TIME DEVELOPMENT GROUP

TRAFFIC IMPACT AND PARKING STUDY

376-390 Derry Road, City of Mississauga

Project No.: TR16-0538

December 2017

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December 15, 2017
Reference No. TR16-0538

Mr. Mike Wang
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Dear Mr. Wang:

Re: Traffic Impact and Parking Study
376-390 Derry Road
City of Mississauga

Cole Engineering Group Ltd. (COLE) is pleased to submit this Traffic Impact and Parking Study the above noted development. This report documents our findings and conclusions regarding the traffic impact and parking requirements in support of an Official Plan, a Site Plan, and Re-Zoning application for the above noted development located in the southeast quadrant of the Derry Road and McLauglin Road intersection in the City of Mississauga (the "City"), in Peel Region (the "Region").

Based on the attached preliminary Site Plan, the intention is to provide up to 126 lane townhouses, 513m^2 commercial (323m^2 will be built in Phase 1 and 190m^2 in Phase 2) and 323m^2 office component. Vehicular access to the subject site will be provided right-in / right-out (RI/RO) via Derry Road for the interim scenario. The RI/RO access will be closed during the ultimate scenario, when the development to the immediate east of the proposed site is developed, the future public road (Longview Place) is extended to intersect with Derry Road and St. Barbara Boulevard. Emergency access to the subject site will be provided via Derry Road.

This Traffic Impact and Parking Study concludes that the development will have minimal impact to the study intersections. Further, the proposed parking supply was found to be adequate to accommodate the parking demands of the proposed development.

Should you have any questions, please do not hesitate to contact the undersigned.

Yours truly,

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Issues and Revisions Registry

Identification	Date	Description of issued and/or revision
Draft Report	June 2017	For Client Review
Draft Report	August 2017	For Client Review
Final Report	December 2017	For Submission

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1 Introduction

Cole Engineering Group Ltd. (COLE) was retained by Time Development Group (the "Client") to undertake a Traffic Impact and Parking Study (TIPS) in support of an Official Plan, a Site Plan, and Re-Zoning application for the above noted development located in the southeast quadrant of Derry Road and McLaughlin Road intersection in the City of Mississauga (the "City"), in Peel Region (the "Region"). The site location is illustrated in **Figure 1-1**.

The subject site consist of two (2) properties, municipally know as 376 and 390 Derry Road, in the City. Based on the latest preliminary Site Plan, the intention is to provide up to 126 lane townhouses, 513m^2 commercial (323m^2 will be built in Phase 1 and 190m^2 in Phase 2) and 323m^2 office component. Vehicular access to the subject site will be provided temporary right-in / right-out (RIRO) via Derry Road for the interim condition. The RIRO access will be closed during the ultimate scenario, the proposed development will be served by the future public road (Longview Place) is extended to intersect with Derry Road and St. Barbara Boulevard and secondary access will be via Arrowsmith Drive to Mclaughlin Road.

A preliminary Site Plan for the subject site is illustrated in **Figure 1-2**.

The purpose of this study is to:

- Focus on the intersections of:
  - Derry Road / McLaughlin Road (Signalized);
  - Derry Road / St. Barbara Boulevard (Signalized);
  - Derry Road / Derrycrest Drive – Martiz Drive (Signalized); and,
  - McLaughlin Road / Novo Star Drive – Arrowsmith Drive (Signalized).
- Establish existing traffic conditions for the study area through the operational assessment of the study area intersections;
- Determine future traffic conditions for a post build out, five (5) and 10-year traffic horizons;
- Identify study area capacity constraints (if any) in the future background conditions and recommend roadway improvements, if required, to provide better roadway operations;
- Forecast and estimate the site traffic associated with the proposed development using the information published in the *Trip Generation Manual, 9th Edition*, by the Institute of Transportation Engineers (ITE);
- Undertake future total traffic analysis to determine the impact of the proposed development on the surrounding road network and recommend any improvements which may be required to accommodate the proposed development;
- Identify mitigation measures to address any deficiencies at each horizon year (existing, future background and future total traffic) for key study area intersections; and,
- Review the adequacy of the proposed parking supply with regards to the future demands of the site.

2 Study Approach

The study's methodology and analysis reflects the Region's Guidelines for the preparation of Traffic Impact Studies, Regional Guidelines for Using Synchro Version 7.73 Rev 8 and the City's Traffic Impact Study Guidelines.

Weekday morning and afternoon peak period traffic volume counts were collected by Accu-Traffic Inc. on behalf of COLE for the study area intersections on April 4, 2017. This data will represent existing baseline conditions.

Future background traffic volumes for the 2022 and 2027 horizon years, excluding the additional traffic volumes generated by the proposed development, consists of existing traffic, traffic growth from outside the study area and future background developments in the vicinity of the subject site.

Future total traffic conditions will be determined by the summation of the estimated traffic volumes generated by the site and the background traffic volumes for the 2022 and 2027 full build-out horizon.

The study area intersections were analyzed using *Synchro 9.0* software which utilizes the U.S. Transportation Research Board Highway Capacity Manual 2000 methodology.

It should be noted that the proposed development has a right-in/right-out (RI/RO) access on Derry Road for the interim scenario. The RI/RO access will be closed during the ultimate scenario, when the development (358 and 346 Derry Road West) to the immediate east of the proposed site is developed, the future public road (Longview Place) is extended to intersect with Derry Road and St. Barbara Boulevard. The development to the immediate east of the proposed site has an intention to develop however timing of the development has yet to be confirmed. For the purpose of this study, the interim scenarios analyzed in Phase 1 (FT 2022) and the ultimate scenarios analyzed in Phase 2 (FT 2027).

Emergency access to the subject site will be provided via Derry Road. The emergency access will be used by emergency vehicle such as Fire Department, Ambulance, Police and Region's and City's maintenance vehicles.

2.1 Assessment of Signalized Intersection Operations

Analysis of the intersection operations was conducted using the *Synchro 9.0* software. The signalized intersection analysis is representative of the following assumptions:

- Peak hour factor for the signalized intersection is 1.0 based on the Regional *Synchro* Guidelines;
- Heavy vehicle percentages are based on the existing traffic volumes;
- 3.7m lane width on Regional road;
- 3.5m lane width on the intersection street / access;
- Saturation flow ratio is based on the *Synchro* default of 1,900 vehicles per hour; and,
- *Synchro* results for the signalized intersections are provided in Highway Capacity Manual (HCM) format.

2.2 Assessment of Unsignalized Intersection Operations

The unsignalized intersection operational analysis in this report was also conducted using *Synchro 9.0* software, which employs the Highway Capacity Manual (HCM 2000) methodology. Synchro results for the unsignalized intersections are provided in HCM format.

3 Existing Traffic Conditions

3.1 Existing Road Network

The existing road network, lane configuration and traffic control for the study intersections are shown in **Figure 3-1** following the report. The details are described as follows:

- **Derry Road** is a six (6) lane east-west arterial roadway under the jurisdiction of the Region. It maintains a speed limit of 70km/h within the study area. Derry Road provides exclusive turning lanes at the intersections of McLaughlin Road, St. Barbara Boulevard and Derrycrest Drive – Martiz Drive;
- **McLaughlin Road** is a four (4) lane north-south major collector road under the jurisdiction of the City with a posted speed limit of 60km/h within the study area. McLaughlin Road provides exclusive left and right turning lanes at the intersection of Derry road;
- **St. Barbara Boulevard** is a two (2) lane north-south local road under the jurisdiction of the City with a posted speed of 50km/h. St. Barbara Boulevard provides exclusive left turn lane at the intersection of Derry Road;
- **Derrycrest Drive – Martiz Drive** is a two (2) lane north-south local road under the jurisdiction of the City with a posted speed of 50km/h. Derrycrest Drive provides exclusive left and right turning lanes at the intersection of Derry Road and Martiz Drive provides an exclusive left turn lane at the same intersection;
- **Arrowsmith Drive** is a two (2) lane east-west local road under the jurisdiction of the City; and,
- **Longview Place** is a two (2) lane north-south local road under the jurisdiction of the City. Ultimately it is planned that Longview Place will be extended to Derry Road at the signalized intersection aligned with the north leg St. Barbara Boulevard. Further discussion about this improvement is provided in the following sections.

3.2 Existing Traffic Counts

Details of intersection turning movement counts used in the traffic assessment are summarized in **Table 3.1** and were conducted by Accu-Traffic Inc. on behalf of COLE. Existing turning movement counts are provided in **Appendix A**.

Table 3.1 Intersection Turning Movement Count Details

Intersection	Count Date	Count Hours
Derry Road / McLaughlin Road (Signalized)	April 4, 2017	7:00 AM to 9:00 AM 4:00 PM to 6:00 PM
Derry Road / St. Barbara Boulevard (Signalized)	April 4, 2017	7:00 AM to 9:00 AM 4:00 PM to 6:00 PM
Derry Road / Derrycrest Drive – Martiz Drive (Signalized)	April 4, 2017	7:00 AM to 9:00 AM 4:00 PM to 6:00 PM
McLaughlin Road / Novo Star Drive – Arrowsmith Drive	April 4, 2017	7:00 AM to 9:00 AM 4:00 PM to 6:00 PM

3.3 Existing Traffic Analysis

The existing traffic volumes for the weekday AM and PM peak hours are illustrated in **Figure 3-2**. These peak hour volumes were analyzed using the *Synchro 9.0* software which employs the 2000 Highway Capacity Methodology for the intersection analysis. The results of the existing intersection operations are summarized in **Table 3.2** below with level of service (LOS) and the volume to capacity (v/c) ratios for overall and individual movements. As per the City's Traffic Impact Study Guidelines, v/c ratios for overall signalized intersection operations, through movements, or shared through / turning movements greater than 0.85, and v/c ratios for exclusive movements greater than 0.90 have been shown in bold. The intersection capacity analysis reports under the existing conditions are presented in **Appendix B**.

Table 3.2 Existing Traffic Analysis – Level of Service

Intersection	Key Movement	LOS (v/c)	
		AM Peak	PM Peak
Derry Road / McLaughlin Road (Signalized)	Overall	D (1.15)	D (1.10)
	EB left	C (0.34)	**F (1.18)**
	EB through	**D (0.91)**	C (0.42)
	EB right	A (0.29)	A (0.07)
	WB left	**F (1.28)**	C (0.65)
	WB through	C (0.43)	**C (0.93)**
	WB right	A (0.05)	D (0.20)
	NB left	E (0.55)	**F (0.96)**
	NB through	D (0.55)	**E (0.97)**
	NB right	D (0.14)	C (0.08)
	SB left	E (0.64)	F (0.78)
	SB through	**F (1.04)**	D (0.53)
	SB right	C (0.06)	C (0.14)

Intersection	Key Movement	LOS (v/c)	
		AM Peak	PM Peak
Derry Road / St. Barbara Boulevard (Signalized)	Overall	C (0.81)	A (0.63)
	EB left	B (0.13)	D (0.65)
	EB through	C (0.71)	A (0.25)
	WB through	B (0.34)	A (0.56)
	WB right	B (0.03)	A (0.39)
	SB left	**E (0.98)**	D (0.52)
	SB right	C (0.12)	D (0.10)
Derry Road / Derrycrest Drive – Martiz Drive (Signalized)	Overall	A (0.56)	C (0.86)
	EB left	A (0.46)	D (0.39)
	EB through	A (0.48)	B (0.42)
	EB right	A (0.50)	B (0.03)
	WB left	B (0.56)	B (0.10)
	WB through	A (0.26)	C (0.74)
	WB right	A (0.03)	B (0.01)
	NB left	D (0.27)	**E (0.97)**
	NB through-right	D (0.33)	C (0.64)
	SB left	D (0.09)	E (0.62)
	SB through	D (0.54)	D (0.24)
	SB right	D (0.02)	D (0.20)
McLaughlin Road / Novo Star Drive – Arrowsmith Drive (Signalized)	Overall	B (0.81)	A (0.58)
	EB left	C (0.38)	D (0.38)
	EB through-right	D (0.58)	C (0.10)
	WB left	C (0.35)	C (0.11)
	WB through-right	C (0.22)	C (0.08)
	NB left	B (0.45)	A (0.26)
	NB through-right	A (0.30)	A (0.57)
	SB left	A (0.04)	B (0.27)
	SB through-right	C (0.90)	A (0.37)

NOTE: Considering that all of the measured / existing traffic volume movements were actually accommodated by the intersections, then the above-stated levels of service greater than 1.0 are an overstatement by the Synchro software.

The results of the existing 2017 traffic analysis indicate that all intersections are generally functioning with acceptable LOS and v/c ratios with the exception of the following movements:

- The eastbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'D' with a v/c ratio of 0.91 during the morning peak period;
- The westbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.28 during the morning peak period;
- The southbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.04 during the morning peak period;
- The eastbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.18 during the afternoon peak period;
- The westbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'C' with a v/c ratio of 0.94 during the afternoon peak period; and,
- The northbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'E' with a v/c ratio of 0.97 during the afternoon peak period.

4 Future Background Traffic Operations

Horizons of five (5)-years (2022) and 10 years (2027) were selected to represent future traffic conditions. Future background traffic volumes consist of the following components:

- Background traffic growth from outside the study area; and,
- Traffic generated within the study area from other proposed developments in the vicinity of the subject development.

4.1 Future Planned Roadway Improvements

It should be noted that the proposed development has a RI/RO access on Derry Road for the interim scenario. There will be no traffic interaction between the subject site and proposed future Longview Place extension during the Phase 1 (2022 horizon year). The RI/RO access will be closed during the ultimate scenario, when the development to the immediate east of the proposed site is developed, the future public road (Longview Place) is extended to intersect with Derry Road and St. Barbara Boulevard. For the purpose of this study, the interim scenarios analyzed in Phase 1 (FT 2022) and the ultimate scenarios analyzed in Phase 2 (FT 2027). The future road network, lane configuration and traffic control for the study intersections are shown in **Figure 4-1A** and **Figure 4-1B,** future 2022 and future 2027 conditions respectively.

Hurontario Light Rail Transit (LRT): The Hurontario LRT project will bring 20km of fast, reliable, rapid transit to the cities of Mississauga and Brampton along the Hurontario corridor. Main Light Rail Transit system have been obtained and funding for this project is committed by the Provincial Government with an anticipated start of construction scheduled for 2018. This project will impact right-of-way requirements, property accesses, allowed turning movements and will result in the permanent removal of a general purpose traffic lane in each direction for many segments of the corridor.

Martiz Drive: Based on the discussing with the City staff the 2022 analysis assumes lane reductions on Hurontario Street for LRT and the widening of Maritz Drive from one (1) through lane in each direction to two (2) through lanes in each direction. After reviewing some aerial imagery Maritz Drive has been widened already to two (2) through lanes in each direction except from Derry Road to Longside Drive in the southbound direction. It is assumed based on the City's model Maritz Drive will be widened between Derry Road and Longside Drive to two (2) through lanes in the southbound direction by the horizon year of 2022.

Mavis Road Class EA Study: The City, in partnership with the Region, has initiated a Class Environmental Assessment (Class EA) study for Mavis Road from Courtneypark Drive West, in the City, to Ray Lawson Boulevard, in the City of Brampton, to address existing and future 'multi-modal' transportation conditions. This Class EA study will examine how traffic operates both now and in the future, and will identify ways to address current and future needs to best serve a variety of users including motorists, transit users, pedestrians and cyclists.

4.2 Historical Traffic Growth

Based on the available Average Annual Daily Traffic (AADT) volumes along Derry Road (600m west of Hurontario Street) were consulted from 1996-2015. The traffic volumes identified a 2% growth rate per annum year along Derry Road. However, taking into consideration the high level of development and construction activity planned in 2017-2022 in the subject Study Area and surrounding areas, the annual background traffic growth rates of a 1% and 0.5% per annum (compounded) was applied to the through movements along Derry Road for 2022 and 2027 horizon years, respectively. In addition, based on the discussion with the City staff, the following rates rate per annum was applied to through movements during the a.m. and p.m. peak hours, along McLaughlin Road, Martiz Drive and Derrycrest Drive. The annual background traffic growth rates shown in **Table 4.1** below, were applied for this study.

Table 4.1 Background Annual Growth Rates

Years	Derry Road	McLaughlin Road	Martiz Drive / Derrycrest Drive	
2017-2022	1.0%	0.5% (NB – PM)	5.0% (NB-AM)	5.5% (SB –AM)
			3.5% (NB-PM)	4.0% (SB – PM)
2022-2027	0.5%	0%	1.0%	

4.3 Background Developments

The background traffic volume for this study includes traffic generated from proposed and planned developments within the study area and the immediate vicinity, as identified by the City and summarized in **Table 4.2.** Corresponding site locations are provided in **Figures 4-2A,** following the report.

This study had referred to the following technical reports for traffic generation and assignment for the background developments noted in **Table 4.2.**

Table 4.2 Future Background Developments Summary

Development	Uses	Build out Timeline	Source
270 Derry Road	Office Building with Accessory / Retail	Application in process	**Table 4.3**
290 Derry Road (Proposed Hotel)	(120 Suites and 5,330ft^2 Restaurant)	Under Construction	Trans-Plan Inc.
320 Derry Road (Proposed Residential and Commercial)	45 Residential Dwelling 1,965m^2 Commercial	2018	NexTrans
600 Novo Star Drive (SP 15-012)	New French Elementary School	Approved	NexTrans

The future background trip generation was undertaken using information contained in the *Trip Generation Manual, 9th Edition* published by the Institute of Transportation Engineers (ITE). The weekday AM and PM peak hour traffic estimates used the ITE regression equation for Land Use Code 710 (General Office Building). The trip rate used to calculate the gross trips is calculated using the regression equation in the Trip Generation Manual. The summary of the trip generation is shown in **Table 4.3** below.

Table 4.3 Future Background Development Trip Generation

		AM Peak Hour			PM Peak Hour		
		IN	OUT	TOTAL	IN	OUT	TOTAL
General Office Building (710) 270 Derry Road (27,437.21ft^2)	Directional Distribution	88%	12%	100%	17%	83%	100%
	Trip Rate	2.18	0.30	2.48	0.67	3.30	3.97
	Gross Trips	60	8	68	19	90	109
New Trips		**60**	**8**	**68**	**19**	**90**	**109**

The future background development is expected to generate 68 two (2) way new trips (60 trips in / eight (8) trips out) during the weekday AM peak hour and 109 two (2) way new trips (19 trips in / 90 trips out) during the PM peak hour. The future background developments total traffic volumes illustrated in **Figure 4-2B**.

4.4 Future Background Traffic Analysis

4.4.1 Future (2022) Background Traffic Conditions

The future (2022) background traffic volumes shown in **Figure 4-3** were analyzed using the *Synchro 9.0* software which employs the 2000 Highway Capacity Methodology for the intersection analysis. The results are summarized in **Table 4.4** on the following page. As per the City's Traffic Impact Study Guidelines, v/c ratios for overall signalized intersection operations, through movements, or shared through / turning movements greater than 0.85, and v/c ratios for exclusive movements greater than 0.90 have been shown in bold. The intersection capacity and queuing analysis reports under the future (2022) background conditions are presented in **Appendix C.** Based on the discussion with City staff; it is assumed based on the City's model Maritz Drive will be widened between Derry Road and Longside Drive to two (2) through lanes in the southbound direction by the horizon year of 2022.

