community plan (see **Figure 3.3**). These zones correspond to the major development blocks, as outlined by the area's proposed major road network and natural features. The Caledon Terra (Mayfield West) subject property is herein represented partially by zones 25 and 26.



Source: Nak Design, August 29, 2013

Figure 3.3: MW2 Traffic Analysis Zone System

The zonal map illustrated in **Figure 3.3** was prepared on August 29, 2013 utilizing the endorsed Framework Plan. Since then, the Framework Plan and individual draft plans have changed. However, the traffic zones remain consistent with that illustrated in **Figure 3.3.**

3.4 FUTURE TOTAL TRAFFIC CONDITIONS

3.4.1 2017 Opening Day Intersection Capacity Analysis

The Aimsun mesoscopic analysis of the 2017 Opening Day scenario demonstrates that site traffic associated with the development of the Caledon Terra (Mayfield West) property will distribute roughly equally north and south on McLaughlin Road, ultimately destined east on Mayfield Road and south on Hwy 410 (see **Figure 3.4**). This pattern underscores the draw of regional employment centres in Bolton, Brampton, and Mississauga.

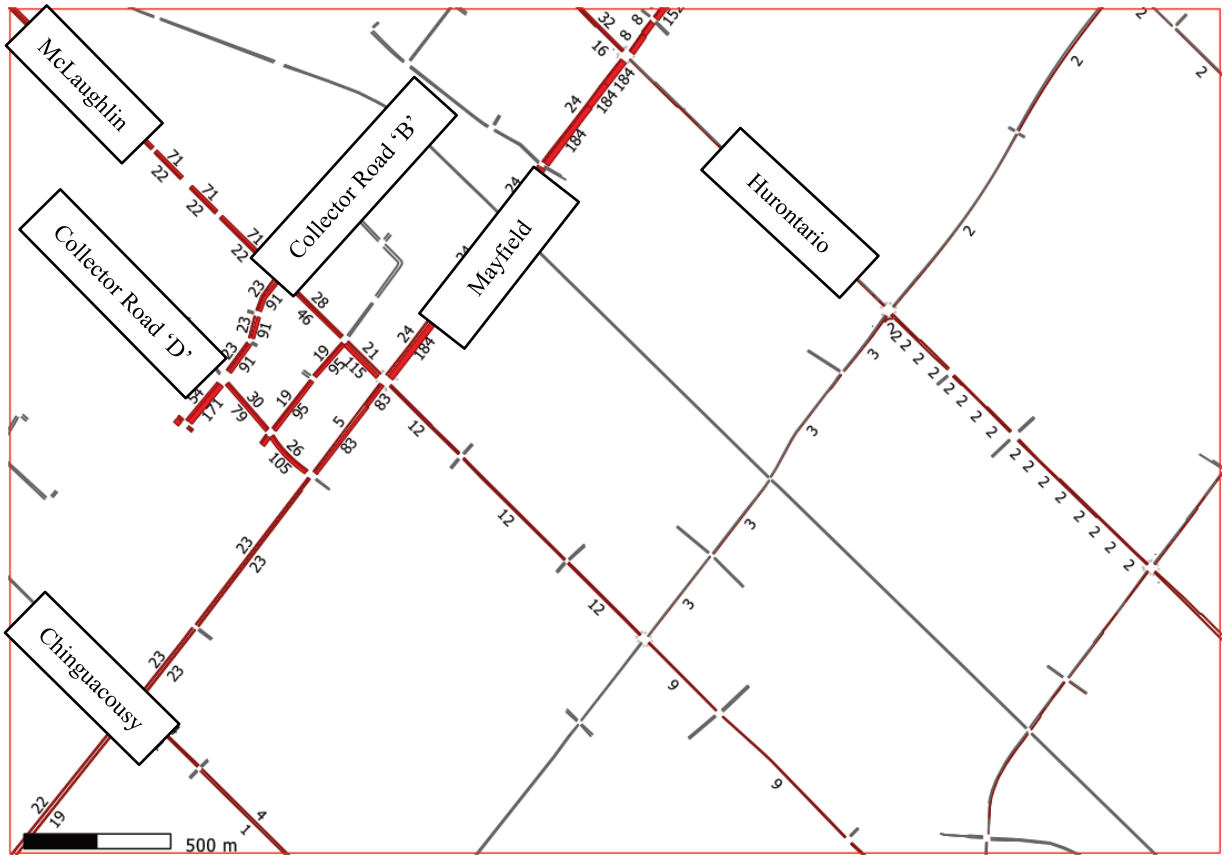


Figure 3.4: Site Trip Assignment – 2017 Opening Day Scenario – Weekday AM Three-Hour Volumes

The trip assignment resulting from the Aimsun Mesoscopic model suggests that impacts associated with the development of Caledon Terra (Mayfield West) will be localized along McLaughlin Road and Mayfield Road, with accesses provided via Street 'A'/Collector Road 'D' and Collector Road 'B'. Synchro capacity analysis will therefore focus on the following intersections:

- Old School Road and McLaughlin Road;
- Mayfield Road and Chinguacousy Road;
- Mayfield Road and McLaughlin Road;
- Mayfield Road and Street 'A'/Collector Road 'D';
- McLaughlin Road and Collector Road 'B'; and
- Collector Road 'B' and Street 'A'/Collector Road 'D'.

The lane configurations and traffic volumes at the above-noted intersections under opening day conditions are illustrated in **Figure 3.5** and **Figure 3.6**, respectively.

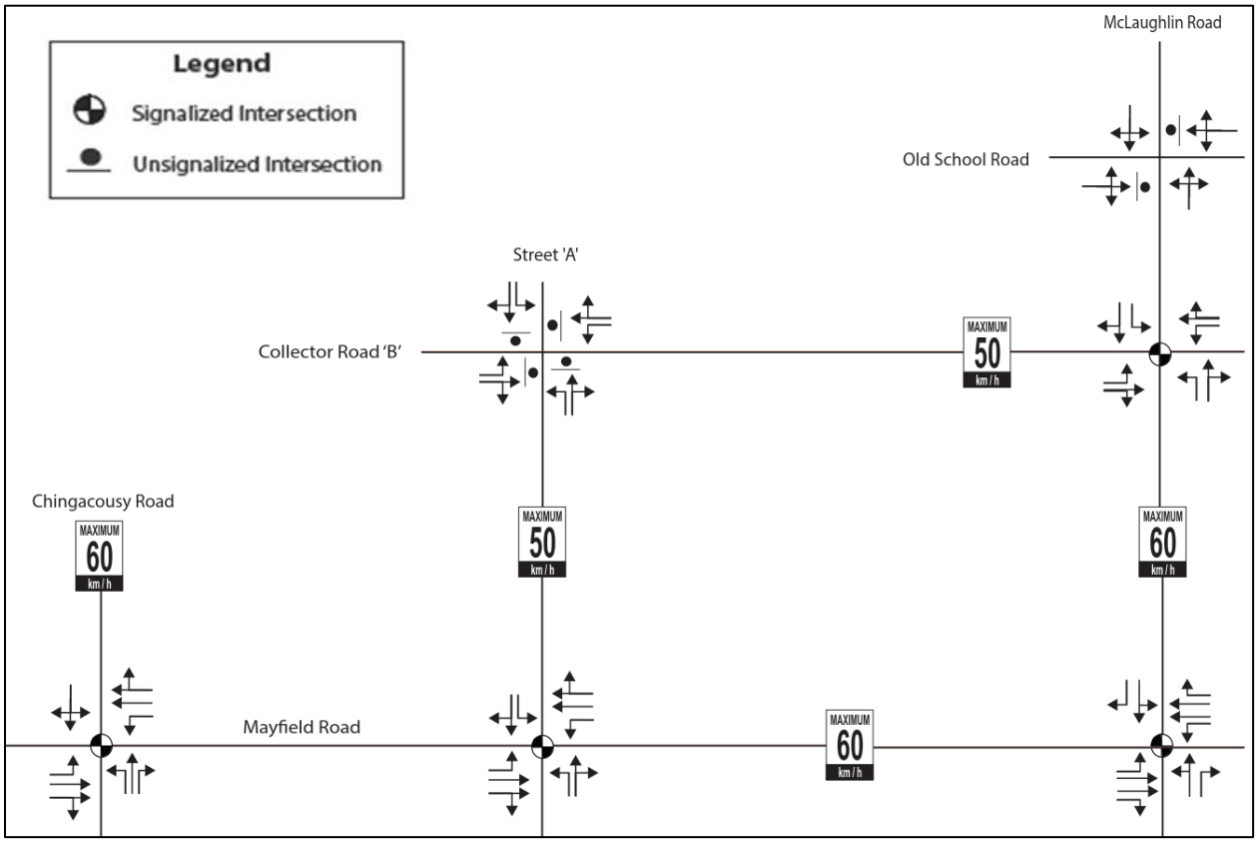


Figure 3.5: 2017 Opening Day Lane Configuration

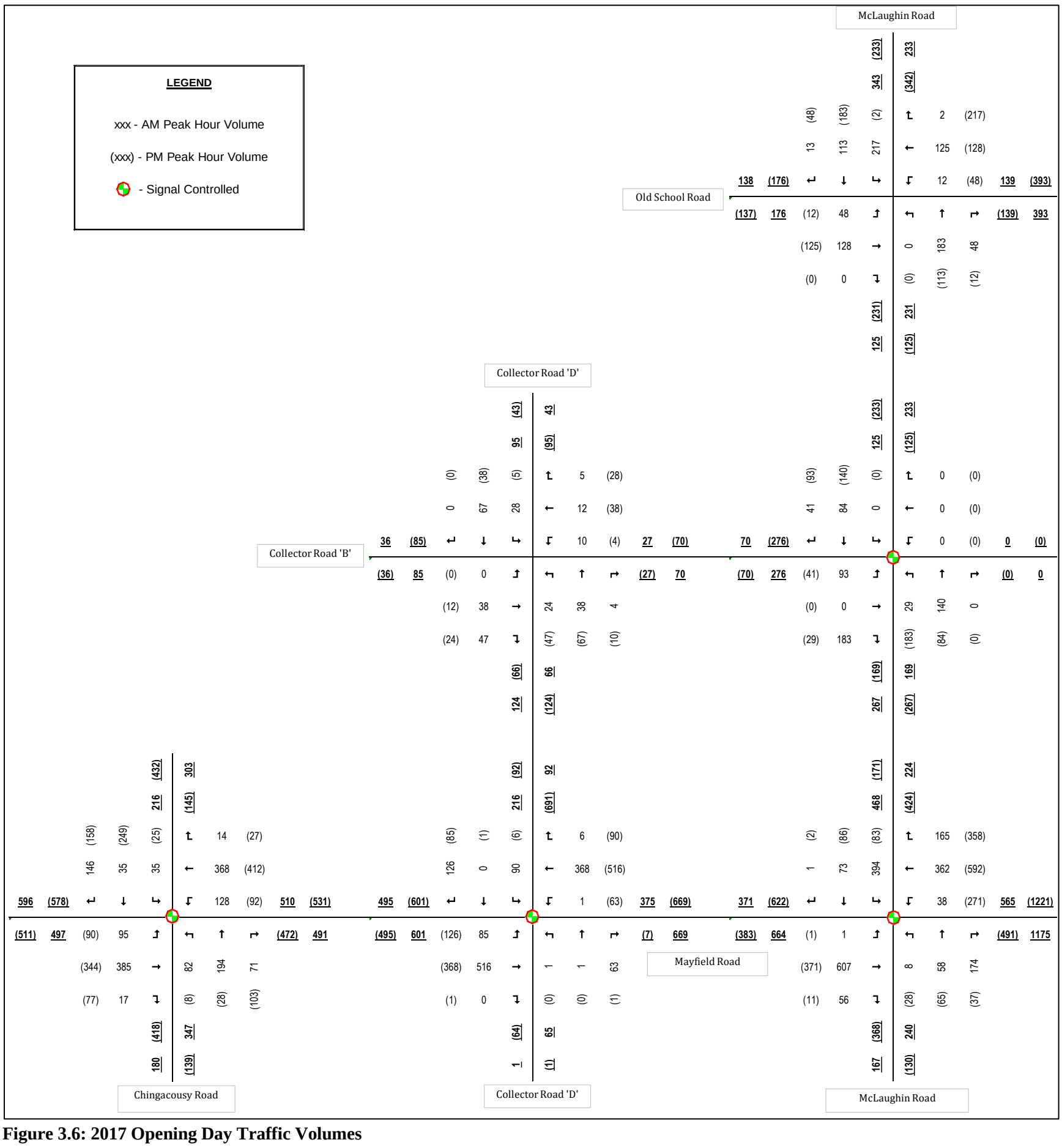


Figure 3.6: 2017 Opening Day Traffic Volumes

An intersection capacity analysis was completed for future traffic conditions under the 2017 Opening Day scenario for the AM and PM peak hours, with the movements of interest (movements with either a v/c ratio of 0.85 and higher or a LOS of D and higher) for the signalized and unsignalized intersections summarized in **Table 3.3** and **Table 3.4**, respectively. Detailed outputs are provided in **Appendix B**.

Intersection	Weekday AM Peak Hour								
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
								50th	95th
Chinguacousy Rd & Mayfield	0.70	33	C	WBLTR	0.85	41	D	84	157
McLaughlin Rd & Mayfield	0.58	92	F	SBT	1.59	327	F	~157	#220
McLaughlin Rd & Collector Road B	0.18	10	A	-	-	-	-	-	-
Collector Road D/Street A & Mayfield	0.46	19	B	-	-	-	-	-	-
Intersection	**Weekday PM Peak Hour**								
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
								50th	95th
Chinguacousy Rd & Mayfield	0.70	35	C	-	-	-	-	-	-
McLaughlin Rd & Mayfield	0.42	26	C	WBR	0.24	59	E	29	50
				SBT	0.77	64	E	38	#65
McLaughlin Rd & Collector Road B	0.24	5	A	-	-	-	-	-	-
Collector Road D/Street A & Mayfield	0.44	11	B	-	-	-	-	-	-

Table 3.3: 2017 Opening Day Signalized Intersection LOS Summary

Intersection	Movement of Interest	AM Peak Hour					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
McLaughlin Rd & Old School Rd	EBLTR	176	232	57	41	0.76	F
	WBLTR	139	265	33	21	0.52	D

Table 3.4: 2017 Opening Day Unsignalized Intersection LOS Summary

The analysis demonstrates that all signalized intersections are expected to operate at good to acceptable LOS under the opening day traffic conditions during the AM and PM peak hours with minimal delays with the exception of the southbound through-left movement at the Mayfield/McLaughlin intersection in the AM peak hour.

All unsignalized intersections are also expected to operate at good to acceptable LOS under the opening day traffic conditions during the AM and PM peak hours with minimal delays with the exception of the eastbound approach at the Old School Road/McLaughlin intersection in the AM peak hour. The eastbound approach is expected to experience slightly longer delays.

3.4.2 2017 Opening Day Recommended Intersection Improvements

In order to improve operations at the Mayfield/McLaughlin signalized intersection in the AM peak hour, we recommend optimizing the signal timing plan, which will significantly enhance future operations as shown in **Table 3.5**. Detailed outputs are provided in **Appendix C**.

Intersection	Weekday AM Peak Hour								
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
								50th	95th
McLaughlin Rd & Mayfield	0.58	36	D	WBR	0.11	106	F	22	40
				SBT	0.88	49	D	97	136

Table 3.5: 2017 Signalized Intersection LOS Summary – With Improvements

3.4.3 2017 Opening Day Sensitivity Analysis Intersection Capacity Analysis

According to the Region's capital works program, Mayfield Road is scheduled to be widened from two to four lanes by 2017 and from four to six lanes by 2021. However, the Region is considering moving directly from two to six lanes by 2021, as discussed during the August 3, 2016 meeting, of which minutes are provided in **Appendix D**.

In light of this information, a sensitivity analysis was conducted to examine the impact of delaying the Mayfield Road lane widening project to 2021, with the reassigned traffic volumes provided in **Figure 3.7**.

The results of the intersection capacity analysis for the signalized and unsignalized intersections are provided in **Table 3.6** and **Table 3.7**, respectively, with the movements of interest (movements with either a v/c ratio of 0.85 and higher or a LOS of D and higher). Detailed outputs are provided in **Appendix E**.

Intersection	Weekday AM Peak Hour								
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
								50th	95th
Chinguacousy Rd & Mayfield	0.70	34	C	-	-	-	-	-	-
McLaughlin Rd & Mayfield	0.53	82	F	SBTL	1.48	280	F	~142	#204
McLaughlin Rd & Collector Road B	0.21	10	A	-	-	-	-	-	-
Collector Road D/Street A & Mayfield	0.41	19	B	-	-	-	-	-	-
Intersection	**Weekday PM Peak Hour**								
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
								50th	95th
Chinguacousy Rd & Mayfield	0.71	34	C	-	-	-	-	-	-
McLaughlin Rd & Mayfield	0.37	27	C	WBR	0.21	63	E	30	51
				SBTL	0.76	63	E	36	#60
McLaughlin Rd & Collector Road B	0.24	5	A	-	-	-	-	-	-
Collector Road D/Street A & Mayfield	0.39	11	B	-	-	-	-	-	-

Table 3.6: 2017 Opening Day Sensitivity Analysis Signalized Intersection LOS Summary

Intersection	Movement of Interest	AM Peak Hour					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
McLaughlin Rd & Old School Rd	EBLTR	226	227	105	70	1.00	F
	WBLTR	149	235	43	29	0.63	E

Table 3.7: 2017 Opening Day Sensitivity Analysis Unsignalized Intersection LOS Summary

The analysis demonstrates that the delay in widening Mayfield Road will have minimal impact on the traffic operations for the intersections within the study area as compared to the operations in **Section 3.4.1**. The southbound through-left movement at the Mayfield/McLaughlin intersection will continue to operate over capacity; however, the recommended improvements provided in **Section 3.4.2** will alleviate capacity issues at this intersection.

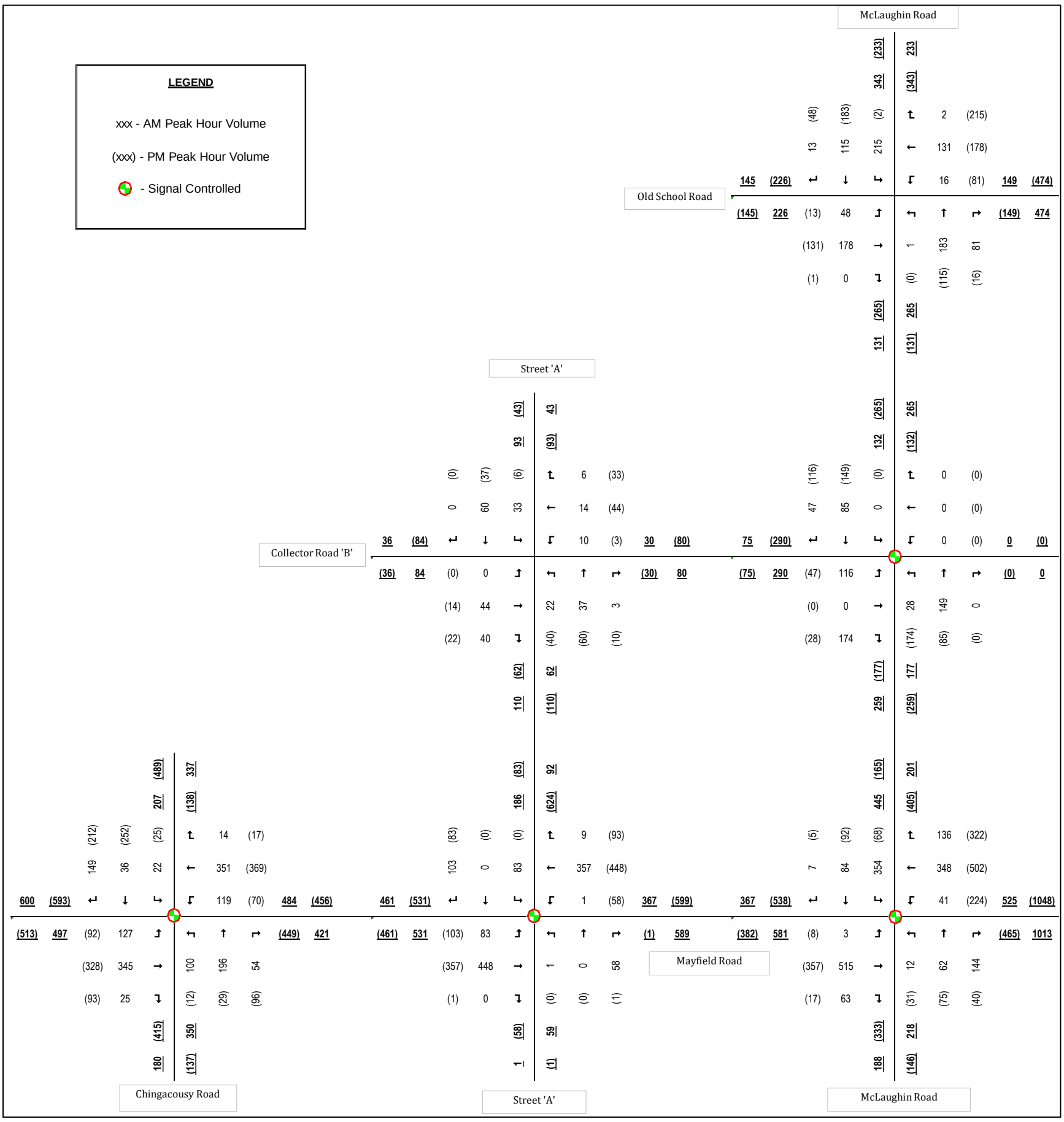


Figure 3.7: 2017 Opening Day Sensitivity Analysis Traffic Volumes

3.4.4 2021 Full Build-Out of MW2 Stage 1 Intersection Capacity Analysis

Under the 2021 Full Build-Out scenario, Aimsun mesoscopic traffic modeling demonstrates that the travel patterns observed under the 2017 scenario will persist, with some redistribution through MW2. Specifically, a higher proportion of trips destined to Hwy 410 will increasingly use The Spine Road through MW2, where previously they routed north via Old School Road (see **Figure 3.8**).

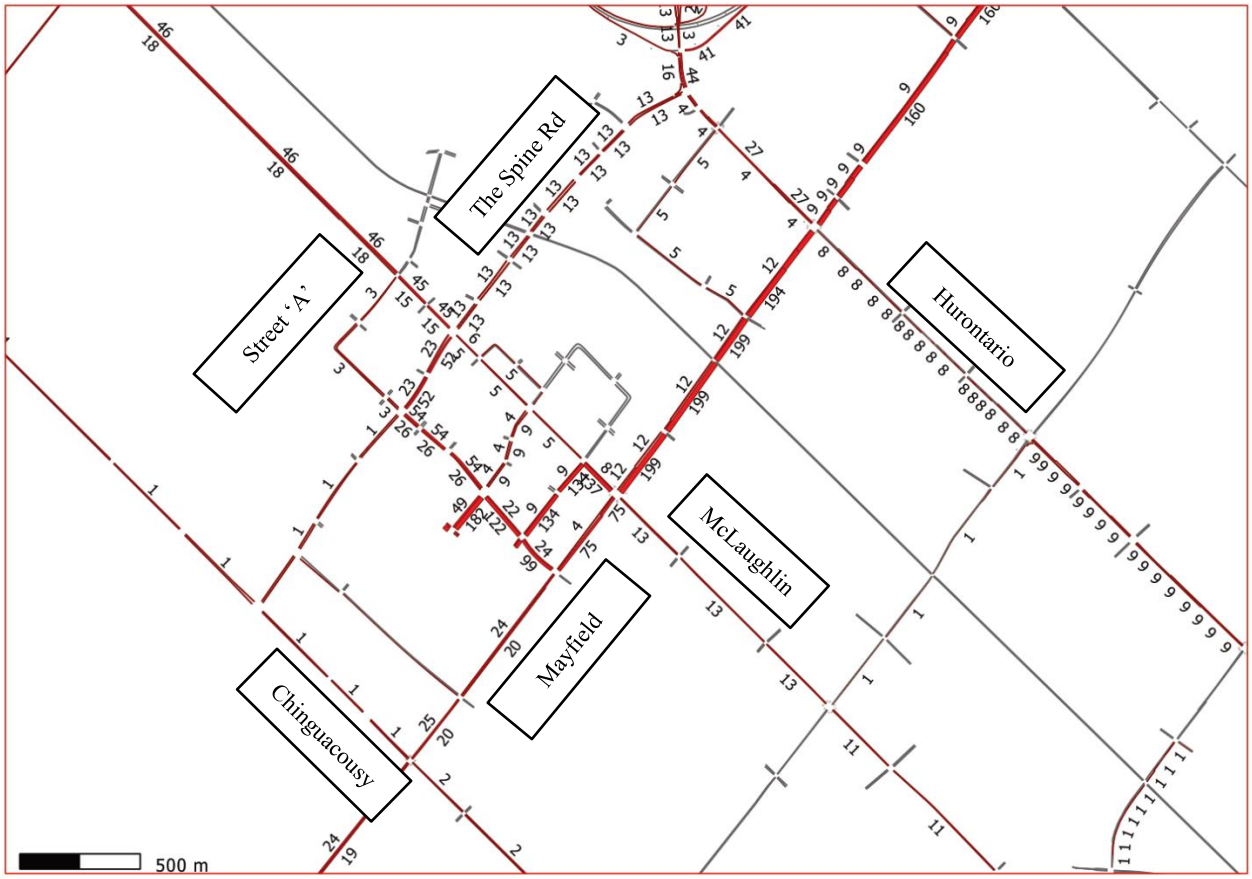


Figure 3.8: Site Trip Assignment – 2021 Full Build-Out Scenario – Weekday AM Three-Hour Volumes

Based on the trip assignment illustrated above, the Synchro intersection capacity analysis for this scenario will assess operations at the following intersections:

- Old School Road and McLaughlin Road;
- Mayfield Road and Chinguacousy Road;
- Mayfield Road and McLaughlin Road;
- Mayfield Road and Hurontario Street;
- Mayfield Road and Robertson Davies Drive;
- Mayfield Road and Street 'A' / Collector Road 'D';
- McLaughlin Road and Collector Road 'B'; and
- Collector Road 'B' and Street 'A' / Collector Road 'D'.

The lane configurations and traffic volumes at the above-noted intersections under full build-out conditions are illustrated in **Figure 3.9** and **Figure 3.10**, respectively.

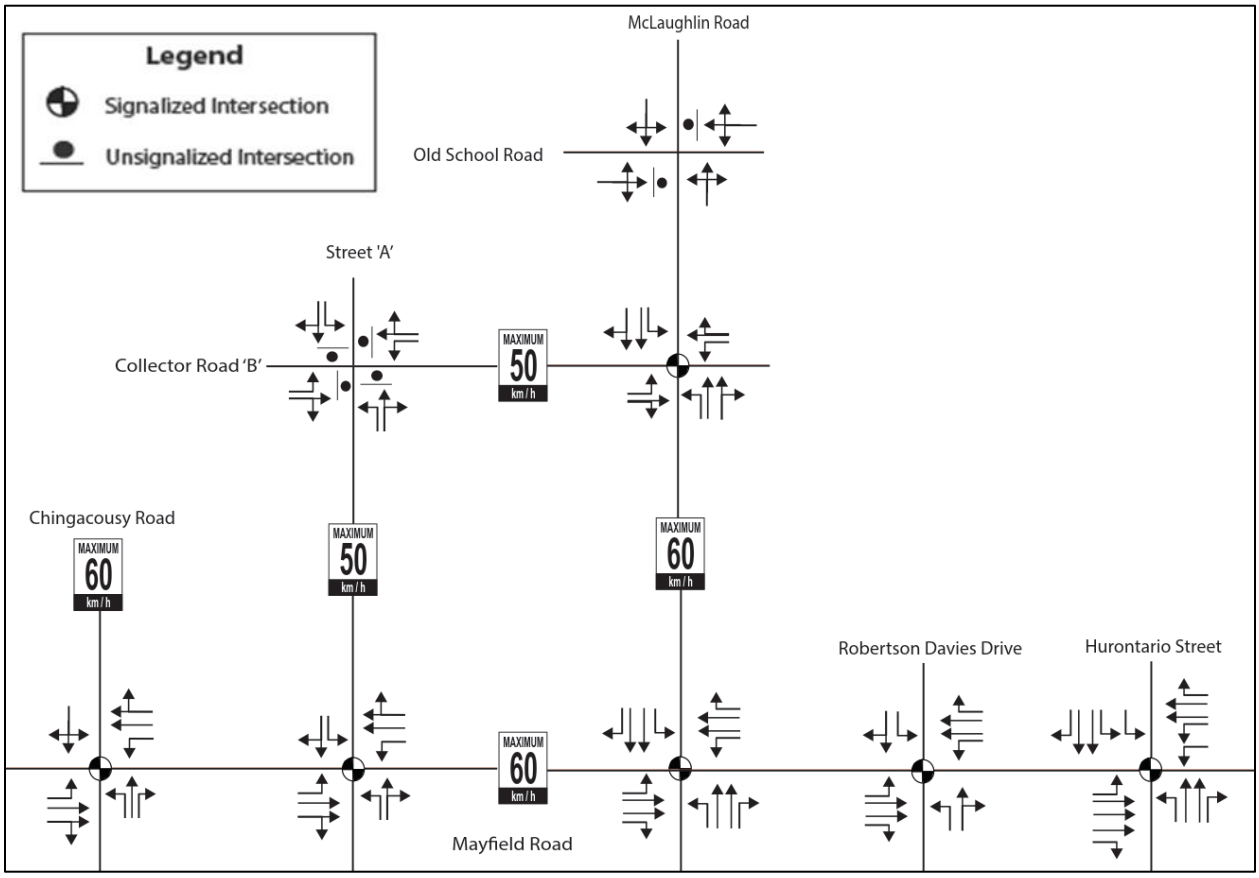


Figure 3.9: 2021 Full Build-Out Lane Configurations

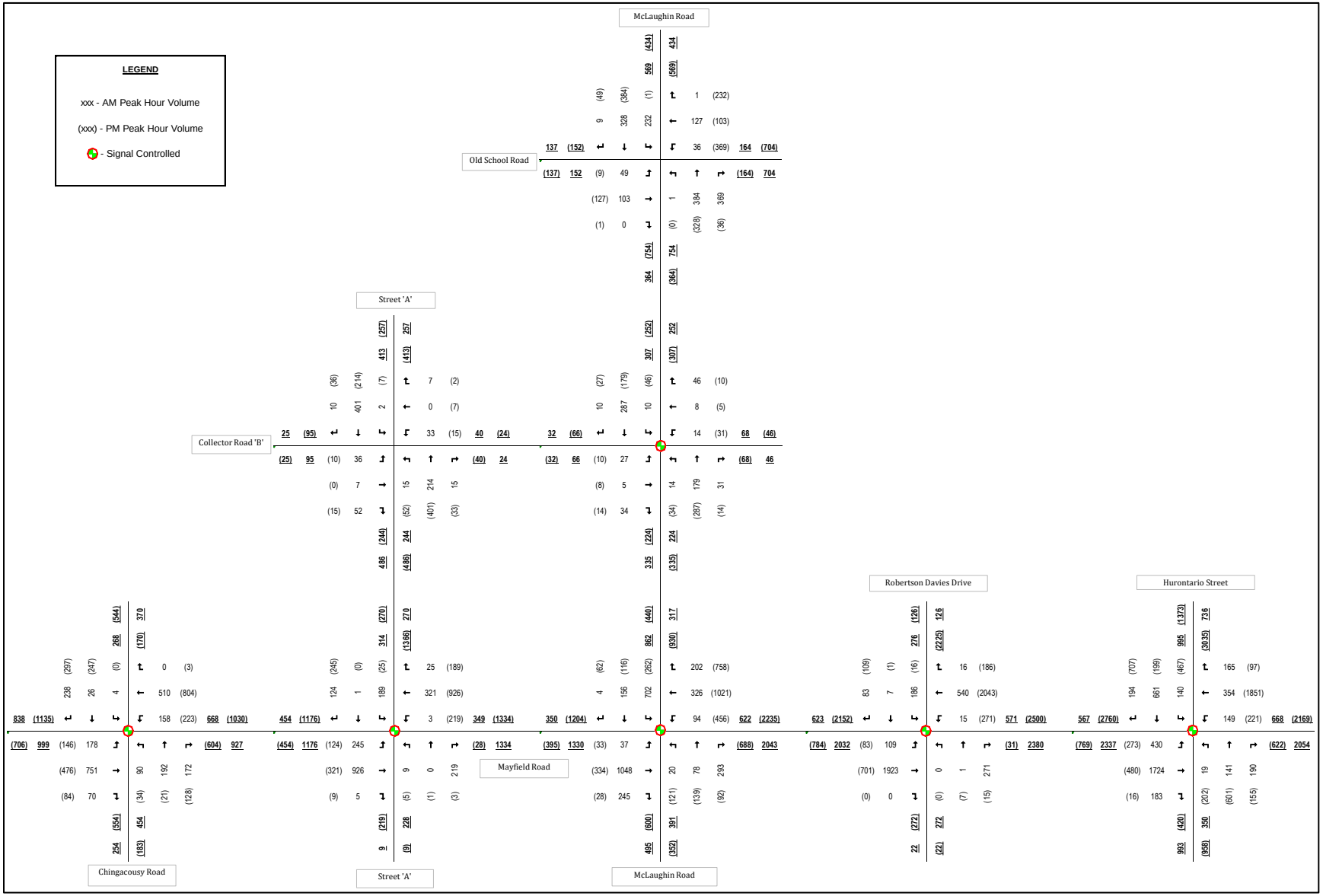


Figure 3.10: 2021 Full Build-Out Traffic Volumes

An intersection capacity analysis was completed for future traffic conditions under the Full Build-Out scenario for the AM and PM peak hours, with the movements of interest (movements with either a v/c ratio of 0.85 and higher or a LOS of D and higher) for the signalized and unsignalized intersections summarized in **Table 3.8** and **Table 3.9**, respectively. Detailed capacity analysis outputs can be found in **Appendix F**.

Intersection	Weekday AM Peak Hour								
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
								50th	95th
Chinguacousy Rd & Mayfield	0.47	27	C	-	-	-	-	-	-
McLaughlin Rd & Mayfield	0.93	41	D	EBT	0.91	38	D	128	#160
				NBR	0.76	68	E	28	#70
				SBL	1.03	72	E	139	#190
Hurontario St & Mayfield	0.77	29	C	SBL	0.57	74	E	18	29
McLaughlin Rd & Collector Road B	0.13	6	A	-	-	-	-	-	-
Street A & Mayfield	0.54	17	B	NBL	0.38	68	E	2	8
Robertson Davies Dr & Mayfield	0.87	24	C	EBT	0.89	19	B	224	m239
				NBTR	0.85	69	E	54	#97
Intersection	**Weekday PM Peak Hour**								
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
								50th	95th
Chinguacousy Rd & Mayfield	0.74	37	D	SBLTR	0.89	52	D	105	#181
McLaughlin Rd & Mayfield	0.63	21	C	-	-	-	-	-	-
Hurontario St & Mayfield	1.41	271	F	EBL	0.89	49	D	~47	#108
				WBT	1.73	372	F	~342	#384
				SBL	3.74	1308	F	~104	#137
				SBR	0.94	63	E	90	#185
McLaughlin Rd & Collector Road B	0.13	4	A	-	-	-	-	-	-
Street A & Mayfield	0.41	15	B	-	-	-	-	-	-
Robertson Davies Dr & Mayfield	0.90	8	A	EBL	0.95	103	F	16	m#52

Table 3.8: 2021 Full Build-Out Signalized Intersection LOS Summary

The analysis demonstrates that traffic associated with the development of the Caledon Terra (Mayfield West) property will be well accommodated on the road network. All signalized intersections are expected to operate at good to acceptable LOS under full build-out traffic conditions during the AM and PM peak hours with the exception of the Mayfield/McLaughlin intersection in the AM peak hour and Hurontario/Mayfield in the PM peak hour, which is the result of the development of the rest of the MW2 area.

Analysis of operations at the unsignalized intersection of Old School/McLaughlin revealed operational issues with future traffic volumes, presented in **Table 3.9**, which is the result of increased north-south through, and east-west left turning volumes as a result of the development of MW2.

Intersection	Movement of Interest	AM Peak Hour					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
McLaughlin Rd & Old School Rd	EBLTR	0	0	Err	Err	No Capacity Error	F
	WBLTR		0	Err	Err	No Capacity Error	F
Intersection	**Movement of Interest**	**PM Peak Hour**					
		Flow Rate (vph)	**Capacity (vph)**	**Control Delay (s)**	**95th Queue (m)**	**V/C**	**LOS**
McLaughlin Rd & Old School Rd	EBLTR	137	289	28	18	0.47	D
	WBLTR	704	287	691	431	2.45	F

Table 3.9: 2021 Full Build-Out Unsignalized Intersection LOS Summary

To improve operations at the three above-noted intersections under full build-out traffic conditions, intersection improvements have been recommended and their impacts have been analysed in **Section 3.4.5** below.

3.4.5 2021 Full Build-Out Recommended Intersection Improvements

In order to accommodate the traffic volumes associated with the MW2 development, the following intersection improvements (illustrated in **Figure 3.11**) are recommended:

- McLaughlin Road and Mayfield Road:
  - Signal timing improvement – optimize splits for the AM peak hour to allow for more green time for the north-south approach.
- Hurontario Street and Mayfield Road:
  - Three through lanes, and single exclusive right and left turn lanes for the westbound approach; and
  - Signal timing improvement – change the southbound right turn movement from "Perm" to "pm+ov".
- McLaughlin Road and Old School Road:
  - Exclusive left turn and shared through-right lanes for the eastbound and westbound approaches;
  - Shared through-right lanes for the northbound and southbound approaches; and
  - Two-way-left-turn lane along McLaughlin Road for this particular intersection to allow for two stage left turns from the east and west approaches.

The westbound approach of the Hurontario/Mayfield intersection is currently operating with two through lanes and a double left-turn lane. However, the traffic volumes for the westbound left turn movement is less than 250 in both AM and PM peak hours but the westbound through movement is almost 2,000 vehicles in the PM peak hour (see **Figure 3.10**). It would be more effective to utilize the second left turn lane as a through lane to accommodate the westbound through traffic during the PM peak hour.

The above-mentioned recommended intersection improvements will significantly enhance future operations as shown in **Table 3.10** (signalized intersections) and **Table 3.11** (unsignalized intersections). Detailed outputs are provided in **Appendix G**.

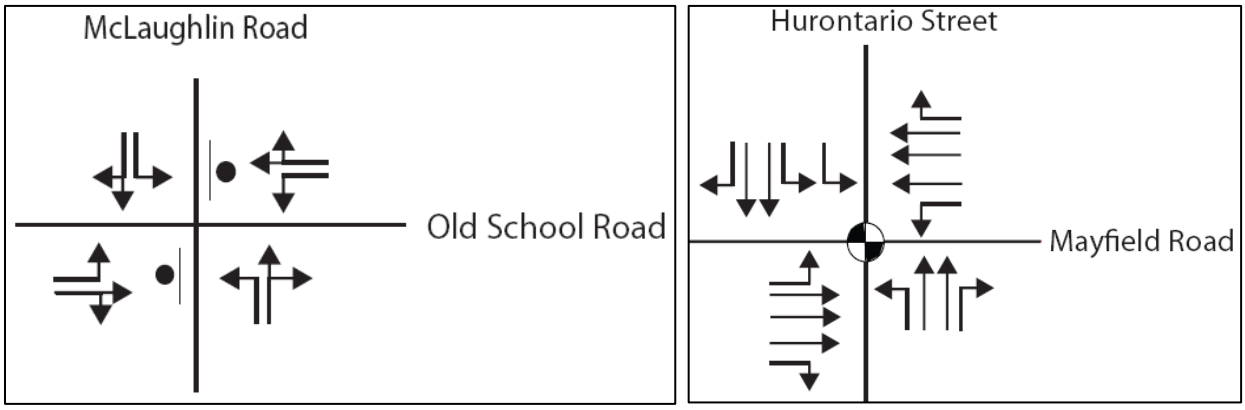


Figure 3.11: 2021 Full Build-Out – With Improvements – Lane Configuration

Intersection	Weekday AM Peak Hour								
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
								50th	95th
McLaughlin Rd & Mayfield Rd	0.93	38	D	EBT	0.93	40	D	129	#159
				NBR	0.81	73	E	32	#77
				SBL	0.96	52	D	132	#179
Intersection	**Weekday PM Peak Hour**								
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
								50th	95th
Hurontario St & Mayfield Rd	1.07	71	E	EBL	1.05	105	F	~33	#101
				WBT	1.11	98	F	~182	#212
				NBT	0.91	66	E	73	#104
				SBL	0.98	87	F	57	#91
				SBR	0.99	66	E	128	#219

Table 3.10: 2021 Signalized Intersection LOS Summary – With Improvements

Intersection	Movement of Interest	AM Peak Hour					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
McLaughlin Rd & Old School Rd	EBL	66	126	61	19	0.52	F
	EBTR	124	172	67	34	0.72	F
	WBL	4	114	38	1	0.04	E
	WBTR	99	243	30	14	0.41	D
Intersection	**Movement of Interest**	**AM Peak Hour**					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
McLaughlin Rd & Old School Rd	WBL	369	408	56	73	0.90	F

Table 3.11: 2021 Unsignalized Intersection LOS Summary – With Improvements

The recommended improvements will significantly enhance operations at the respective signalized and unsignalized intersections, with all movements operating with more capacity and shorter delays. However, the Hurontario/Mayfield intersection will continue to operate with some capacity constraints at the east-west approaches, which is common along a major corridor in a fully developed area.

4.0 RECOMMENDATIONS

The following section provides recommendations based on information found in the typical standards, MW2 TMP and the Town's Zoning By-law 2006-50.

4.1 ROAD GEOMETRY – INTERNAL ROAD NETWORK

The Aimsun models produced for this analysis are flexible enough that actual road and intersection geometry can be replicated to some extent. While a number of new intersections and planned improvements to existing intersections have been modelled, it is not the scope of this analysis to provide their detailed design. Standard lane widths and turning lane tapers were used in the models, the focus of the analysis being exerted at a large scale.

As part of its scope, the MW2 TMP has broadly addressed the location of new streets and their lane configurations, traffic calming measures to be implemented with new street construction, and a number of active transportation facilities and infrastructure. The MW2 TMP thus addressed Phases 1 and 2 of the Municipal Class Environmental Assessment (MCEA) process. The MW2 TMP identified the need for subsequent MCEA to be undertaken for the construction of The Spine Road, and the widening of McLaughlin Road. Additional details such as sections and profiles will be addressed as part of these more detailed undertakings, and will inform later construction efforts.

The proposed draft plan includes residential units with driveway access along the collector roadways. In our professional opinion, driveways along a collector roadway with low volumes such as Collector Road 'D'/Street 'A' and Collector Road 'B' will not adversely impact traffic operations along the roadway or create any potential conflicts. The following general road design elements are recommended for collector roadways, which is applicable to Collector Road 'D'/Street 'A' and Collector Road 'B' within the Caledon Terra (Mayfield West) property:

- Two-lane roadways – one lane per direction;
- Exclusive left-turn lanes at arterial intersections – 3.0 meters with provision for a 2.0 meter median island; and
- 1.5 meter wide bike lanes or a 1.5 meter widening to accommodate cycling facilities such as on-road bike lanes or shared lanes.

The following general road design elements are recommended for local roadways, which is applicable to Streets '2', '3', '4' and '5' within the Caledon Terra (Mayfield West) property:

- Two-lane roadways – one lane per direction;
- 1.5 meter sidewalks; and
- No provision for cycling facilities.

The recommended lane configurations for the internal road network are illustrated in **Figure 4.1**.

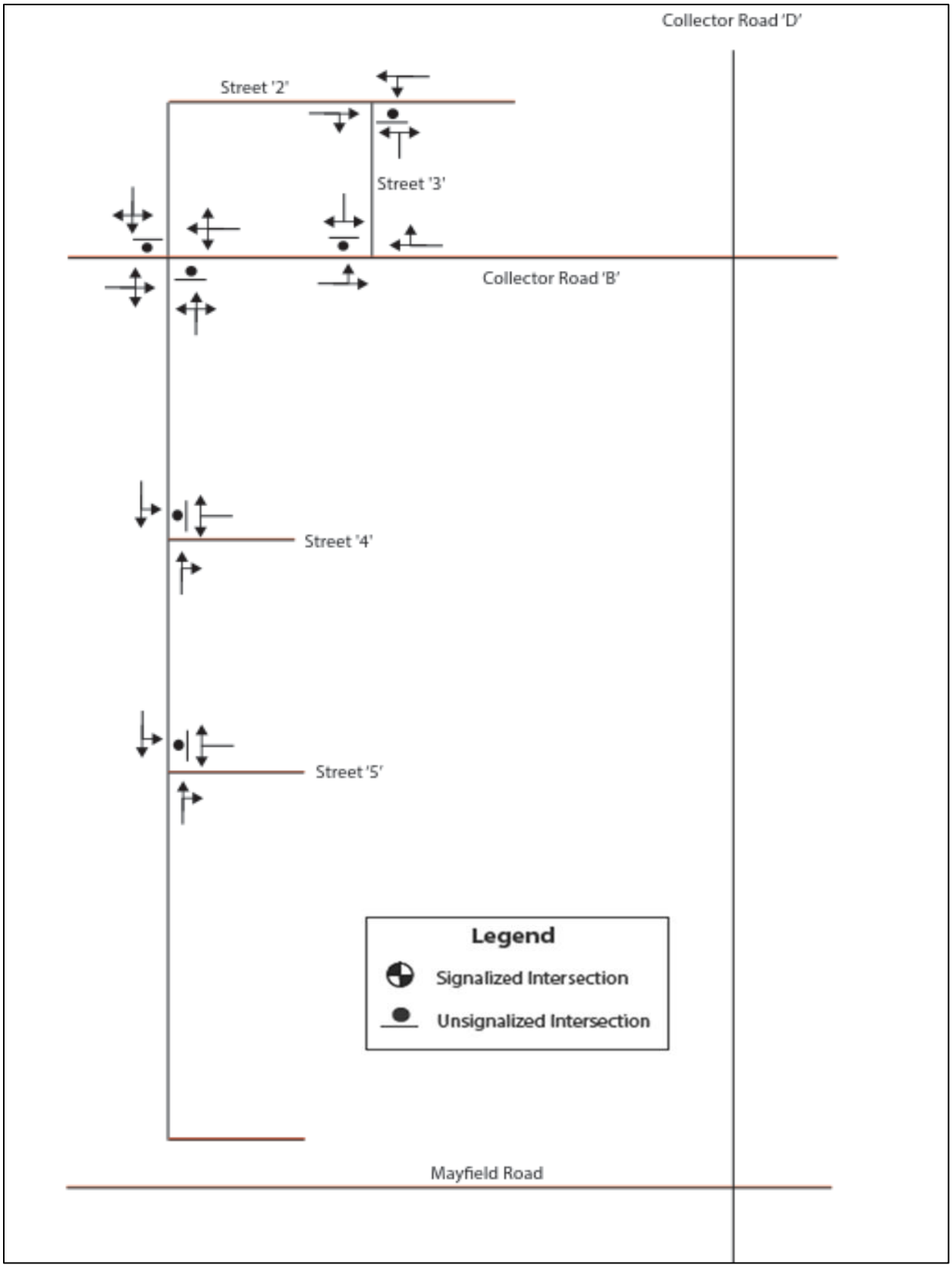


Figure 4.1: Future Internal Lane Configuration

4.2 PARKING

Parking standards and requirements were reviewed as part of the MW2 TMP and a parking strategy was developed to support the proposed parking requirements. The proposed parking requirements were based on the examination and comparison of recommended requirements in other jurisdictions as well as the suggested parking rates contained within the ITE Parking Generation Manual. **Table 4.1** compares the parking requirements from the existing Town of Caledon Zoning By-law 2006-50 and the minimum requirements proposed in the MW2 TMP.

Land Use Description	Existing Town of Caledon Zoning By-law 2006-50	TMP Proposed Minimum Parking Standard
Detached and Semi-Detached	2.00 spaces per unit, plus an additional 0.25 visitor spaces per unit for townhomes	2.00 spaces per dwelling unit
Street Townhomes		2.00 spaces per dwelling unit and 2.00 on-street spaces per dwelling unit
Multiple Family: Bachelor/1 Bedroom	1.50 spaces per unit plus 0.25 visitor spaces per unit to be provided in a designated visitor area	1.00 space per dwelling unit
2+ Bedrooms		1.50 spaces per dwelling unit
Visitor Parking		0.25 spaces per dwelling unit to be provided in a designated on-site visitor parking area

Source: MW2 TMP, October 2015

Table 4.1: Proposed Minimum Parking Standards for Residential Uses

The proposed development includes 180 single-detached residential units. The required parking for is summarized in **Table 4.2**.

Use	Units	Parking Rate	Required Number of Parking Spaces
Single Detached	180	2.0	360
		Total Overall Parking Requirement	**360**

Table 4.2: Required Minimum Parking Requirement for the Proposed Development

Based on the proposed parking standards extracted from the MW2 TMP, the proposed development would be required to provide a total of 360 parking spaces that can be satisfied with a garage and the driveway space behind the garage for the two spaces per unit requirement.

4.3 TRAFFIC CALMING

Applicable traffic calming and management measures discussed in the MW2 TMP are summarized in **Table 4.3**. The location where traffic calming and management measures are to be applied is dependent on appropriate context and objective of implementation. Implementation objectives discussed in the MW2 TMP include – reducing vehicular speeds, discouraging through traffic, minimizing conflict between street users and improving the neighbourhood environment. One example of where traffic calming measures can be implemented is near a school zone, with the objective of reducing vehicle speed.

Traffic Calming Measure		Local Road	Low-Volume Collector	Other Collector	Arterial
Vertical Deflection	Speed Hump	✓	ⓘ	✗	✗
	Raised Intersection	✗	✗	ⓘ	ⓘ
	Raised Crosswalk	✗	✓	✓	ⓘ
	Sidewalk Extension	✓	✗	✗	✗
Horizontal Deflection	Curb Extension	✓	✓	✓	✓
	Traffic Circle / Mini Roundabout	✓	✓	✗	✗
	Raised Median Island	✗	✓	✓	✓
	Curb Radius Reduction	✓	✓	✓	ⓘ
	On-Street Parking	✓	✓	✓	ⓘ
Obstruction	Directional Closure	✓	ⓘ	✗	✗
	Right-In / Right-Out Island	✓	✓	✓	✓
	Raised Median through Intersection	✗	✓	✓	ⓘ
	Intersection Channelization	✓	✓	ⓘ	ⓘ
Signage *(When used primarily for Traffic Calming purposes)*	Traffic Calmed Neighbourhood	✓	✓	ⓘ	ⓘ
	Turn Prohibited	ⓘ	ⓘ	ⓘ	ⓘ
	Through Traffic Prohibited	ⓘ	ⓘ	ⓘ	ⓘ
	One-Way	ⓘ	ⓘ	✗	✗
	Maximum Speed	✗	✗	✗	✗
	Stop	✗	✗	✗	✗
	Warning Signs (children playing, school area, etc.)	ⓘ	ⓘ	ⓘ	ⓘ

✓ = **Appropriate Measure** ⓘ = Use with Caution ✗ = Not Recommended

Source: MW2 TMP, December 2015

Table 4.3: Applicability of Traffic Calming and Management Measures

5.0 CONCLUSIONS AND RECOMMENDATIONS

The Caledon Terra (Mayfield West) property, located west of the Collector Road 'D'/Collector Road 'B' intersection, has been analyzed based on the development of 180 single-detached residential units.

Under existing conditions, all signalized and unsignalized intersections in the study area are currently operating with very good overall LOS and reserve capacity during both weekday AM and PM peak hours, with very short overall delays.

Overall, the proposed development is expected to produce a total of 129 new trips (32 in, 97 out) during the weekday AM peak hour, and 169 new trips (106 in, 63 out) during the weekday PM peak hour.

The analyses of future traffic associated with the development of the Caledon Terra (Mayfield West) property demonstrates that under the 2017 Opening Day and 2021 Full Build-Out scenario, the key intersections most affected by site traffic will operate at acceptable levels of service during both the weekday AM and PM peak hours.