Table 4.4 Future (2022) Background Traffic Analysis – Level of Service

Intersection	Key Movement	LOS (v/c)	
		AM Peak	PM Peak
Derry Road / McLaughlin Road (Signalized)	Overall	E (1.17)	F (1.11)
	EB left	C (0.37)	**F (1.18)**
	EB through	**E (0.97)**	D (0.46)
	EB right	A (0.29)	A (0.07)
	WB left	**F (1.28)**	D (072)
	WB through	C (0.47)	**F (0.99)**
	WB right	A (0.05)	A (0.21)
	NB left	E (0.55)	**F (0.96)**
	NB through	D (0.57)	**F (1.01)**
	NB right	D (0.15)	C (0.10)
	SB left	E (0.65)	E (0.80)
	SB through	**F (1.05)**	D (0.54)
	SB right	C (0.06)	C (0.14)
Derry Road / McLaughlin Road (Signalized) **(OPTIMIZED)**	Overall	D (0.97)	D (0.95)
	EB left	C (0.34)	**F (0.99)**
	EB through	**E (0.96)**	D (0.48)
	EB right	A (0.29)	A (0.07)
	WB left	**F (0.95)**	C (0.61)
	WB through	C (0.46)	**C (0.94)**
	WB right	A (0.05)	A (0.21)
	NB left	E (0.48)	E (0.67)
	NB through	D (0.54)	**E (0.95)**
	NB right	C (0.13)	C (0.09)
	SB left	E (0.62)	E (0.68)
	SB through	**E (0.99)**	D (0.56)
	SB right	C (0.06)	C (0.12)

Intersection	Key Movement	LOS (v/c)	
		AM Peak	PM Peak
Derry Road / St. Barbara Boulevard – Future Longview Place Extension (Signalized) (There will be no traffic interaction between the subject site and Longview Place)	Overall	C (0.93)	B (0.70)
	EB left	B (0.14)	F (0.79)
	EB through	**C (0.88)**	B (0.40)
	EB right	B (0.02)	A (0.01)
	WB left	C (0.47)	A (0.36)
	WB through	B (0.36)	B (0.72)
	WB right	B (0.03)	A (0.48)
	NB left	E (0.43)	D (0.52)
	NB through-right	D (0.02)	D (0.06)
	SB left	**E (1.01)**	C (0.27)
	SB through-right	C (0.14)	C (0.01)
Derry Road / St. Barbara Boulevard – Future Longview Place Extension (Signalized) (There will be no traffic interaction between the subject site and Longview Place in Phase 1) **(OPTIMIZED)**	Overall	C (0.85)	Not Optimized
	EB left	B (0.14)	
	EB through	C (0.87)	
	EB right	B (0.02)	
	WB left	C (0.47)	
	WB through	B (0.37)	
	WB right	B (0.03)	
	NB left	E (0.43)	
	NB through-right	D (0.02)	
	SB left	D (0.89)	
	SB through-right	C (0.14)	
Derry Road / Derrycrest Drive – Martiz Drive (Signalized)	Overall	A (0.65)	C (0.91)
	EB left	B (0.53)	D (0.39)
	EB through	A (0.52)	B (0.48)
	EB right	A (0.50)	B (0.03)
	WB left	C (0.70)	B (0.13)
	WB through	A (0.29)	C (0.82)
	WB right	A (0.03)	B (0.01)
	NB left	D (0.26)	**E (0.99)**
	NB through-right	D (0.21)	C (0.38)
	SB left	D (0.08)	E (0.64)
	SB through-right	D (0.37)	D (0.27)

Intersection	Key Movement	LOS (v/c)	
		AM Peak	PM Peak
Derry Road / Derrycrest Drive – Martiz Drive (Signalized) **(OPTIMIZED)**	Overall	Not Optimized	C (0.91)
	EB left		D (0.39)
	EB through		B (0.51)
	EB right		B (0.03)
	WB left		B (0.14)
	WB through		C (0.86)
	WB right		B (0.01)
	NB left		**E (0.91)**
	NB through-right		C (0.35)
	SB left		E (0.64)
	SB through-right		D (0.29)
McLaughlin Road / Novo Star Drive – Arrowsmith Drive (Signalized)	Overall	C (0.83)	A (0.62)
	EB left	C (0.44)	D (0.44)
	EB through-right	D (0.62)	C (0.10)
	WB left	C (0.36)	C (0.10)
	WB through-right	C (0.21)	C (0.10)
	NB left	C (0.55)	A (0.28)
	NB through-right	A (0.31)	A (0.61)
	SB left	A (0.04)	B (0.35)
	SB through-right	C (0.92)	A (0.39)

NOTE: Considering that all of the measured / existing traffic volume movements were actually accommodated by the intersections, then the above-stated levels of service greater than 1.0 are an overstatement by the Synchro software.

The results of the future 2022 background traffic analysis indicate that all intersections are generally functioning with acceptable LOS and v/c ratios with the exception of the following movements:

- The eastbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'E' with a v/c ratio of 0.97 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.96;
- The westbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.28 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'F' and v/c ratio of 0.95;
- The southbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'E' with a v/c ratio of 1.05 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.99;

- The eastbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.18 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'F' and v/c ratio of 0.99;
- The westbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 0.99 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'C' and v/c ratio of 0.94;
- The northbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.01 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.95;
- The northbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 0.96 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.67;
- The eastbound through movement, at the intersection of Derry Road and St. Barbara Boulevard – Future Longview Place Extension, is operating at a LOS 'C' with a v/c ratio of 0.88 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'C' and v/c ratio of 0.87. It should be noted that there will be no traffic interaction between the subject site and Longview Place in Phase 1;
- The southbound left movement, at the intersection of Derry Road and St. Barbara Boulevard – Future Longview Place Extension , is operating at a LOS 'E' with a v/c ratio of 1.01 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'D' and v/c ratio of 0.89; and,
- The northbound left movement, at the intersection of Derry Road and Martiz Drive-Derrycrest Drive, is operating at a LOS 'F' with a v/c ratio of 0.99 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.91.

It should be noted that the signal timing splits for the intersection of Derry Road / McLaughlin Road, Derry Road and St. Barbara Boulevard – Future Longview Place Extension and Derry Road / Martiz Drive-Derrycrest Drive were optimized to improve the traffic operations for the above mentioned approaches. The results of the analysis indicate that the optimized splits will significantly reduce the v/c ratios and improve the overall LOS of the intersection. The future background / total 2022 traffic analyses are based on the existing and optimized signal splits are presented in this report for the above mentioned intersections.

4.4.2 Future (2027) Background Traffic Conditions

The future (2027) background traffic volumes shown in **Figure 4-4** were analyzed using the *Synchro 9.0* software which employs the 2000 Highway Capacity Methodology for the intersection analysis. The results are summarized in **Table 4.5.** As per the City's Traffic Impact Study Guidelines, v/c ratios for overall signalized intersection operations, through movements, or shared through / turning movements greater than 0.85, and v/c ratios for exclusive movements greater than 0.90 have been shown in bold. The intersection capacity and queuing analysis reports under the future (2027) background conditions are presented in **Appendix D.** Based on the discussion with City staff; it is assumed based on the City's model Maritz Drive will be widened between Derry Road and Longside Drive to two (2) through lanes in the southbound direction by the horizon year of 2022 and 2027.

Table 4.5 Future (2027) Background Traffic Analysis – Level of Service

Intersection	Key Movement	LOS (v/c)	
		AM Peak	PM Peak
Derry Road / McLaughlin Road (Signalized)	Overall	E (1.17)	E (1.11)
	EB left	C (0.38)	**F (1.18)**
	EB through	**E (1.00)**	C (0.47)
	EB right	A (0.29)	A (0.07)
	WB left	**F (1.28)**	D (0.74)
	WB through	C (0.48)	**E (1.02)**
	WB right	A (0.05)	A (0.21)
	NB left	E (0.55)	**F (0.96)**
	NB through	D (0.57)	**E (1.01)**
	NB right	D (0.15)	C (0.10)
	SB left	E (0.65)	F (0.80)
	SB through	**F (1.05)**	D (0.54)
	SB right	C (0.06)	C (0.14)
Derry Road / McLaughlin Road (Signalized) **(OPTIMIZED)**	Overall	D (0.98)	D (0.96)
	EB left	C (0.35)	**F (0.99)**
	EB through	**E (0.98)**	D (0.50)
	EB right	A (0.29)	A (0.07)
	WB left	**F (0.95)**	C (0.62)
	WB through	C (0.47)	**D (0.96)**
	WB right	A (0.05)	A (0.21)
	NB left	E (0.48)	E (0.67)
	NB through	D (0.54)	**E (0.95)**
	NB right	C (0.13)	C (0.09)
	SB left	E (0.62)	E (0.68)
	SB through	**E (0.99)**	D (0.56)
	SB right	C (0.06)	C (0.12)

Intersection	Key Movement	LOS (v/c)	
		AM Peak	PM Peak
Derry Road / St. Barbara Boulevard – Future Longview Place Extension (Signalized)	Overall	C (0.95)	B (0.70)
	EB left	B (0.14)	E (0.79)
	EB through	**C (0.90)**	B (0.41)
	EB right	B (0.02)	B (0.01)
	WB left	C (0.47)	A (0.37)
	WB through	B (0.37)	B (0.75)
	WB right	B (0.03)	B (0.48)
	NB left	E (0.43)	D (0.52)
	NB through-right	D (0.02)	D (0.06)
	SB left	**E (1.01)**	C (0.27)
	SB through-right	E (0.14)	C (0.01)
Derry Road / St. Barbara Boulevard – Future Longview Place Extension (Signalized) **(OPTIMIZED)**	Overall	C (0.87)	Not Optimized
	EB left	B (0.15)	
	EB through	**C (0.90)**	
	EB right	B (0.02)	
	WB left	C (0.47)	
	WB through	B (0.38)	
	WB right	B (0.03)	
	NB left	E (0.43)	
	NB through-right	D (0.02)	
	SB left	D (0.89)	
	SB through-right	C (0.15)	
Derry Road / Derrycrest Drive – Martiz Drive (Signalized)	Overall	A (0.70)	C (0.93)
	EB left	B (0.55)	D (0.40)
	EB through	A (0.54)	B (0.50)
	EB right	A (0.51)	B (0.03)
	WB left	D (0.76)	B (0.13)
	WB through	A (0.30)	C (0.84)
	WB right	A (0.03)	B (0.01)
	NB left	D (0.26)	**E (0.99)**
	NB through-right	D (0.21)	D (0.39)
	SB left	D (0.08)	E (0.64)
	SB through-right	D (0.38)	D (0.27)

Intersection	Key Movement	LOS (v/c)	
		AM Peak	PM Peak
Derry Road / Derrycrest Drive – Martiz Drive (Signalized)	Overall	Not Optimized	C (0.92)
	EB left		D (0.39)
	EB through		C (0.53)
	EB right		B (0.03)
	WB left		B (0.15)
	WB through		C (0.89)
	WB right		B (0.01)
	NB left		**D (0.91)**
	NB through-right		C (0.36)
	SB left		E (0.64)
	SB through-right		D (0.25)
McLaughlin Road / Novo Star Drive – Arrowsmith Drive (Signalized)	Overall	C (0.83)	A (0.60)
	EB left	C (0.44)	D (0.44)
	EB through-right	D (0.62)	C (0.10)
	WB left	C (0.36)	C (0.10)
	WB through-right	C (0.21)	C (0.10)
	NB left	C (0.55)	A (0.27)
	NB through-right	A (0.31)	A (0.59)
	SB left	A (0.04)	B (0.30)
	SB through-right	C (0.92)	A (0.38)

NOTE: Considering that all of the measured / existing traffic volume movements were actually accommodated by the intersections, then the above-stated levels of service greater than 1.0 are an overstatement by the Synchro software.

The results of the future 2027 background traffic analysis indicate that all intersections are generally functioning with acceptable LOS and v/c ratios with the exception of the following movements:

- The eastbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS ‘E’ with a v/c ratio of 1.00 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of ‘E’ and v/c ratio of 0.98;
- The westbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS ‘F’ with a v/c ratio of 1.28 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of ‘F’ and v/c ratio of 0.95;
- The southbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS ‘E’ with a v/c ratio of 1.05 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of ‘E’ and v/c ratio of 0.99;

- The eastbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.18 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'F' and v/c ratio of 0.99;
- The westbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.02 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'C' and v/c ratio of 0.96;
- The northbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.01 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.95;
- The northbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 0.96 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.67;
- The eastbound through movement, at the intersection of Derry Road and St. Barbara Boulevard – Future Longview Place Extension, is operating at a LOS 'C' with a v/c ratio of 0.90 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'C' and v/c ratio of 0.90. It should be noted that there will be no traffic interaction between the subject site and Longview Place in Phase 1;
- The southbound left movement, at the intersection of Derry Road and St. Barbara Boulevard – Future Longview Place Extension , is operating at a LOS 'E' with a v/c ratio of 1.01 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'D' and v/c ratio of 0.89; and,
- The northbound left movement, at the intersection of Derry Road and Martiz Drive-Derrycrest Drive, is operating at a LOS 'F' with a v/c ratio of 0.99 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.91.

It should be noted that the signal timing splits for the intersection of Derry Road / McLaughlin Road, Derry Road and St. Barbara Boulevard – Future Longview Place Extension and Derry Road / Martiz Drive-Derrycrest Drive were optimized to improve the traffic operations for the above mentioned approaches. The results of the analysis indicate that the optimized splits will significantly reduce the v/c ratios and improve the overall LOS of the intersection. The future background / total 2027 traffic analyses are based on the existing and optimized signal splits are presented in this report for the above mentioned intersections.

5 Future Total Traffic Operations

For the purpose of this study, the interim scenarios analyzed in Phase 1 (FT 2022) and the ultimate scenarios analyzed in Phase 2 (FT 2027).

5.1 Site Generated Traffic

Trip generation was undertaken using information contained in the *Trip Generation Manual, 9th Edition* published by the Institute of Transportation Engineers (ITE). The weekday AM and PM peak hour traffic estimates used the ITE regression equation for Land Use Code 230 (Residential Condominium / Townhouse), and 820 (Shopping Centre). A trip reduction of 14% was used to account for public transit use and travel demand management measures. The trip rate used to calculate the gross trips is calculated using the regression equation in the Trip Generation Manual for residential component. To be more realistic average trip rate used for commercial component. The summary of the trip generation is shown in **Table 5.1** on the following page.

Table 5.1 Site Trip Generation

		AM Peak Hour			PM Peak Hour		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Residential Condominium/Townhouse (LUC 230) 126 Units	Directional Distribution	17%	83%	100%	67%	33%	100%
	Trip Rate	0.09	0.40	0.49	0.39	0.19	0.58
	Gross Trips	11	51	62	49	24	73
	Transit Reduction (14%)	2	7	9	7	3	10
	Internal Capture (4% - PM Peak)	-	-	-	1	1	2
	New Trip Rates	0.07	0.36	0.50	0.33	0.15	0.48
	Net Trips	**9**	**44**	**53**	**41**	**20**	**61**
Commercial (LUC 820) 3,476.74ft^2 **(Phase 1)**	Directional Distribution	62%	38%	100%	48%	52%	100%
	Trip Rate	0.60	0.36	0.96	1.78	1.93	3.71
	Gross Trip	2	1	3	6	7	13
	Internal Capture (4% - PM Peak)	-	-	-	1	1	2
	Net Trip	**2**	**1**	**3**	**5**	**6**	**13**

		AM Peak Hour			PM Peak Hour		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Commercial (LUC 820) (3,476.74ft^2+2,045.14ft^2) **(Phase 2)**	Directional Distribution	62%	38%	100%	48%	52%	**100%**
	Trip Rate	0.60	0.36	0.96	1.78	1.93	**3.71**
	Gross Trip	3	2	5	10	10	**20**
	Internal Capture (4% - PM Peak)	-	-	-	1	1	**2**
	Net Trip	**3**	**2**	**5**	**9**	**9**	**18**
Office (LUC 710) 3,476.74ft^2	Directional Distribution	88%	12%	100%	17%	83%	100%
	Trip Rate	1.37	0.19	1.56	0.25	1.24	1.49
	Gross Trip	4	1	5	1	4	5
	Internal Capture (4% - PM Peak)	-	-	-	-	-	-
	Net Trip	**4**	**1**	**5**	**1**	**4**	**5**
Total Ne Trips (Phase 1)		**15**	**46**	**61**	**47**	**30**	**77**
Total Net Trip (Phase 2)		**16**	**47**	**63**	**51**	**33**	**84**

In Phase 1 (2022 horizon) the proposed development is expected to generate 61 two (2) way new trips (15 trips in / 46 trips out) during the weekday AM peak hour and 77 two (2) way new trips (47 trips in / 30 trips out) during the PM peak hour. **Figure 5-1** illustrate the resulting site trip assignments.

In Phase 2 (2027 horizon) the proposed development is expected to generate 63 two (2) way new trips (16 trips in / 47 trips out) during the weekday AM peak hour and 84 two (2) way new trips (51 trips in / 33 trips out) during the PM peak hour. **Figure 5-2** illustrate the resulting site trip assignments.

5.2 Site Trip Distribution

The trip distribution was based on existing turning movements in the vicinity of the site along with the 2011 TTS data analysis and presented in **Table 5.2**. It should be noted that since the site access is RI/RO during the Phase 1 the proposed distribution is adjusted accordingly. The inbound traffic from east travel from via McLaughlin Road and the outbound traffic from the subject site travel to northbound, southbound and westbound, U-Turn at St. Barbara Boulevard.

Table 5.2 Site Trip Distribution (Phase 2)

Direction (from / to)	Via	Trip Distribution – Commercial (Inbound / Outbound)	Trip Distribution – Residential (Inbound / Outbound)
North	McLaughlin Road	11%	8%
South	McLaughlin Road	6%	21%
East	Derry Road	77%	9%
West	Derry Road	6%	62%
Total		**100%**	**100%**

5.3 Future Total Traffic Analysis (Phase 1)

5.3.1 Future (2022) Total Traffic Analysis (Phase 1)

The future (2022) total traffic consists of future (2022) background traffic plus site-related traffic. The future (2022) total traffic volumes in the weekday AM and PM peak hours are illustrated **Figure 5-3**.

Intersection capacity analysis under the future (2022) total traffic conditions was completed using *Synchro 9* software which employs the 2000 Highway Capacity Methodology for the intersection analysis. The traffic analysis results for future (2022) total traffic are summarized in **Table 5.3** on the following page. As per the City's Traffic Impact Study Guidelines, v/c ratios for overall signalized intersection operations, through movements, or shared through / turning movements greater than 0.85, and v/c ratios for exclusive movements greater than 0.90 have been shown in bold. The intersection capacity analysis under the future (2022) total traffic conditions (Phase 1) are presented in **Appendix E**.