A sensitivity analysis was conducted to analyze the impact of the delay of the Mayfield Road lane widening on traffic operations under the 2017 Opening Day scenario, which was determined to be minimal.

By 2021, Mayfield Road will be widened to six lanes west of Hurontario Street. The regional growth will quickly use up the increased capacity which is a trend already visible under existing conditions. The further development of MW2 Stage 1 will therefore be met with some capacity constraints on eastbound and westbound movements on Mayfield Road in particular, with indirect impacts to movements to and from MW2. In spite of this, the analysis demonstrates that the traffic associated with the development of the Caledon Terra Lands will have minimal impact on the surrounding road network. The site traffic will be accommodated on the road network throughout the development of MW2 Stage 1. The only recommendations are the addition of turning lanes at the Old School/McLaughlin intersection and the conversion of one westbound left turn lane into a through lane at the Hurontario/Mayfield intersection.

APPENDIX A

Intersection Capacity Analysis- Existing Traffic Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	16	67	0	0	128	0	0	68	0	213	60	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	16	67	0	0	128	0	0	68	0	213	60	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	618	554	60	588	555	68	61			68		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	618	554	60	588	555	68	61			68		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	82	100	100	66	100	100			86		
cM capacity (veh/h)	266	379	1005	326	379	995	1542			1533		

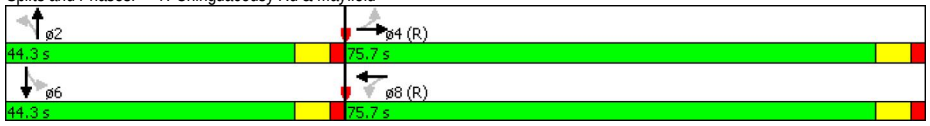
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	83	128	68	274
Volume Left	16	0	0	213
Volume Right	0	0	0	1
cSH	350	379	1542	1533
Volume to Capacity	0.24	0.34	0.00	0.14
Queue Length 95th (m)	6.9	11.1	0.0	3.7
Control Delay (s)	18.4	19.3	0.0	6.3
Lane LOS	C	C		A
Approach Delay (s)	18.4	19.3	0.0	6.3
Approach LOS	C	C		

Intersection Summary				
Average Delay		10.3		
Intersection Capacity Utilization		42.8%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Volume (vph)	56	309	94	317	85	175	28
Lane Group Flow (vph)	0	395	0	414	0	295	165
Turn Type	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases		4		8		2	6
Permitted Phases	4		8		2		
Detector Phase	4	4	8	8	2	2	6
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	25.6	25.6	25.6	25.6	25.6	25.6	25.6
Total Split (s)	75.7	75.7	75.7	75.7	44.3	44.3	44.3
Total Split (%)	63.1%	63.1%	63.1%	63.1%	36.9%	36.9%	36.9%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-1.0		-1.0		-1.0	-1.0
Total Lost Time (s)		5.6		5.6		5.6	5.6
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	C-Min	C-Min	Max	Max	Max
v/c Ratio		0.70		0.86		0.36	0.18
Control Delay		36.6		58.6		20.4	5.6
Queue Delay		0.0		0.0		0.0	0.0
Total Delay		36.6		58.6		20.4	5.6
Queue Length 50th (m)		76.6		69.5		38.3	3.1
Queue Length 95th (m)		89.1		96.4		74.6	17.3
Internal Link Dist (m)		999.3		1373.7		1019.2	908.6
Turn Bay Length (m)							
Base Capacity (vph)		865		738		815	902
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		0.46		0.56		0.36	0.18

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 7: Chinguacousy Rd & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	309	30	94	317	3	85	175	35	0	28	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6			5.6			5.6			5.6	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			1.00			0.98			0.89	
Flt Protected		0.99			0.99			0.99			1.00	
Satd. Flow (prot)		1696			1693			1768			1589	
Flt Permitted		0.86			0.74			0.86			1.00	
Satd. Flow (perm)		1477			1265			1542			1589	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	309	30	94	317	3	85	175	35	0	28	137
RTOR Reduction (vph)	0	4	0	0	1	0	0	3	0	0	65	0
Lane Group Flow (vph)	0	391	0	0	413	0	0	292	0	0	100	0
Heavy Vehicles (%)	33%	8%	5%	12%	12%	20%	4%	6%	6%	6%	4%	8%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		44.6			44.6			62.2			62.2	
Effective Green, g (s)		45.6			45.6			63.2			63.2	
Actuated g/C Ratio		0.38			0.38			0.53			0.53	
Clearance Time (s)		6.6			6.6			6.6			6.6	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		561			480			812			836	
v/s Ratio Prot											0.06	
v/s Ratio Perm		0.26			c0.33			c0.19				
v/c Ratio		0.70			0.86			0.36			0.12	
Uniform Delay, d1		31.4			34.3			16.6			14.3	
Progression Factor		1.00			1.24			1.00			1.00	
Incremental Delay, d2		7.0			17.8			1.2			0.3	
Delay (s)		38.4			60.2			17.8			14.6	
Level of Service		D			E			B			B	
Approach Delay (s)		38.4			60.2			17.8			14.6	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	37.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.2
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	2	414	47	385	10	58	109	13	44
Lane Group Flow (vph)	2	450	47	396	0	68	109	0	57
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		2	6	
Detector Phase	4	4	8	8	2	2	2	6	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	88.0	88.0	88.0	88.0	32.0	32.0	32.0	32.0	32.0
Total Split (%)	73.3%	73.3%	73.3%	73.3%	26.7%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0		5.0	5.0		5.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None
v/c Ratio	0.00	0.31	0.06	0.27		0.42	0.46		0.38
Control Delay	5.5	11.5	6.4	8.3		58.7	15.5		57.5
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	5.5	11.5	6.4	8.3		58.7	15.5		57.5
Queue Length 50th (m)	0.2	78.1	3.0	27.1		15.4	0.0		12.9
Queue Length 95th (m)	m0.0	98.7	10.9	68.4		28.9	16.3		25.5
Internal Link Dist (m)		1373.7		866.8		1234.6			475.2
Turn Bay Length (m)	60.0		60.0				30.0		
Base Capacity (vph)	770	1468	753	1478		405	431		380
Starvation Cap Reductn	0	0	0	0		0	0		0
Spillback Cap Reductn	0	0	0	0		0	0		0
Storage Cap Reductn	0	0	0	0		0	0		0
Reduced v/c Ratio	0.00	0.31	0.06	0.27		0.17	0.25		0.15

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: McLaughlin Rd & Mayfield

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	414	36	47	385	11	10	58	109	13	44	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lane Util. Factor	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	0.85		1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	
Satd. Flow (prot)	1690	1775		1755	1787			1893	1543		1836	
Flt Permitted	0.52	1.00		0.49	1.00			0.94	1.00		0.91	
Satd. Flow (perm)	932	1775		911	1787			1801	1543		1689	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2	414	36	47	385	11	10	58	109	13	44	0
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	99	0	0	0
Lane Group Flow (vph)	2	449	0	47	395	0	0	68	10	0	57	0
Heavy Vehicles (%)	8%	7%	6%	4%	7%	8%	5%	0%	5%	5%	3%	8%
Bus Blockages (#/hr)	0	0	2	0	0	2	0	0	2	0	0	2
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	98.2	98.2		98.2	98.2			9.8	9.8		9.8	
Effective Green, g (s)	99.2	99.2		99.2	99.2			10.8	10.8		10.8	
Actuated g/C Ratio	0.83	0.83		0.83	0.83			0.09	0.09		0.09	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	770	1467		753	1477			162	138		152	
v/s Ratio Prot		c0.25			0.22							
v/s Ratio Perm	0.00			0.05				c0.04	0.01		0.03	
v/c Ratio	0.00	0.31		0.06	0.27			0.42	0.07		0.38	
Uniform Delay, d1	1.8	2.4		1.9	2.3			51.6	50.0		51.4	
Progression Factor	2.32	4.18		2.67	3.06			1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.5		0.2	0.4			1.8	0.2		1.6	
Delay (s)	4.2	10.6		5.2	7.5			53.4	50.2		53.0	
Level of Service	A	B		A	A			D	D		D	
Approach Delay (s)		10.6			7.3			51.4			53.0	
Approach LOS		B			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.32			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	50.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	128	0	0	67	213	0	60	0	0	68	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	128	0	0	67	213	0	60	0	0	68	16
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	382	136	76	200	144	60	84			60		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	382	136	76	200	144	60	84			60		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	83	100	100	91	79	100			100		
cM capacity (veh/h)	423	755	985	660	747	1005	1513			1544		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	129	280	60	84
Volume Left	1	0	0	0
Volume Right	0	213	0	16
cSH	750	929	1513	1544
Volume to Capacity	0.17	0.30	0.00	0.00
Queue Length 95th (m)	4.7	9.7	0.0	0.0
Control Delay (s)	10.8	10.5	0.0	0.0
Lane LOS	B	B		
Approach Delay (s)	10.8	10.5	0.0	0.0
Approach LOS	B	B		

Intersection Summary				
Average Delay	7.9			
Intersection Capacity Utilization	27.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	84	296	45	331	15	23	5	225
Lane Group Flow (vph)	0	459	0	376	0	114	0	323
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6
Total Split (s)	88.0	88.0	88.0	88.0	32.0	32.0	32.0	32.0
Total Split (%)	73.3%	73.3%	73.3%	73.3%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.6		5.6		5.6		5.6
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Min	C-Min	C-Min	C-Min	Max	Max	Max	Max
v/c Ratio		0.77		0.57		0.14		0.38
Control Delay		35.9		51.6		9.9		23.5
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		35.9		51.6		9.9		23.5
Queue Length 50th (m)		87.8		90.0		4.6		44.0
Queue Length 95th (m)		93.5		78.4		19.1		87.7
Internal Link Dist (m)		999.3		1373.7		1019.2		908.6
Turn Bay Length (m)								
Base Capacity (vph)		952		1060		790		851
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		0.48		0.35		0.14		0.38

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 7: Chinguacousy Rd & Mayfield

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	84	296	79	45	331	0	15	23	76	5	225	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6			5.6			5.6			5.6	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			1.00			0.91			0.96	
Flt Protected		0.99			0.99			0.99			1.00	
Satd. Flow (prot)		1659			1705			1643			1754	
Flt Permitted		0.82			0.90			0.94			1.00	
Satd. Flow (perm)		1378			1543			1558			1750	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	84	296	79	45	331	0	15	23	76	5	225	93
RTOR Reduction (vph)	0	12	0	0	0	0	0	39	0	0	8	0
Lane Group Flow (vph)	0	448	0	0	376	0	0	75	0	0	315	0
Heavy Vehicles (%)	33%	8%	5%	12%	12%	20%	4%	6%	6%	6%	4%	8%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		50.0			50.0			56.8			56.8	
Effective Green, g (s)		51.0			51.0			57.8			57.8	
Actuated g/C Ratio		0.42			0.42			0.48			0.48	
Clearance Time (s)		6.6			6.6			6.6			6.6	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		585			655			750			842	
v/s Ratio Prot												
v/s Ratio Perm		c0.32			0.24			0.05			c0.18	
v/c Ratio		0.76			0.57			0.10			0.37	
Uniform Delay, d1		29.4			26.2			16.9			19.7	
Progression Factor		1.00			1.94			1.00			1.00	
Incremental Delay, d2		9.2			3.5			0.3			1.3	
Delay (s)		38.6			54.5			17.2			20.9	
Level of Service		D			D			B			C	
Approach Delay (s)		38.6			54.5			17.2			20.9	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.2
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	ø7
Lane Configurations										
Volume (vph)	395	170	404	18	39	46	6	86	3	
Lane Group Flow (vph)	409	170	416	0	57	46	0	92	3	
Turn Type	NA	pm+pt	NA	Perm	NA	Perm	Perm	NA	Perm	
Protected Phases	4	3	8		2			6		7
Permitted Phases		8		2		2	6		6	
Detector Phase	4	3	8	2	2	2	6	6	6	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	10.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	7.0
Total Split (s)	71.0	23.0	87.0	26.0	26.0	26.0	26.0	26.0	26.0	7.0
Total Split (%)	59.2%	19.2%	72.5%	21.7%	21.7%	21.7%	21.7%	21.7%	21.7%	6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	3.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes	Yes							Yes
Recall Mode	C-Max	None	C-Max	None	None	None	None	None	None	None
v/c Ratio	0.32	0.21	0.29		0.34	0.19		0.49	0.01	
Control Delay	8.6	10.3	14.7		54.4	2.4		59.2	0.0	
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	8.6	10.3	14.7		54.4	2.4		59.2	0.0	
Queue Length 50th (m)	54.6	27.0	80.2		12.7	0.0		20.8	0.0	
Queue Length 95th (m)	82.7	48.6	106.9		25.0	1.0		36.1	0.0	
Internal Link Dist (m)	1373.7		866.8		1234.6			159.7		
Turn Bay Length (m)		85.0				80.0				
Base Capacity (vph)	1279	874	1456		288	345		319	337	
Starvation Cap Reductn	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.32	0.19	0.29		0.20	0.13		0.29	0.01	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Splits and Phases: 8: McLaughlin Rd & Mayfield

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	395	14	170	404	12	18	39	46	6	86	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		3.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor		1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt		0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected		1.00		0.95	1.00			0.98	1.00		1.00	1.00
Satd. Flow (prot)		1787		1755	1787			1862	1543		1857	1500
Flt Permitted		1.00		0.48	1.00			0.87	1.00		0.98	1.00
Satd. Flow (perm)		1787		877	1787			1649	1543		1823	1500
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	395	14	170	404	12	18	39	46	6	86	3
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	41	0	0	3
Lane Group Flow (vph)	0	408	0	170	415	0	0	57	5	0	92	0
Heavy Vehicles (%)	8%	7%	6%	4%	7%	8%	5%	0%	5%	5%	3%	8%
Bus Blockages (#/hr)	0	0	2	0	0	2	0	0	2	0	0	2
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		84.9		96.7	96.7			11.3	11.3		11.3	11.3
Effective Green, g (s)		85.9		97.7	97.7			12.3	12.3		12.3	12.3
Actuated g/C Ratio		0.72		0.81	0.81			0.10	0.10		0.10	0.10
Clearance Time (s)		6.0		4.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1279		778	1454			169	158		186	153
v/s Ratio Prot		c0.23		0.02	c0.23							
v/s Ratio Perm				0.16				0.03	0.00		c0.05	0.00
v/c Ratio		0.32		0.22	0.29			0.34	0.03		0.49	0.00
Uniform Delay, d1		6.3		2.6	2.7			50.1	48.5		50.9	48.3
Progression Factor		1.14		4.41	4.72			1.00	1.00		1.00	1.00
Incremental Delay, d2		0.6		0.1	0.5			1.2	0.1		2.1	0.0
Delay (s)		7.8		11.7	13.2			51.2	48.6		53.0	48.3
Level of Service		A		B	B			D	D		D	D
Approach Delay (s)		7.8			12.8			50.0			52.8	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX B

Intersection Capacity Analysis – 2017 Opening Day Horizon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	48	128	0	12	125	2	0	183	48	217	113	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	48	128	0	12	125	2	0	183	48	217	113	13
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	825	784	120	824	767	207	126			231		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	825	784	120	824	767	207	126			231		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	71	53	100	93	55	100	100			84		
cM capacity (veh/h)	167	272	932	163	278	833	1460			1337		

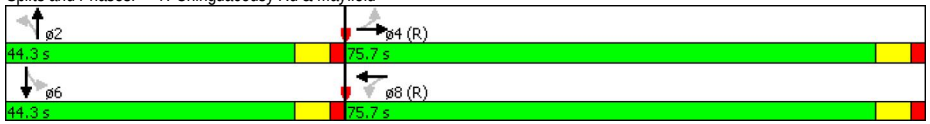
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	176	139	231	343
Volume Left	48	12	0	217
Volume Right	0	2	48	13
cSH	232	265	1460	1337
Volume to Capacity	0.76	0.52	0.00	0.16
Queue Length 95th (m)	40.6	21.4	0.0	4.4
Control Delay (s)	56.9	32.7	0.0	5.7
Lane LOS	F	D		A
Approach Delay (s)	56.9	32.7	0.0	5.7
Approach LOS	F	D		

Intersection Summary				
Average Delay		18.6		
Intersection Capacity Utilization		61.4%	ICU Level of Service	B
Analysis Period (min)		15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕		↕
Volume (vph)	95	385	128	368	82	194	35	35
Lane Group Flow (vph)	0	497	0	510	0	347	0	216
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6
Total Split (s)	75.7	75.7	75.7	75.7	44.3	44.3	44.3	44.3
Total Split (%)	63.1%	63.1%	63.1%	63.1%	36.9%	36.9%	36.9%	36.9%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.6		5.6		5.6		5.6
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Min	C-Min	C-Min	C-Min	Max	Max	Max	Max
v/c Ratio		0.75		0.85		0.53		0.32
Control Delay		31.5		39.5		31.8		16.9
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		31.5		39.5		31.8		16.9
Queue Length 50th (m)		88.8		84.4		59.8		18.7
Queue Length 95th (m)		108.5		156.9		102.9		43.2
Internal Link Dist (m)		999.3		987.4		1019.2		908.6
Turn Bay Length (m)								
Base Capacity (vph)		788		714		649		667
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		0.63		0.71		0.53		0.32

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 7: Chinguacousy Rd & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	385	17	128	368	14	82	194	71	35	35	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6			5.6			5.6			5.6	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.97			0.91	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		1681			1684			1750			1618	
Flt Permitted		0.79			0.72			0.87			0.90	
Satd. Flow (perm)		1348			1221			1539			1469	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	385	17	128	368	14	82	194	71	35	35	146
RTOR Reduction (vph)	0	2	0	0	1	0	0	6	0	0	54	0
Lane Group Flow (vph)	0	495	0	0	509	0	0	341	0	0	162	0
Heavy Vehicles (%)	33%	8%	5%	12%	12%	20%	4%	6%	6%	6%	4%	8%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		57.6			57.6			49.2			49.2	
Effective Green, g (s)		58.6			58.6			50.2			50.2	
Actuated g/C Ratio		0.49			0.49			0.42			0.42	
Clearance Time (s)		6.6			6.6			6.6			6.6	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		658			596			643			614	
v/s Ratio Prot												
v/s Ratio Perm		0.37			c0.42			c0.22			0.11	
v/c Ratio		0.75			0.85			0.53			0.26	
Uniform Delay, d1		24.8			26.9			26.1			22.8	
Progression Factor		1.00			0.98			1.00			1.00	
Incremental Delay, d2		7.8			14.1			3.1			1.1	
Delay (s)		32.6			40.5			29.2			23.9	
Level of Service		C			D			C			C	
Approach Delay (s)		32.6			40.5			29.2			23.9	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.2
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	607	56	38	362	165	8	58	174	394	73	1
Lane Group Flow (vph)	1	607	56	38	362	165	0	66	174	0	467	1
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	88.0	88.0	88.0	88.0	88.0	88.0	32.0	32.0	32.0	32.0	32.0	32.0
Total Split (%)	73.3%	73.3%	73.3%	73.3%	73.3%	73.3%	26.7%	26.7%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	None
v/c Ratio	0.00	0.26	0.05	0.07	0.15	0.15		0.32	0.36		1.59	0.00
Control Delay	8.0	10.8	3.2	12.0	10.8	5.5		44.1	7.8		312.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	8.0	10.8	3.2	12.0	10.8	5.5		44.1	7.8		312.8	0.0
Queue Length 50th (m)	0.1	38.8	1.8	3.0	15.8	3.8		13.1	0.0		~156.6	0.0
Queue Length 95th (m)	m0.0	40.2	5.1	10.4	31.9	21.8		26.6	17.6		#219.8	0.0
Internal Link Dist (m)		72.5			866.8			1234.6			159.7	
Turn Bay Length (m)	60.0		60.0	60.0		60.0			30.0			30.0
Base Capacity (vph)	659	2359	1074	520	2359	1088		204	482		294	358
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.00	0.26	0.05	0.07	0.15	0.15		0.32	0.36		1.59	0.00

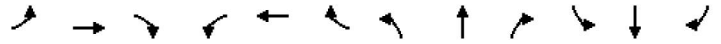
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated

~ 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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: McLaughlin Rd & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	607	56	38	362	165	8	58	174	394	73	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99	1.00		0.96	1.00
Satd. Flow (prot)	1690	3411	1528	1755	3411	1500		1898	1543		1761	1500
Flt Permitted	0.54	1.00	1.00	0.41	1.00	1.00		0.48	1.00		0.71	1.00
Satd. Flow (perm)	953	3411	1528	752	3411	1500		911	1543		1310	1500
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	607	56	38	362	165	8	58	174	394	73	1
RTOR Reduction (vph)	0	0	17	0	0	51	0	0	135	0	0	1
Lane Group Flow (vph)	1	607	39	38	362	114	0	66	39	0	467	0
Heavy Vehicles (%)	8%	7%	6%	4%	7%	8%	5%	0%	5%	5%	3%	8%
Bus Blockages (#/hr)	0	0	2	0	0	2	0	0	2	0	0	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	82.0	82.0	82.0	82.0	82.0	82.0		26.0	26.0		26.0	26.0
Effective Green, g (s)	83.0	83.0	83.0	83.0	83.0	83.0		27.0	27.0		27.0	27.0
Actuated g/C Ratio	0.69	0.69	0.69	0.69	0.69	0.69		0.22	0.22		0.22	0.22
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	659	2359	1056	520	2359	1037		204	347		294	337
v/s Ratio Prot		c0.18			0.11							
v/s Ratio Perm	0.00		0.03	0.05		0.08		0.07	0.03		c0.36	0.00
v/c Ratio	0.00	0.26	0.04	0.07	0.15	0.11		0.32	0.11		1.59	0.00
Uniform Delay, d1	5.7	6.9	5.9	6.0	6.4	6.2		38.9	37.0		46.5	36.0
Progression Factor	1.42	1.51	2.01	1.90	1.66	5.62		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	0.1	0.3	0.1	0.2		0.9	0.1		280.4	0.0
Delay (s)	8.1	10.7	11.8	11.7	10.7	34.9		39.8	37.1		326.9	36.0
Level of Service	A	B	B	B	B	C		D	D		F	D
Approach Delay (s)		10.8			17.8			37.9			326.3	
Approach LOS		B			B			D			F	

Intersection Summary				
HCM 2000 Control Delay	92.4	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	65.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	38	47	10	12	5	24	38	4	28	67	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	38	47	10	12	5	24	38	4	28	67	0

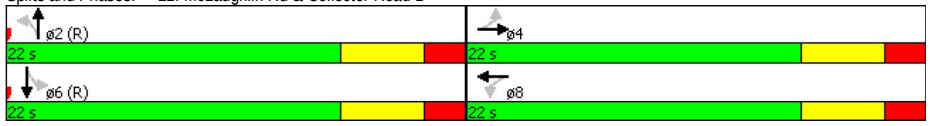
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	0	85	10	17	24	42	28	67
Volume Left (vph)	0	0	10	0	24	0	28	0
Volume Right (vph)	0	47	0	5	0	4	0	0
Hadj (s)	0.00	-0.35	0.53	-0.17	0.53	-0.03	0.53	0.03
Departure Headway (s)	4.9	4.6	5.5	4.8	5.4	4.8	5.4	4.9
Degree Utilization, x	0.00	0.11	0.02	0.02	0.04	0.06	0.04	0.09
Capacity (veh/h)	723	756	625	717	646	721	647	716
Control Delay (s)	6.7	6.9	7.4	6.7	7.4	6.9	7.4	7.1
Approach Delay (s)	6.9		7.0		7.1		7.2	
Approach LOS	A		A		A		A	

Intersection Summary				
Delay	7.1			
Level of Service	A			
Intersection Capacity Utilization	22.1%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	NBL	NBT	SBT	ø8
Lane Configurations						
Volume (vph)	93	0	29	140	84	
Lane Group Flow (vph)	93	183	29	140	125	
Turn Type	Perm	NA	Perm	NA	NA	
Protected Phases		4		2	6	8
Permitted Phases	4		2			
Detector Phase	4	4	2	2	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	None
v/c Ratio	0.30	0.18	0.04	0.12	0.11	
Control Delay	16.2	0.4	5.1	5.2	4.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	16.2	0.4	5.1	5.2	4.5	
Queue Length 50th (m)	6.1	0.0	0.8	3.8	2.5	
Queue Length 95th (m)	13.0	0.0	3.4	10.3	9.2	
Internal Link Dist (m)		139.8		291.5	261.3	
Turn Bay Length (m)	20.0		20.0			
Base Capacity (vph)	550	1126	806	1191	1148	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.17	0.16	0.04	0.12	0.11	

Intersection Summary
Cycle Length: 44
Actuated Cycle Length: 44
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 21: McLaughlin Rd & Collector Road B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	93	0	183	0	0	0	29	140	0	0	84	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0					5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00					1.00	1.00			1.00	
Frt	1.00	0.85					1.00	1.00			0.95	
Flt Protected	0.95	1.00					0.95	1.00			1.00	
Satd. Flow (prot)	1789	1601					1789	1883			1791	
Flt Permitted	0.76	1.00					0.68	1.00			1.00	
Satd. Flow (perm)	1426	1601					1275	1883			1791	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	93	0	183	0	0	0	29	140	0	0	84	41
RTOR Reduction (vph)	0	148	0	0	0	0	0	0	0	0	17	0
Lane Group Flow (vph)	93	35	0	0	0	0	29	140	0	0	108	0
Turn Type	Perm	NA		Perm			Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.4	7.4					24.6	24.6			24.6	
Effective Green, g (s)	8.4	8.4					25.6	25.6			25.6	
Actuated g/C Ratio	0.19	0.19					0.58	0.58			0.58	
Clearance Time (s)	6.0	6.0					6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	
Lane Grp Cap (vph)	272	305					741	1095			1042	
v/s Ratio Prot		0.02						c0.07			0.06	
v/s Ratio Perm	c0.07						0.02					
v/c Ratio	0.34	0.11					0.04	0.13			0.10	
Uniform Delay, d1	15.4	14.7					3.9	4.2			4.1	
Progression Factor	1.00	1.00					0.88	0.88			1.00	
Incremental Delay, d2	0.8	0.2					0.1	0.2			0.2	
Delay (s)	16.2	14.9					3.6	3.9			4.3	
Level of Service	B	B					A	A			A	
Approach Delay (s)		15.3			0.0			3.8			4.3	
Approach LOS		B			A			A			A	

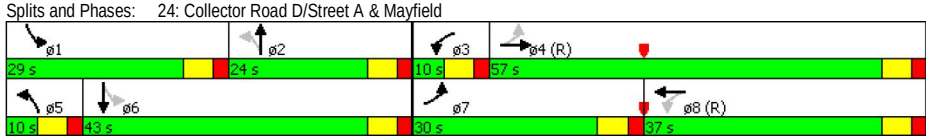
Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	44.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	34.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	85	516	1	368	1	1	90	0
Lane Group Flow (vph)	94	573	1	416	1	71	100	140
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	22.0	10.0	22.0	10.0	22.0	10.0	22.0
Total Split (s)	30.0	57.0	10.0	37.0	10.0	24.0	29.0	43.0
Total Split (%)	25.0%	47.5%	8.3%	30.8%	8.3%	20.0%	24.2%	35.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
v/c Ratio	0.15	0.43	0.00	0.36	0.01	0.42	0.39	0.19
Control Delay	5.8	8.4	8.0	15.8	35.0	20.0	43.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.8	8.4	8.0	15.8	35.0	20.0	43.7	0.6
Queue Length 50th (m)	4.5	36.3	0.1	55.1	0.2	0.2	20.2	0.0
Queue Length 95th (m)	m10.9	82.7	m0.3	105.3	1.6	14.0	32.8	0.0
Internal Link Dist (m)		987.4		265.7		116.7		292.5
Turn Bay Length (m)	60.0		60.0					
Base Capacity (vph)	776	1334	547	1156	142	313	374	873
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	0.12	0.43	0.00	0.36	0.01	0.23	0.27	0.16

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 70 (58%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: Collector Road D/Street A & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	516	0	1	368	6	1	1	63	90	0	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	1883		1789	1879		1789	1605		1789	1601	
Flt Permitted	0.41	1.00		0.39	1.00		0.67	1.00		0.48	1.00	
Satd. Flow (perm)	775	1883		731	1879		1257	1605		898	1601	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	94	573	0	1	409	7	1	1	70	100	0	140
RTOR Reduction (vph)	0	0	0	0	0	0	0	64	0	0	116	0
Lane Group Flow (vph)	94	573	0	1	416	0	1	7	0	100	24	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	81.6	74.5		69.2	68.1		10.0	9.2		26.4	19.6	
Effective Green, g (s)	82.6	75.5		71.2	69.1		12.0	10.2		27.4	20.6	
Actuated g/C Ratio	0.69	0.63		0.59	0.58		0.10	0.08		0.23	0.17	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	605	1184		452	1081		133	136		295	274	
v/s Ratio Prot	c0.01	c0.30		0.00	0.22		0.00	0.00		c0.03	0.02	
v/s Ratio Perm	0.10			0.00			0.00			c0.04		
v/c Ratio	0.16	0.48		0.00	0.38		0.01	0.05		0.34	0.09	
Uniform Delay, d1	7.2	11.9		10.3	13.9		48.6	50.5		38.0	41.8	
Progression Factor	0.88	0.77		1.17	1.13		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.3		0.0	1.0		0.0	0.2		0.7	0.1	
Delay (s)	6.4	10.4		12.0	16.6		48.6	50.6		38.6	41.9	
Level of Service	A	B		B	B		D	D		D	D	
Approach Delay (s)		9.9			16.6			50.6			40.6	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	13	125	0	48	128	217	0	113	12	2	183	48
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	13	125	0	48	128	217	0	113	12	2	183	48
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	611	336	207	392	354	119	231			125		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	611	336	207	392	354	119	231			125		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	79	100	90	78	77	100			100		
cM capacity (veh/h)	257	584	833	473	570	933	1337			1462		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	138	393	125	233
Volume Left	13	48	0	2
Volume Right	0	217	12	48
cSH	522	704	1337	1462
Volume to Capacity	0.26	0.56	0.00	0.00
Queue Length 95th (m)	8.0	26.5	0.0	0.0
Control Delay (s)	14.4	16.4	0.0	0.1
Lane LOS	B	C		A
Approach Delay (s)	14.4	16.4	0.0	0.1
Approach LOS	B	C		

Intersection Summary				
Average Delay		9.5		
Intersection Capacity Utilization		53.3%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕		↕
Volume (vph)	90	344	92	412	8	28	25	249
Lane Group Flow (vph)	0	511	0	531	0	139	0	432
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6
Total Split (s)	88.0	88.0	88.0	88.0	32.0	32.0	32.0	32.0
Total Split (%)	73.3%	73.3%	73.3%	73.3%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.6		5.6		5.6		5.6
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Min	C-Min	C-Min	C-Min	Max	Max	Max	Max
v/c Ratio		0.73		0.75		0.20		0.64
Control Delay		26.8		40.5		11.4		36.7
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		26.8		40.5		11.4		36.7
Queue Length 50th (m)		86.8		106.6		5.2		77.8
Queue Length 95th (m)		83.5		131.0		23.4		#169.0
Internal Link Dist (m)		999.3		983.8		1019.2		908.6
Turn Bay Length (m)								
Base Capacity (vph)		935		949		685		677
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		0.20		0.64

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Chinguacousy Rd & Mayfield

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	344	77	92	412	27	8	28	103	25	249	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6			5.6			5.6			5.6	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.99			0.90			0.95	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		1666			1683			1628			1725	
Flt Permitted		0.81			0.81			0.97			0.98	
Satd. Flow (perm)		1354			1380			1588			1692	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	90	344	77	92	412	27	8	28	103	25	249	158
RTOR Reduction (vph)	0	8	0	0	2	0	0	63	0	0	13	0
Lane Group Flow (vph)	0	503	0	0	529	0	0	76	0	0	419	0
Heavy Vehicles (%)	33%	8%	5%	12%	12%	20%	4%	6%	6%	6%	4%	8%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		60.7			60.7			46.1			46.1	
Effective Green, g (s)		61.7			61.7			47.1			47.1	
Actuated g/C Ratio		0.51			0.51			0.39			0.39	
Clearance Time (s)		6.6			6.6			6.6			6.6	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		696			709			623			664	
v/s Ratio Prot												
v/s Ratio Perm		0.37			c0.38			0.05			c0.25	
v/c Ratio		0.72			0.75			0.12			0.63	
Uniform Delay, d1		22.5			23.0			23.3			29.4	
Progression Factor		1.00			1.60			1.00			1.00	
Incremental Delay, d2		6.4			6.4			0.4			4.5	
Delay (s)		28.9			43.0			23.7			33.9	
Level of Service		C			D			C			C	
Approach Delay (s)		28.9			43.0			23.7			33.9	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	34.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.2
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

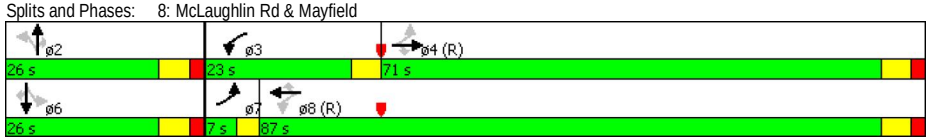
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	371	11	271	592	358	28	65	37	83	86	2
Lane Group Flow (vph)	1	371	11	271	592	358	0	93	37	0	169	2
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	7.0	22.0	22.0	10.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	7.0	71.0	71.0	23.0	87.0	87.0	26.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	5.8%	59.2%	59.2%	19.2%	72.5%	72.5%	21.7%	21.7%	21.7%	21.7%	21.7%	21.7%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	2.0	5.0	5.0	3.0	5.0	5.0		5.0	5.0		5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
v/c Ratio	0.00	0.17	0.01	0.33	0.23	0.29		0.44	0.12		0.77	0.01
Control Delay	1.0	2.6	0.0	11.5	12.3	7.7		51.9	0.8		70.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	1.0	2.6	0.0	11.5	12.3	7.7		51.9	0.8		70.8	0.0
Queue Length 50th (m)	0.0	3.5	0.0	38.0	44.8	28.9		19.7	0.0		37.9	0.0
Queue Length 95th (m)	m0.1	5.3	0.0	55.0	60.2	49.6		36.0	0.0		#64.6	0.0
Internal Link Dist (m)		79.0			866.8			1234.6			159.7	
Turn Bay Length (m)	60.0		60.0	60.0		60.0			30.0			30.0
Base Capacity (vph)	587	2185	1011	869	2560	1215		242	345		250	337
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.00	0.17	0.01	0.31	0.23	0.29		0.38	0.11		0.68	0.01

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

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

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: McLaughlin Rd & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	371	11	271	592	358	28	65	37	83	86	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	5.0	5.0	3.0	5.0	5.0		5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99	1.00		0.98	1.00
Satd. Flow (prot)	1690	3411	1528	1755	3411	1500		1865	1543		1803	1500
Flt Permitted	0.43	1.00	1.00	0.51	1.00	1.00		0.73	1.00		0.77	1.00
Satd. Flow (perm)	762	3411	1528	941	3411	1500		1387	1543		1430	1500
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	371	11	271	592	358	28	65	37	83	86	2
RTOR Reduction (vph)	0	0	4	0	0	96	0	0	31	0	0	2
Lane Group Flow (vph)	1	371	7	271	592	262	0	93	6	0	169	0
Heavy Vehicles (%)	8%	7%	6%	4%	7%	8%	5%	0%	5%	5%	3%	8%
Bus Blockages (#/hr)	0	0	2	0	0	2	0	0	2	0	0	2
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	76.7	75.9	75.9	90.5	86.7	86.7		17.5	17.5		17.5	17.5
Effective Green, g (s)	78.7	76.9	76.9	91.5	87.7	87.7		18.5	18.5		18.5	18.5
Actuated g/C Ratio	0.66	0.64	0.64	0.76	0.73	0.73		0.15	0.15		0.15	0.15
Clearance Time (s)	3.0	6.0	6.0	4.0	6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	513	2185	979	796	2492	1096		213	237		220	231
v/s Ratio Prot	0.00	0.11		c0.03	0.17							
v/s Ratio Perm	0.00		0.00	c0.23		0.17		0.07	0.00		c0.12	0.00
v/c Ratio	0.00	0.17	0.01	0.34	0.24	0.24		0.44	0.02		0.77	0.00
Uniform Delay, d1	7.1	8.7	7.8	4.1	5.3	5.3		46.0	43.1		48.7	42.9
Progression Factor	0.33	0.26	1.00	2.72	2.40	11.16		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	0.0	0.3	0.2	0.5		1.4	0.0		14.8	0.0
Delay (s)	2.3	2.5	7.8	11.3	12.8	59.3		47.5	43.1		63.5	42.9
Level of Service	A	A	A	B	B	E		D	D		E	D
Approach Delay (s)		2.6			26.1			46.2			63.3	
Approach LOS		A			C			D			E	

Intersection Summary				
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0	
Intersection Capacity Utilization	52.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	12	24	4	38	28	47	67	10	5	38	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	12	24	4	38	28	47	67	10	5	38	0

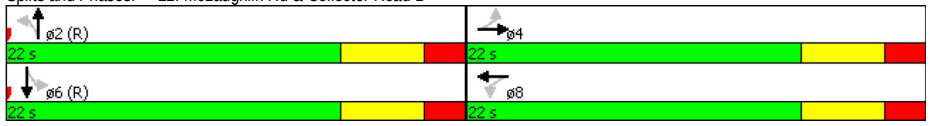
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	0	36	4	66	47	77	5	38
Volume Left (vph)	0	0	4	0	47	0	5	0
Volume Right (vph)	0	24	0	28	0	10	0	0
Hadj (s)	0.00	-0.43	0.53	-0.26	0.53	-0.06	0.53	0.03
Departure Headway (s)	5.0	4.5	5.5	4.7	5.3	4.7	5.4	4.9
Degree Utilization, x	0.00	0.05	0.01	0.09	0.07	0.10	0.01	0.05
Capacity (veh/h)	716	758	630	739	656	737	642	710
Control Delay (s)	6.8	6.5	7.3	6.9	7.5	7.1	7.2	7.0
Approach Delay (s)	6.5		6.9		7.2		7.0	
Approach LOS	A		A		A		A	

Intersection Summary					
Delay	7.0				
Level of Service	A				
Intersection Capacity Utilization	19.6%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	NBL	NBT	SBT	ø8
Lane Configurations						
Volume (vph)	41	0	183	84	140	
Lane Group Flow (vph)	41	29	183	84	233	
Turn Type	Perm	NA	Perm	NA	NA	
Protected Phases		4		2	6	8
Permitted Phases	4		2			
Detector Phase	4	4	2	2	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	None
v/c Ratio	0.16	0.03	0.21	0.06	0.17	
Control Delay	16.2	0.1	5.1	4.1	3.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	16.2	0.1	5.1	4.1	3.1	
Queue Length 50th (m)	2.7	0.0	5.4	2.2	3.9	
Queue Length 95th (m)	8.0	0.0	14.5	6.4	11.6	
Internal Link Dist (m)		139.8		291.5	261.3	
Turn Bay Length (m)	20.0		20.0			
Base Capacity (vph)	550	1039	861	1404	1343	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.07	0.03	0.21	0.06	0.17	

Intersection Summary
Cycle Length: 44
Actuated Cycle Length: 44
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 21: McLaughlin Rd & Collector Road B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	0	29	0	0	0	183	84	0	0	140	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0					5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00					1.00	1.00			1.00	
Frt	1.00	0.85					1.00	1.00			0.94	
Flt Protected	0.95	1.00					0.95	1.00			1.00	
Satd. Flow (prot)	1789	1601					1789	1883			1771	
Flt Permitted	0.76	1.00					0.61	1.00			1.00	
Satd. Flow (perm)	1426	1601					1155	1883			1771	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	41	0	29	0	0	0	183	84	0	0	140	93
RTOR Reduction (vph)	0	25	0	0	0	0	0	0	0	0	32	0
Lane Group Flow (vph)	41	4	0	0	0	0	183	84	0	0	201	0
Turn Type	Perm	NA		Perm			Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	4.6	4.6					27.4	27.4			27.4	
Effective Green, g (s)	5.6	5.6					28.4	28.4			28.4	
Actuated g/C Ratio	0.13	0.13					0.65	0.65			0.65	
Clearance Time (s)	6.0	6.0					6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	
Lane Grp Cap (vph)	181	203					745	1215			1143	
v/s Ratio Prot		0.00						0.04			0.11	
v/s Ratio Perm	c0.03						c0.16					
v/c Ratio	0.23	0.02					0.25	0.07			0.18	
Uniform Delay, d1	17.3	16.8					3.3	2.9			3.1	
Progression Factor	1.00	1.00					1.00	0.99			1.00	
Incremental Delay, d2	0.6	0.0					0.8	0.1			0.3	
Delay (s)	17.9	16.8					4.1	3.0			3.5	
Level of Service	B	B					A	A			A	
Approach Delay (s)		17.5			0.0			3.7			3.5	
Approach LOS		B			A			A			A	

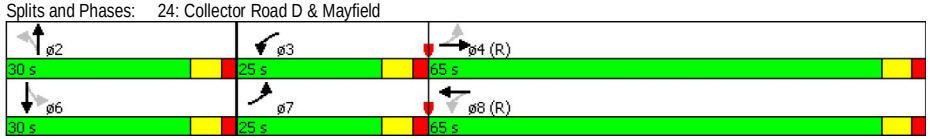
Intersection Summary			
HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	44.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Configurations							
Volume (vph)	126	368	63	516	0	6	1
Lane Group Flow (vph)	140	410	70	673	1	7	95
Turn Type	pm+pt	NA	pm+pt	NA	NA	Perm	NA
Protected Phases	7	4	3	8	2		6
Permitted Phases	4		8			6	
Detector Phase	7	4	3	8	2	6	6
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	22.0	10.0	22.0	22.0	22.0	22.0
Total Split (s)	25.0	65.0	25.0	65.0	30.0	30.0	30.0
Total Split (%)	20.8%	54.2%	20.8%	54.2%	25.0%	25.0%	25.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	C-Max	None	C-Max	None	None	None
v/c Ratio	0.23	0.28	0.09	0.49	0.00	0.07	0.49
Control Delay	4.1	11.0	1.2	7.2	0.0	52.5	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.1	11.0	1.2	7.2	0.0	52.5	19.2
Queue Length 50th (m)	7.2	60.2	1.0	39.9	0.0	1.6	0.2
Queue Length 95th (m)	m13.3	72.1	2.6	59.9	0.0	6.2	16.0
Internal Link Dist (m)		983.8		262.9	98.7		293.4
Turn Bay Length (m)	60.0		60.0				
Base Capacity (vph)	733	1443	955	1365	770	297	408
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.28	0.07	0.49	0.00	0.02	0.23

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: Collector Road D & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	126	368	1	63	516	90	0	0	1	6	1	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98			0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1789	1883		1789	1841			1601		1789	1604	
Flt Permitted	0.34	1.00		0.51	1.00			1.00		0.76	1.00	
Satd. Flow (perm)	638	1883		965	1841			1601		1426	1604	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	140	409	1	70	573	100	0	0	1	7	1	94
RTOR Reduction (vph)	0	0	0	0	3	0	0	1	0	0	88	0
Lane Group Flow (vph)	140	410	0	70	670	0	0	0	0	7	7	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	96.9	89.8		92.9	87.8			7.1		7.1	7.1	
Effective Green, g (s)	98.9	90.8		94.9	88.8			8.1		8.1	8.1	
Actuated g/C Ratio	0.82	0.76		0.79	0.74			0.07		0.07	0.07	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	603	1424		805	1362			108		96	108	
v/s Ratio Prot	c0.02	0.22		0.00	c0.36			0.00			0.00	
v/s Ratio Perm	0.18			0.06						c0.00		
v/c Ratio	0.23	0.29		0.09	0.49			0.00		0.07	0.07	
Uniform Delay, d1	3.3	4.5		2.7	6.4			52.2		52.4	52.4	
Progression Factor	1.86	2.13		0.55	0.87			1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.5		0.0	1.3			0.0		0.3	0.3	
Delay (s)	6.2	10.2		1.5	6.8			52.2		52.8	52.7	
Level of Service	A	B		A	A			D		D	D	
Approach Delay (s)		9.2			6.3			52.2			52.7	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX C

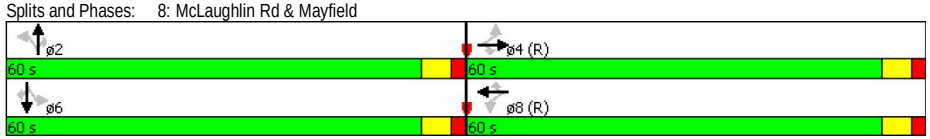
Intersection Capacity Analysis – 2017 Opening Day – With Improvements

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	607	56	38	362	165	8	58	174	394	73	1
Lane Group Flow (vph)	1	607	56	38	362	165	0	66	174	0	467	1
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	None
v/c Ratio	0.00	0.35	0.07	0.11	0.21	0.19		0.09	0.24		0.88	0.00
Control Delay	26.0	19.8	9.2	32.8	32.4	20.5		20.3	3.6		51.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	26.0	19.8	9.2	32.8	32.4	20.5		20.3	3.6		51.4	0.0
Queue Length 50th (m)	0.1	45.1	1.6	7.8	41.2	22.1		9.2	0.0		97.2	0.0
Queue Length 95th (m)	m0.5	88.6	13.1	19.0	56.6	39.9		16.8	11.9		136.2	0.0
Internal Link Dist (m)		72.5			866.8			1234.6			159.7	
Turn Bay Length (m)	60.0		60.0	60.0		60.0			30.0			30.0
Base Capacity (vph)	472	1746	809	349	1746	848		826	801		600	702
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.00	0.35	0.07	0.11	0.21	0.19		0.08	0.22		0.78	0.00

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: McLaughlin Rd & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	607	56	38	362	165	8	58	174	394	73	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99	1.00		0.96	1.00
Satd. Flow (prot)	1690	3411	1528	1755	3411	1500		1898	1543		1761	1500
Flt Permitted	0.52	1.00	1.00	0.37	1.00	1.00		0.94	1.00		0.71	1.00
Satd. Flow (perm)	923	3411	1528	683	3411	1500		1804	1543		1310	1500
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	607	56	38	362	165	8	58	174	394	73	1
RTOR Reduction (vph)	0	0	27	0	0	81	0	0	104	0	0	1
Lane Group Flow (vph)	1	607	29	38	362	84	0	66	70	0	467	0
Heavy Vehicles (%)	8%	7%	6%	4%	7%	8%	5%	0%	5%	5%	3%	8%
Bus Blockages (#/hr)	0	0	2	0	0	2	0	0	2	0	0	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	60.4	60.4	60.4	60.4	60.4	60.4		47.6	47.6		47.6	47.6
Effective Green, g (s)	61.4	61.4	61.4	61.4	61.4	61.4		48.6	48.6		48.6	48.6
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51	0.51		0.41	0.41		0.41	0.41
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	472	1745	781	349	1745	767		730	624		530	607
v/s Ratio Prot		c0.18			0.11							
v/s Ratio Perm	0.00		0.02	0.06		0.06		0.04	0.05		c0.36	0.00
v/c Ratio	0.00	0.35	0.04	0.11	0.21	0.11		0.09	0.11		0.88	0.00
Uniform Delay, d1	14.3	17.4	14.6	15.2	16.0	15.2		22.0	22.3		33.0	21.2
Progression Factor	1.47	1.03	1.86	1.76	1.86	6.99		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.5	0.1	0.6	0.3	0.3		0.1	0.1		15.7	0.0
Delay (s)	21.1	18.5	27.2	27.3	30.0	106.2		22.1	22.3		48.7	21.2
Level of Service	C	B	C	C	C	F		C	C		D	C
Approach Delay (s)		19.2			52.1			22.3			48.7	
Approach LOS		B			D			C			D	

Intersection Summary				
HCM 2000 Control Delay	36.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	65.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

APPENDIX D

Region of Peel August 3, 2016 Meeting Minutes Excerpt

AGREEMENT OF PURCHASE AND SALE (the "Agreement")

BETWEEN:

[*OWNER OR CORPORATE NAME (ALL CAPS)]

(the "**Owner**")

- and -

THE REGIONAL MUNICIPALITY OF PEEL

(the "**Region**")

WHEREAS:

A. The Owner is the owner of those lands located on the north side of Mayfield Road (Regional Road 14) and legally described as Part of Lot 18, Concession * West of Hurontario Street Town of Caledon (formerly Township of Chinguacousy), Regional Municipality of Peel, and designated as * (the "**Owner's Lands**");

B. The Region proposes to reconstruct and widen Mayfield Road from west of Chinguacousy Road to west of Hurontario Street (the "**Works**") on a portion of the Owner's Lands; and

C. The Owner proposes to develop the Owner's Lands pursuant to the Mayfield West Secondary Plan Area – Phase 2.

NOW THEREFORE, the parties agree as follows:

1. THE LANDS AND PURCHASE PRICE

1.1. The Owner hereby offers to convey and the Region hereby agrees to acquire:

(a) the fee simple lands shown hatched in red on Schedule "A" attached hereto, (the "**Fee Simple Lands**"); and

(b) a permanent easement for the purpose of constructing, installing, operating, maintaining, inspecting, altering, removing, replacing, reconstructing, enlarging and repairing drainage ditches, culverts, headwalls and/or retaining walls and related appurtenances, and sideslopes and grading appurtenant to Mayfield Road (Regional Road 14) on, over, under and through a portion of the Owner's Lands shown hatched in blue on Schedule "A" attached hereto, (the "**Permanent Easement Lands**").

1.2. The Fee Simple Lands and the Permanent Easement Lands shall collectively be referred to as the "**Lands**", and the Owner agrees to transfer the Lands gratuitously to the Region for the price of **Two Dollars ($2.00)** (the "**Purchase Price**"), constituting good and valuable consideration.

1.3. Areas shown are approximate and the Owner shall prepare and deposit at its own expense a reference plan and/or subdivision plan that accords substantially to the property sketch attached as Schedule "A" hereto, which reference plan and/or subdivision plan, as applicable and normally accepted practice, shall include area calculations of each part to be acquired.

1.4. The Purchase Price shall be paid on the Closing Date, as defined below, subject to any adjustments, provided the title is good and free from all physical structures, including billboards and their underground supports, and all encumbrances except any registered municipal easements, any registered municipal agreements, by-laws or governmental enactments, provided same have been complied with.

1.5. The parties agree that any improvements, trees or shrubs within the Lands shall be included in the Purchase Price.

1.6. The Purchase Price does not include any taxes payable under the *Excise Tax Act,* RSC 1985, c E-15 and the Region hereby covenants to self-assess and remit applicable Harmonized Sales Tax (HST) in addition to the Purchase Price in accordance with the provisions of the *Excise Tax Act.*

1.7. Execution of this Agreement by the parties shall be deemed to grant to the Region and its permitted contractors and invitees the right to enter into possession of the Lands and the Region to exercise any and all rights that the Region would acquire following the conveyance of the Lands, without prejudice to its rights herein or acknowledgement of title.

2. CLOSING

2.1. The closing date of this transaction shall be the later of **January 4, 2021** or the date on which the transactions contemplated herein are completed by the Owner in conjunction with the registration of a subdivision plan and registration documents that include the Lands, or other development approval_(the "**Closing Date**"). Vacant unencumbered possession of the Lands shall be given to the Region on the Closing Date, unless otherwise provided. In the event that a plan of subdivision of the Owner's Lands, which includes the Lands in blocks to be conveyed to the Region as a condition of subdivision approval or other development approval, is registered prior to **January 4, 2021**, then this Agreement shall be terminated following registration of any required conveyances pursuant to such application and the parties shall have no further obligations hereunder.

2.2. Any tender of documents or money may be made upon either party or their solicitors, and the money may be tendered by negotiable cheque.

2.3. The Region shall be allowed to investigate the title to the Lands, at its own expense, until the Closing Date. If within that time any valid objection to title is made, in writing, which the Owner is unable to remove and which is not waived by the Region, this Agreement shall be null and void.

2.4. The Region shall not call for the production of any title deed or other evidence of title, except as may be in the possession of the Owner.