Table 5.3 Future (2022) Total Traffic Analysis – Level of Service

Intersection	Key Movement	LOS (v/c)	
		AM Peak	PM Peak
Derry Road / McLaughlin Road (Signalized)	Overall	E (1.19)	E (1.11)
	EB left	C (0.37)	**F (1.18)**
	EB through	**E (0.97)**	C (0.46)
	EB right	A (0.29)	A (0.07)
	WB left	**F (1.34)**	D (0.73)
	WB through	C (0.47)	**E (0.99)**
	WB right	A (0.05)	A (0.21)
	NB left	E (0.55)	**F (0.96)**
	NB through	D (0.57)	**E (1.01)**
	NB right	D (0.18)	C (0.17)
	SB left	E (0.65)	F (0.82)
	SB through	**F (1.05)**	D (0.54)
	SB right	C (0.06)	C (0.14)

Intersection	Key Movement	LOS (v/c)	
		AM Peak	PM Peak
Derry Road / McLaughlin Road (Signalized) **(OPTIMIZED)**	Overall	D (0.97)	D (0.95)
	EB left	C (0.34)	**F (0.99)**
	EB through	**E (0.96)**	D (0.48)
	EB right	A (0.29)	A (0.07)
	WB left	**F (0.99)**	C (0.62)
	WB through	C (0.46)	**D (0.94)**
	WB right	A (0.05)	A (0.21)
	NB left	E (0.48)	E (0.67)
	NB through	D (0.54)	**E (0.95)**
	NB right	C (0.16)	C (0.16)
	SB left	E (0.62)	E (0.70)
	SB through	**E (0.99)**	D (0.56)
	SB right	C (0.06)	C (0.12)
Derry Road / St. Barbara Boulevard – Future Longview Place Extension (Signalized)	Overall	C (0.94)	B (0.76)
	EB left	B (0.21)	F (0.87)
	EB through	**C (0.89)**	B (0.40)
	EB right	B (0.02)	B (0.01)
	WB left	C (0.47)	A (0.37)
	WB through	B (0.36)	B (0.72)
	WB right	B (0.03)	B (0.48)
	NB left	E (0.43)	D (0.52)
	NB through-right	D (0.02)	D (0.06)
	SB left	**E (1.01)**	C (0.27)
	SB through-right	C (0.14)	C (0.01)
Derry Road / St. Barbara Boulevard – Future Longview Place Extension (Signalized) **(OPTIMIZED)**	Overall	C (0.86)	Not Optimized
	EB left	C (0.22)	
	EB through	**C (0.88)**	
	EB right	B (0.02)	
	WB left	C (0.47)	
	WB through	B (0.37)	
	WB right	B (0.03)	
	NB left	E (0.43)	
	NB through-right	D (0.02)	
	SB left	D (0.89)	
	SB through-right	C (0.14)	

Intersection	Key Movement	LOS (v/c)	
		AM Peak	PM Peak
Derry Road / Derrycrest Drive – Martiz Drive (Signalized)	Overall	A (0.67)	C (0.91)
	EB left	B (0.53)	D (0.39)
	EB through	A (0.53)	B (0.49)
	EB right	A (0.51)	B (0.03)
	WB left	C (0.72)	B (0.13)
	WB through	A (0.29)	C (0.82)
	WB right	A (0.03)	B (0.01)
	NB left	D (0.26)	**E (0.99)**
	NB through-right	D (0.21)	C (0.38)
	SB left	D (0.08)	E (0.64)
	SB through-right	D (0.37)	D (0.27)
Derry Road / Derrycrest Drive – Martiz Drive (Signalized) **(OPTIMIZED)**	Overall	Not Optimized	C (0.91)
	EB left		D (0.39)
	EB through		C (0.52)
	EB right		B (0.03)
	WB left		B (0.14)
	WB through		C (0.86)
	WB right		B (0.01)
	NB left		**D (0.91)**
	NB through-right		C (0.35)
	SB left		E (0.64)
	SB through-right		D (0.24)
McLaughlin Road / Novo Star Drive – Arrowsmith Drive (Signalized)	Overall	C (0.84)	A (0.62)
	EB left	C (0.44)	D (0.44)
	EB through-right	D (0.62)	C (0.10)
	WB left	C (0.36)	C (0.10)
	WB through-right	C (0.21)	C (0.12)
	NB left	C (0.55)	A (0.27)
	NB through-right	A (0.31)	A (0.61)
	SB left	A (0.04)	B (0.32)
	SB through-right	C (0.92)	A (0.38)
Derry Road / Site Access (RIRO)	EB through-right	- (0.43)	- (0.22)
	NB right	B (0.06)	A (0.03)

NOTE: Considering that all of the measured / existing traffic volume movements were actually accommodated by the intersections, then the above-stated levels of service greater than 1.0 are an overstatement by the Synchro software.

Similar to the future background 2022 traffic analysis, the results of the future 2022 total traffic analysis indicate that all intersections are generally functioning with acceptable LOS and v/c ratios with the exception of the following movements:

- The eastbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'E' with a v/c ratio of 0.97 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.96;
- The westbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.24 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'F' and v/c ratio of 0.99;
- The southbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'E' with a v/c ratio of 1.05 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.99;
- The eastbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.18 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'F' and v/c ratio of 0.99;
- The westbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 0.99 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'C' and v/c ratio of 0.94;
- The northbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.01 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.95;
- The northbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 0.96 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.67;
- The eastbound through movement, at the intersection of Derry Road and St. Barbara Boulevard – Future Longview Place Extension, is operating at a LOS 'C' with a v/c ratio of 0.89 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'C' and v/c ratio of 0.88. It should be noted that there will be no traffic interaction between the subject site and Longview Place in Phase 1;

- The southbound left movement, at the intersection of Derry Road and St. Barbara Boulevard – Future Longview Place Extension , is operating at a LOS 'E' with a v/c ratio of 1.01 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'D' and v/c ratio of 0.89; and,
- The northbound left movement, at the intersection of Derry Road and Martiz Drive-Derrycrest Drive, is operating at a LOS 'F' with a v/c ratio of 0.99 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.91.

5.3.2 Storage and Queuing Assessments

A queue analysis was conducted for the proposed interim RI/RO Site Access / Derry Road intersection using *Synchro 9.0*. The queue analysis evaluates the storage requirement for the auxiliary turn lane was conducted for the future total 2022 (Phase 1). The Region's standard drawing No 5-1-4, stipulates that all exclusive right turn to be a minimum storage length of 30m on regional roads. Based on above statement the proposed 30 m storage length (eastbound right) can accommodate the 95th percentile queue length. The queue assessment under the future (2022) total traffic conditions (Phase 1) are presented in **Appendix E**.

5.4 Future Total Traffic Analysis (Phase 2)

5.4.1 Future (2027) Total Traffic Analysis (Phase 2)

The future (2027) total traffic consists of future (2027) background traffic plus site-related traffic. The future (2027) total traffic volumes in the weekday AM and PM peak hours are illustrated **Figure 5-4.**

Intersection capacity analysis under the future (2027) total traffic conditions was completed using *Synchro 9* software which employs the 2000 Highway Capacity Methodology for the intersection analysis. The traffic analysis results for future (2027) total traffic are summarized in **Table 5.4** on the following page. As per the City's Traffic Impact Study Guidelines, v/c ratios for overall signalized intersection operations, through movements, or shared through / turning movements greater than 0.85, and v/c ratios for exclusive movements greater than 0.90 have been shown in bold. The intersection capacity analysis under the future (2027) total traffic conditions are presented in **Appendix F**.

Table 5.4 Future (2027) Total Traffic Analysis – Level of Service

Intersection	Key Movement	LOS (v/c)	
		AM Peak	PM Peak
Derry Road / McLaughlin Road (Signalized)	Overall	E (1.17)	E (1.11)
	EB left	C (0.38)	**F (1.18)**
	EB through	**E (1.00)**	C (0.48)
	EB right	A (0.29)	A (0.07)
	WB left	**F (1.28)**	D (0.74)
	WB through	C (0.49)	**E (1.02)**
	WB right	A (0.05)	A (0.21)
	NB left	E (0.55)	**F (0.96)**
	NB through	D (0.57)	**E (1.01)**
	NB right	D (0.15)	C (0.10)
	SB left	E (0.65)	F (0.82)
	SB through	**F (1.05)**	D (0.54)
	SB right	C (0.06)	C (0.14)
Derry Road / McLaughlin Road (Signalized) **(OPTIMIZED)**	Overall	D (0.98)	D (0.96)
	EB left	C (0.35)	**F (0.99)**
	EB through	**E (0.99)**	D (0.50)
	EB right	A (0.29)	A (0.07)
	WB left	**F (0.95)**	C (0.62)
	WB through	C (0.448)	**D (0.96)**
	WB right	A (0.05)	A (0.21)
	NB left	E (0.48)	E (0.67)
	NB through	D (0.54)	**E (0.95)**
	NB right	C (0.13)	C (0.09)
	SB left	E (0.62)	E (0.70)
	SB through	**E (0.99)**	D (0.56)
	SB right	C (0.06)	C (0.12)
Derry Road / St. Barbara Boulevard – Future Longview Place Extension (Signalized)	Overall	C (0.95)	B (0.71)
	EB left	B (0.15)	E (0.79)
	EB through	**D (0.92)**	B (0.41)
	EB right	B (0.02)	B (0.02)
	WB left	C (0.56)	B (0.50)
	WB through	B (0.38)	B (0.75)
	WB right	B (0.03)	B (0.48)
	NB left	E (0.49)	D (0.54)
	NB through-right	D (0.04)	D (0.08)
	SB left	**E (0.99)**	C (0.27)
	SB through-right	C (0.14)	C (0.01)

Intersection	Key Movement	LOS (v/c)	
		AM Peak	PM Peak
Derry Road / St. Barbara Boulevard – Future Longview Place Extension (Signalized) **(OPTIMIZED)**	Overall	C (0.87)	Not Optimized
	EB left	C (0.15)	
	EB through	**C (0.91)**	
	EB right	B (0.02)	
	WB left	C (0.56)	
	WB through	B (0.39)	
	WB right	B (0.03)	
	NB left	E (0.49)	
	NB through-right	D (0.04)	
	SB left	**D (0.87)**	
	SB through-right	D (0.14)	
Derry Road / Derrycrest Drive – Martiz Drive (Signalized)	Overall	B (0.72)	C (0.94)
	EB left	B (0.55)	D (0.40)
	EB through	A (0.55)	B (0.51)
	EB right	A (0.51)	B (0.03)
	WB left	D (0.79)	B (0.14)
	WB through	A (0.31)	C (0.86)
	WB right	A (0.03)	B (0.01)
	NB left	D (0.26)	**E (0.99)**
	NB through-right	D (0.21)	C (0.39)
	SB left	D (0.08)	E (0.64)
	SB through-right	D (0.38)	D (0.27)
Derry Road / Derrycrest Drive – Martiz Drive (Signalized) **(OPTIMIZED)**	Overall	Not Optimized	C (0.93)
	EB left		D (0.39)
	EB through		C (0.54)
	EB right		B (0.03)
	WB left		B (0.15)
	WB through		C (0.90)
	WB right		B (0.01)
	NB left		**D (0.91)**
	NB through-right		C (0.36)
	SB left		E (0.64)
	SB through-right		D (0.25)

Intersection	Key Movement	LOS (v/c)	
		AM Peak	PM Peak
McLaughlin Road / Novo Star Drive – Arrowsmith Drive (Signalized)	Overall	C (0.83)	A (0.61)
	EB left	C (0.44)	D (0.44)
	EB through-right	D (0.62)	C (0.10)
	WB left	D (0.45)	C (0.13)
	WB through-right	C (0.21)	C (0.10)
	NB left	C (0.55)	A (0.27)
	NB through-right	A (0.31)	A (0.59)
	SB left	A (0.04)	B (0.30)
	SB through-right	C (0.92)	A (0.38)

NOTE: Considering that all of the measured / existing traffic volume movements were actually accommodated by the intersections, then the above-stated levels of service greater than 1.0 are an overstatement by the Synchro software.

The results of the future 2027 total traffic analysis indicate that all intersections are generally functioning with acceptable LOS and v/c ratios with the exception of the following movements:

- The eastbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS ‘F’ with a v/c ratio of 0.96 during the morning peak period;
- The eastbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS ‘E’ with a v/c ratio of 1.06 during the morning peak period;
- The westbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS ‘F’ with a v/c ratio of 0.97 during the morning peak period;
- The southbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS ‘E’ with a v/c ratio of 1.00 during the morning peak period;
- The westbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS ‘E’ with a v/c ratio of 1.12 during the afternoon peak period;
- The northbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS ‘E’ with a v/c ratio of 1.01 during the afternoon peak period;
- The eastbound through movement, at the intersection of Derry Road and St. Barbara Boulevard – Future Longview Place Extension , is operating at a LOS ‘C’ with a v/c ratio of 0.98 during the morning peak period;
- The southbound left movement, at the intersection of Derry Road and St. Barbara Boulevard – Future Longview Place Extension , is operating at a LOS ‘D’ with a v/c ratio of 0.96 during the morning peak period;
- The westbound through movement, at the intersection of Derry Road and St. Barbara Boulevard – Future Longview Place Extension , is operating at a LOS ‘C’ with a v/c ratio of 0.99 during the afternoon peak period; and,
- The westbound through movement and northbound left, at the intersection of Derry Road and Martiz Drive-Derrycrest Drive, is operating at a LOS ‘D’ and ‘E’ with a v/c ratio of 0.99 and 1.03 during the afternoon peak period.

5.5 Horizon Year Level of Service Comparisons

As a further demonstration of the traffic impacts resulting from the proposed development, the following table has been assembled to compare traffic operations for future background (2022 - 2027) traffic conditions versus the future (2022-2027) total traffic conditions. **Table 5.5** and **Table 5.6** below summarizes the LOS detailed throughout this report, categorized by a.m., p.m., and Saturday peak hour periods.

Table 5.5 LOS Horizon Year Comparison (FB 2022 versus FT 2022)

Intersection	Key Intersections	AM Peak Hour			PM Peak Hour		
		FB2022	FT2022	-/+	FB2022	FT2022	-/+
Derry Road / McLaughlin Road (Signalized)	Overall	E (1.17)	E (1.19)	+0.02	F (1.11)	E (1.11)	--
	EBL	C (0.37)	C (0.37)	--	**F (1.18)**	**F (1.18)**	--
	EBT	**E (0.97)**	**E (0.97)**	--	D (0.46)	C (0.46)	--
	EBR	A (0.29)	A (0.29)	--	A (0.07)	A (0.07)	--
	WBL	**F (1.28)**	**F (1.34)**	+0.06	D (0.72)	D (0.73)	+0.01
	WBT	C (0.47)	C (0.47)	--	**F (0.99)**	**E (0.99)**	--
	WBR	A (0.05)	A (0.05)	--	A (0.21)	A (0.21)	--
	NBL	E (0.55)	E (0.55)	--	**F (0.96)**	**F (0.96)**	--
	NBT	D (0.57)	D (0.57)	--	**F (1.01)**	**E (1.01)**	--
	NBR	D (0.15)	D (0.18)	+0.03	C (0.10)	C (0.17)	+0.07
	SBL	E (0.65)	E (0.65)	--	E (0.80)	F (0.82)	+0.02
	SBT	**F (1.05)**	**F (1.05)**	--	D (0.54)	D (0.54)	--
	SBR	C (0.06)	C (0.06)	--	C (0.14)	C (0.14)	--
Derry Road / McLaughlin Road (Signalized) **Optimized**	Overall	D (0.97)	D (0.97)	--	D (0.95)	D (0.95)	--
	EBL	C (0.34)	C (0.34)	--	**F (0.99)**	**F (0.99)**	--
	EBT	**E (0.96)**	**E (0.96)**	--	D (0.48)	D (0.48)	--
	EBR	A (0.29)	A (0.29)	--	A (0.07)	A (0.07)	--
	WBL	**F (0.95)**	**F (0.99)**	--	C (0.61)	C (0.62)	+0.01
	WBT	C (0.46)	C (0.46)	+0.04	**C (0.94)**	**D (0.94)**	--
	WBR	A (0.05)	A (0.05)	--	A (0.21)	A (0.21)	--
	NBL	E (0.48)	E (0.48)	--	E (0.67)	E (0.67)	--
	NBT	D (0.54)	D (0.54)	--	**E (0.95)**	**E (0.95)**	--
	NBR	C (0.13)	C (0.16)	+0.03	C (0.09)	C (0.16)	+0.07
	SBL	E (0.62)	E (0.62)	--	E (0.68)	E (0.70)	+0.02
	SBT	**E (0.99)**	**E (0.99)**	--	D (0.56)	D (0.56)	--
	SBR	C (0.06)	C (0.06)	--	C (0.12)	C (0.12)	--

Intersection	Key Intersections	AM Peak Hour			PM Peak Hour		
		FB2022	FT2022	-/+	FB2022	FT2022	-/+
Derry Road / St. Barbara Boulevard – Future Longview Place Extension (Signalized)	Overall	C (0.93)	C (0.94)	+0.01	B (0.70)	B (0.76)	+0.06
	EBL	B (0.14)	B (0.21)	+0.07	F (0.79)	F (0.87)	+0.08
	EBT	**C (0.88)**	**C (0.89)**	+0.01	B (0.40)	B (0.40)	--
	EBR	B (0.02)	B (0.02)	--	A (0.01)	B (0.01)	--
	WBL	C (0.47)	C (0.47)	--	A (0.36)	A (0.37)	+0.01
	WBT	B (0.36)	B (0.36)	--	B (0.72)	B (0.72)	--
	WBR	B (0.03)	B (0.03)	--	A (0.48)	B (0.48)	--
	NBL	E (0.43)	E (0.43)	--	D (0.52)	D (0.52)	--
	NBTR	D (0.02)	D (0.02)	--	D (0.06)	D (0.06)	--
	SBL	**E (1.01)**	**E (1.01)**	--	C (0.27)	C (0.27)	--
	SBTR	C (0.14)	C (0.14)	--	C (0.01)	C (0.01)	--
Derry Road / St. Barbara Boulevard – Future Longview Place Extension (Signalized) **Optimized**	Overall	C (0.85)	C (0.86)	+0.01	Not Optimized	Not Optimized	NA
	EBL	B (0.14)	C (0.22)	+0.08			
	EBT	C (0.87)	**C (0.88)**	+0.01			
	EBR	B (0.02)	B (0.02)	--			
	WBL	C (0.47)	C (0.47)	--			
	WBT	B (0.37)	B (0.37)	--			
	WBR	B (0.03)	B (0.03)	--			
	NBL	E (0.43)	E (0.43)	--			
	NBTR	D (0.02)	D (0.02)	--			
	SBL	D (0.89)	D (0.89)	--			
	SBTR	C (0.14)	C (0.14)	--			
Derry Road / Derrycrest Drive – Martiz Drive (Signalized)	Overall	A (0.65)	A (0.67)	+0.02	C (0.91)	C (0.91)	--
	EBL	B (0.53)	B (0.53)	--	D (0.39)	D (0.39)	--
	EBT	A (0.52)	A (0.53)	+0.01	B (0.48)	B (0.49)	+0.01
	EBR	A (0.50)	A (0.51)	+0.01	B (0.03)	B (0.03)	--
	WBL	C (0.70)	C (0.72)	+0.02	B (0.13)	B (0.13)	--
	WBT	A (0.29)	A (0.29)	--	C (0.82)	C (0.82)	--
	WBR	A (0.03)	A (0.03)	--	B (0.01)	B (0.01)	--
	NBL	D (0.26)	D (0.26)	--	**E (0.99)**	**E (0.99)**	--
	NBTR	D (0.21)	D (0.21)	--	C (0.38)	C (0.38)	--
	SBL	D (0.08)	D (0.08)	--	E (0.64)	E (0.64)	--
	SBTR	D (0.37)	D (0.37)	--	D (0.27)	D (0.27)	--

Intersection	Key Intersections	AM Peak Hour			PM Peak Hour		
		FB2022	FT2022	-/+	FB2022	FT2022	-/+
Derry Road / Derrycrest Drive – Martiz Drive (Signalized) **Optimized**	Overall	Not Optimized	Not Optimized	NA	C (0.91)	C (0.91)	--
	EBL				D (0.39)	D (0.39)	--
	EBT				B (0.51)	C (0.52)	+0.01
	EBR				B (0.03)	B (0.03)	--
	WBL				B (0.14)	B (0.14)	--
	WBT				C (0.86)	C (0.86)	--
	WBR				B (0.01)	B (0.01)	--
	NBL				**E (0.91)**	**D (0.91)**	--
	NBTR				C (0.35)	C (0.35)	--
	SBL				E (0.64)	E (0.64)	--
	SBTR				D (0.29)	D (0.24)	--
McLaughlin Road / Novo Star Drive – Arrowsmith Drive (Signalized)	Overall	C (0.83)	C (0.84)	+0.01	A (0.62)	A (0.62)	--
	EBL	C (0.44)	C (0.44)	--	D (0.44)	D (0.44)	--
	EBTR	D (0.62)	D (0.62)	--	C (0.10)	C (0.10)	--
	WBL	C (0.36)	C (0.36)	--	C (0.10)	C (0.10)	--
	WBTR	C (0.21)	C (0.21)	--	C (0.10)	C (0.12)	+0.2
	NBL	C (0.55)	C (0.55)	--	A (0.28)	A (0.27)	--
	NBTR	A (0.31)	A (0.31)	--	A (0.61)	A (0.61)	--
	SBL	A (0.04)	A (0.04)	--	B (0.35)	B (0.32)	--
	SBTR	C (0.92)	C (0.92)	--	A (0.39)	A (0.38)	--

-/+ represents difference, (--) no change in level of service

The results of the level of service future background 2022 versus future total 2022 comparison table indicates that there are no drastic change between the future background traffic conditions and future total traffic conditions. The proposed development is expected to have negligible impact on the surrounding road network.

Table 5.6 LOS Horizon Year Comparison (FB 2027 versus FT 2027)

Intersection	Key Intersections	AM Peak Hour			PM Peak Hour		
		FB2027	FT2027	-/+	FB2027	FT2027	-/+
Derry Road / McLaughlin Road (Signalized)	Overall	E (1.17)	E (1.17)	--	E (1.11)	E (1.11)	--
	EBL	C (0.38)	C (0.38)	--	**F (1.18)**	**F (1.18)**	--
	EBT	**E (1.00)**	**E (1.00)**	--	C (0.47)	C (0.48)	+0.01
	EBR	A (0.29)	A (0.29)	--	A (0.07)	A (0.07)	--
	WBL	**F (1.28)**	**F (1.28)**	--	D (0.74)	D (0.74)	--
	WBT	C (0.48)	C (0.49)	+0.01	**E (1.02)**	**E (1.02)**	--
	WBR	A (0.05)	A (0.05)	--	A (0.21)	A (0.21)	--
	NBL	E (0.55)	E (0.55)	--	**F (0.96)**	**F (0.96)**	--
	NBT	D (0.57)	D (0.57)	--	**E (1.01)**	**E (1.01)**	--
	NBR	D (0.15)	D (0.15)	--	C (0.10)	C (0.10)	--
	SBL	E (0.65)	E (0.65)	--	F (0.80)	F (0.82)	+0.02
	SBT	**F (1.05)**	**F (1.05)**	--	D (0.54)	D (0.54)	--
	SBR	C (0.06)	C (0.06)	---	C (0.14)	C (0.14)	--
Derry Road / McLaughlin Road (Signalized) **Optimized**	Overall	D (0.98)	D (0.98)	--	D (0.96)	D (0.96)	--
	EBL	C (0.35)	C (0.35)	--	**F (0.99)**	**F (0.99)**	--
	EBT	**E (0.98)**	**E (0.99)**	+0.1	D (0.50)	D (0.50)	--
	EBR	A (0.29)	A (0.29)	--	A (0.07)	A (0.07)	--
	WBL	**F (0.95)**	**F (0.95)**	--	C (0.62)	C (0.62)	--
	WBT	C (0.47)	C (0.48)	+0.01	**D (0.96)**	**D (0.96)**	--
	WBR	A (0.05)	A (0.05)	--	A (0.21)	A (0.21)	--
	NBL	E (0.48)	E (0.48)	--	E (0.67)	E (0.67)	--
	NBT	D (0.54)	D (0.54)	--	**E (0.95)**	**E (0.95)**	--
	NBR	C (0.13)	C (0.13)	--	C (0.09)	C (0.09)	--
	SBL	E (0.62)	E (0.62)	+0.03	E (0.68)	E (0.70)	+0.02
	SBT	**E (0.99)**	**E (0.99)**	--	D (0.56)	D (0.56)	--
	SBR	C (0.06)	C (0.06)	--	C (0.12)	C (0.12)	--
Derry Road / St. Barbara Boulevard – Future Longview Place Extension (Signalized)	Overall	C (0.95)	C (0.95)	--	B (0.70)	B (0.71)	+0.01
	EBL	B (0.14)	B (0.15)	+0.01	E (0.79)	E (0.79)	--
	EBT	**C (0.90)**	**D (0.92)**	+0.02	B (0.41)	B (0.41)	--
	EBR	B (0.02)	B (0.02)	--	B (0.01)	B (0.02)	--
	WBL	C (0.47)	C (0.56)	+0.09	A (0.37)	B (0.50)	+0.03
	WBT	B (0.37)	B (0.38)	+0.01	B (0.75)	B (0.75)	--
	WBR	B (0.03)	B (0.03)	--	B (0.48)	B (0.48)	--
	NBL	E (0.43)	E (0.49)	+0.06	D (0.52)	D (0.54)	+0.02
	NBTR	D (0.02)	D (0.04)	+0.02	D (0.06)	D (0.08)	+0.02
	SBL	**E (1.01)**	**E (0.99)**	-0.02	C (0.27)	C (0.27)	--
	SBTR	E (0.14)	C (0.14)	--	C (0.01)	C (0.01)	--

Intersection	Key Intersections	AM Peak Hour			PM Peak Hour		
		FB2027	FT2027	-/+	FB2027	FT2027	-/+
Derry Road / St. Barbara Boulevard – Future Longview Place Extension (Signalized) **Optimized**	Overall	C (0.87)	C (0.87)	--	Not Optimized	Not Optimized	NA
	EBL	B (0.15)	C (0.15)	--			
	EBT	**C (0.90)**	**C (0.91)**	+0.01			
	EBR	B (0.02)	B (0.02)	--			
	WBL	C (0.47)	C (0.56)	+0.03			
	WBT	B (0.38)	B (0.39)	+0.01			
	WBR	B (0.03)	B (0.03)	--			
	NBL	E (0.43)	E (0.49)	+0.06			
	NBTR	D (0.02)	D (0.04)	+0.02			
	SBL	D (0.89)	D (0.87)	-0.02			
	SBTR	C (0.15)	D (0.14)	-0.01			
Derry Road / Derrycrest Drive – Martiz Drive (Signalized)	Overall	A (0.70)	B (0.72)	+0.02	C (0.93)	C (0.94)	+0.01
	EBL	B (0.55)	B (0.55)	--	D (0.40)	D (0.40)	--
	EBT	A (0.54)	A (0.55)	+0.01	B (0.50)	B (0.51)	+0.01
	EBR	A (0.51)	A (0.51)	+0.03	B (0.03)	B (0.03)	--
	WBL	D (0.76)	D (0.79)	--	B (0.13)	B (0.14)	+0.01
	WBT	A (0.30)	A (0.31)	+0.01	C (0.84)	C (0.86)	+0.02
	WBR	A (0.03)	A (0.03)	--	B (0.01)	B (0.01)	--
	NBL	D (0.26)	D (0.26)	--	**E (0.99)**	**E (0.99)**	--
	NBTR	D (0.21)	D (0.21)	--	D (0.39)	C (0.39)	--
	SBL	D (0.08)	D (0.08)	--	E (0.64)	E (0.64)	--
	SBTR	D (0.38)	D (0.38)	--	D (0.27)	D (0.27)	--
Derry Road / Derrycrest Drive – Martiz Drive (Signalized) **Optimized**	Overall	Not Optimized	Not Optimized	NA	C (0.92)	C (0.93)	+0.01
	EBL				D (0.39)	D (0.39)	--
	EBT				C (0.53)	C (0.54)	+0.01
	EBR				B (0.03)	B (0.03)	--
	WBL				B (0.15)	B (0.15)	--
	WBT				C (0.89)	C (0.90)	+0.02
	WBR				B (0.01)	B (0.01)	--
	NBL				**D (0.91)**	**D (0.91)**	--
	NBTR				C (0.36)	C (0.36)	--
	SBL				E (0.64)	E (0.64)	--
	SBTR				D (0.25)	D (0.25)	--

Intersection	Key Intersections	AM Peak Hour			PM Peak Hour		
		FB2027	FT2027	-/+	FB2027	FT2027	-/+
McLaughlin Road / Novo Star Drive – Arrowsmith Drive (Signalized)	Overall	C (0.83)	C (0.83)	--	A (0.60)	A (0.61)	+0.01
	EBL	C (0.44)	C (0.44)	--	D (0.44)	D (0.44)	--
	EBTR	D (0.62)	D (0.62)	--	C (0.10)	C (0.10)	--
	WBL	C (0.36)	D (0.45)	+0.09	C (0.10)	C (0.13)	+0.03
	WBTR	C (0.21)	C (0.21)	--	C (0.10)	C (0.10)	--
	NBL	C (0.55)	C (0.55)	--	A (0.27)	A (0.27)	--
	NBTR	A (0.31)	A (0.31)	--	A (0.59)	A (0.59)	--
	SBL	A (0.04)	A (0.04)	--	B (0.30)	B (0.30)	--
	SBTR	C (0.92)	C (0.92)	--	A (0.38)	A (0.38)	--

-/+ represents difference, (--) no change in level of service

The results of the level of service future background 2027 versus future total 2027 comparison table indicates that there are no drastic change between the future background traffic conditions and future total traffic conditions. The proposed development is expected to have negligible impact on the surrounding road network.

6 Parking Analysis

To determine the adequacy of the proposed parking supply to service the proposed hotel development, the existing in force City Zoning By-law No. 0225-2007 Part 3 was reviewed and examined.

Based on the parking ratios noted above, parking for this site is required as noted in **Table 6.1** below.

Table 6.1 City of Mississauga Zoning By-Law 0225-2007 Parking Requirement

Land Use	Size	Required Parking		Provided Parking
		Parking Rate	Parking Requirement	
Residential (Lane Town Houses)	126 Units	2.0 Spaces / Unit	252	252
		0.25 Visitor Spaces / Unit	32	28
Commercial/Retail	Phase 1: 323m^2 Phase 2: 513m^2	4.3 spaces / 100m^2 GFA	Phase 1: 14 Phase 2: 22	Phase 1: 29 Phase 2: 40
Office	323 m^2	3.2 spaces / 100m^2 GFA	10	
Phase 1 Total			**308**	**309**
Phase 2 Total			**316**	**320**

Based on the City's By-law, the proposed development requires a total of 308 parking spaces in Phase 1 and 316 parking spaces in Phase 2. The proposal provides a total parking supply of 309 and 320 parking spaces which meets the City's By-law parking spaces requirement for residential and commercial and office parking, as well as visitor parking spaces.

Based on the discussion with the Client, there will be a legal arrangement between residential component and commercial / office component for the share parking.

7 On-Site Circulation Review

The *AutoTURN* analysis for garbage trucks entering and exiting the site is illustrated in **Figure 7-1**. The garbage truck dimensions were based on the standards set out in the Region's Waste Collection Design Standards Manual, for an 11.93m long Fully-Automated Waste Collection Vehicle, however to be more conservative a 12.0m long typical garbage truck used in the analysis.

From the analysis, there is adequate manoeuvring area on-site to enable garbage and other similar service trucks to exit the site in a forward manner without adversely affecting the adjacent public roadways.

8 Transportation Demand Management (TDM) Plan

Transportation Demand Management (TDM) Plan refers to a variety of strategies to reduce congestion, minimize the number of single-occupant vehicles, encourage non-auto modes of travel, and reduce vehicle dependency to create a sustainable transportation system. In short, a TDM plan works to change how, when, where, and why people travel.

The TDM measures have been prepared to address the following required transportation demand management objectives:

- Provision of facilities / operations to minimize single occupant vehicle (SOV) access to the study area and encourage the use of alternate transportation modes, particularly transit; and,
- Identify the operational and financial roles and responsibilities of the landowner including program development, implementation and ongoing management and operations of the travel demand management plan / program.

The TDM education and promotion related strategies support mobility by making the public aware of the options available and actively encourages the use of alternative transportation. These marketing initiatives may take the form of general marketing to targeted outreach. TDM marketing and promotion approaches include:

- Area marketing campaigns – Promoting transit services, carpooling or other TDM;
- Education Programs – Campaigns to inform the public about the specifics of services; and,
- Employer Based Outreach – Partnerships with employers to support TDM.

8.1 Existing Transit Routes

Existing surface transit in the area is provided via Mississauga Transit (miWAY) and Brampton Transit. Schedule and maps are illustrated below and in **Appendix G**:

- **mi WAY Route 66 – McLaughlin –** runs north south from Kingknoll Drive to Rathburn Road West with headways of approximately 10 minutes;
- **mi WAY Route 42 – Derry** – runs east-west from Meadowvale Town Center to Westwood Mall on Derry Road with headways of approximately 20 minutes; and,
- **Brampton Transit 6 – James Potter** – run generally north south from Queen Street West to Derry Road and operates on a headway of 10 minutes.

8.2 Transportation Demand Management (TDM) Programs

8.2.1 Area Marketing Campaigns

Area marketing campaigns are premised on the objective of behavioural change. The methods of persuasion include conveying messages of:

- Personal benefit;
- Social benefit, and,
- Adhering to the "social norm".

It is recognized that individuals are more likely to change their current behaviour or continue that behaviour if it is the social norm amongst their peers.

One of the first area marketing TDM campaigns within the GTA was established by Metropolitan Toronto in 1994. The Diamond Lane Campaign was implemented in co-ordination with the expansion of the High Occupancy Lane network. The campaign included billboard, transit vehicle, radio, and newspaper ads. Transportation Management Association (TMA)'s can help facilitate TDM directives by developing promotional materials, advocate for funding, conduct transportation fairs, and many other things.

8.2.2 Education Programs and Information Services

The effectiveness of transportation systems to provide mobility to the public is only as good as the awareness of the public to the services provided. Education programs and information services (such as call-lines and internet based route planners) can supplement marketing campaigns, increasing the commuter's understanding of their mobility options.

Miway provides http://www.mississauga.ca/portal/miway, which is a map based navigator. Progressive trip planners including web based trip data, can add to the commuter's understanding of travel options by providing real time information.

A Denver, Colorado TMA (Transportation Solutions) managed a program which was designed to improve ridership. Before-and-after surveys were to gauge the impact of the efforts. The results clearly demonstrated the direct impact of the project on improved perceptions of bus transportation in the area. The results showed an increase in awareness:

- 17% increase in those who "know which bus routes to take to work / school"; and,
- 19% increase in those who feel they have "the information I need to ride the bus".

8.2.3 Walking / Cycling

The City has a long-standing commitment to an off-road trail system, having built over 250 km of pathways and trails in parks and greenspaces across the City. Pathways in the neighbourhood parks provide cycling and walking friendly connections to schools, community centres and libraries. In addition, cycling safety programs were offered such as CAN-BIKE courses and community safety workshops. The Road Safety Handbook was published and includes a chapter on cycling safety.

8.2.4 Bicycle Parking

Short-term bicycle parking is typically provided in close proximity to entrances via high tensile strength racks. Long term bicycle parking is intended for use over several hours or overnight and the residents will also likely use their garages for bicycle storage and parking on a long term basis.

The proposed development will provide a brick shed, to be located to the close proximity to entrance that will serve as a secure storage facility for both commercial / office component and visitors wishing to cycle to and from the site, thus further reducing the SOV mode. The brick shed will serve as both short term and long term bicycle parking. **Table 8.1** below summarizes the required bicycle parking spaces for the proposed development, based on short-term and long-term parking.

Table 8.1 Required Bicycle Parking Supply (Parking Strategy)

Type of Bicycle Parking	Rate	# Parking Required
Residential		
Residential (126 Units)	0.08 /unit (Short-Term)	10
Office		
Office Building (323m^2)	0.03 spaces / 100m^2 (Short-term)	--
	0.17 spaces / 100m^2 (long-term)	1
Retail		
Commercial / Retail (513m^2)	0.085 spaces / 100m^2 (Short-term)	--
	0.25 spaces / 100m^2 (long-term)	1
Total Short-Term		**10**
Total Long-Term		**2**

The proposed development will provide a total of 10 bicycle parking spaces for visitors (short-term) and two (2) bicycle parking spaces for commercial / retail (long-term), the residents will also likely use their garages for bicycle storage and parking on a long term basis.

8.2.5 Carpooling

The Smart Commute program has been established in the form of 10 TMAs across the GTA. The Smart Commute TMAs are supported by Metrolinx to coordinate and implement TDM initiatives.