2.5. The Owner shall provide on the Closing Date any certificates, affidavits, declarations or any other documents required for compliance with the *Family Law Act*, RSO 1990, c F.3, the *Income Tax Act*, RSC 1985, c 1 (5th Supp), and any other statutes, where such certificates, affidavits, declarations or documents are required to permit the conveyance of the Lands to the Region free of any claim, lien or interest of any person or government.

2.6. The Transfer(s) pursuant to this Agreement shall be prepared by the Region's solicitor and the Owner shall execute all necessary Transfer(s) and documents required in connection with this transaction. The Easement Schedule(s) shall be in the standard form attached as Schedule "B".

2.7. This transaction shall be completed by electronic registration pursuant to Part III of the *Land Registration Reform Act*, RSO 1990, c L.4. The Owner and the Region agree to instruct their respective solicitors to enter into the form of "Document Registration Agreement" approved by the Law Society of Upper Canada from time to time (the "**DRA**"). The Owner and the Region acknowledge and agree that the delivery of documents and the release thereof will: (a) not occur at the same time as the registration of the Transfer (and other documents intended to be registered in connection with the completion of this transaction); and (b) be subject to conditions whereby the solicitor(s) receiving documents and/or money will be required to hold them in escrow and not release them except in accordance with the terms of the DRA.

2.8. Until completion of this transaction on the Closing Date, the Lands shall be and remain at the risk of the Owner, except as otherwise provided.

2.9. Time is of the essence hereof, provided that the time for doing or completing any matter herein may be extended or abridged as agreed in writing between the Owner and Region or by their respective solicitors.

3. RIGHT OF ENTRY

3.1. The Region, its agents and contractors, shall have the right of entry onto the Lands from the date of acceptance of this Agreement for the purposes of inspection, survey and performing environmental testing as it deems necessary including, but not limited to, obtaining soil and liquid samples and drilling test holes.

3.2. The Region shall indemnify and save harmless the Owner from any kind of liability, suit, claim, demand, fine, action or proceeding of any kind for which the Owner may become liable or suffer by reason of the Region's early entry onto the Lands, and any breach of or non-performance by the Region of this Agreement, save and except any negligence by the Owner, and those for whom the Owner is responsible in law.

4. LEGAL EXPENSES AND INDEPENDENT LEGAL ADVICE

4.1. The parties agree that the Owner is responsible for any legal fees incurred by the Owner in connection with the negotiation of this Agreement and the conveyance of the Lands

4.2. The Owner acknowledges that it has read, understands and agrees with all of the provisions of this Agreement, and acknowledges that it has had the opportunity to obtain independent legal advice with respect to same.

5. OWNER'S REPRESENTATIONS AND WARRANTIES

5.1. If all or any part of the Owner's Lands are subject to any interest or right to occupy or use the Owner's Lands, the Owner hereby warrants:

(a) that it has disclosed those interests or rights to the Region in writing, prior to executing this Agreement; and

(b) that it has obtained all necessary consents, authorizations, or surrenders from the tenant for this transaction.

5.2. The Owner represents and warrants to the Region that:

(a) there has been no release, deposit, spill, disposal, leakage or discharge of any contaminant, waste, pollutant, or hazardous substance on, from, under or to the Owner's Lands;

(b) the Owner has not received notice of any violation or alleged non-compliance with any laws, regulations, by-laws, guidelines, or policies pertaining to the environmental condition of the Owner's Lands, nor has any proceeding, investigation or other evaluation been commenced to determine whether any such violation or non-compliance exists;

(c) the Owner has not received notice of any claims or demands pertaining to the environmental condition of the Owner's Lands or of adjacent lands;

(d) there are no facts or conditions relating to the Owner's Lands that could give rise to any remedial obligations, claims, demands or orders;

(e) the Owner's Lands have not been used as a waste disposal site; and

(f) no storage tanks are or have been on, at or under the Owner's Lands.

5.3. The Owner shall provide the Region with all consents or authorizations, written or otherwise, necessary or desirable to enable the Region to obtain information as the Region may consider necessary or advisable in determining the environmental condition of the Lands within three (3) days following the request therefor. In addition, prior to the Closing Date, the Owner shall provide to the Region:

a) an environmental site assessment. The environmental clearance shall be paid for by the Owner and based on the appropriate level of site assessment as established by the Ministry of the Environment and Climate Change; and

b) a Ministry of the Environment and Climate Change record of site condition for all lands, including easements, to be conveyed to the Region, including lands for public highway purposes. The costs associated with the record of site condition shall be payable by the Owner.

5.4. In the event that the Region is not satisfied, in its sole and absolute discretion, with results of any inspection, environmental test, survey, or response to inquiries or if any environmental contaminants are released prior to the Closing Date, the Region may, without limiting any other right that the Region may have, at its sole option, rescind this Agreement by delivering notice of termination to the Owner in accordance with section 8 herein, and in such event the Region shall be released from all obligations hereunder.

5.5. The Owner warrants that spousal consent is not necessary to this transaction under the provisions of the *Family Law Act*, unless the Owner's spouse has executed the consent herein provided.

5.6. In the event the Owner becomes a party to any negotiations or agreements for the sale or lease or other disposal of any party of the Owner's Lands, the Owner shall advise the Region of the details of same prior to the completion of any sale or disposal of any part of the Owner's Lands. For greater clarity, the foregoing obligation to notify the Region shall not apply to the Owner negotiating or entering into any agreements to sell any portion of the Owner's Lands to a bona fide third party purchaser of any residential internal lots for a dwelling to be constructed on a portion of the Owner's Lands.

5.7. It is agreed that there is no representation, warranty, collateral agreement or conditions affecting this Agreement or the Lands other than as expressed herein.

6. INDEMNITY

6.1. The Region will indemnify and save harmless the Owner from any kind of liability, suit, claim, demand, fine, action, or proceeding of any kind for which the Owner may become liable or suffer by reason of the use of the Permanent Easement Lands for the Works by the Region or those for whom it is in law responsible, including any breach of or non-performance by the Region of any provision of this Agreement, save and except any negligence by the Owner (and those from whom the Owner is responsible in law).

7. NOTICES

7.1. Any demand, notice or communication to be provided hereunder, except for demands, notices or communications exchanged in anticipation of closing, shall be in writing and may be given by personal delivery, or by courier sent by prepaid registered mail or by fax transmission, addressed to the respective parties as follows:

(a) **in the case of the Owner, to**:

OWNER ADDRESS

(b) **in the case of the Region, to**:

The Regional Municipality of Peel
10 Peel Centre Drive, Suite B, 6th Floor
Brampton, ON L6T 4B9
Attention: Manager, Real Estate
Telephone: (905) 791-7800 Ext. 7624
Facsimile: (905) 791-3645

or to any other address, fax number or person that the party designates. Any notice, if delivered personally or by courier, is deemed to have been given when actually received, if transmitted by fax before 4:00 p.m. on a Business Day, is deemed to have been given on that Business Day, defined below, and if transmitted by fax after 4:00 p.m. on a Business Day, is deemed to have been given on the next Business Day.

For the purposes of this section, Business Day means every day except Saturday, Sundays and statutory and civic holidays in the Province of Ontario.

7.2. Such addresses may be changed from time to time by either party giving notice as provided in section 8.1 above.

8. ENTIRE AGREEMENT

8.1. This Agreement constitutes the entire agreement between the parties and supersedes and invalidates all other commitments, representations and warranties relating to the subject matter hereof which may have been made by the parties either orally or in writing prior to the date hereof, and all of which become null and void from the date the Agreement is signed.

8.2. The following attached schedule(s) are incorporated by reference and form an integral part of this Agreement:

Schedule "**A**" – Property Sketch(s);

Schedule "**B**" – Permanent Easement; and

Schedule "**C**" – Additional Clauses.

9. NO ASSIGNMENT

9.1. This Agreement shall not be assigned by the Owner without the written consent of the Region, which consent may be withheld in the Region's sole and absolute discretion.

10. GENERAL

10.1. The recitals herein are true and accurate.

10.2. All covenants, provisions and terms contained in this Agreement on the part of both the Owner and Region shall not merge upon the closing of this transaction and shall survive the Closing Date.

10.3. The parties agree that this Agreement is strictly confidential and deals with matters of a personal and commercially sensitive nature. Accordingly, this Agreement shall not be disclosed to any person or entity other than for the purpose of proceeding with this transaction, legal purposes, accounting and auditing purposes, or as required by any applicable law.

10.4. This Agreement shall enure to the benefit of and be binding upon the heirs, executors, successors and assigns of the parties.

10.5. Unless otherwise specified, the singular includes the plural and vice versa and words importing gender include all genders.

10.6. Each capitalized term has the meaning given to it in this Agreement.

10.7. All dollar amounts referred to in this Agreement are in the lawful money of Canada.

10.8. This Agreement is governed by the laws of the Province of Ontario and the laws of Canada applicable therein.

10.9. References to any statute or any provision thereof include such statute or provision as amended, revised, re-enacted and/or consolidated from time to time and any successor statute.

10.10. The headings are for convenience of reference only and do not affect the interpretation of this Agreement.

THE REMAINDER OF THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK.

10.11. This Agreement, when executed by the parties, shall constitute a binding agreement.

IN WITNESS WHEREOF the Owner has at _____ on the _____ day of _____, 20____ affixed its corporate seal attested by the hands of the duly authorized officer(s).

*** Insert company name in CAPS, as shown in corporate search**

PER: _____

Name:

Title:

PER: _____

Name:

Title:

I/We have authority to bind the Corporation.

IN WITNESS WHEREOF The Regional Municipality of Peel has at the City of Brampton on the ____ day of _____, 20____ affixed its name under the hands of its duly authorized signing officer(s).

Document Execution No.:_____

File No.: PF- 10054.XX
Legal File No.: XXX
Project: #13-4055
Date: August 2, 2016

THE REGIONAL MUNICIPALITY OF PEEL

PER: _____

Name: Gary Kocialek, P. Eng.

Title: Director of Transportation
Public Works

I have authority to bind the Regional Corporation.

SCHEDULE "A" – Property Sketch(s)

SCHEDULE "B" – Permanent Easement

SCHEDULE TO TRANSFER OF EASEMENT IN GROSS

WHEREAS the dominant tenement of the Transferee consists of the system of roads of **THE REGIONAL MUNICIPALITY OF PEEL** situate in the Regional Municipality of Peel together with the buildings and plants of the Region situate on lands owned by The Regional Municipality of Peel.

The Transferor hereby grants, conveys and transfers unto the Transferee its successors and assigns the right, interest and easement in gross on, over, under and through the servient tenement for the following purposes, namely, to construct, install, operate, maintain, inspect, alter, remove, replace, reconstruct, enlarge and repair:

a) **DRAINAGE DITCHES, CULVERTS, HEADWALLS AND RELATED APPURTENANCES, and**
b) **SIDESLOPES AND GRADING APPURTENANT TO MAYFIELD ROAD (REGIONAL ROAD 14)**

and for every such purpose and for all purposes necessary or incidental to the exercise of the rights hereby created, the Transferees shall have access to the servient tenement at all times by its servants, agents, contractors, licensees and assignees and its or their vehicles, supplies and equipment.

The Transferor hereby agrees that the Transferee shall have the right to sever, fell, cut, trim and remove at any time all trees, shrubs, bushes and branches, stumps and roots, and to prevent or control the growth of same within the limits of the servient tenement which may at any time interfere with or endanger the operation of the **DRAINAGE DITCHES, CULVERTS, HEADWALLS, SIDE SLOPES AND GRADING AND RELATED APPURTENANCES.**

The Transferor hereby promises the Transferee that no other easement will be granted over the servient tenement prior to registration of this document.

The Transferor, for itself, its successors and assigns, covenants with the Transferee, its successors and assigns to keep the servient tenement free and clear of any buildings, structures or obstructions; not to deposit on or remove any fill from the servient tenement and not to do or suffer to be done any other thing which might injure or damage the said drainage ditches, culverts, headwalls, side slopes and grading. Provided however, that the Transferor may undertake such work on the servient tenement as may be required in connection with the development of the lands pursuant to an approved plan of subdivision or approved site plan, provided that such work shall only be undertaken in accordance with such engineering drawings approved by the Transferee acting reasonably.

The Transferor covenants with the Transferee that it has the right to convey this easement to the Transferee notwithstanding any act of the Transferor.

The Transferor covenants with the Transferee that it will execute such further assurances of the servient tenement in respect of this easement as may be requisite.

Notwithstanding any rule of law or equity, the drainage ditches, culverts, headwalls, side slopes, grading and related appurtenances thereto shall be the property of the Transferee even though the same may be annexed or affixed to the servient tenement.

SCHEDULE "C" – Additional Clauses

1. The Owner acknowledges that there may be other Regional requirements relating to any development of the Owner's Lands including but not limited to future intersection blocks, buffer blocks, reserves, easements, etc. This Agreement in no way limits the Region's ability to make conditions and requirements during any planning process. The Owner further acknowledges that should additional property requirements be identified, the Region reserves the right to acquire these additional property requirements from the Owner gratuitously, whether or not the Owner has commenced a planning application process and the Owner agrees to co-operate with the Region in conveying these additional property requirements. The parties acknowledge and agree that nothing in this Agreement shall be deemed to fetter or interfere with the Region's responsibilities and rights as a municipal body to grant regulatory approval(s) or conditions for any of the additional or future works to be completed by the Owner.

2. Once the Owner has developed the Owner's Lands and confirmed that the new property lines are at grade with the newly constructed road, the Owner may apply to the Region, in writing, for release of the easement and, provided that the easement is no longer required by the Region, the said easement shall be released by the Region.

APPENDIX E

Intersection Capacity Analysis – 2017 Opening Day Sensitivity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	48	178	0	16	131	2	1	183	81	215	115	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	48	178	0	16	131	2	1	183	81	215	115	13
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	844	818	122	866	784	224	128			264		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	844	818	122	866	784	224	128			264		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	69	31	100	85	52	100	100			83		
cM capacity (veh/h)	155	259	930	108	271	816	1458			1300		

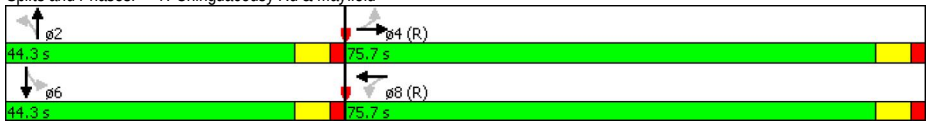
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	226	149	265	343
Volume Left	48	16	1	215
Volume Right	0	2	81	13
cSH	227	235	1458	1300
Volume to Capacity	1.00	0.63	0.00	0.17
Queue Length 95th (m)	69.6	29.0	0.0	4.5
Control Delay (s)	104.5	43.4	0.0	5.8
Lane LOS	F	E	A	A
Approach Delay (s)	104.5	43.4	0.0	5.8
Approach LOS	F	E		

Intersection Summary			
Average Delay		32.6	
Intersection Capacity Utilization		64.2%	ICU Level of Service C
Analysis Period (min)		15	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	127	345	119	351	100	196	22	36
Lane Group Flow (vph)	0	497	0	484	0	350	0	207
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6
Total Split (s)	75.7	75.7	75.7	75.7	44.3	44.3	44.3	44.3
Total Split (%)	63.1%	63.1%	63.1%	63.1%	36.9%	36.9%	36.9%	36.9%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.6		5.6		5.6		5.6
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Min	C-Min	C-Min	C-Min	Max	Max	Max	Max
v/c Ratio		0.84		0.79		0.56		0.29
Control Delay		38.6		34.9		32.8		13.6
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		38.6		34.9		32.8		13.6
Queue Length 50th (m)		94.6		78.5		61.6		13.7
Queue Length 95th (m)		119.5		149.7		106.2		35.7
Internal Link Dist (m)		999.3		987.4		1019.2		908.6
Turn Bay Length (m)								
Base Capacity (vph)		712		735		629		705
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		0.70		0.66		0.56		0.29

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 7: Chinguacousy Rd & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	127	345	25	119	351	14	100	196	54	22	36	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6			5.6			5.6			5.6	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			1.00			0.98			0.90	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		1649			1684			1759			1611	
Flt Permitted		0.73			0.74			0.83			0.94	
Satd. Flow (perm)		1217			1258			1489			1524	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	127	345	25	119	351	14	100	196	54	22	36	149
RTOR Reduction (vph)	0	2	0	0	1	0	0	5	0	0	66	0
Lane Group Flow (vph)	0	495	0	0	483	0	0	345	0	0	141	0
Heavy Vehicles (%)	33%	8%	5%	12%	12%	20%	4%	6%	6%	6%	4%	8%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		57.5			57.5			49.3			49.3	
Effective Green, g (s)		58.5			58.5			50.3			50.3	
Actuated g/C Ratio		0.49			0.49			0.42			0.42	
Clearance Time (s)		6.6			6.6			6.6			6.6	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		593			613			624			638	
v/s Ratio Prot												
v/s Ratio Perm		c0.41			0.38			c0.23			0.09	
v/c Ratio		0.83			0.79			0.55			0.22	
Uniform Delay, d1		26.6			25.6			26.4			22.3	
Progression Factor		1.00			1.03			1.00			1.00	
Incremental Delay, d2		13.0			9.6			3.5			0.8	
Delay (s)		39.6			36.0			29.9			23.1	
Level of Service		D			D			C			C	
Approach Delay (s)		39.6			36.0			29.9			23.1	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	34.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.2
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	515	63	41	348	136	12	62	144	354	84	7
Lane Group Flow (vph)	3	515	63	41	348	136	0	74	144	0	438	7
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	88.0	88.0	88.0	88.0	88.0	88.0	32.0	32.0	32.0	32.0	32.0	32.0
Total Split (%)	73.3%	73.3%	73.3%	73.3%	73.3%	73.3%	26.7%	26.7%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	None
v/c Ratio	0.00	0.22	0.06	0.07	0.15	0.13		0.36	0.31		1.48	0.02
Control Delay	7.3	10.0	2.8	11.9	10.7	5.6		45.4	8.1		267.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	7.3	10.0	2.8	11.9	10.7	5.6		45.4	8.1		267.6	0.1
Queue Length 50th (m)	0.0	31.5	1.7	3.3	15.1	3.0		14.8	0.0		~142.0	0.0
Queue Length 95th (m)	m0.8	32.3	5.2	10.8	30.7	18.7		29.7	16.1		#203.8	0.2
Internal Link Dist (m)		72.5			866.8			1234.6			159.7	
Turn Bay Length (m)	60.0		60.0	60.0		60.0			30.0			30.0
Base Capacity (vph)	668	2359	1076	578	2359	1079		203	458		296	358
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.00	0.22	0.06	0.07	0.15	0.13		0.36	0.31		1.48	0.02

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated

~ 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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: McLaughlin Rd & Mayfield

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	515	63	41	348	136	12	62	144	354	84	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99	1.00		0.96	1.00
Satd. Flow (prot)	1690	3411	1528	1755	3411	1500		1890	1543		1765	1500
Flt Permitted	0.54	1.00	1.00	0.45	1.00	1.00		0.47	1.00		0.72	1.00
Satd. Flow (perm)	966	3411	1528	837	3411	1500		903	1543		1317	1500
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	515	63	41	348	136	12	62	144	354	84	7
RTOR Reduction (vph)	0	0	19	0	0	42	0	0	112	0	0	5
Lane Group Flow (vph)	3	515	44	41	348	94	0	74	32	0	438	2
Heavy Vehicles (%)	8%	7%	6%	4%	7%	8%	5%	0%	5%	5%	3%	8%
Bus Blockages (#/hr)	0	0	2	0	0	2	0	0	2	0	0	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	82.0	82.0	82.0	82.0	82.0	82.0		26.0	26.0		26.0	26.0
Effective Green, g (s)	83.0	83.0	83.0	83.0	83.0	83.0		27.0	27.0		27.0	27.0
Actuated g/C Ratio	0.69	0.69	0.69	0.69	0.69	0.69		0.22	0.22		0.22	0.22
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	668	2359	1056	578	2359	1037		203	347		296	337
v/s Ratio Prot		c0.15			0.10							
v/s Ratio Perm	0.00		0.03	0.05		0.06		0.08	0.02		c0.33	0.00
v/c Ratio	0.00	0.22	0.04	0.07	0.15	0.09		0.36	0.09		1.48	0.00
Uniform Delay, d1	5.7	6.7	5.9	6.0	6.4	6.1		39.3	36.8		46.5	36.1
Progression Factor	1.29	1.44	1.84	1.90	1.66	5.25		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	0.1	0.2	0.1	0.2		1.1	0.1		233.2	0.0
Delay (s)	7.4	9.9	10.9	11.6	10.7	32.1		40.4	36.9		279.7	36.1
Level of Service	A	A	B	B	B	C		D	D		F	D
Approach Delay (s)		10.0			16.3			38.1			275.9	
Approach LOS		A			B			D			F	

Intersection Summary				
HCM 2000 Control Delay	82.2	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	60.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	44	40	10	14	6	22	37	3	33	60	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	44	40	10	14	6	22	37	3	33	60	0

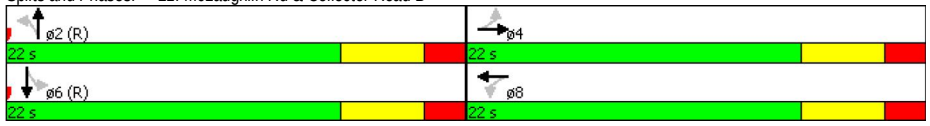
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	0	84	10	20	22	40	33	60
Volume Left (vph)	0	0	10	0	22	0	33	0
Volume Right (vph)	0	40	0	6	0	3	0	0
Hadj (s)	0.00	-0.30	0.53	-0.18	0.53	-0.02	0.53	0.03
Departure Headway (s)	4.9	4.6	5.5	4.8	5.4	4.8	5.4	4.9
Degree Utilization, x	0.00	0.11	0.02	0.03	0.03	0.05	0.05	0.08
Capacity (veh/h)	725	750	627	721	646	718	646	715
Control Delay (s)	6.7	7.0	7.4	6.7	7.4	6.9	7.4	7.1
Approach Delay (s)	7.0		6.9		7.1		7.2	
Approach LOS	A		A		A		A	

Intersection Summary				
Delay	7.1			
Level of Service	A			
Intersection Capacity Utilization	22.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	NBL	NBT	SBT	ø8
Lane Configurations						
Volume (vph)	116	0	28	149	85	
Lane Group Flow (vph)	116	174	28	149	132	
Turn Type	Perm	NA	Perm	NA	NA	
Protected Phases		4		2	6	8
Permitted Phases	4		2			
Detector Phase	4	4	2	2	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	None
v/c Ratio	0.36	0.17	0.04	0.13	0.12	
Control Delay	16.4	0.4	5.5	5.7	4.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	16.4	0.4	5.5	5.7	4.7	
Queue Length 50th (m)	7.5	0.0	0.8	4.3	2.6	
Queue Length 95th (m)	15.1	0.0	3.5	11.3	10.0	
Internal Link Dist (m)		139.8		291.5	261.3	
Turn Bay Length (m)	20.0		20.0			
Base Capacity (vph)	550	1124	785	1165	1122	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.21	0.15	0.04	0.13	0.12	

Intersection Summary
Cycle Length: 44
Actuated Cycle Length: 44
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 21: McLaughlin Rd & Collector Road B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	116	0	174	0	0	0	28	149	0	0	85	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0					5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00					1.00	1.00			1.00	
Frt	1.00	0.85					1.00	1.00			0.95	
Flt Protected	0.95	1.00					0.95	1.00			1.00	
Satd. Flow (prot)	1789	1601					1789	1883			1783	
Flt Permitted	0.76	1.00					0.67	1.00			1.00	
Satd. Flow (perm)	1426	1601					1267	1883			1783	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	116	0	174	0	0	0	28	149	0	0	85	47
RTOR Reduction (vph)	0	138	0	0	0	0	0	0	0	0	20	0
Lane Group Flow (vph)	116	36	0	0	0	0	28	149	0	0	112	0
Turn Type	Perm	NA		Perm			Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.0	8.0					24.0	24.0			24.0	
Effective Green, g (s)	9.0	9.0					25.0	25.0			25.0	
Actuated g/C Ratio	0.20	0.20					0.57	0.57			0.57	
Clearance Time (s)	6.0	6.0					6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	
Lane Grp Cap (vph)	291	327					719	1069			1013	
v/s Ratio Prot		0.02						c0.08			0.06	
v/s Ratio Perm	c0.08						0.02					
v/c Ratio	0.40	0.11					0.04	0.14			0.11	
Uniform Delay, d1	15.2	14.2					4.2	4.5			4.4	
Progression Factor	1.00	1.00					0.89	0.88			1.00	
Incremental Delay, d2	0.9	0.1					0.1	0.3			0.2	
Delay (s)	16.1	14.4					3.8	4.2			4.6	
Level of Service	B	B					A	A			A	
Approach Delay (s)		15.1			0.0			4.1			4.6	
Approach LOS		B			A			A			A	

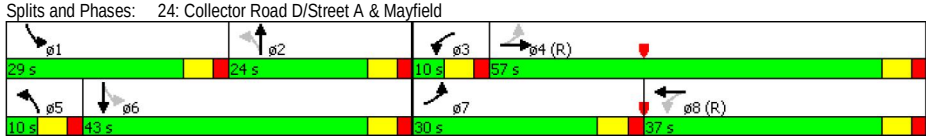
Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	44.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	34.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	83	448	1	357	1	0	83	0
Lane Group Flow (vph)	92	498	1	407	1	64	92	114
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	22.0	10.0	22.0	10.0	22.0	10.0	22.0
Total Split (s)	30.0	57.0	10.0	37.0	10.0	24.0	29.0	43.0
Total Split (%)	25.0%	47.5%	8.3%	30.8%	8.3%	20.0%	24.2%	35.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
v/c Ratio	0.14	0.37	0.00	0.34	0.01	0.13	0.38	0.16
Control Delay	5.7	7.9	8.0	14.0	38.0	0.6	45.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.7	7.9	8.0	14.0	38.0	0.6	45.5	0.5
Queue Length 50th (m)	4.3	28.4	0.1	53.4	0.2	0.0	18.6	0.0
Queue Length 95th (m)	m10.7	71.0	m0.3	101.1	1.7	0.0	32.2	0.0
Internal Link Dist (m)		987.4		265.7		116.7		292.5
Turn Bay Length (m)	60.0		60.0					
Base Capacity (vph)	798	1359	626	1182	130	607	363	877
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	0.12	0.37	0.00	0.34	0.01	0.11	0.25	0.13

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 70 (58%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: Collector Road D/Street A & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	448	0	1	357	9	1	0	58	83	0	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	1883		1789	1877		1789	1601		1789	1601	
Flt Permitted	0.42	1.00		0.45	1.00		0.68	1.00		0.46	1.00	
Satd. Flow (perm)	799	1883		839	1877		1288	1601		866	1601	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	92	498	0	1	397	10	1	0	64	92	0	114
RTOR Reduction (vph)	0	0	0	0	0	0	0	59	0	0	96	0
Lane Group Flow (vph)	92	498	0	1	407	0	1	5	0	92	18	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	83.2	76.1		71.0	69.9		8.8	8.0		24.8	18.0	
Effective Green, g (s)	84.2	77.1		73.0	70.9		10.8	9.0		25.8	19.0	
Actuated g/C Ratio	0.70	0.64		0.61	0.59		0.09	0.08		0.22	0.16	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	629	1209		527	1108		123	120		276	253	
v/s Ratio Prot	c0.01	c0.26		0.00	0.22		0.00	0.00		c0.03	0.01	
v/s Ratio Perm	0.09			0.00			0.00			c0.04		
v/c Ratio	0.15	0.41		0.00	0.37		0.01	0.04		0.33	0.07	
Uniform Delay, d1	6.6	10.4		9.3	12.8		49.7	51.5		39.1	43.0	
Progression Factor	1.02	0.89		1.43	1.11		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.9		0.0	0.9		0.0	0.1		0.7	0.1	
Delay (s)	6.8	10.2		13.4	15.2		49.7	51.6		39.8	43.1	
Level of Service	A	B		B	B		D	D		D	D	
Approach Delay (s)		9.7			15.2			51.6			41.6	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	13	131	1	81	178	215	0	115	16	2	183	48
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	13	131	1	81	178	215	0	115	16	2	183	48
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	638	342	207	400	358	123	231			131		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	638	342	207	400	358	123	231			131		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	77	100	82	69	77	100			100		
cM capacity (veh/h)	226	579	833	461	568	928	1337			1454		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	145	474	131	233
Volume Left	13	81	0	2
Volume Right	1	215	16	48
cSH	509	658	1337	1454
Volume to Capacity	0.28	0.72	0.00	0.00
Queue Length 95th (m)	8.9	46.5	0.0	0.0
Control Delay (s)	14.9	23.3	0.0	0.1
Lane LOS	B	C		A
Approach Delay (s)	14.9	23.3	0.0	0.1
Approach LOS	B	C		

Intersection Summary				
Average Delay		13.4		
Intersection Capacity Utilization		58.9%	ICU Level of Service	B
Analysis Period (min)		15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		✣		✣		✣		✣
Volume (vph)	92	328	70	369	12	29	25	252
Lane Group Flow (vph)	0	513	0	456	0	137	0	489
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6
Total Split (s)	88.0	88.0	88.0	88.0	32.0	32.0	32.0	32.0
Total Split (%)	73.3%	73.3%	73.3%	73.3%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-1.0		-1.0		-1.0		-1.0
Total Lost Time (s)		5.6		5.6		5.6		5.6
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Min	C-Min	C-Min	C-Min	Max	Max	Max	Max
v/c Ratio		0.74		0.63		0.20		0.70
Control Delay		28.1		37.3		12.8		37.4
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		28.1		37.3		12.8		37.4
Queue Length 50th (m)		89.0		91.4		6.7		89.1
Queue Length 95th (m)		85.3		110.4		25.3		#193.7
Internal Link Dist (m)		999.3		983.8		1019.2		908.6
Turn Bay Length (m)								
Base Capacity (vph)		950		992		688		700
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		0.54		0.46		0.20		0.70

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Chinguacousy Rd & Mayfield

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	92	328	93	70	369	17	12	29	96	25	252	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6			5.6			5.6			5.6	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.99			0.91			0.94	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		1659			1689			1636			1705	
Flt Permitted		0.82			0.85			0.95			0.98	
Satd. Flow (perm)		1373			1443			1559			1676	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	92	328	93	70	369	17	12	29	96	25	252	212
RTOR Reduction (vph)	0	11	0	0	2	0	0	53	0	0	17	0
Lane Group Flow (vph)	0	502	0	0	454	0	0	84	0	0	472	0
Heavy Vehicles (%)	33%	8%	5%	12%	12%	20%	4%	6%	6%	6%	4%	8%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		58.9			58.9			47.9			47.9	
Effective Green, g (s)		59.9			59.9			48.9			48.9	
Actuated g/C Ratio		0.50			0.50			0.41			0.41	
Clearance Time (s)		6.6			6.6			6.6			6.6	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		685			720			635			682	
v/s Ratio Prot												
v/s Ratio Perm		c0.37			0.31			0.05			c0.28	
v/c Ratio		0.73			0.63			0.13			0.69	
Uniform Delay, d1		23.7			22.0			22.3			29.3	
Progression Factor		1.00			1.64			1.00			1.00	
Incremental Delay, d2		6.8			3.9			0.4			5.7	
Delay (s)		30.6			39.8			22.7			35.0	
Level of Service		C			D			C			D	
Approach Delay (s)		30.6			39.8			22.7			35.0	
Approach LOS		C			D			C			D	

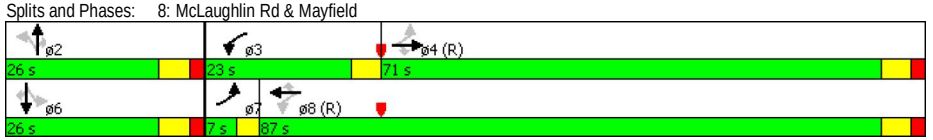
Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.2
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		

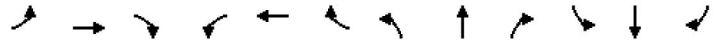
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	357	17	224	502	322	31	75	40	68	92	5
Lane Group Flow (vph)	8	357	17	224	502	322	0	106	40	0	160	5
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	7.0	22.0	22.0	10.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	7.0	71.0	71.0	23.0	87.0	87.0	26.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	5.8%	59.2%	59.2%	19.2%	72.5%	72.5%	21.7%	21.7%	21.7%	21.7%	21.7%	21.7%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	2.0	5.0	5.0	3.0	5.0	5.0		5.0	5.0		5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
v/c Ratio	0.01	0.16	0.02	0.27	0.20	0.27		0.50	0.13		0.76	0.02
Control Delay	1.2	2.6	0.0	11.7	12.7	8.7		54.7	0.8		71.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	1.2	2.6	0.0	11.7	12.7	8.7		54.7	0.8		71.3	0.0
Queue Length 50th (m)	0.1	3.6	0.0	33.7	40.5	30.2		22.8	0.0		36.0	0.0
Queue Length 95th (m)	m0.5	5.4	0.0	50.2	54.8	51.1		40.4	0.0		#60.1	0.0
Internal Link Dist (m)		79.0			866.8			1234.6			159.7	
Turn Bay Length (m)	60.0		60.0	60.0		60.0			30.0			30.0
Base Capacity (vph)	646	2226	1028	881	2570	1209		243	345		243	337
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.01	0.16	0.02	0.25	0.20	0.27		0.44	0.12		0.66	0.01

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: McLaughlin Rd & Mayfield





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	357	17	224	502	322	31	75	40	68	92	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	5.0	5.0	3.0	5.0	5.0		5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99	1.00		0.98	1.00
Satd. Flow (prot)	1690	3411	1528	1755	3411	1500		1866	1543		1811	1500
Flt Permitted	0.47	1.00	1.00	0.52	1.00	1.00		0.73	1.00		0.75	1.00
Satd. Flow (perm)	832	3411	1528	958	3411	1500		1389	1543		1392	1500
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	8	357	17	224	502	322	31	75	40	68	92	5
RTOR Reduction (vph)	0	0	6	0	0	86	0	0	34	0	0	4
Lane Group Flow (vph)	8	357	11	224	502	236	0	106	6	0	160	1
Heavy Vehicles (%)	8%	7%	6%	4%	7%	8%	5%	0%	5%	5%	3%	8%
Bus Blockages (#/hr)	0	0	2	0	0	2	0	0	2	0	0	2
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	78.1	77.3	77.3	90.8	87.0	87.0		17.2	17.2		17.2	17.2
Effective Green, g (s)	80.1	78.3	78.3	91.8	88.0	88.0		18.2	18.2		18.2	18.2
Actuated g/C Ratio	0.67	0.65	0.65	0.76	0.73	0.73		0.15	0.15		0.15	0.15
Clearance Time (s)	3.0	6.0	6.0	4.0	6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	568	2225	997	802	2501	1100		210	234		211	227
v/s Ratio Prot	0.00	0.10		c0.02	0.15							
v/s Ratio Perm	0.01		0.01	c0.19		0.16		0.08	0.00		c0.11	0.00
v/c Ratio	0.01	0.16	0.01	0.28	0.20	0.21		0.50	0.03		0.76	0.00
Uniform Delay, d1	6.7	8.1	7.3	3.8	5.0	5.1		46.8	43.4		48.8	43.2
Progression Factor	0.33	0.28	1.00	2.99	2.61	12.33		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	0.0	0.2	0.2	0.4		1.9	0.0		14.4	0.0
Delay (s)	2.2	2.4	7.3	11.7	13.2	62.9		48.7	43.4		63.2	43.2
Level of Service	A	A	A	B	B	E		D	D		E	D
Approach Delay (s)		2.6			28.2			47.2			62.6	
Approach LOS		A			C			D			E	

Intersection Summary				
HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0	
Intersection Capacity Utilization	49.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	14	22	3	44	33	40	60	10	6	37	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	14	22	3	44	33	40	60	10	6	37	0

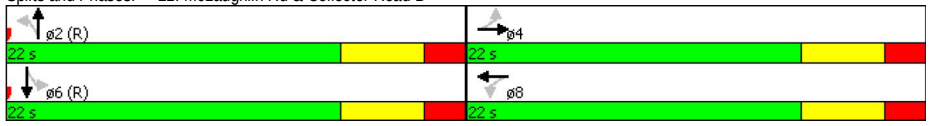
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	0	36	3	77	40	70	6	37
Volume Left (vph)	0	0	3	0	40	0	6	0
Volume Right (vph)	0	22	0	33	0	10	0	0
Hadj (s)	0.00	-0.39	0.53	-0.27	0.53	-0.07	0.53	0.03
Departure Headway (s)	4.9	4.5	5.4	4.6	5.4	4.8	5.4	4.9
Degree Utilization, x	0.00	0.05	0.00	0.10	0.06	0.09	0.01	0.05
Capacity (veh/h)	720	758	635	746	652	733	640	708
Control Delay (s)	6.7	6.6	7.3	6.9	7.5	7.0	7.3	7.0
Approach Delay (s)	6.6		7.0		7.2		7.0	
Approach LOS	A		A		A		A	

Intersection Summary					
Delay	7.0				
Level of Service	A				
Intersection Capacity Utilization	19.9%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	NBL	NBT	SBT	ø8
Lane Configurations						
Volume (vph)	47	0	174	85	149	
Lane Group Flow (vph)	47	28	174	85	265	
Turn Type	Perm	NA	Perm	NA	NA	
Protected Phases		4		2	6	8
Permitted Phases	4		2			
Detector Phase	4	4	2	2	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	None
v/c Ratio	0.18	0.03	0.21	0.06	0.20	
Control Delay	16.3	0.1	5.2	4.2	3.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	16.3	0.1	5.2	4.2	3.2	
Queue Length 50th (m)	3.1	0.0	5.2	2.2	4.5	
Queue Length 95th (m)	8.7	0.0	14.3	6.6	13.1	
Internal Link Dist (m)		139.8		291.5	261.3	
Turn Bay Length (m)	20.0		20.0			
Base Capacity (vph)	550	1027	833	1397	1332	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.09	0.03	0.21	0.06	0.20	

Intersection Summary
Cycle Length: 44
Actuated Cycle Length: 44
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 21: McLaughlin Rd & Collector Road B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	47	0	28	0	0	0	174	85	0	0	149	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0					5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00					1.00	1.00			1.00	
Frt	1.00	0.85					1.00	1.00			0.93	
Flt Protected	0.95	1.00					0.95	1.00			1.00	
Satd. Flow (prot)	1789	1601					1789	1883			1760	
Flt Permitted	0.76	1.00					0.60	1.00			1.00	
Satd. Flow (perm)	1426	1601					1122	1883			1760	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	47	0	28	0	0	0	174	85	0	0	149	116
RTOR Reduction (vph)	0	24	0	0	0	0	0	0	0	0	37	0
Lane Group Flow (vph)	47	4	0	0	0	0	174	85	0	0	228	0
Turn Type	Perm	NA		Perm			Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	4.7	4.7					27.3	27.3			27.3	
Effective Green, g (s)	5.7	5.7					28.3	28.3			28.3	
Actuated g/C Ratio	0.13	0.13					0.64	0.64			0.64	
Clearance Time (s)	6.0	6.0					6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	
Lane Grp Cap (vph)	184	207					721	1211			1132	
v/s Ratio Prot		0.00						0.05			0.13	
v/s Ratio Perm	c0.03						c0.16					
v/c Ratio	0.26	0.02					0.24	0.07			0.20	
Uniform Delay, d1	17.2	16.7					3.3	2.9			3.2	
Progression Factor	1.00	1.00					1.00	0.99			1.00	
Incremental Delay, d2	0.7	0.0					0.8	0.1			0.4	
Delay (s)	18.0	16.7					4.1	3.0			3.6	
Level of Service	B	B					A	A			A	
Approach Delay (s)		17.5			0.0			3.8			3.6	
Approach LOS		B			A			A			A	

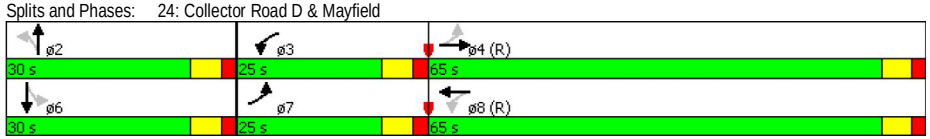
Intersection Summary			
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	44.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Configurations							
Volume (vph)	103	357	58	448	0	9	0
Lane Group Flow (vph)	114	398	64	590	1	10	92
Turn Type	pm+pt	NA	pm+pt	NA	NA	Perm	NA
Protected Phases	7	4	3	8	2		6
Permitted Phases	4		8			6	
Detector Phase	7	4	3	8	2	6	6
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	22.0	10.0	22.0	22.0	22.0	22.0
Total Split (s)	25.0	65.0	25.0	65.0	30.0	30.0	30.0
Total Split (%)	20.8%	54.2%	20.8%	54.2%	25.0%	25.0%	25.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	C-Max	None	C-Max	None	None	None
v/c Ratio	0.17	0.27	0.08	0.43	0.00	0.11	0.16
Control Delay	3.4	10.5	1.0	5.9	0.0	55.3	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.4	10.5	1.0	5.9	0.0	55.3	0.6
Queue Length 50th (m)	5.9	59.4	0.8	34.2	0.0	2.3	0.0
Queue Length 95th (m)	m9.0	66.9	1.8	51.3	0.0	7.7	0.0
Internal Link Dist (m)		983.8		262.9	98.7		293.4
Turn Bay Length (m)	60.0		60.0				
Base Capacity (vph)	799	1454	970	1380	778	297	723
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.27	0.07	0.43	0.00	0.03	0.13

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: Collector Road D & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	357	1	58	448	83	0	0	1	9	0	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98			0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1789	1883		1789	1839			1601		1789	1601	
Flt Permitted	0.39	1.00		0.52	1.00			1.00		0.76	1.00	
Satd. Flow (perm)	728	1883		978	1839			1601		1426	1601	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	114	397	1	64	498	92	0	0	1	10	0	92
RTOR Reduction (vph)	0	0	0	0	3	0	0	1	0	0	86	0
Lane Group Flow (vph)	114	398	0	64	587	0	0	0	0	10	6	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	97.2	90.5		93.8	88.8			6.5		6.5	6.5	
Effective Green, g (s)	99.2	91.5		95.8	89.8			7.5		7.5	7.5	
Actuated g/C Ratio	0.83	0.76		0.80	0.75			0.06		0.06	0.06	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	669	1435		821	1376			100		89	100	
v/s Ratio Prot	c0.01	0.21		0.00	c0.32			0.00			0.00	
v/s Ratio Perm	0.13			0.06						c0.01		
v/c Ratio	0.17	0.28		0.08	0.43			0.00		0.11	0.06	
Uniform Delay, d1	2.6	4.3		2.5	5.6			52.7		53.1	52.9	
Progression Factor	1.87	2.21		0.50	0.86			1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.4		0.0	1.0			0.0		0.6	0.2	
Delay (s)	4.9	9.9		1.3	5.7			52.7		53.7	53.2	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		8.8			5.3			52.7			53.2	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX F

Intersection Capacity Analysis – 2021 Full Build-Out

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	49	103	0	36	127	1	1	384	369	232	328	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	49	103	0	36	127	1	1	384	369	232	328	9
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1432	1552	332	1418	1372	568	337			753		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1432	1552	332	1418	1372	568	337			753		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	100	0	0	100	100			73		
cM capacity (veh/h)	0	83	709	0	106	522	1222			857		

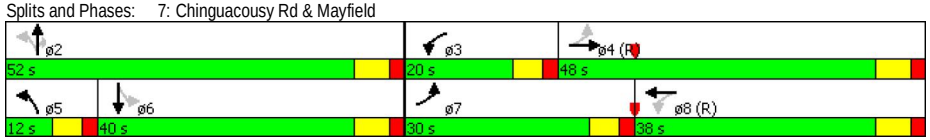
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	152	164	754	569
Volume Left	49	36	1	232
Volume Right	0	1	369	9
cSH	0	0	1222	857
Volume to Capacity	Err	Err	0.00	0.27
Queue Length 95th (m)	Err	Err	0.0	8.3
Control Delay (s)	Err	Err	0.0	6.5
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	0.0	6.5
Approach LOS	F	F		

Intersection Summary				
Average Delay		Err		
Intersection Capacity Utilization		96.2%	ICU Level of Service	F
Analysis Period (min)		15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	178	751	158	510	90	192	172	4	26
Lane Group Flow (vph)	178	821	158	510	90	192	172	0	268
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA
Protected Phases	7	4	3	8	5	2			6
Permitted Phases	4		8		2		2	6	
Detector Phase	7	4	3	8	5	2	2	6	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	25.6	10.0	25.6	10.0	25.6	25.6	25.6	25.6
Total Split (s)	30.0	48.0	20.0	38.0	12.0	52.0	52.0	40.0	40.0
Total Split (%)	25.0%	40.0%	16.7%	31.7%	10.0%	43.3%	43.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.6	4.0	4.6	4.0	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0
Total Lost Time (s)	5.0	5.6	5.0	5.6	5.0	5.6	5.6		5.6
Lead/Lag	Lead	Lag	Lead	Lag	Lead			Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes			Yes	Yes
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	None
v/c Ratio	0.37	0.46	0.37	0.29	0.41	0.47	0.36		0.75
Control Delay	10.3	19.8	21.1	28.6	41.2	43.2	7.0		22.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	10.3	19.8	21.1	28.6	41.2	43.2	7.0		22.5
Queue Length 50th (m)	13.2	59.7	24.4	47.5	17.5	39.9	0.0		6.8
Queue Length 95th (m)	28.1	93.3	35.3	47.1	28.7	56.3	15.7		31.7
Internal Link Dist (m)		999.3		312.6		1019.2			908.6
Turn Bay Length (m)	15.0		60.0		60.0				
Base Capacity (vph)	589	1783	462	1750	222	700	701		616
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	0.30	0.46	0.34	0.29	0.41	0.27	0.25		0.44

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 51 (43%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 7: Chinguacousy Rd & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	178	751	70	158	510	0	90	192	172	4	26	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.6		5.0	5.6		5.0	5.6	5.6		5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00		1.00	
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85		0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1372	3344		1630	3259		1755	1812	1541		1570	
Flt Permitted	0.44	1.00		0.27	1.00		0.25	1.00	1.00		0.99	
Satd. Flow (perm)	633	3344		471	3259		462	1812	1541		1559	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	178	751	70	158	510	0	90	192	172	4	26	238
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	133	0	216	0
Lane Group Flow (vph)	178	817	0	158	510	0	90	192	39	0	52	0
Heavy Vehicles (%)	33%	8%	5%	12%	12%	20%	4%	6%	6%	6%	4%	8%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	74.3	62.8		75.5	63.4		25.9	25.9	25.9		10.0	
Effective Green, g (s)	76.3	63.8		77.5	64.4		26.9	26.9	26.9		11.0	
Actuated g/C Ratio	0.64	0.53		0.65	0.54		0.22	0.22	0.22		0.09	
Clearance Time (s)	6.0	6.6		6.0	6.6		6.0	6.6	6.6		6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	479	1777		430	1748		221	406	345		142	
v/s Ratio Prot	0.04	c0.24		c0.04	0.16		0.04	c0.11				
v/s Ratio Perm	0.20			0.20			0.05		0.03		0.03	
v/c Ratio	0.37	0.46		0.37	0.29		0.41	0.47	0.11		0.36	
Uniform Delay, d1	9.2	17.4		9.3	15.3		38.7	40.4	37.0		51.2	
Progression Factor	1.00	1.00		2.41	1.65		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.5	0.9		0.5	0.4		1.2	0.9	0.1		1.6	
Delay (s)	9.7	18.3		22.9	25.6		39.9	41.3	37.2		52.8	
Level of Service	A	B		C	C		D	D	D		D	
Approach Delay (s)		16.7			24.9			39.5			52.8	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.2
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

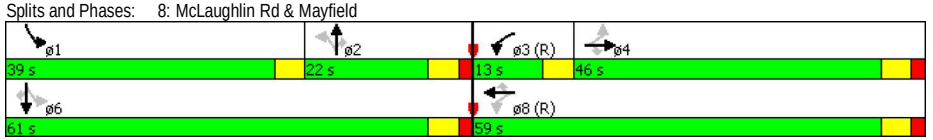
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	1048	245	94	326	202	20	78	293	702	156	4
Lane Group Flow (vph)	37	1048	245	94	326	202	20	78	293	702	156	4
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8					1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	3	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	10.0	22.0	22.0	22.0	22.0	22.0	10.0	22.0	22.0
Total Split (s)	46.0	46.0	46.0	13.0	59.0	59.0	22.0	22.0	22.0	39.0	61.0	61.0
Total Split (%)	38.3%	38.3%	38.3%	10.8%	49.2%	49.2%	18.3%	18.3%	18.3%	32.5%	50.8%	50.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	3.0	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes		
Recall Mode	Min	Min	Min	C-Max	C-Min	C-Min	None	None	None	Min	Min	Min
v/c Ratio	0.11	0.91	0.37	0.38	0.20	0.25	0.14	0.18	0.87	1.00	0.10	0.01
Control Delay	18.2	40.2	3.8	11.6	9.2	4.8	47.9	47.1	45.8	64.2	18.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.9	0.0	0.0
Total Delay	18.2	40.2	3.8	11.6	9.2	4.8	47.9	47.1	45.8	81.1	18.7	0.0
Queue Length 50th (m)	5.4	128.2	12.4	8.8	25.8	23.6	4.2	8.5	27.6	139.4	10.5	0.0
Queue Length 95th (m)	m7.4	#159.8	2.3	17.1	34.8	44.9	11.6	15.9	#69.7	#190.2	16.7	0.0
Internal Link Dist (m)		388.2			866.8			1234.6			159.7	
Turn Bay Length (m)	80.0			80.0	80.0		80.0	80.0		80.0	80.0	80.0
Base Capacity (vph)	337	1165	675	248	1592	808	169	517	367	701	1653	734
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	36	0	0
Spillback Cap Reductn	0	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	0
Reduced v/c Ratio	0.11	0.90	0.36	0.38	0.20	0.25	0.12	0.15	0.80	1.06	0.09	0.01

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 113 (94%), Referenced to phase 3:WBL and 8:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

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

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: McLaughlin Rd & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	1048	245	94	326	202	20	78	293	702	156	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	3.0	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1690	3411	1528	1755	3411	1500	1738	3650	1543	1738	3544	1500
Flt Permitted	0.55	1.00	1.00	0.09	1.00	1.00	0.65	1.00	1.00	0.58	1.00	1.00
Satd. Flow (perm)	987	3411	1528	170	3411	1500	1195	3650	1543	1065	3544	1500
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	37	1048	245	94	326	202	20	78	293	702	156	4
RTOR Reduction (vph)	0	0	155	0	0	108	0	0	152	0	0	2
Lane Group Flow (vph)	37	1048	90	94	326	94	20	78	141	702	156	2
Heavy Vehicles (%)	8%	7%	6%	4%	7%	8%	5%	0%	5%	5%	3%	8%
Bus Blockages (#/hr)	0	0	2	0	0	2	0	0	2	0	0	2
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	39.4	39.4	39.4	55.0	55.0	55.0	13.4	13.4	13.4	53.0	53.0	53.0
Effective Green, g (s)	40.4	40.4	40.4	56.0	56.0	56.0	14.4	14.4	14.4	54.0	54.0	54.0
Actuated g/C Ratio	0.34	0.34	0.34	0.47	0.47	0.47	0.12	0.12	0.12	0.45	0.45	0.45
Clearance Time (s)	6.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	332	1148	514	245	1591	700	143	438	185	684	1594	675
v/s Ratio Prot		c0.31		c0.04	0.10			0.02		c0.31	0.04	
v/s Ratio Perm	0.04		0.06	0.14		0.06	0.02		0.09	c0.15		0.00
v/c Ratio	0.11	0.91	0.18	0.38	0.20	0.13	0.14	0.18	0.76	1.03	0.10	0.00
Uniform Delay, d1	27.4	38.1	28.1	23.3	18.9	18.2	47.3	47.5	51.1	30.7	19.0	18.2
Progression Factor	0.64	0.74	0.54	0.41	0.46	1.51	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	10.2	0.2	4.4	0.3	0.4	0.4	0.2	16.7	41.3	0.0	0.0
Delay (s)	17.6	38.4	15.4	13.9	8.9	28.0	47.7	47.7	67.9	72.0	19.0	18.2
Level of Service	B	D	B	B	A	C	D	D	E	E	B	B
Approach Delay (s)		33.6			15.9			62.8			62.2	
Approach LOS		C			B			E			E	