Smart Commute – Mississauga is a TMA committed to reducing traffic congestion, improving air quality and advocating for sustainable transportation within the study area. Since inception in 2001, Smart Commute has collectively reduced approximately 1.2 million SOV trips, which avoided more than 61 million vehicle kilometres traveled and prevented the emission of over 14,000 tonnes of greenhouse gases and 88 tonnes of smog-causing air pollutants. Smart Commute works to:

- Implement employee trip reduction programs at local workplaces;
- Decrease traffic congestion, and improve air quality and health by reducing vehicle emissions;
- Improve employee productivity and morale, and reduce employee turnover;

- Advocate for improved transit service, and increased local transportation infrastructure;
- Bus-only and cycling lanes, and a wider network of subway and light rapid transit;
- Promote the benefits of transit-supportive development and smart-growth strategies;
- Encourage legislative flexibility in support of high-value, cost effective transportation strategies such as vanpools, telework, transit subsidies and shuttle services; and,
- Increase opportunities for TMA collaboration with business and government.

Smart Commute offers one-on-one support for staff to use sustainable modes of transportation and provides promotions and incentives on an on-going basis. A web based car matching tool is provided to allow carpoolers to easily identify ride matching options among a large membership base and form carpooling arrangements.

8.2.6 Projected TDM Measure Cost

A brief breakdown on the estimated implementation costs associated with the above recommended TDM strategies are provided in **Table 8.2** below.

Table 8.2 Estimated TDM Program Cost

TDM Measure	Unit Price	Number of Units	Expected Cost	Cost Borne By
PRESTO Cards	TBD	126	TBD	Developer
Bike Rack	$300.00	Two (2) racks (Six (6) bicycles per rack)	$600.00	Developer
Bike Rack Installation	$500.00	Two (2) racks	$1,000.00	Developer
Total			**$1,600.00**	--

The estimated cost to administer the TDM Plan is **$1,600.00** with all of it being borne by the developer.

TDM strategies do not work in isolation, but instead they would work together synergistically as one (1) integrated plan specifically focused to the identified study area. In short, TDM works best when complementary strategies are packaged together (i.e. transit incentive and efficient transit system). Similarly, the objectives of the TDM plan cannot be achieved alone, but instead it requires the cooperation between different stakeholders including the developers, City / Region authorities, transit providers, and other involved / impacted partners.

9 Conclusions

Full build out of the subject site is anticipated to be completed by 2022.

9.1 Existing Conditions:

All intersection within the study area are operating with residual capacity and an acceptable LOS service in the existing condition except following movements at the intersection of Derry Road and McLaughlin Road:

- The eastbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'D' with a v/c ratio of 0.91 during the morning peak period;
- The westbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.28 during the morning peak period;
- The southbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.04 during the morning peak period;
- The eastbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.18 during the afternoon peak period;
- The westbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'C' with a v/c ratio of 0.94 during the afternoon peak period; and,
- The northbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'E' with a v/c ratio of 0.97 during the afternoon peak period.

The intersection of Derry Road and St. Barbara Boulevard – Future Longview Place Extension:

- The northbound left movement, at the intersection of Derry Road and Martiz Drive-Derrycrest Drive, is operating at a LOS 'E' with a v/c ratio of 0.98 during the afternoon peak period.

The intersection of Derry Road and Martiz Drive-Derrycrest Drive:

- The westbound through movement and northbound left, at, is operating at a LOS 'E' with a v/c ratio of 0.97 during the afternoon peak period.

Considering that all of the measured / existing traffic volume movements were actually accommodated by the intersections, then the levels of service greater than 1.0 are an overstatement by the Syncrho software.

9.2 Future Background Conditions:

Future 2022 Background Traffic Condition:

The results of the future 2022 background traffic analysis indicate that all intersections are generally functioning with acceptable LOS and v/c ratios with the exception of the following movements:

- The intersection of Derry Road and McLaughlin Road:
  - The eastbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'E' with a v/c ratio of 0.97 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.96;

- The westbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.28 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'F' and v/c ratio of 0.95;
- The southbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'E' with a v/c ratio of 1.05 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.99;
- The eastbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.18 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'F' and v/c ratio of 0.99;
- The westbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 0.99 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'C' and v/c ratio of 0.94;
- The northbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 1.01 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.95; and,
- The northbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 0.96 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.67.

- The intersection of Derry Road and St. Barbara Boulevard – Future Longview Place Extension:
  - The eastbound through movement, at the intersection of Derry Road and St. Barbara Boulevard – Future Longview Place Extension, is operating at a LOS 'C' with a v/c ratio of 0.88 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'C' and v/c ratio of 0.87. It should be noted that there will be no traffic interaction between the subject site and Longview Place in Phase 1; and,
  - The southbound left movement, at the intersection of Derry Road and St. Barbara Boulevard – Future Longview Place Extension , is operating at a LOS 'E' with a v/c ratio of 1.01 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'D' and v/c ratio of 0.89.
- The intersection of Derry Road and Martiz Drive-Derrycrest Drive:
  - The northbound left movement, at the intersection of Derry Road and Martiz Drive-Derrycrest Drive, is operating at a LOS 'F' with a v/c ratio of 0.99 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.91.

Future 2022 Background Traffic Condition:

Similar to the future background 2022 traffic analysis the future background 2027 traffic all intersections are generally functioning with acceptable LOS and v/c ratios with recommended signal optimization.

9.3 Trip Generation:

In Phase 1 (2022 Horizon) the proposed development is expected to generate 61 two (2) way new trips (15 trips in / 46 trips out) during the weekday AM peak hour and 77 two (2) way new trips (47 trips in / 30 trips out) during the PM peak hour.

In Phase 2 (2027 Horizon) the proposed development is expected to generate 63 two (2) way new trips (16 trips in / 47 trips out) during the weekday AM peak hour and 84 two (2) way new trips (51 trips in / 33 trips out) during the PM peak hour.

9.4 Future Total Conditions:

Future 2022 Total Traffic Condition:

The results of the future 2022 total traffic analysis indicate that all intersections are generally functioning with acceptable LOS and v/c ratios with the exception of the following movements:

- The intersection of Derry Road and McLaughlin Road:
  - The eastbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS ‘E’ with a v/c ratio of 0.97 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of ‘E’ and v/c ratio of 0.96;
  - The westbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS ‘F’ with a v/c ratio of 1.24 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of ‘F’ and v/c ratio of 0.99;
  - The southbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS ‘E’ with a v/c ratio of 1.05 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of ‘E’ and v/c ratio of 0.99;
  - The eastbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS ‘F’ with a v/c ratio of 1.18 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of ‘F’ and v/c ratio of 0.99;
  - The westbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS ‘F’ with a v/c ratio of 0.99 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of ‘C’ and v/c ratio of 0.94;
  - The northbound through movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS ‘F’ with a v/c ratio of 1.01 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of ‘E’ and v/c ratio of 0.95; and,

- The northbound left movement, at the intersection of Derry Road and McLaughlin Road, is operating at a LOS 'F' with a v/c ratio of 0.96 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.67.

- The intersection of Derry Road and St. Barbara Boulevard – Future Longview Place Extension:
  - The eastbound through movement, at the intersection of Derry Road and St. Barbara Boulevard – Future Longview Place Extension, is operating at a LOS 'C' with a v/c ratio of 0.89 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'C' and v/c ratio of 0.88. It should be noted that there will be no traffic interaction between the subject site and Longview Place in Phase 1; and,
  - The southbound left movement, at the intersection of Derry Road and St. Barbara Boulevard – Future Longview Place Extension , is operating at a LOS 'E' with a v/c ratio of 1.01 during the morning peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'D' and v/c ratio of 0.89.
- The intersection of Derry Road and Martiz Drive-Derrycrest Drive:
  - The northbound left movement, at the intersection of Derry Road and Martiz Drive-Derrycrest Drive, is operating at a LOS 'F' with a v/c ratio of 0.99 during the afternoon peak period. To improve the intersection operations, signal timing splits were optimized. The resultant movement is expected to operate with an LOS of 'E' and v/c ratio of 0.91.

Future 2027 Total Traffic Condition:

Similar to the future total 2022 traffic analysis the future total 2027 traffic all intersections are generally functioning with acceptable LOS and v/c ratios with recommended signal optimization.

Storage and Queue Assessment

The proposed 30 m storage for the eastbound right can accommodate 95th queue length at the proposed interim site access and Derry Road intersection.

9.5 Parking Analysis:

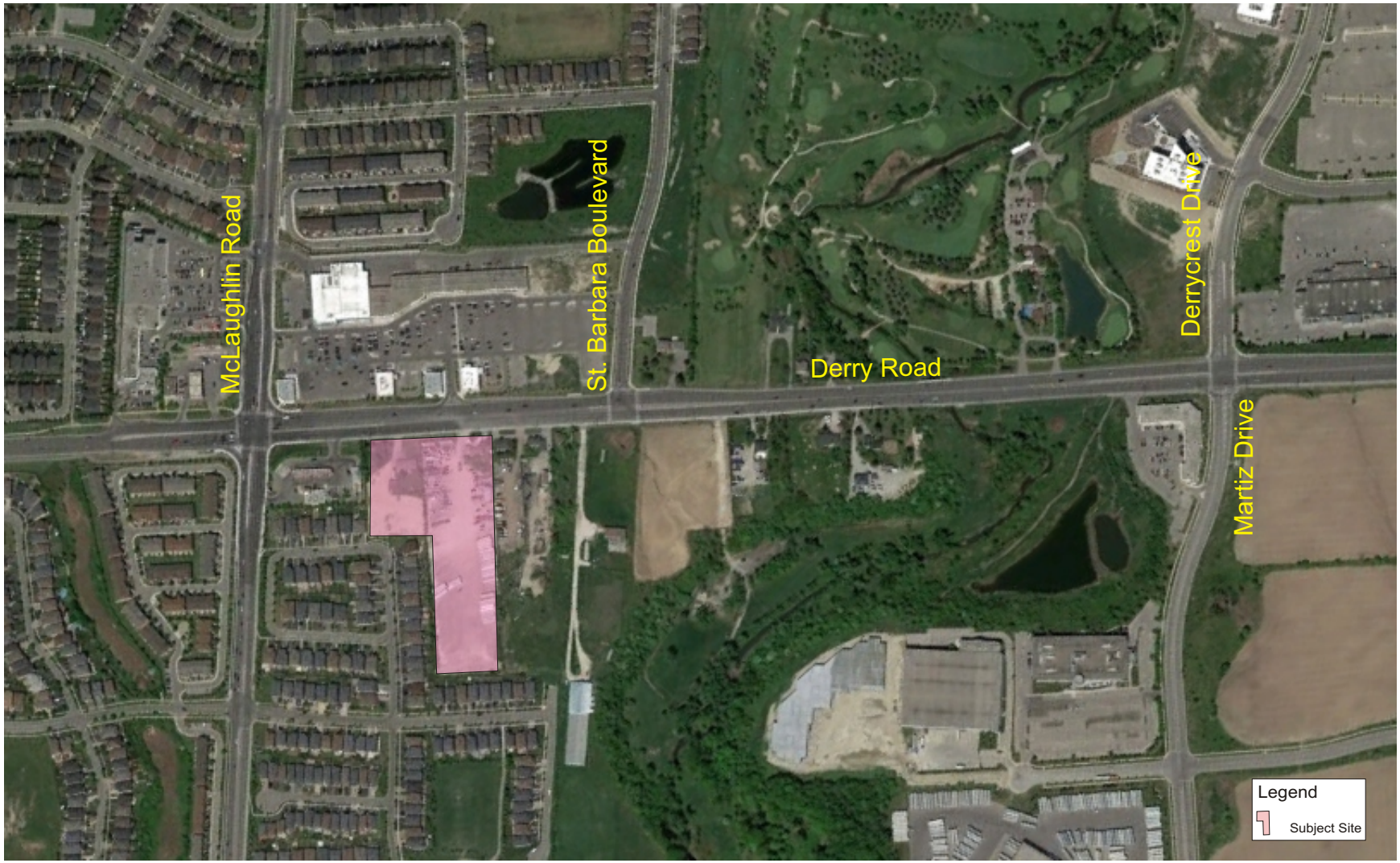
Based on the City's By-law, the proposed development requires a total of 308 parking spaces in Phase I and 316 parking spaces in Phase II. The proposal provides a total parking supply of 309 and 320 parking spaces which meets the City's By-law parking spaces requirement for residential and commercial and office parking, as well as visitor parking spaces.

9.6 On-site Circulation Review:

Based on the proposed configuration, there is adequate manoeuvring area on-site to enable garbage and other similar service trucks to enter / exit the site in a forward manner without adversely affecting the adjacent public roadways.

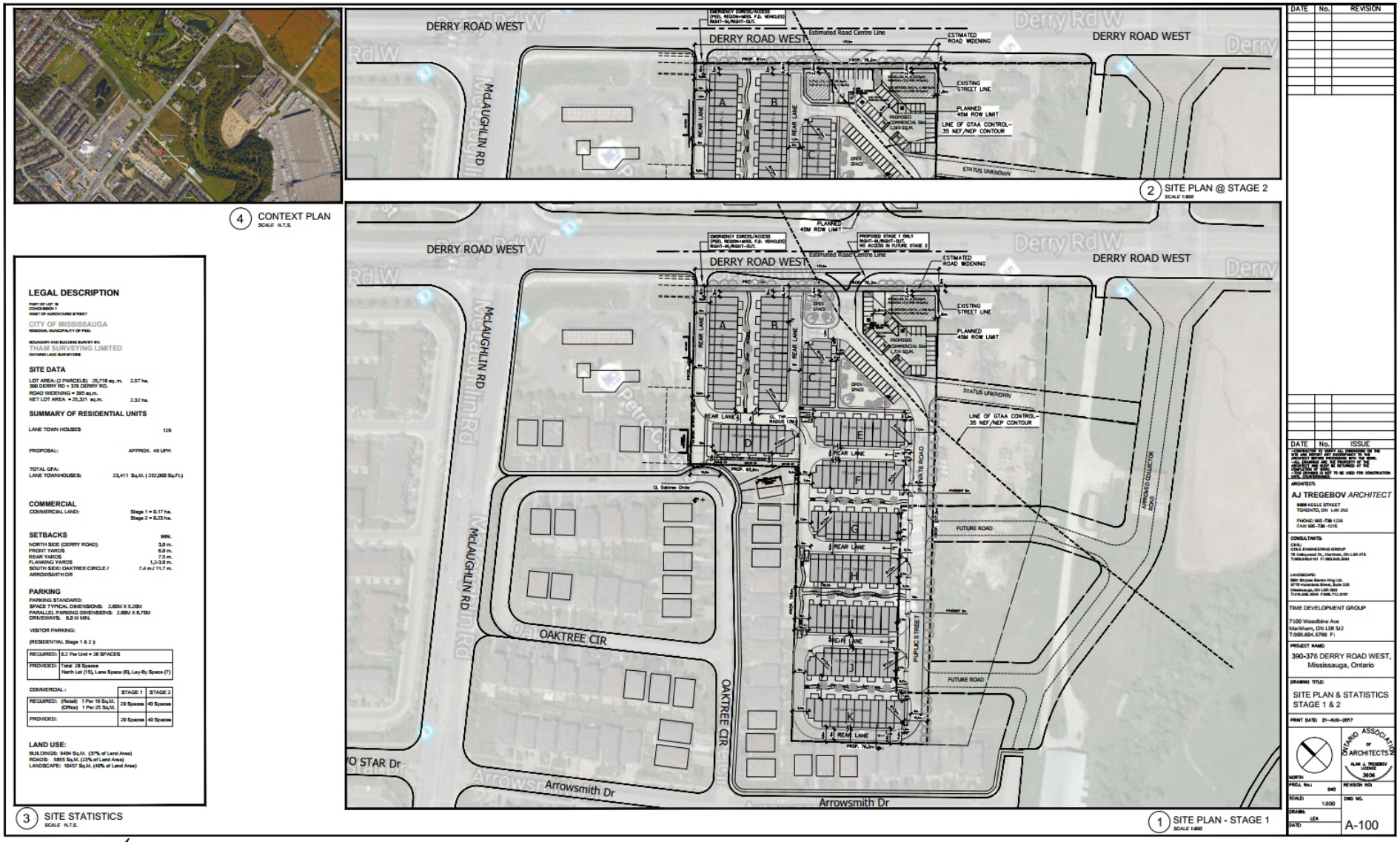
9.7 Transportation Demand Management (TDM) Plan:

The proposed development will provide a total of 10 bicycle parking spaces for visitors (short-term) and two (2) bicycle parking spaces for commercial / retail (long-term) component, also the residents will also likely use their garages for bicycle storage and parking on a long term basis. The estimated cost to administer the TDM Plan is $1,600.00 with all of it being borne by the developer.



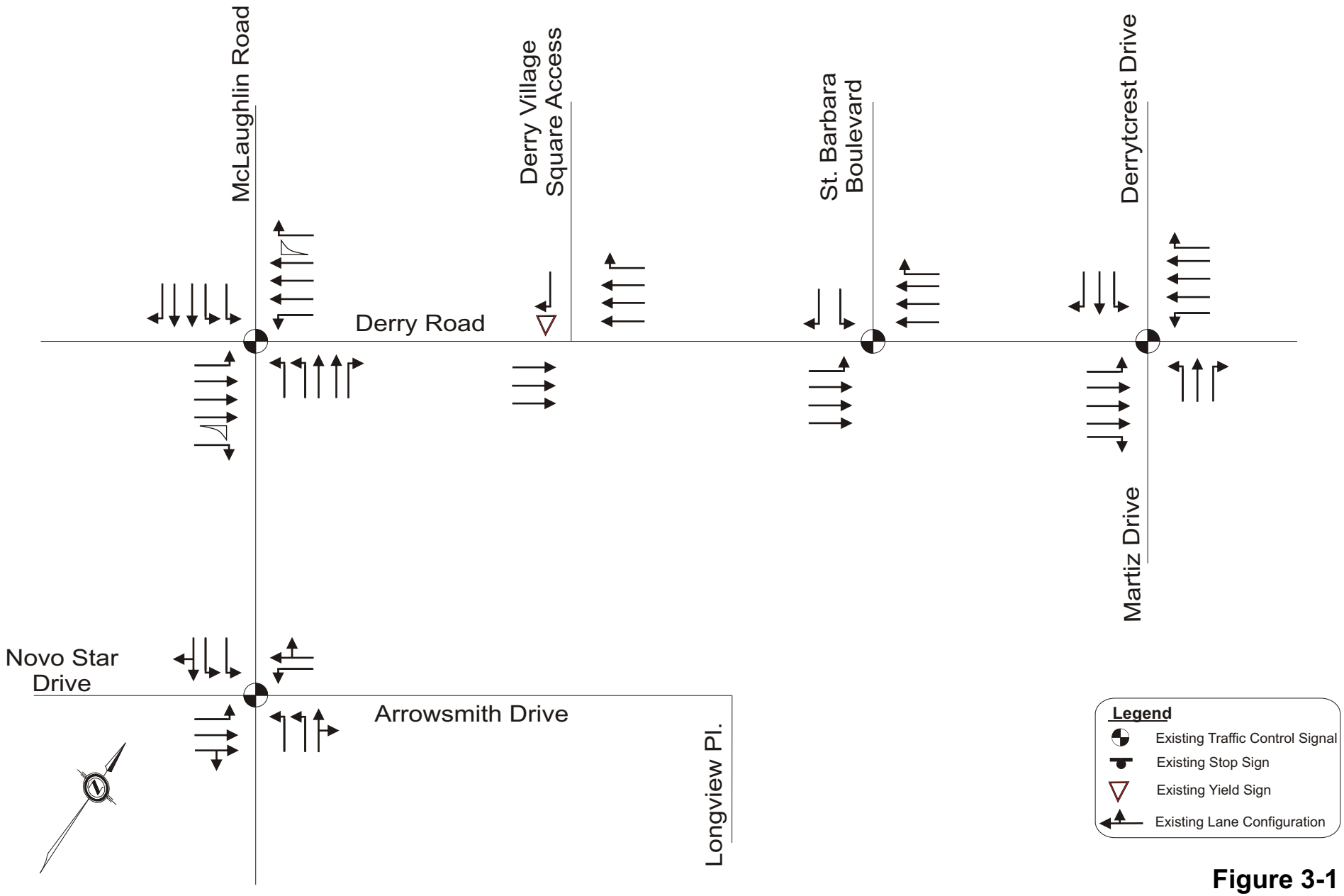
N.T.S.