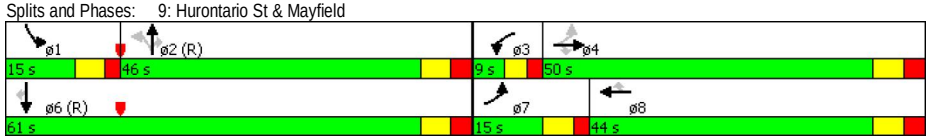
Intersection Summary				
HCM 2000 Control Delay	41.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	97.7%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

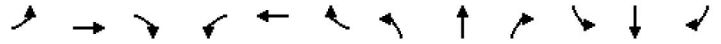
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	430	1724	183	149	354	165	19	141	190	140	661	194
Lane Group Flow (vph)	430	1724	183	149	354	165	19	141	190	140	661	194
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4		4			8	2		2			6
Detector Phase	7	4	4	3	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	44.0	44.0	9.0	44.0	44.0	45.0	45.0	45.0	10.0	45.0	45.0
Total Split (s)	15.0	50.0	50.0	9.0	44.0	44.0	46.0	46.0	46.0	15.0	61.0	61.0
Total Split (%)	12.5%	41.7%	41.7%	7.5%	36.7%	36.7%	38.3%	38.3%	38.3%	12.5%	50.8%	50.8%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio	0.64	0.80	0.25	0.39	0.39	0.37	0.15	0.23	0.51	0.57	0.62	0.33
Control Delay	10.0	25.0	3.0	52.0	35.9	7.0	45.1	43.6	19.5	79.9	33.6	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.0	25.0	3.0	52.0	35.9	7.0	45.1	43.6	19.5	79.9	33.6	6.0
Queue Length 50th (m)	25.0	126.4	5.2	17.0	33.5	0.0	4.0	15.9	11.5	18.0	48.1	1.2
Queue Length 95th (m)	m51.1	170.0	m8.7	27.0	46.4	15.3	10.7	23.8	32.7	28.6	65.3	14.0
Internal Link Dist (m)		456.2			1363.3			1227.0			551.5	
Turn Bay Length (m)	170.0		170.0	128.0		128.0	70.0		109.0	190.0		190.0
Base Capacity (vph)	670	2168	745	378	1050	489	241	1116	571	254	1593	779
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.80	0.25	0.39	0.34	0.34	0.08	0.13	0.33	0.55	0.41	0.25

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 62 (52%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Hurontario St & Mayfield





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	430	1724	183	149	354	165	19	141	190	140	661	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1597	4948	1506	3079	3318	1188	1722	3349	1421	3001	3476	1471
Flt Permitted	0.41	1.00	1.00	0.95	1.00	1.00	0.40	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	690	4948	1506	3079	3318	1188	726	3349	1421	3001	3476	1471
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	430	1724	183	149	354	165	19	141	190	140	661	194
RTOR Reduction (vph)	0	0	85	0	0	120	0	0	111	0	0	135
Lane Group Flow (vph)	430	1724	98	149	354	45	19	141	79	140	661	59
Confl. Peds. (#/hr)	12		1	1		12			19	19		
Heavy Vehicles (%)	14%	6%	7%	15%	10%	34%	6%	9%	10%	18%	5%	11%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4		4			8	2		2			6
Actuated Green, G (s)	70.4	51.6	51.6	13.8	31.8	31.8	20.7	20.7	20.7	8.9	35.6	35.6
Effective Green, g (s)	71.4	52.6	52.6	14.8	32.8	32.8	21.7	21.7	21.7	9.9	36.6	36.6
Actuated g/C Ratio	0.60	0.44	0.44	0.12	0.27	0.27	0.18	0.18	0.18	0.08	0.31	0.31
Clearance Time (s)	6.0	7.0	7.0	5.0	7.0	7.0	7.0	7.0	7.0	6.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	664	2168	660	379	906	324	131	605	256	247	1060	448
v/s Ratio Prot	c0.18	c0.35		0.05	0.11			0.04		0.05	c0.19	
v/s Ratio Perm	0.20		0.06			0.04	0.03		0.06			0.04
v/c Ratio	0.65	0.80	0.15	0.39	0.39	0.14	0.15	0.23	0.31	0.57	0.62	0.13
Uniform Delay, d1	14.1	29.1	20.2	48.5	35.5	32.9	41.3	42.0	42.6	53.0	35.8	30.2
Progression Factor	0.58	0.80	0.52	1.00	1.00	1.00	1.00	1.00	1.00	1.34	0.85	1.06
Incremental Delay, d2	1.0	1.0	0.0	0.7	0.3	0.2	2.3	0.9	3.1	2.8	2.6	0.6
Delay (s)	9.2	24.3	10.5	49.1	35.8	33.1	43.7	42.9	45.7	73.7	33.2	32.7
Level of Service	A	C	B	D	D	C	D	D	D	E	C	C
Approach Delay (s)		20.5			38.1			44.5			38.8	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.0	
Intersection Capacity Utilization	77.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	36	7	52	33	0	7	15	214	15	2	401	10
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	36	7	52	33	0	7	15	214	15	2	401	10

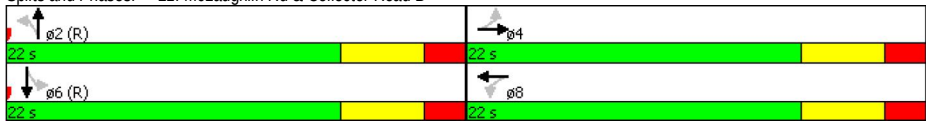
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	36	59	33	7	15	229	2	411
Volume Left (vph)	36	0	33	0	15	0	2	0
Volume Right (vph)	0	52	0	7	0	15	0	10
Hadj (s)	0.53	-0.58	0.53	-0.67	0.53	-0.01	0.53	0.02
Departure Headway (s)	6.7	5.6	6.8	5.6	5.8	5.3	5.7	5.1
Degree Utilization, x	0.07	0.09	0.06	0.01	0.02	0.33	0.00	0.59
Capacity (veh/h)	493	584	481	575	597	663	612	686
Control Delay (s)	9.0	7.9	9.0	7.4	7.7	9.7	7.5	14.0
Approach Delay (s)	8.3		8.7		9.6		14.0	
Approach LOS	A		A		A		B	

Intersection Summary					
Delay	11.7				
Level of Service	B				
Intersection Capacity Utilization	37.0%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	27	5	14	8	14	179	10	287
Lane Group Flow (vph)	27	39	14	54	14	210	10	297
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.11	0.13	0.06	0.17	0.02	0.08	0.01	0.11
Control Delay	16.0	8.4	15.2	8.3	3.9	2.9	4.1	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	8.4	15.2	8.3	3.9	2.9	4.1	3.4
Queue Length 50th (m)	1.8	0.3	0.9	0.5	0.3	2.2	0.3	3.9
Queue Length 95th (m)	6.2	5.5	4.0	6.6	1.7	5.1	1.5	8.3
Internal Link Dist (m)		139.8		112.0		291.5		261.3
Turn Bay Length (m)	20.0		20.0		20.0		20.0	
Base Capacity (vph)	549	653	549	662	808	2642	879	2682
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	0.05	0.06	0.03	0.08	0.02	0.08	0.01	0.11

Intersection Summary
Cycle Length: 44
Actuated Cycle Length: 44
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 21: McLaughlin Rd & Collector Road B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	5	34	14	8	46	14	179	31	10	287	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.87		1.00	0.87		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	1637		1789	1643		1789	3499		1789	3560	
Flt Permitted	0.75	1.00		0.75	1.00		0.57	1.00		0.62	1.00	
Satd. Flow (perm)	1421	1637		1421	1643		1074	3499		1168	3560	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	27	5	34	14	8	46	14	179	31	10	287	10
RTOR Reduction (vph)	0	30	0	0	40	0	0	11	0	0	3	0
Lane Group Flow (vph)	27	9	0	14	14	0	14	199	0	10	294	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	4.3	4.3		4.3	4.3		27.7	27.7		27.7	27.7	
Effective Green, g (s)	5.3	5.3		5.3	5.3		28.7	28.7		28.7	28.7	
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.65	0.65		0.65	0.65	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	171	197		171	197		700	2282		761	2322	
v/s Ratio Prot		0.01			0.01			0.06			c0.08	
v/s Ratio Perm	c0.02			0.01			0.01			0.01		
v/c Ratio	0.16	0.05		0.08	0.07		0.02	0.09		0.01	0.13	
Uniform Delay, d1	17.3	17.1		17.2	17.2		2.7	2.8		2.7	2.9	
Progression Factor	1.00	1.00		1.00	1.00		0.94	0.91		1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.2	0.1		0.1	0.1		0.0	0.1	
Delay (s)	17.8	17.2		17.4	17.3		2.6	2.7		2.7	3.0	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		17.4			17.3			2.6			3.0	
Approach LOS		B			B			A			A	

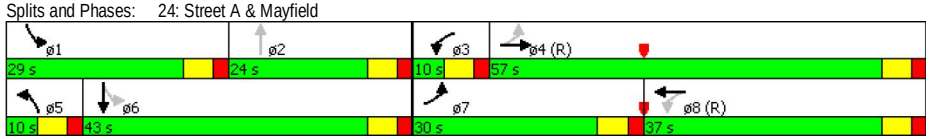
Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	44.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	28.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	245	926	3	321	9	0	189	1
Lane Group Flow (vph)	245	932	3	346	10	243	189	125
Turn Type	pm+pt	NA	pm+pt	NA	Prot	NA	pm+pt	NA
Protected Phases	7	4	3	8	5		1	6
Permitted Phases	4		8			2	6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	22.0	10.0	22.0	10.0	22.0	10.0	22.0
Total Split (s)	30.0	57.0	10.0	37.0	10.0	24.0	29.0	43.0
Total Split (%)	25.0%	47.5%	8.3%	30.8%	8.3%	20.0%	24.2%	35.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
v/c Ratio	0.35	0.41	0.01	0.19	0.14	0.70	0.63	0.26
Control Delay	4.2	6.8	5.7	8.0	59.6	17.3	45.0	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.2	6.8	5.7	8.0	59.6	17.3	45.0	7.3
Queue Length 50th (m)	3.8	7.5	0.1	8.2	2.3	0.0	37.9	0.2
Queue Length 95th (m)	31.3	119.2	m0.6	7.3	8.0	22.6	50.7	14.3
Internal Link Dist (m)		624.9		388.2		133.9		297.5
Turn Bay Length (m)	30.0		60.0					
Base Capacity (vph)	777	2278	370	1783	74	459	382	592
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	0.32	0.41	0.01	0.19	0.14	0.53	0.49	0.21

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 11 (9%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: Street A & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	245	926	5	3	321	25	9	0	219	189	1	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	3575		1789	3540		1789	1601		1789	1603	
Flt Permitted	0.48	1.00		0.29	1.00		0.95	1.00		0.21	1.00	
Satd. Flow (perm)	902	3575		540	3540		1789	1601		399	1603	
Peak-hour factor, PHF	1.00	1.00	0.90	0.90	1.00	1.00	0.90	0.90	0.90	1.00	0.90	1.00
Adj. Flow (vph)	245	926	6	3	321	25	10	0	243	189	1	124
RTOR Reduction (vph)	0	0	0	0	4	0	0	215	0	0	94	0
Lane Group Flow (vph)	245	932	0	3	342	0	10	28	0	189	31	0
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5			1	6	
Permitted Phases	4			8				2		6		
Actuated Green, G (s)	73.0	65.8		55.7	54.5		0.8	12.9		35.0	28.2	
Effective Green, g (s)	74.0	66.8		57.7	55.5		1.8	13.9		36.0	29.2	
Actuated g/C Ratio	0.62	0.56		0.48	0.46		0.02	0.12		0.30	0.24	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	656	1990		282	1637		26	185		317	390	
v/s Ratio Prot	c0.04	c0.26		0.00	0.10		0.01			c0.08	0.02	
v/s Ratio Perm	0.19			0.00				0.02		c0.09		
v/c Ratio	0.37	0.47		0.01	0.21		0.38	0.15		0.60	0.08	
Uniform Delay, d1	10.5	15.9		16.3	19.2		58.6	47.7		33.9	35.0	
Progression Factor	0.31	0.50		0.51	0.43		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.7		0.0	0.3		9.2	0.4		3.0	0.1	
Delay (s)	3.5	8.7		8.3	8.4		67.8	48.1		36.9	35.1	
Level of Service	A	A		A	A		E	D		D	D	
Approach Delay (s)		7.6			8.4			48.9			36.2	
Approach LOS		A			A			D			D	

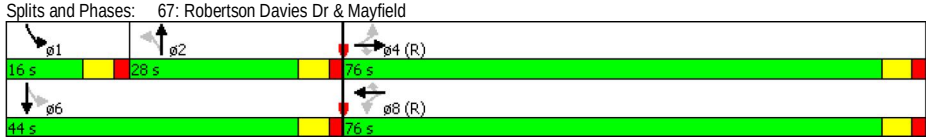
Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	109	1923	15	540	16	1	186	7
Lane Group Flow (vph)	109	1923	15	540	16	272	186	90
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		8		6	
Detector Phase	4	4	8	8	8	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	28.0	28.0	28.0	28.0	28.0	28.0	10.0	28.0
Total Split (s)	76.0	76.0	76.0	76.0	76.0	28.0	16.0	44.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	63.3%	23.3%	13.3%	36.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag						Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None
v/c Ratio	0.22	0.89	0.24	0.25	0.02	0.87	0.76	0.16
Control Delay	10.5	20.0	27.3	13.3	2.6	67.8	52.2	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	20.0	27.3	13.3	2.6	67.8	52.2	7.9
Queue Length 50th (m)	9.0	224.4	2.5	49.3	0.3	54.3	32.9	1.1
Queue Length 95th (m)	m10.2	m238.8	m9.1	61.2	2.4	#96.7	#52.8	12.5
Internal Link Dist (m)		866.8		456.2		231.1		552.0
Turn Bay Length (m)	100.0		100.0		100.0		60.0	
Base Capacity (vph)	486	2165	62	2165	1001	335	246	583
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	0.22	0.89	0.24	0.25	0.02	0.81	0.76	0.15

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 50 (42%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 67: Robertson Davies Dr & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	109	1923	0	15	540	16	0	1	271	186	7	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.85		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1789	3579		1789	3579	1601		1602		1789	1623	
Flt Permitted	0.43	1.00		0.06	1.00	1.00		1.00		0.20	1.00	
Satd. Flow (perm)	803	3579		104	3579	1601		1602		374	1623	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	109	1923	0	15	540	16	0	1	271	186	7	83
RTOR Reduction (vph)	0	0	0	0	0	6	0	29	0	0	57	0
Lane Group Flow (vph)	109	1923	0	15	540	10	0	243	0	186	33	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	71.6	71.6		71.6	71.6	71.6		20.4		36.4	36.4	
Effective Green, g (s)	72.6	72.6		72.6	72.6	72.6		21.4		37.4	37.4	
Actuated g/C Ratio	0.60	0.60		0.60	0.60	0.60		0.18		0.31	0.31	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	485	2165		62	2165	968		285		246	505	
v/s Ratio Prot		c0.54			0.15			c0.15		c0.07	0.02	
v/s Ratio Perm	0.14			0.14		0.01				0.17		
v/c Ratio	0.22	0.89		0.24	0.25	0.01		0.85		0.76	0.07	
Uniform Delay, d1	10.8	20.2		11.0	11.0	9.4		47.8		33.3	29.0	
Progression Factor	0.86	0.82		1.28	1.15	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.4	2.4		8.8	0.3	0.0		21.2		12.4	0.1	
Delay (s)	9.7	19.1		22.8	13.0	9.4		68.9		45.7	29.1	
Level of Service	A	B		C	B	A		E		D	C	
Approach Delay (s)		18.6			13.1			68.9			40.3	
Approach LOS		B			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	100.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	127	1	369	103	232	0	328	36	1	384	49
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	127	1	369	103	232	0	328	36	1	384	49
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1040	774	408	821	781	346	433			364		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1040	774	408	821	781	346	433			364		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	61	100	0	68	67	100			100		
cM capacity (veh/h)	105	329	643	205	326	697	1127			1195		

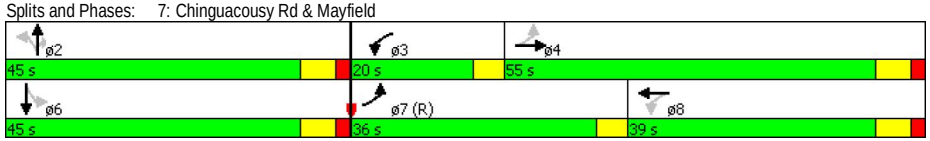
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	137	704	364	434
Volume Left	9	369	0	1
Volume Right	1	232	36	49
cSH	289	287	1127	1195
Volume to Capacity	0.47	2.45	0.00	0.00
Queue Length 95th (m)	18.2	431.3	0.0	0.0
Control Delay (s)	28.1	691.2	0.0	0.0
Lane LOS	D	F		A
Approach Delay (s)	28.1	691.2	0.0	0.0
Approach LOS	D	F		

Intersection Summary			
Average Delay		299.3	
Intersection Capacity Utilization		81.3%	ICU Level of Service D
Analysis Period (min)		15	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT
Lane Configurations								
Volume (vph)	146	476	223	804	34	21	128	247
Lane Group Flow (vph)	146	560	223	807	34	21	128	544
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases	4		8		2		2	
Detector Phase	7	4	3	8	2	2	2	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	25.6	10.0	25.6	25.6	25.6	25.6	25.6
Total Split (s)	36.0	55.0	20.0	39.0	45.0	45.0	45.0	45.0
Total Split (%)	30.0%	45.8%	16.7%	32.5%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.0	4.6	4.0	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	5.6	3.0	5.6	5.6	5.6	5.6	5.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	C-Min	Min	Min	Min	None	None	None	None
v/c Ratio	0.37	0.40	0.50	0.80	0.38	0.03	0.21	0.89
Control Delay	15.7	25.2	19.2	44.4	44.3	25.8	5.5	52.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	25.2	19.2	44.4	44.3	25.8	5.5	52.0
Queue Length 50th (m)	16.4	48.8	30.8	61.9	5.7	3.1	0.0	104.9
Queue Length 95th (m)	26.4	61.2	48.1	76.4	17.6	9.1	13.1	#180.7
Internal Link Dist (m)		999.3		312.6		1019.2		908.6
Turn Bay Length (m)	15.0		60.0		60.0			
Base Capacity (vph)	460	1461	482	1027	91	635	623	622
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	0.32	0.38	0.46	0.79	0.37	0.03	0.21	0.87

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 70 (58%), Referenced to phase 7:EBL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Chinguacousy Rd & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	146	476	84	223	804	3	34	21	128	0	247	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.6		3.0	5.6		5.6	5.6	5.6		5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00		1.00	1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1372	3318		1630	3256		1755	1812	1541		1676	
Flt Permitted	0.15	1.00		0.44	1.00		0.14	1.00	1.00		1.00	
Satd. Flow (perm)	216	3318		758	3256		260	1812	1541		1676	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	146	476	84	223	804	3	34	21	128	0	247	297
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	84	0	36	0
Lane Group Flow (vph)	146	548	0	223	807	0	34	21	44	0	508	0
Heavy Vehicles (%)	33%	8%	5%	12%	12%	20%	4%	6%	6%	6%	4%	8%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm		NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	66.7	49.4		49.6	36.3		40.1	40.1	40.1		40.1	
Effective Green, g (s)	67.7	50.4		51.6	37.3		41.1	41.1	41.1		41.1	
Actuated g/C Ratio	0.56	0.42		0.43	0.31		0.34	0.34	0.34		0.34	
Clearance Time (s)	4.0	6.6		4.0	6.6		6.6	6.6	6.6		6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	385	1393		429	1012		89	620	527		574	
v/s Ratio Prot	c0.09	0.17		c0.06	c0.25			0.01			c0.30	
v/s Ratio Perm	0.13			0.16			0.13		0.03			
v/c Ratio	0.38	0.39		0.52	0.80		0.38	0.03	0.08		0.89	
Uniform Delay, d1	15.8	24.2		22.6	37.9		29.8	26.2	26.7		37.2	
Progression Factor	1.00	1.00		1.12	1.02		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.6	0.2		1.0	4.0		2.7	0.0	0.1		15.2	
Delay (s)	16.5	24.4		26.2	42.7		32.6	26.3	26.8		52.4	
Level of Service	B	C		C	D		C	C	C		D	
Approach Delay (s)		22.7			39.2			27.8			52.4	
Approach LOS		C			D			C			D	

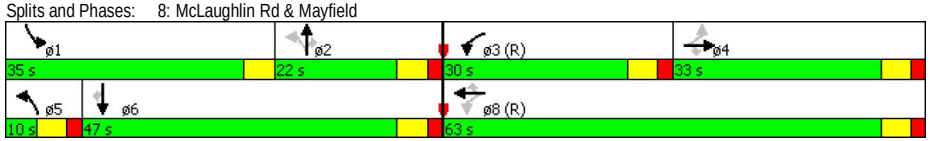
Intersection Summary			
HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	334	28	456	1021	758	121	139	92	262	116	62
Lane Group Flow (vph)	33	334	28	456	1021	758	121	139	92	262	116	62
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2			6
Detector Phase	4	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	10.0	22.0	22.0	10.0	22.0	22.0	10.0	22.0	22.0
Total Split (s)	33.0	33.0	33.0	30.0	63.0	63.0	10.0	22.0	22.0	35.0	47.0	47.0
Total Split (%)	27.5%	27.5%	27.5%	25.0%	52.5%	52.5%	8.3%	18.3%	18.3%	29.2%	39.2%	39.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Min	Min	Min	C-Max	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.41	0.60	0.07	0.57	0.50	0.63	0.48	0.42	0.31	0.75	0.17	0.15
Control Delay	47.8	39.8	0.6	17.1	9.3	2.0	40.0	55.0	2.7	57.8	38.2	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	39.8	0.6	17.1	9.3	2.0	40.0	55.0	2.7	57.8	38.2	0.8
Queue Length 50th (m)	7.2	40.1	0.2	36.2	34.5	0.0	20.8	16.5	0.0	58.4	12.4	0.0
Queue Length 95th (m)	18.2	53.4	0.1	#95.5	61.0	0.0	31.0	26.2	0.0	80.8	17.0	0.0
Internal Link Dist (m)		388.2			866.8			1234.6			159.7	
Turn Bay Length (m)	80.0		80.0	80.0		80.0	80.0		80.0	80.0		80.0
Base Capacity (vph)	116	795	489	807	2042	1202	254	517	367	463	1240	613
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.42	0.06	0.57	0.50	0.63	0.48	0.27	0.25	0.57	0.09	0.10

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 43 (36%), Referenced to phase 3:WBL and 8:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: McLaughlin Rd & Mayfield



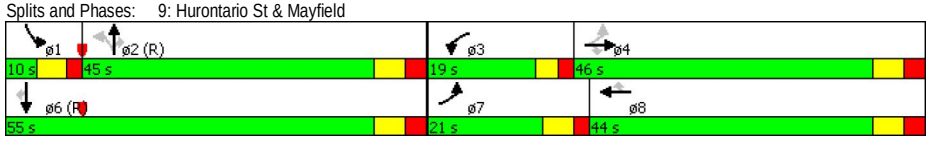
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	334	28	456	1021	758	121	139	92	262	116	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1690	3411	1528	1755	3411	1500	1738	3650	1543	1738	3544	1500
Flt Permitted	0.28	1.00	1.00	0.31	1.00	1.00	0.68	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	499	3411	1528	565	3411	1500	1242	3650	1543	1738	3544	1500
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	33	334	28	456	1021	758	121	139	92	262	116	62
RTOR Reduction (vph)	0	0	23	0	0	304	0	0	84	0	0	50
Lane Group Flow (vph)	33	334	5	456	1021	454	121	139	8	262	116	12
Heavy Vehicles (%)	8%	7%	6%	4%	7%	8%	5%	0%	5%	5%	3%	8%
Bus Blockages (#/hr)	0	0	2	0	0	2	0	0	2	0	0	2
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2			6
Actuated Green, G (s)	18.5	18.5	18.5	70.9	70.9	70.9	18.6	9.9	9.9	23.2	22.4	22.4
Effective Green, g (s)	19.5	19.5	19.5	71.9	71.9	71.9	20.6	10.9	10.9	24.2	23.4	23.4
Actuated g/C Ratio	0.16	0.16	0.16	0.60	0.60	0.60	0.17	0.09	0.09	0.20	0.19	0.19
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	81	554	248	808	2043	898	253	331	140	350	691	292
v/s Ratio Prot		0.10		c0.22	0.30		0.04	0.04		c0.15	0.03	
v/s Ratio Perm	0.07		0.00	c0.12		0.30	c0.04		0.01			0.01
v/c Ratio	0.41	0.60	0.02	0.56	0.50	0.51	0.48	0.42	0.06	0.75	0.17	0.04
Uniform Delay, d1	45.1	46.7	42.2	13.9	13.8	13.8	44.2	51.6	49.9	45.0	40.2	39.2
Progression Factor	0.76	0.76	1.00	0.98	0.57	0.10	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.3	1.9	0.0	2.1	0.6	1.5	1.4	0.9	0.2	8.5	0.1	0.1
Delay (s)	37.5	37.5	42.2	15.7	8.5	2.8	45.7	52.4	50.0	53.5	40.3	39.3
Level of Service	D	D	D	B	A	A	D	D	D	D	D	D
Approach Delay (s)		37.8			8.1			49.5			48.0	
Approach LOS		D			A			D			D	

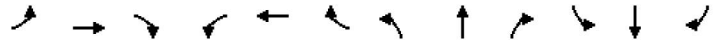
Intersection Summary				
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	68.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	273	480	16	221	1851	97	202	601	155	467	199	707
Lane Group Flow (vph)	273	480	16	221	1851	97	202	601	155	467	199	707
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4		4			8	2		2			6
Detector Phase	7	4	4	3	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	44.0	44.0	9.0	44.0	44.0	45.0	45.0	45.0	10.0	45.0	45.0
Total Split (s)	21.0	46.0	46.0	19.0	44.0	44.0	45.0	45.0	45.0	10.0	55.0	55.0
Total Split (%)	17.5%	38.3%	38.3%	15.8%	36.7%	36.7%	37.5%	37.5%	37.5%	8.3%	45.8%	45.8%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	None	C-Min	C-Min
v/c Ratio	0.90	0.26	0.02	0.63	1.73	0.20	0.60	0.61	0.29	3.74	0.15	0.95
Control Delay	55.5	25.6	0.1	58.7	359.5	2.8	43.7	38.7	6.0	1266.4	25.6	45.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.5	25.6	0.1	58.7	359.5	2.8	43.7	38.7	6.0	1266.4	25.6	45.0
Queue Length 50th (m)	~47.4	40.4	0.0	25.6	~341.8	0.0	38.9	61.0	0.0	~103.7	14.9	90.0
Queue Length 95th (m)	#107.5	42.3	0.2	38.4	#384.1	5.1	63.7	79.1	14.3	#136.7	26.6	#184.8
Internal Link Dist (m)		456.2			1363.3			1227.0			551.5	
Turn Bay Length (m)	170.0		170.0	128.0		128.0	70.0		109.0	190.0		190.0
Base Capacity (vph)	305	1848	647	384	1072	476	369	1088	572	125	1419	778
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.26	0.02	0.58	1.73	0.20	0.55	0.55	0.27	3.74	0.14	0.91

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 10 (8%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
~ 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.