Figure 1-1
Site Location



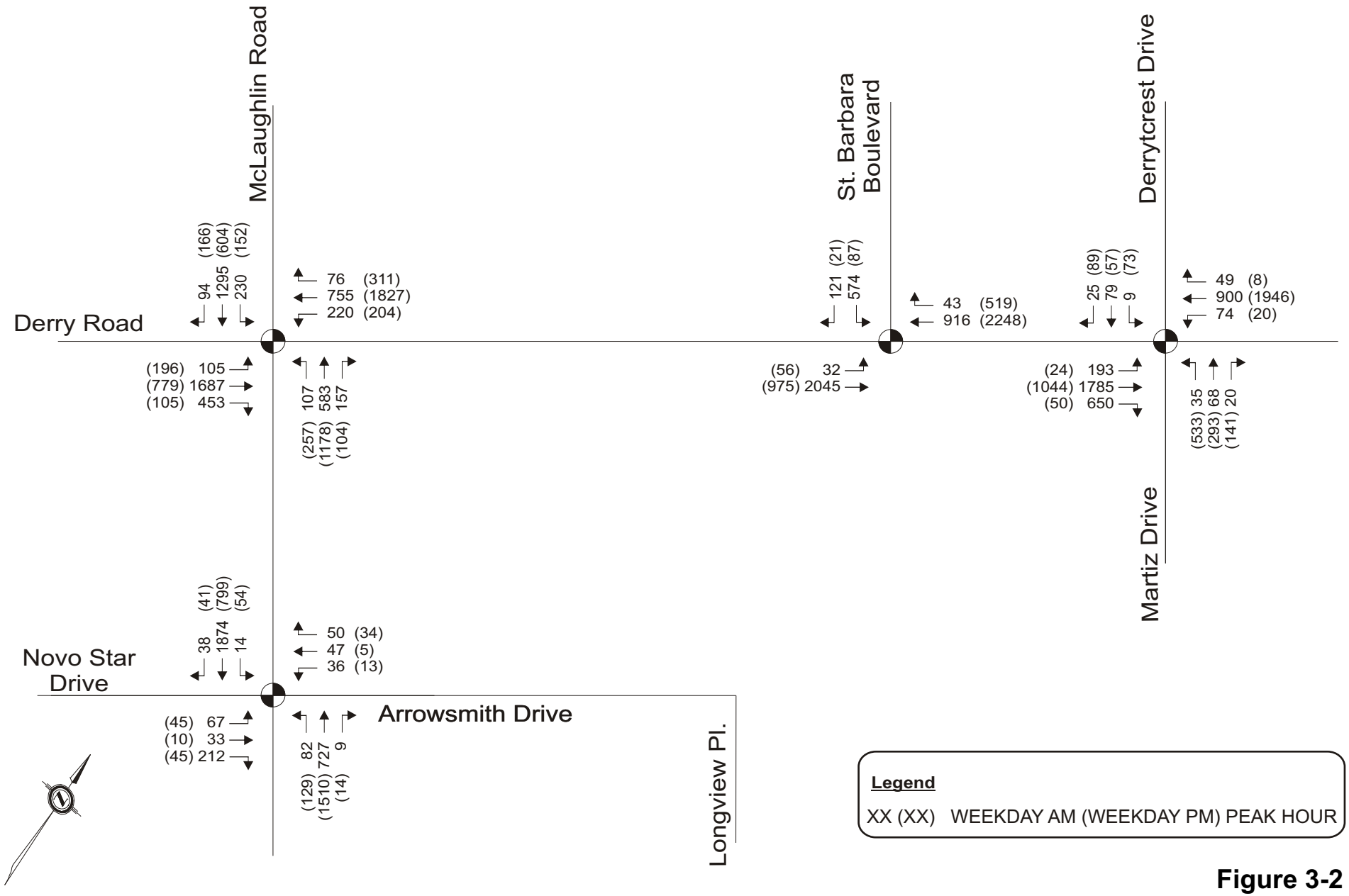
N.T.S.

Figure 1-2
Site Plan



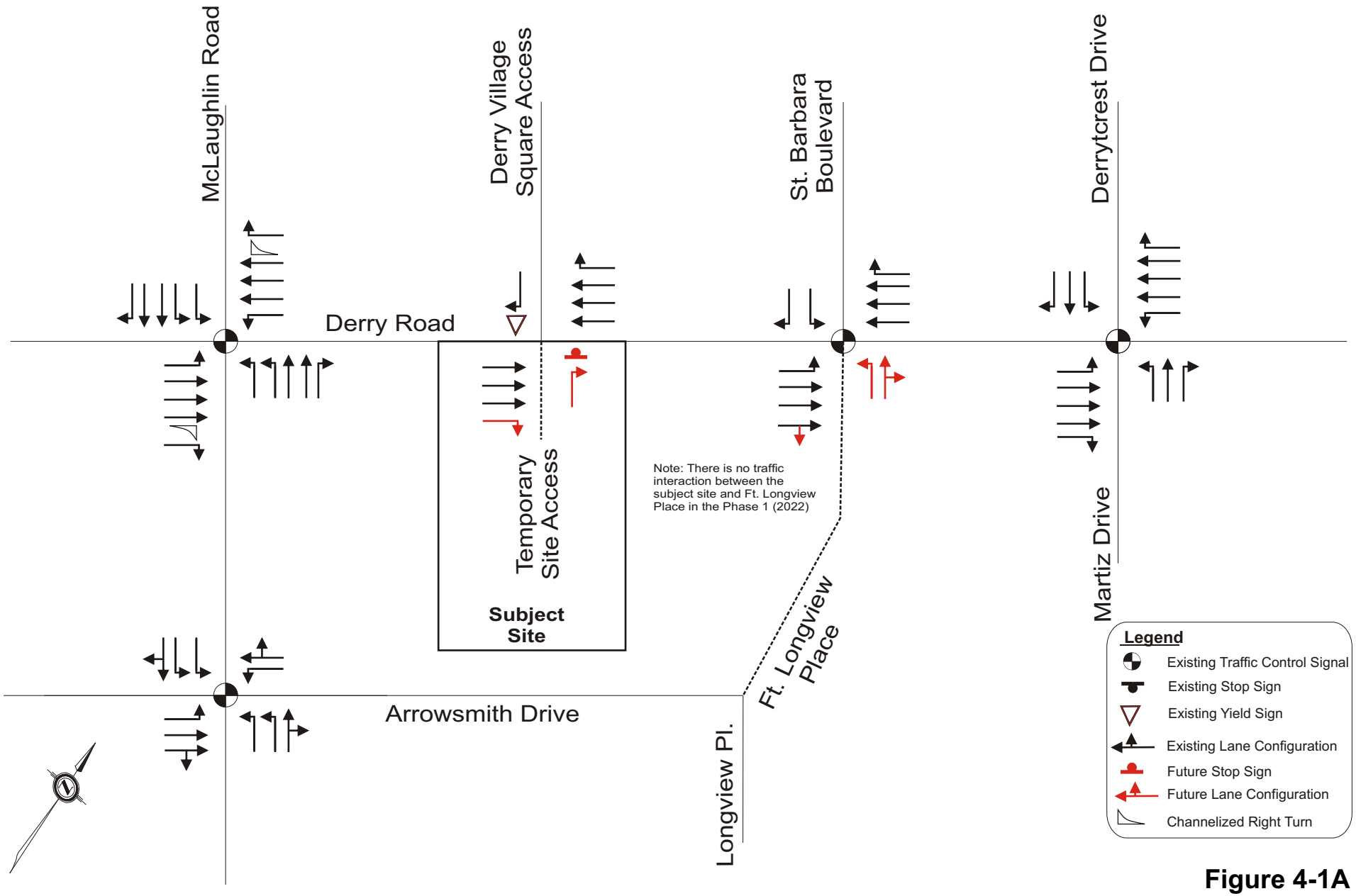
N.T.S.

Figure 3-1
Existing (2017) Lane Configuration



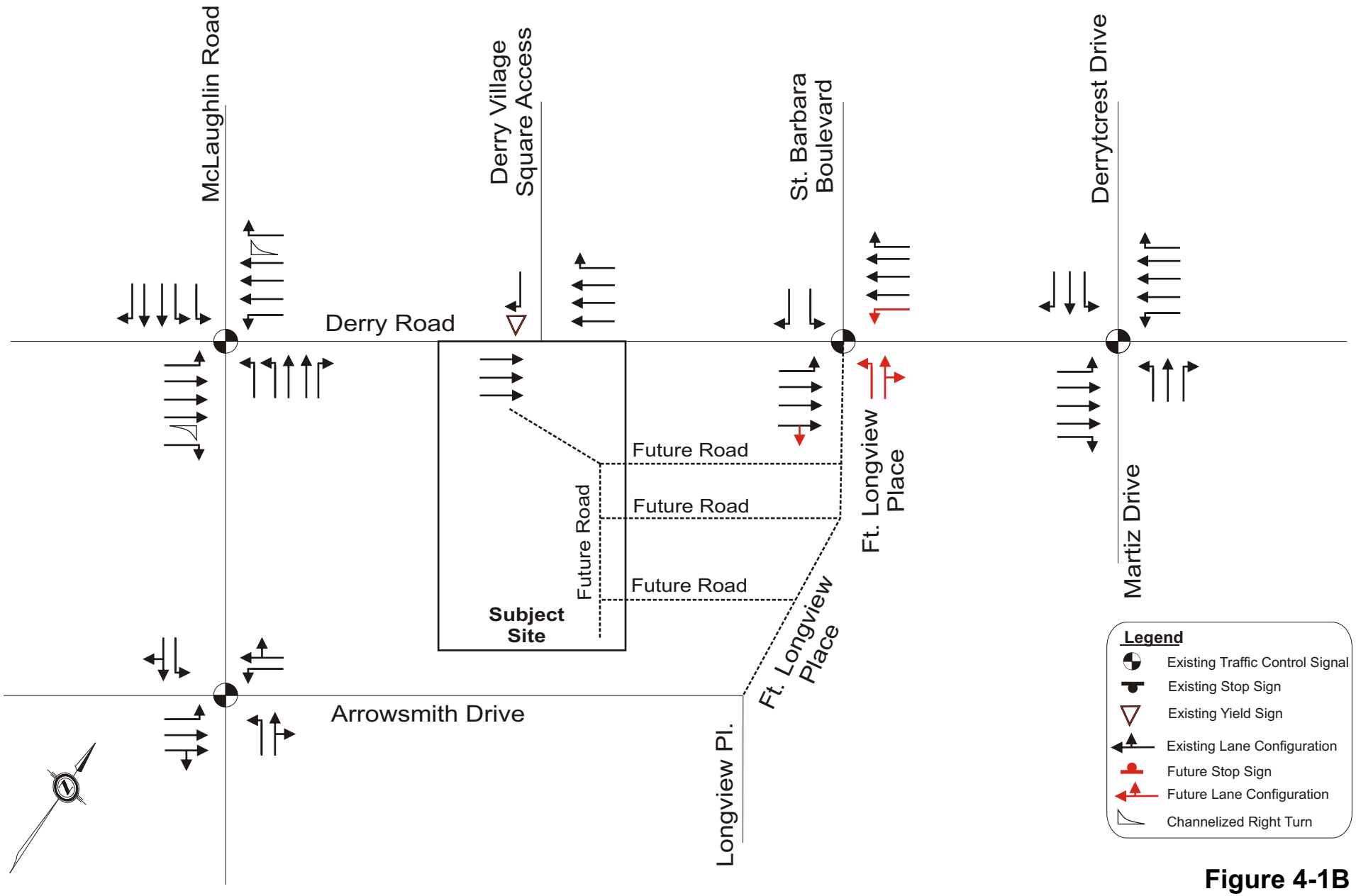
N.T.S.

Figure 3-2
Existing (2017) Traffic Volumes



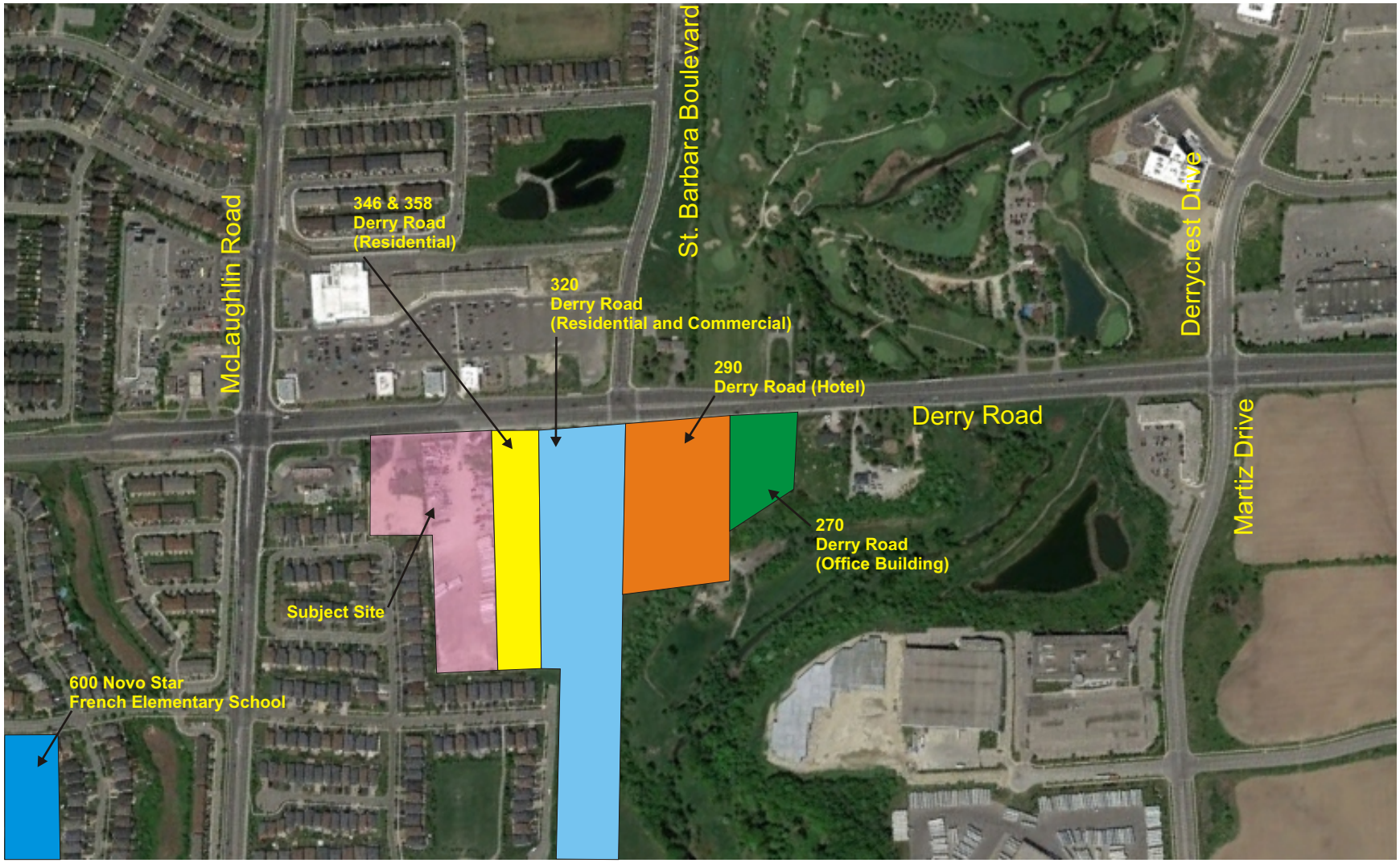
N.T.S.

Figure 4-1A
Phase 1 (2022) Future Lane Configuration



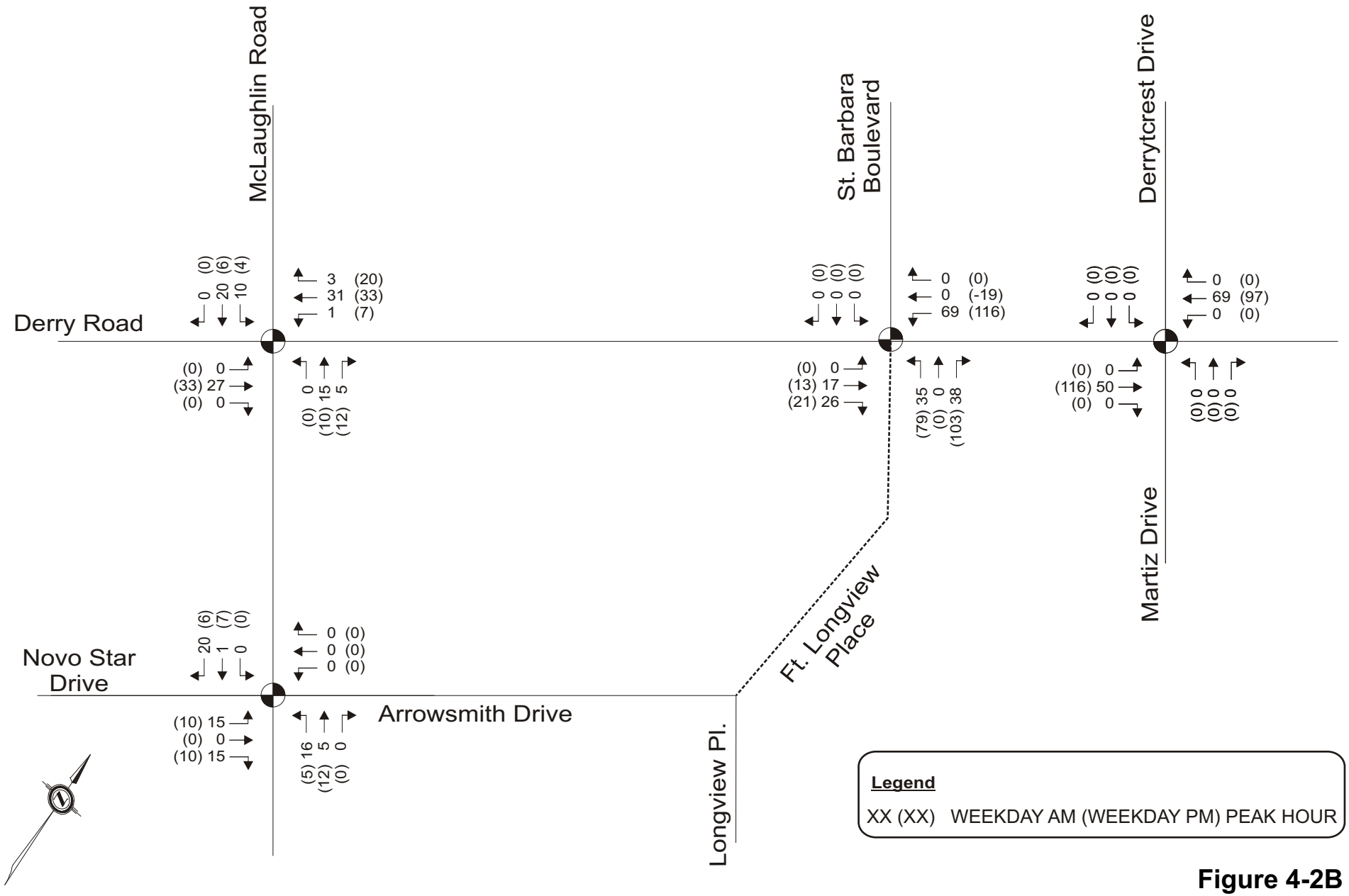
N.T.S.

Figure 4-1B
Phase 2 (2027) Future Lane Configuration



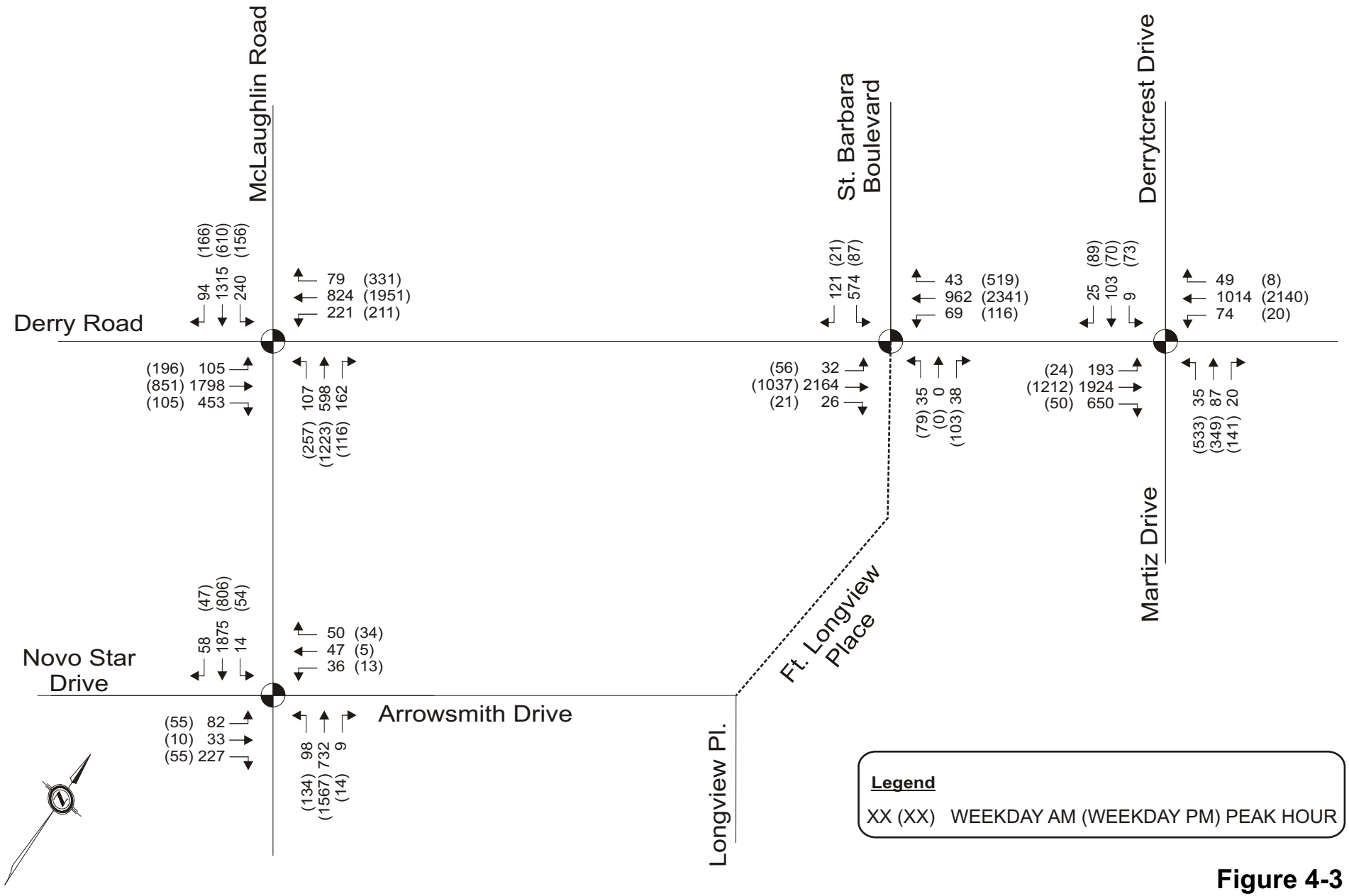
N.T.S.

Figure 4-2A
Future Background Development Locations



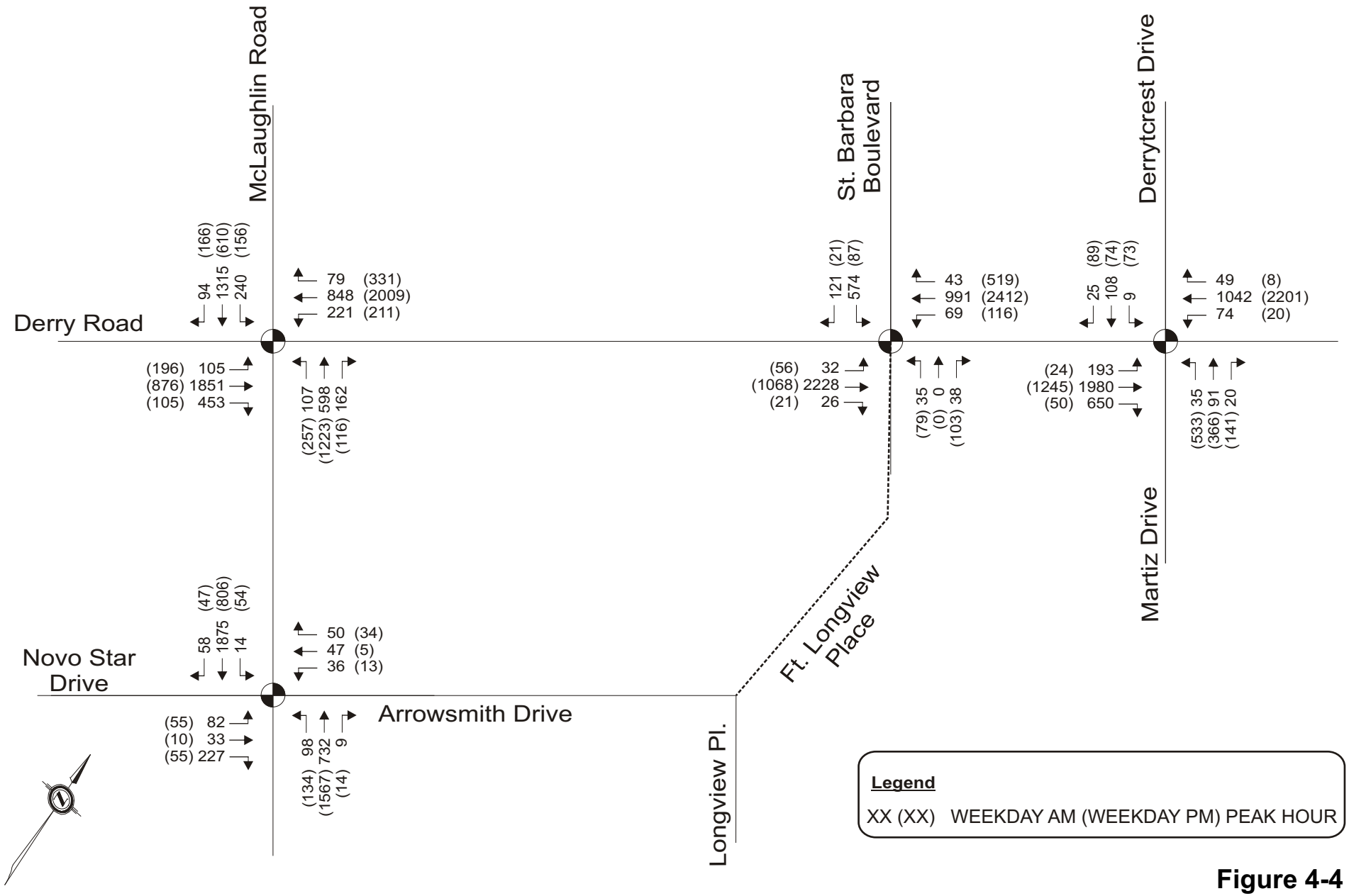
N.T.S.

Figure 4-2B
Future Background Developments Traffic Volumes



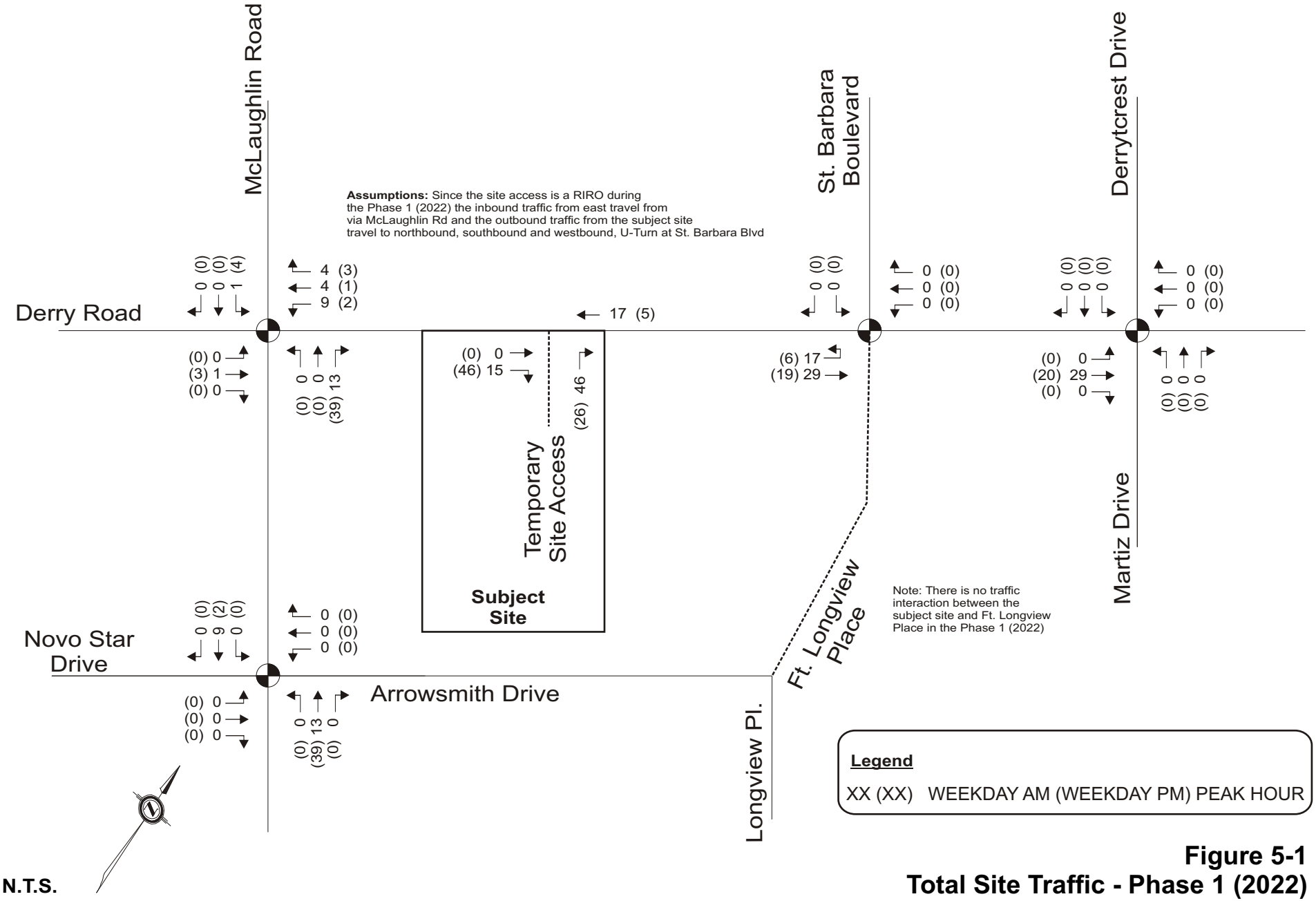
N.T.S.

Figure 4-3
Future (2022) Background Traffic Volumes



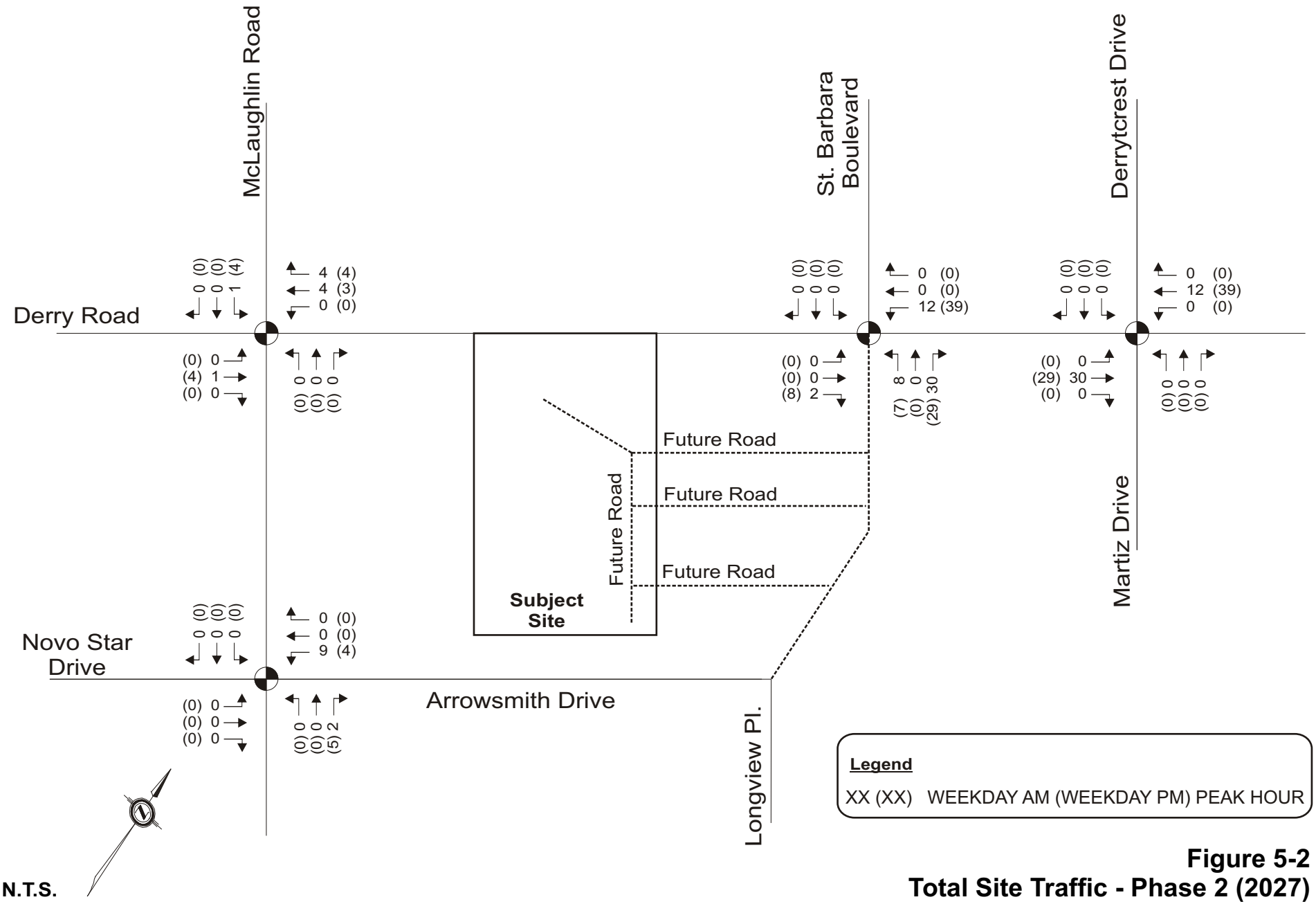
N.T.S.