Splits and Phases: 9: Hurontario St & Mayfield





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	273	480	16	221	1851	97	202	601	155	467	199	707
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1601	4948	1506	3079	3318	1191	1722	3349	1439	3001	3476	1471
Flt Permitted	0.09	1.00	1.00	0.95	1.00	1.00	0.63	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	154	4948	1506	3079	3318	1191	1136	3349	1439	3001	3476	1471
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	273	480	16	221	1851	97	202	601	155	467	199	707
RTOR Reduction (vph)	0	0	10	0	0	66	0	0	109	0	0	187
Lane Group Flow (vph)	273	480	6	221	1851	31	202	601	46	467	199	521
Confl. Peds. (#/hr)	12		1	1		12			19	19		
Heavy Vehicles (%)	14%	6%	7%	15%	10%	34%	6%	9%	10%	18%	5%	11%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4		4			8	2		2			6
Actuated Green, G (s)	61.6	43.8	43.8	12.8	37.8	37.8	34.4	34.4	34.4	4.0	44.4	44.4
Effective Green, g (s)	62.6	44.8	44.8	13.8	38.8	38.8	35.4	35.4	35.4	5.0	45.4	45.4
Actuated g/C Ratio	0.52	0.37	0.37	0.12	0.32	0.32	0.29	0.29	0.29	0.04	0.38	0.38
Clearance Time (s)	6.0	7.0	7.0	5.0	7.0	7.0	7.0	7.0	7.0	6.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	307	1847	562	354	1072	385	335	987	424	125	1315	556
v/s Ratio Prot	c0.14	0.10		0.07	c0.56			0.18		c0.16	0.06	
v/s Ratio Perm	0.32		0.00			0.03	0.18		0.03			c0.35
v/c Ratio	0.89	0.26	0.01	0.62	1.73	0.08	0.60	0.61	0.11	3.74	0.15	0.94
Uniform Delay, d1	35.5	26.1	23.7	50.6	40.6	28.2	36.3	36.4	30.8	57.5	24.6	35.9
Progression Factor	0.67	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.07	1.06
Incremental Delay, d2	25.0	0.1	0.0	3.4	330.9	0.1	7.8	2.8	0.5	1250.6	0.2	25.3
Delay (s)	48.8	24.1	23.7	54.0	371.5	28.3	44.1	39.1	31.3	1307.7	26.5	63.2
Level of Service	D	C	C	D	F	C	D	D	C	F	C	E
Approach Delay (s)		32.9			323.8			38.9			481.2	
Approach LOS		C			F			D			F	

Intersection Summary				
HCM 2000 Control Delay	270.6	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.41			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.0	
Intersection Capacity Utilization	121.1%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	0	15	15	7	2	52	401	33	7	214	36
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	0	15	15	7	2	52	401	33	7	214	36

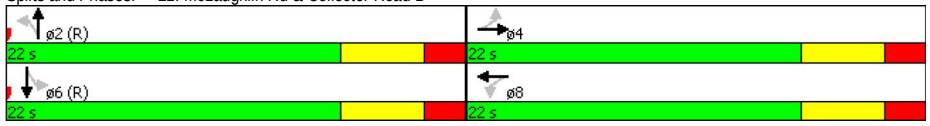
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	10	15	15	9	52	434	7	250
Volume Left (vph)	10	0	15	0	52	0	7	0
Volume Right (vph)	0	15	0	2	0	33	0	36
Hadj (s)	0.53	-0.67	0.53	-0.12	0.53	-0.02	0.53	-0.07
Departure Headway (s)	6.7	5.5	6.7	6.1	5.4	4.8	5.6	5.0
Degree Utilization, x	0.02	0.02	0.03	0.02	0.08	0.58	0.01	0.34
Capacity (veh/h)	485	582	485	534	653	737	626	709
Control Delay (s)	8.6	7.5	8.7	8.0	7.6	13.1	7.4	9.4
Approach Delay (s)	7.9		8.4		12.5		9.3	
Approach LOS	A		A		B		A	

Intersection Summary				
Delay	11.2			
Level of Service	B			
Intersection Capacity Utilization	43.9%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	10	8	31	5	34	287	46	179
Lane Group Flow (vph)	10	22	31	15	34	301	46	206
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.03	0.07	0.10	0.05	0.03	0.10	0.05	0.07
Control Delay	14.7	10.7	15.5	10.7	3.6	2.7	3.6	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	10.7	15.5	10.7	3.6	2.7	3.6	2.6
Queue Length 50th (m)	0.7	0.5	2.1	0.3	0.0	0.0	0.0	0.0
Queue Length 95th (m)	3.2	4.3	6.6	3.5	3.4	8.4	4.2	5.7
Internal Link Dist (m)		139.8		112.0		291.5		261.3
Turn Bay Length (m)	20.0		20.0		20.0		20.0	
Base Capacity (vph)	710	667	710	661	973	2951	888	2915
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	0.03	0.04	0.02	0.03	0.10	0.05	0.07

Intersection Summary
Cycle Length: 44
Actuated Cycle Length: 44
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 21: McLaughlin Rd & Collector Road B



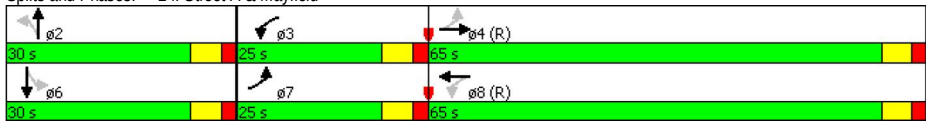
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	8	14	31	5	10	34	287	14	46	179	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.90		1.00	0.90		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	1704		1789	1695		1789	3554		1789	3508	
Flt Permitted	0.98	1.00		0.98	1.00		0.62	1.00		0.57	1.00	
Satd. Flow (perm)	1838	1704		1838	1695		1173	3554		1070	3508	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	8	14	31	5	10	34	287	14	46	179	27
RTOR Reduction (vph)	0	13	0	0	9	0	0	4	0	0	9	0
Lane Group Flow (vph)	10	9	0	31	6	0	34	297	0	46	197	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	3.1	3.1		3.1	3.1		28.9	28.9		28.9	28.9	
Effective Green, g (s)	4.1	4.1		4.1	4.1		29.9	29.9		29.9	29.9	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.68	0.68		0.68	0.68	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	171	158		171	157		797	2415		727	2383	
v/s Ratio Prot		0.01			0.00			c0.08			0.06	
v/s Ratio Perm	0.01			c0.02			0.03			0.04		
v/c Ratio	0.06	0.06		0.18	0.04		0.04	0.12		0.06	0.08	
Uniform Delay, d1	18.2	18.2		18.4	18.2		2.3	2.5		2.4	2.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.2		0.5	0.1		0.1	0.1		0.2	0.1	
Delay (s)	18.3	18.3		18.9	18.3		2.4	2.6		2.5	2.5	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		18.3			18.7			2.6			2.5	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	4.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	44.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	124	321	219	926	5	1	25	0
Lane Group Flow (vph)	124	331	243	1115	6	4	25	245
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	22.0	10.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	25.0	65.0	25.0	65.0	30.0	30.0	30.0	30.0
Total Split (%)	20.8%	54.2%	20.8%	54.2%	25.0%	25.0%	25.0%	25.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
v/c Ratio	0.29	0.13	0.27	0.43	0.10	0.03	0.24	0.57
Control Delay	4.4	3.5	3.9	12.8	54.0	36.5	57.5	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.4	3.5	3.9	12.8	54.0	36.5	57.5	6.3
Queue Length 50th (m)	2.4	4.4	9.0	69.9	1.4	0.2	5.7	0.0
Queue Length 95th (m)	7.0	10.8	32.9	141.4	5.6	3.7	14.3	2.4
Internal Link Dist (m)		624.9		388.2		102.8		297.5
Turn Bay Length (m)	30.0		60.0					
Base Capacity (vph)	591	2575	989	2577	180	350	296	599
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	0.21	0.13	0.25	0.43	0.03	0.01	0.08	0.41

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 24: Street A & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	124	321	9	219	926	189	5	1	3	25	0	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	0.89		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	3562		1789	3488		1789	1672		1789	1601	
Flt Permitted	0.23	1.00		0.54	1.00		0.46	1.00		0.76	1.00	
Satd. Flow (perm)	433	3562		1021	3488		866	1672		1422	1601	
Peak-hour factor, PHF	1.00	1.00	0.90	0.90	1.00	1.00	0.90	0.90	0.90	1.00	0.90	1.00
Adj. Flow (vph)	124	321	10	243	926	189	6	1	3	25	0	245
RTOR Reduction (vph)	0	1	0	0	7	0	0	3	0	0	227	0
Lane Group Flow (vph)	124	330	0	243	1108	0	6	1	0	25	18	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	92.7	85.8		95.9	87.4		7.7	7.7		7.7	7.7	
Effective Green, g (s)	94.7	86.8		97.9	88.4		8.7	8.7		8.7	8.7	
Actuated g/C Ratio	0.79	0.72		0.82	0.74		0.07	0.07		0.07	0.07	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	430	2576		893	2569		62	121		103	116	
v/s Ratio Prot	0.02	0.09		c0.02	c0.32			0.00			0.01	
v/s Ratio Perm	0.21			0.20			0.01			c0.02		
v/c Ratio	0.29	0.13		0.27	0.43		0.10	0.01		0.24	0.15	
Uniform Delay, d1	3.3	5.1		2.4	6.1		52.0	51.7		52.5	52.2	
Progression Factor	1.33	0.64		1.70	1.96		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.2	0.5		0.7	0.0		1.2	0.6	
Delay (s)	4.8	3.3		4.2	12.5		52.7	51.7		53.8	52.8	
Level of Service	A	A		A	B		D	D		D	D	
Approach Delay (s)		3.7			11.0			52.3			52.9	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	83	701	271	2043	186	7	16	1
Lane Group Flow (vph)	83	701	271	2043	186	22	16	110
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		8		6	
Detector Phase	4	4	8	8	8	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	28.0	28.0	28.0	28.0	28.0	28.0	10.0	28.0
Total Split (s)	82.0	82.0	82.0	82.0	82.0	28.0	10.0	38.0
Total Split (%)	68.3%	68.3%	68.3%	68.3%	68.3%	23.3%	8.3%	31.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag						Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None
v/c Ratio	0.91	0.24	0.48	0.71	0.14	0.14	0.11	0.55
Control Delay	95.0	0.9	1.8	4.7	0.0	30.7	46.1	53.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	95.0	0.9	1.8	4.7	0.0	30.7	46.1	53.0
Queue Length 50th (m)	16.4	3.4	1.9	42.2	0.0	1.5	3.4	21.7
Queue Length 95th (m)	m#51.8	5.5	m2.3	m8.7	m0.0	9.8	9.7	38.2
Internal Link Dist (m)		866.8		456.2		231.1		552.0
Turn Bay Length (m)	100.0		100.0		100.0		60.0	
Base Capacity (vph)	91	2862	566	2862	1317	336	144	450
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	0.91	0.24	0.48	0.71	0.14	0.07	0.11	0.24

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 115 (96%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 67: Robertson Davies Dr & Mayfield

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	701	0	271	2043	186	0	7	15	16	1	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.90		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1789	3579		1789	3579	1601		1691		1789	1603	
Flt Permitted	0.06	1.00		0.38	1.00	1.00		1.00		0.50	1.00	
Satd. Flow (perm)	114	3579		709	3579	1601		1691		933	1603	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	701	0	271	2043	186	0	7	15	16	1	109
RTOR Reduction (vph)	0	0	0	0	0	43	0	14	0	0	12	0
Lane Group Flow (vph)	83	701	0	271	2043	143	0	8	0	16	98	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	91.4	91.4		91.4	91.4	91.4		9.0		16.6	16.6	
Effective Green, g (s)	92.4	92.4		92.4	92.4	92.4		10.0		17.6	17.6	
Actuated g/C Ratio	0.77	0.77		0.77	0.77	0.77		0.08		0.15	0.15	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	87	2755		545	2755	1232		140		155	235	
v/s Ratio Prot		0.20			0.57			0.00		0.00	c0.06	
v/s Ratio Perm	c0.73			0.38		0.09				0.01		
v/c Ratio	0.95	0.25		0.50	0.74	0.12		0.06		0.10	0.42	
Uniform Delay, d1	12.0	3.9		5.1	7.4	3.5		50.7		44.2	46.5	
Progression Factor	1.82	0.20		0.30	0.71	0.00		1.00		1.00	1.00	
Incremental Delay, d2	81.4	0.2		0.3	0.2	0.0		0.2		0.3	1.2	
Delay (s)	103.1	1.0		1.8	5.4	0.0		50.8		44.5	47.7	
Level of Service	F	A		A	A	A		D		D	D	
Approach Delay (s)		11.8			4.6			50.8			47.3	
Approach LOS		B			A			D			D	

Intersection Summary

HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX G

Intersection Capacity Analysis – 2021 Full Build-Out – With Improvements

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	49	103	0	36	127	1	1	384	369	232	328	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	49	103	0	36	127	1	1	384	369	232	328	9
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1432	1552	332	1418	1372	568	337			753		
vC1, stage 1 conf vol	796	796		570	570							
vC2, stage 2 conf vol	635	755		848	801							
vCu, unblocked vol	1432	1552	332	1418	1372	568	337			753		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	56	38	100	77	51	100	100			73		
cM capacity (veh/h)	110	166	709	157	259	522	1222			857		

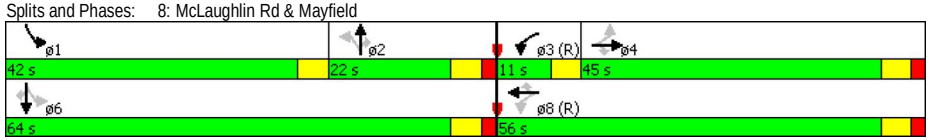
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	49	103	36	128	754	569
Volume Left	49	0	36	0	1	232
Volume Right	0	0	0	1	369	9
cSH	110	166	157	260	1222	857
Volume to Capacity	0.44	0.62	0.23	0.49	0.00	0.27
Queue Length 95th (m)	14.6	25.9	6.4	19.1	0.0	8.3
Control Delay (s)	61.5	56.7	34.7	31.5	0.0	6.5
Lane LOS	F	F	D	D	A	A
Approach Delay (s)	58.2		32.2		0.0	6.5
Approach LOS	F		D			

Intersection Summary					
Average Delay		10.9			
Intersection Capacity Utilization		96.9%	ICU Level of Service		F
Analysis Period (min)		15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	1048	245	94	326	202	20	78	293	702	156	4
Lane Group Flow (vph)	37	1048	245	94	326	202	20	78	293	702	156	4
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	3	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	10.0	22.0	22.0	22.0	22.0	22.0	10.0	22.0	22.0
Total Split (s)	45.0	45.0	45.0	11.0	56.0	56.0	22.0	22.0	22.0	42.0	64.0	64.0
Total Split (%)	37.5%	37.5%	37.5%	9.2%	46.7%	46.7%	18.3%	18.3%	18.3%	35.0%	53.3%	53.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	3.0	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes		
Recall Mode	Min	Min	Min	C-Max	C-Min	C-Min	None	None	None	Min	Min	Min
v/c Ratio	0.11	0.93	0.37	0.45	0.22	0.26	0.13	0.17	0.89	0.94	0.09	0.01
Control Delay	19.0	42.1	3.6	15.1	10.5	5.1	47.5	46.8	51.5	47.9	16.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0
Total Delay	19.0	42.1	3.6	15.1	10.5	5.1	47.5	46.8	51.5	57.9	16.9	0.0
Queue Length 50th (m)	5.1	128.6	11.2	9.3	26.6	23.6	4.2	8.5	32.0	131.8	10.0	0.0
Queue Length 95th (m)	m7.8	#158.5	2.3	18.4	37.6	44.9	11.6	15.9	#76.7	#179.0	15.8	0.0
Internal Link Dist (m)		388.2			866.8			1234.6			159.7	
Turn Bay Length (m)	80.0		80.0	80.0		80.0	80.0		80.0	80.0		80.0
Base Capacity (vph)	329	1137	662	210	1497	772	169	517	353	747	1742	770
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	45	0	0
Spillback Cap Reductn	0	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	0
Reduced v/c Ratio	0.11	0.92	0.37	0.45	0.22	0.26	0.12	0.15	0.83	1.00	0.09	0.01

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 113 (94%), Referenced to phase 3:WBL and 8:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: McLaughlin Rd & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	1048	245	94	326	202	20	78	293	702	156	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	3.0	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1690	3411	1528	1755	3411	1500	1738	3650	1543	1738	3544	1500
Flt Permitted	0.55	1.00	1.00	0.09	1.00	1.00	0.65	1.00	1.00	0.59	1.00	1.00
Satd. Flow (perm)	987	3411	1528	173	3411	1500	1195	3650	1543	1073	3544	1500
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	37	1048	245	94	326	202	20	78	293	702	156	4
RTOR Reduction (vph)	0	0	154	0	0	113	0	0	137	0	0	2
Lane Group Flow (vph)	37	1048	91	94	326	89	20	78	156	702	156	2
Heavy Vehicles (%)	8%	7%	6%	4%	7%	8%	5%	0%	5%	5%	3%	8%
Bus Blockages (#/hr)	0	0	2	0	0	2	0	0	2	0	0	2
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	38.7	38.7	38.7	51.7	51.7	51.7	14.0	14.0	14.0	56.3	56.3	56.3
Effective Green, g (s)	39.7	39.7	39.7	52.7	52.7	52.7	15.0	15.0	15.0	57.3	57.3	57.3
Actuated g/C Ratio	0.33	0.33	0.33	0.44	0.44	0.44	0.12	0.12	0.12	0.48	0.48	0.48
Clearance Time (s)	6.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	326	1128	505	207	1497	658	149	456	192	730	1692	716
v/s Ratio Prot		c0.31		c0.04	0.10			0.02		c0.31	0.04	
v/s Ratio Perm	0.04		0.06	0.16		0.06	0.02		0.10	c0.14		0.00
v/c Ratio	0.11	0.93	0.18	0.45	0.22	0.13	0.13	0.17	0.81	0.96	0.09	0.00
Uniform Delay, d1	27.9	38.8	28.6	25.2	20.9	20.1	46.7	46.9	51.1	27.9	17.1	16.4
Progression Factor	0.65	0.72	0.46	0.43	0.48	1.46	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	12.1	0.2	6.9	0.3	0.4	0.4	0.2	22.2	24.1	0.0	0.0
Delay (s)	18.2	40.2	13.2	17.7	10.3	29.7	47.1	47.1	73.3	52.0	17.2	16.4
Level of Service	B	D	B	B	B	C	D	D	E	D	B	B
Approach Delay (s)		34.6			17.7			66.7			45.5	
Approach LOS		C			B			E			D	

Intersection Summary				
HCM 2000 Control Delay	38.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	97.7%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	127	1	369	103	232	0	328	36	1	384	49
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	127	1	369	103	232	0	328	36	1	384	49
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1040	774	408	821	781	346	433			364		
vC1, stage 1 conf vol	410	410		346	346							
vC2, stage 2 conf vol	630	364		475	435							
vCu, unblocked vol	1040	774	408	821	781	346	433			364		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	75	100	10	79	67	100			100		
cM capacity (veh/h)	247	503	643	408	499	697	1127			1195		

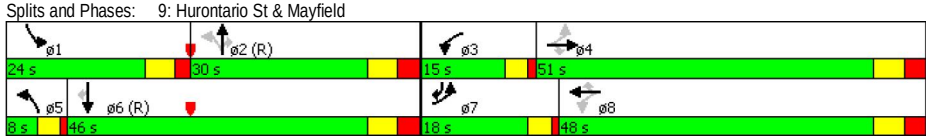
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	9	128	369	335	364	434
Volume Left	9	0	369	0	0	1
Volume Right	0	1	0	232	36	49
cSH	247	503	408	621	1700	1195
Volume to Capacity	0.04	0.25	0.90	0.54	0.21	0.00
Queue Length 95th (m)	0.9	7.6	72.6	24.5	0.0	0.0
Control Delay (s)	20.1	14.6	55.8	17.4	0.0	0.0
Lane LOS	C	B	F	C		A
Approach Delay (s)	14.9		37.5		0.0	0.0
Approach LOS	B		E			

Intersection Summary				
Average Delay	17.4			
Intersection Capacity Utilization	61.2%	ICU Level of Service	B	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	273	480	16	221	1851	97	202	601	155	467	199	707
Lane Group Flow (vph)	273	480	16	221	1851	97	202	601	155	467	199	707
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases	4		4	8		8	2		2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	7
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	44.0	44.0	8.0	11.0	11.0	8.0	11.0	11.0	10.0	45.0	8.0
Total Split (s)	18.0	51.0	51.0	15.0	48.0	48.0	8.0	30.0	30.0	24.0	46.0	18.0
Total Split (%)	15.0%	42.5%	42.5%	12.5%	40.0%	40.0%	6.7%	25.0%	25.0%	20.0%	38.3%	15.0%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	2.0	3.0	1.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	5.0	6.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
v/c Ratio	1.04	0.26	0.02	0.49	1.11	0.19	0.62	0.91	0.38	0.98	0.17	0.90
Control Delay	96.2	12.1	0.1	20.4	95.6	0.9	40.8	65.9	8.1	87.4	30.3	42.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.2	12.1	0.1	20.4	95.6	0.9	40.8	65.9	8.1	87.4	30.3	42.2
Queue Length 50th (m)	~33.4	23.5	0.0	27.7	~182.4	0.0	30.4	73.2	0.0	57.3	18.0	127.7
Queue Length 95th (m)	#101.0	30.4	0.0	43.2	#211.9	0.5	47.8	#104.4	15.3	#91.0	27.3	#219.2
Internal Link Dist (m)		456.2			1363.3			1227.0			551.5	
Turn Bay Length (m)	170.0		170.0	128.0		128.0	70.0		109.0	190.0		190.0
Base Capacity (vph)	263	1875	672	451	1668	523	325	669	416	475	1158	783
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.26	0.02	0.49	1.11	0.19	0.62	0.90	0.37	0.98	0.17	0.90

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated
~ 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.

Splits and Phases: 9: Hurontario St & Mayfield



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	273	480	16	221	1851	97	202	601	155	467	199	707
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	5.0	6.0	3.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1601	4948	1506	1587	4768	1192	1722	3349	1425	3001	3476	1471
Flt Permitted	0.09	1.00	1.00	0.47	1.00	1.00	0.63	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	150	4948	1506	782	4768	1192	1136	3349	1425	3001	3476	1471
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	273	480	16	221	1851	97	202	601	155	467	199	707
RTOR Reduction (vph)	0	0	10	0	0	63	0	0	124	0	0	40
Lane Group Flow (vph)	273	480	6	221	1851	34	202	601	31	467	199	667
Confl. Peds. (#/hr)	12		1	1		12			19	19		
Heavy Vehicles (%)	14%	6%	7%	15%	10%	34%	6%	9%	10%	18%	5%	11%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases	4		4	8		8	2		2			6
Actuated Green, G (s)	58.8	44.5	44.5	51.8	41.0	41.0	26.7	22.7	22.7	18.0	38.7	53.0
Effective Green, g (s)	60.3	45.5	45.5	53.8	42.0	42.0	28.7	23.7	23.7	19.0	39.7	55.0
Actuated g/C Ratio	0.50	0.38	0.38	0.45	0.35	0.35	0.24	0.20	0.20	0.16	0.33	0.46
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	6.0	7.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	260	1876	571	429	1668	417	296	661	281	475	1149	674
v/s Ratio Prot	c0.13	0.10		0.05	0.39		0.03	0.18		c0.16	0.06	c0.13
v/s Ratio Perm	c0.39		0.00	0.18		0.03	0.13		0.02			0.33
v/c Ratio	1.05	0.26	0.01	0.52	1.11	0.08	0.68	0.91	0.11	0.98	0.17	0.99
Uniform Delay, d1	37.4	25.6	23.2	21.2	39.0	26.1	40.3	47.1	39.5	50.3	28.5	32.2
Progression Factor	0.95	0.45	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.05	1.06
Incremental Delay, d2	69.1	0.1	0.0	1.0	58.6	0.1	6.4	18.7	0.8	36.7	0.3	32.1
Delay (s)	104.8	11.7	23.2	22.3	97.6	26.2	46.7	65.8	40.3	86.5	30.3	66.4
Level of Service	F	B	C	C	F	C	D	E	D	F	C	E
Approach Delay (s)		45.0			86.7			57.6			68.0	
Approach LOS		D			F			E			E	

Intersection Summary					
HCM 2000 Control Delay	70.5	HCM 2000 Level of Service		E	
HCM 2000 Volume to Capacity ratio	1.07				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		20.0	
Intersection Capacity Utilization	102.4%	ICU Level of Service		G	
Analysis Period (min)	15				
c Critical Lane Group					