Figure 4-4
Future (2027) Background Traffic Volumes



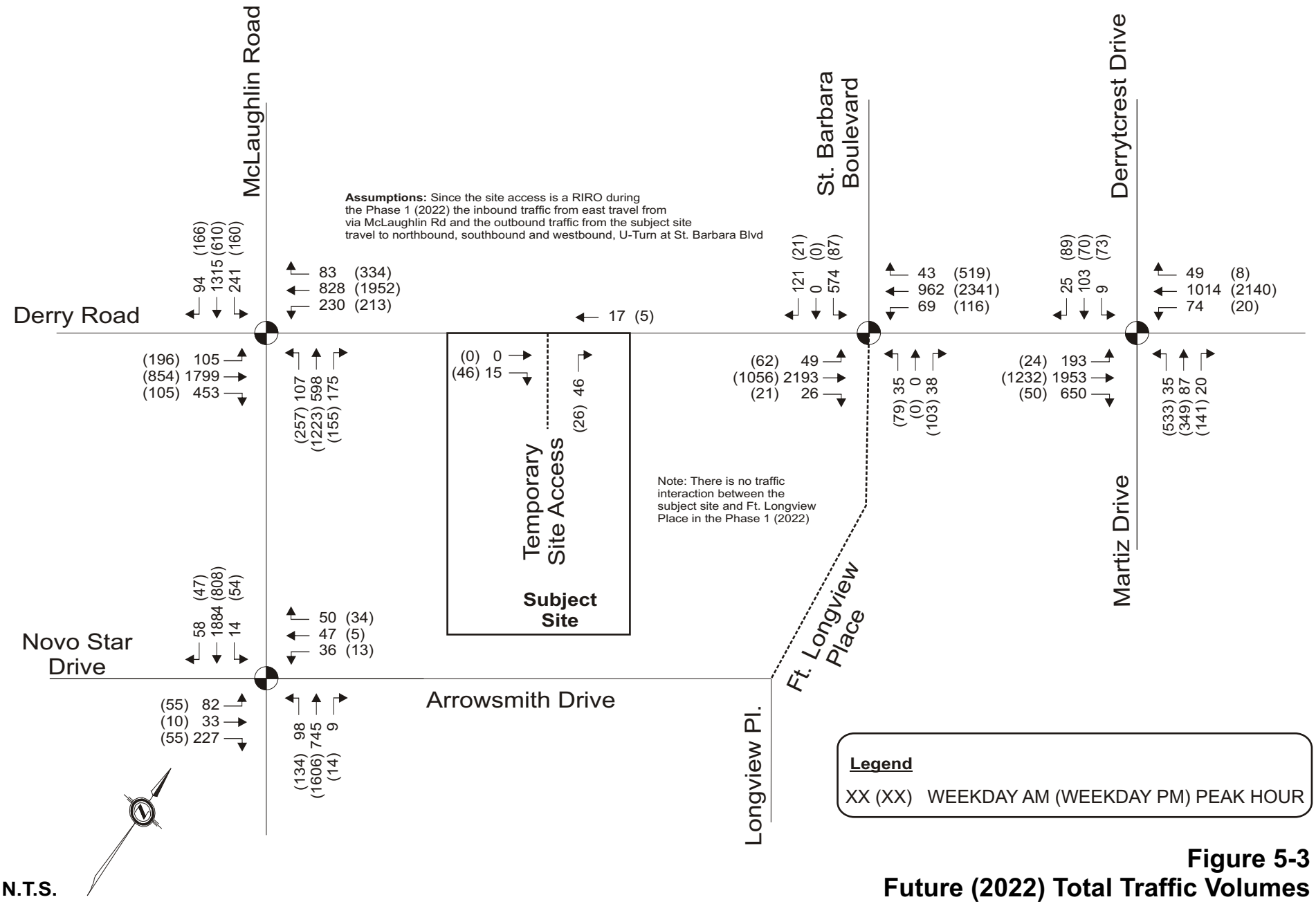
N.T.S.

Figure 5-1
Total Site Traffic - Phase 1 (2022)



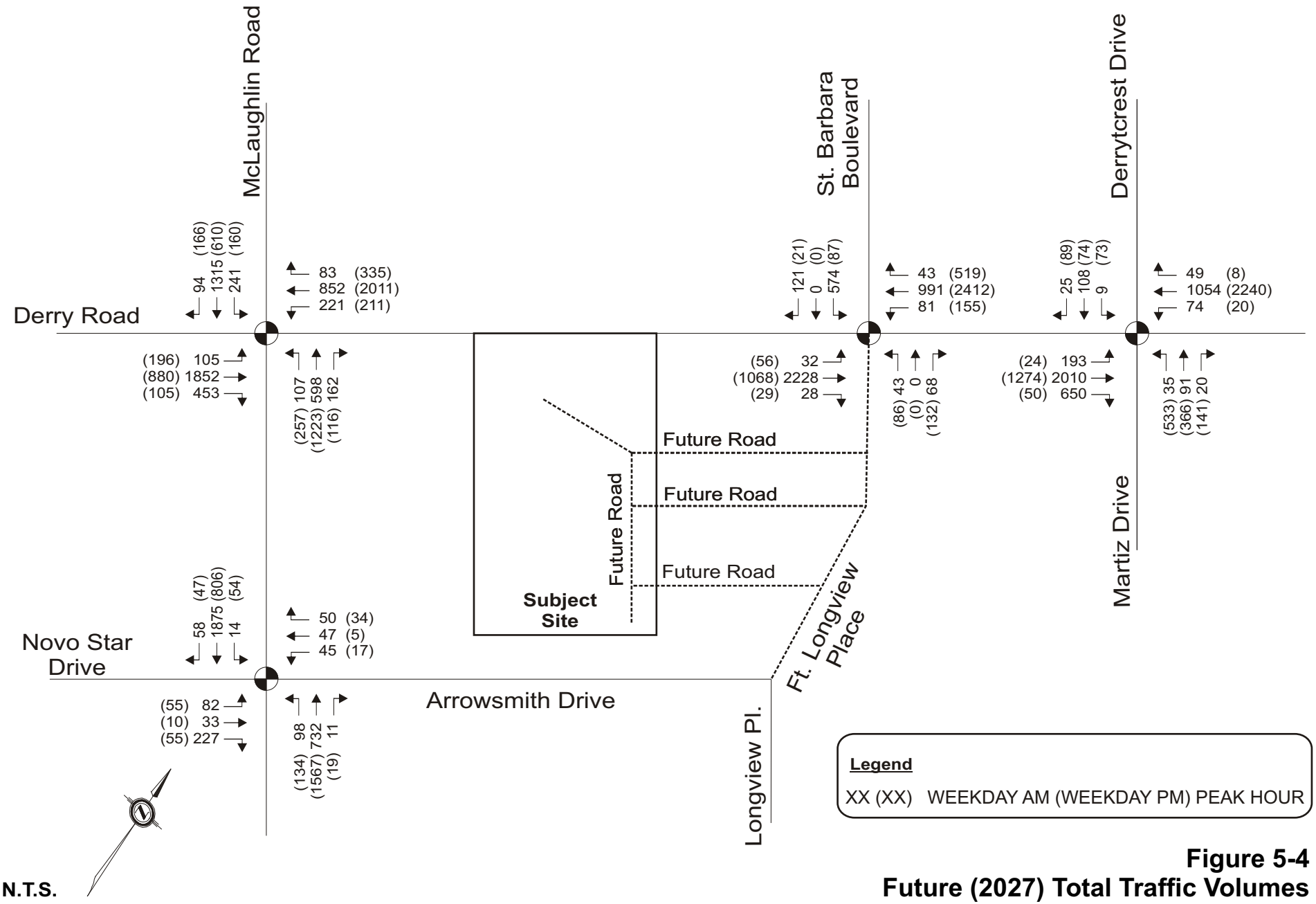
N.T.S.

Figure 5-2
Total Site Traffic - Phase 2 (2027)



N.T.S.

Figure 5-3
Future (2022) Total Traffic Volumes

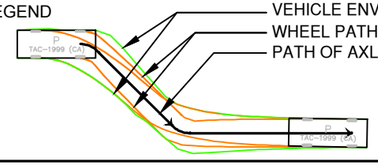


N.T.S.

Figure 5-4
Future (2027) Total Traffic Volumes

COLE ENGINEERING
70 VALLEYWOOD DRIVE, MARKHAM, ON L3R 4T5
T:416.987.6161 / 905.940.6161 F:905.940.2064

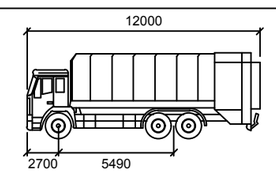
LEGEND



DESIGN VEHICLE

Garbage Truck mm

Width	:	2400
Track	:	2400
Lock to Lock Time	:	6.0
Steering Angle	:	27.4



PEEL REGION GARBAGE TRUCK INTERNAL SITE CIRCULATION
PROPOSED MIXED-USE DEVELOPMENT
376-390 DERRY ROAD
CITY OF MISSISSAUGA
REGION OF PEEL

DATE:	DECEMBER 2017	PROJECT No.:	TR16-0538
SCALE:	N.T.S.	FIGURE No.:	7-1

APPENDIX A

Existing Intersection Turning Movement Count Data

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

Municipality: Mississauga
Site #: 1707200001
Intersection: Derry Rd & McLaughlin Rd
TFR File #: 1
Count date: 5-Apr-17

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total: 2383
North Entering: 1619
North Peds: 16
Peds Cross: ⋈

Heavys	2	17	2	21
Trucks	0	3	2	5
Cars	92	1275	226	1593
Totals	94	1295	230	

Heavys	26
Trucks	2
Cars	736
Totals	764

East Leg Total: 3125
East Entering: 1051
East Peds: 13
Peds Cross: ⧗

McLaughlin Rd

Heavys	Trucks	Cars	Totals
58	24	874	956

Cars	Trucks	Heavys	Totals
72	1	3	76
677	24	54	755
208	4	8	220
957	29	65	

Derry Rd

N
W E
S

Heavys	Trucks	Cars	Totals
1	0	104	105
54	13	1620	1687
4	3	446	453
59	16	2170	

Derry Rd

Cars	Trucks	Heavys	Totals
1995	15	64	2074

McLaughlin Rd

Peds Cross: ⧗
West Peds: 59
West Entering: 2245
West Leg Total: 3201

Cars	1929
Trucks	10
Heavys	29
Totals	1968

Cars	105	560	149	814
Trucks	0	1	0	1
Heavys	2	22	8	32
Totals	107	583	157	

Peds Cross: ⋈
South Peds: 32
South Entering: 847
South Leg Total: 2815

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

Municipality: Mississauga
Site #: 1707200001
Intersection: Derry Rd & McLaughlin Rd
TFR File #: 1
Count date: 5-Apr-17

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total: 2607
North Entering: 922
North Peds: 0
Peds Cross: ⋈

Heavys	1	7	1	9
Trucks	1	2	1	4
Cars	164	595	150	909
Totals	166	604	152	

Heavys	12
Trucks	1
Cars	1672
Totals	1685

East Leg Total: 3377
East Entering: 2342
East Peds: 36
Peds Cross: ⧗

McLaughlin Rd

Heavys	Trucks	Cars	Totals
46	15	2189	2250

Cars	Trucks	Heavys	Totals
309	1	1	311
1771	12	44	1827
203	1	0	204
2283	14	45	

Derry Rd

N
W E
S

Heavys	Trucks	Cars	Totals
1	0	195	196
47	13	719	779
0	1	104	105
48	14	1018	

Derry Rd

Cars	Trucks	Heavys	Totals
972	15	48	1035

McLaughlin Rd

Peds Cross: ⧗
West Peds: 53
West Entering: 1080
West Leg Total: 3330

Cars	902
Trucks	4
Heavys	7
Totals	913

Cars	254	1168	103	1525
Trucks	2	0	1	3
Heavys	1	10	0	11
Totals	257	1178	104	

Peds Cross: ⋈
South Peds: 28
South Entering: 1539
South Leg Total: 2452

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Total Count Diagram

Municipality: Mississauga
Site #: 1707200001
Intersection: Derry Rd & McLaughlin Rd
TFR File #: 1
Count date: 5-Apr-17

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total:	9600
North Entering:	4961
North Peds:	42
Peds Cross:	⋈

Heavys	8	66	6	80
Trucks	4	6	4	14
Cars	501	3589	777	4867
Totals	513	3661	787	

Heavys	76
Trucks	13
Cars	4550
Totals	4639

East Leg Total:	12610
East Entering:	6511
East Peds:	93
Peds Cross:	⧗

McLaughlin Rd

Heavys	Trucks	Cars	Totals
205	64	5871	6140

Cars	Trucks	Heavys	Totals
797	7	5	809
4683	57	192	4932
745	6	19	770
6225	70	216	

Derry Rd

N
W E
S

Heavys	Trucks	Cars	Totals
7	1	599	607
193	54	4581	4828
10	8	1024	1042
210	63	6204	

Derry Rd

Cars	Trucks	Heavys	Totals
5828	60	211	6099

McLaughlin Rd

Peds Cross:	⧗
West Peds:	226
West Entering:	6477
West Leg Total:	12617

Cars	5358
Trucks	20
Heavys	95
Totals	5473

Cars	687	3154	470	4311
Trucks	3	5	2	10
Heavys	5	64	12	81
Totals	695	3223	484	

Peds Cross:	⋈
South Peds:	120
South Entering:	4402
South Leg Total:	9875

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Derry Rd & McLaughlin Rd | **Count Date:** 5-Apr-17 | **Municipality:** Mississauga

North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*	*0*	*7:00:00*	*0*	*0*	*0*	*0*	*0*
8:00:00	*233*	*1231*	*79*	*1543*	*14*	*2082*	*8:00:00*	*66*	*350*	*123*	*539*	*33*
9:00:00	*250*	*1234*	*100*	*1584*	*19*	*2382*	*9:00:00*	*104*	*531*	*163*	*798*	*29*
16:00:00	*0*	*5*	*0*	*5*	*0*	*5*	*16:00:00*	*0*	*0*	*0*	*0*	*0*
17:00:00	*136*	*568*	*153*	*857*	*4*	*2343*	*17:00:00*	*278*	*1118*	*90*	*1486*	*34*
18:00:00	*168*	*623*	*181*	*972*	*5*	*2551*	*18:00:00*	*247*	*1224*	*108*	*1579*	*24*
Totals:	787	3661	513	4961	42	9363	S Totals:	695	3223	484	4402	120

East Approach Totals						East/West Total Approaches	West Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*	*0*	*7:00:00*	*0*	*0*	*0*	*0*	*0*
8:00:00	*126*	*585*	*109*	*820*	*4*	*3015*	*8:00:00*	*113*	*1700*	*382*	*2195*	*49*
9:00:00	*214*	*773*	*67*	*1054*	*16*	*3299*	*9:00:00*	*99*	*1678*	*468*	*2245*	*53*
16:00:00	*0*	*0*	*0*	*0*	*0*	*0*	*16:00:00*	*0*	*0*	*0*	*0*	*0*
17:00:00	*240*	*1848*	*306*	*2394*	*48*	*3345*	*17:00:00*	*167*	*691*	*93*	*951*	*71*
18:00:00	*190*	*1726*	*327*	*2243*	*25*	*3329*	*18:00:00*	*228*	*759*	*99*	*1086*	*53*
Totals:	770	4932	809	6511	93	12988	W Totals:	607	4828	1042	6477	226

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*7:00*	*8:00*	*9:00*	*16:00*	*17:00*	*18:00*	*0:00*	*0:00*
Crossing Values:	*0*	*1583*	*1657*	*5*	*1651*	*1717*	*0*	*0*

Accu-Traffic Inc.

Count Date: 5-Apr-17 Site #: 1707200001

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	69	69	261	261	17	17	0	0	0	0	0	0	0	0	4	4	0	0	5	5
7:30:00	146	77	585	324	37	20	0	0	0	0	0	0	2	2	11	7	1	1	10	5
7:45:00	183	37	859	274	51	14	0	0	0	0	0	0	2	0	28	17	3	2	13	3
8:00:00	231	48	1197	338	75	24	0	0	1	1	0	0	2	0	33	5	4	1	14	1
8:15:00	285	54	1501	304	97	22	0	0	1	0	0	0	2	0	36	3	4	0	25	11
8:30:00	330	45	1803	302	119	22	0	0	2	1	0	0	3	1	40	4	4	0	29	4
8:45:00	409	79	2134	331	143	24	2	2	3	1	0	0	4	1	45	5	5	1	29	0
9:00:00	477	68	2414	280	172	29	2	0	4	1	1	1	4	0	47	2	6	1	33	4
9:15:00	477	0	2419	5	172	0	2	0	4	0	1	0	4	0	47	0	6	0	33	0
16:00:00	477	0	2419	0	172	0	2	0	4	0	1	0	4	0	47	0	6	0	33	0
16:15:00	518	41	2552	133	216	44	3	1	4	0	2	1	5	1	50	3	6	0	35	2
16:30:00	545	27	2689	137	253	37	3	0	4	0	3	1	5	0	53	3	7	1	35	0
16:45:00	573	28	2832	143	292	39	3	0	4	0	3	0	5	0	57	4	7	0	37	2
17:00:00	611	38	2976	144	322	30	3	0	4	0	3	0	5	0	58	1	7	0	37	0
17:15:00	646	35	3140	164	368	46	4	1	4	0	3	0	6	1	60	2	8	1	37	0
17:30:00	683	37	3275	135	408	40	4	0	5	1	4	1	6	0	61	1	8	0	37	0
17:45:00	723	40	3427	152	456	48	4	0	6	1	4	0	6	0	64	3	8	0	37	0
18:00:00	777	54	3589	162	501	45	4	0	6	0	4	0	6	0	66	2	8	0	42	5
18:15:00	777	0	3589	0	501	0	4	0	6	0	4	0	6	0	66	0	8	0	42	0
18:15:15	777	0	3589	0	501	0	4	0	6	0	4	0	6	0	66	0	8	0	42	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 5-Apr-17 Site #: 1707200001

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	22	22	104	104	23	23	0	0	0	0	0	0	2	2	12	12	0	0	0	0
7:30:00	44	22	218	114	59	36	0	0	4	4	0	0	4	2	21	9	1	1	0	0
7:45:00	67	23	369	151	84	25	0	0	9	5	1	1	7	3	40	19	1	0	4	4
8:00:00	117	50	520	151	107	23	0	0	13	4	1	0	9	2	52	12	1	0	4	0
8:15:00	170	53	690	170	122	15	1	1	19	6	1	0	11	2	68	16	1	0	13	9
8:30:00	224	54	872	182	142	20	2	1	24	5	2	1	15	4	83	15	3	2	15	2
8:45:00	275	51	1046	174	156	14	4	2	33	9	2	0	15	0	94	11	4	1	17	2
9:00:00	318	43	1210	164	169	13	5	1	37	4	3	1	17	2	111	17	4	0	20	3
9:15:00	318	0	1210	0	169	0	5	0	37	0	3	0	17	0	111	0	4	0	20	0
16:00:00	318	0	1210	0	169	0	5	0	37	0	3	0	17	0	111	0	4	0	20	0
16:15:00	381	63	1641	431	256	87	5	0	43	6	5	2	17	0	123	12	4	0	28	8
16:30:00	433	52	2098	457	327	71	5	0	44	1	5	0	17	0	133	10	4	0	32	4
16:45:00	492	59	2535	437	392	65	5	0	44	0	6	1	18	1	139	6	4	0	49	17
17:00:00	557	65	3003	468	472	80	5	0	46	2	6	0	18	0	157	18	4	0	68	19
17:15:00	604	47	3409	406	539	67	6	1	50	4	7	1	18	0	165	8	4	0	74	6
17:30:00	646	42	3841	432	612	73	6	0	55	5	7	0	18	0	173	8	4	0	85	11
17:45:00	695	49	4306	465	701	89	6	0	56	1	7	0	18	0	183	10	5	1	85	0
18:00:00	745	50	4683	377	797	96	6	0	57	1	7	0	19	1	192	9	5	0	93	8
18:15:00	745	0	4683	0	797	0	6	0	57	0	7	0	19	0	192	0	5	0	93	0
18:15:15	745	0	4683	0	797	0	6	0	57	0	7	0	19	0	192	0	5	0	93	0

Accu-Traffic Inc.

Count Date: 5-Apr-17 Site #: 1707200001

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	8	8	68	68	23	23	0	0	1	1	0	0	0	0	4	4	1	1	5	5
7:30:00	22	14	120	52	55	32	0	0	1	0	0	0	0	0	13	9	2	1	14	9
7:45:00	37	15	191	71	94	39	0	0	3	2	1	1	1	1	17	4	3	1	26	12
8:00:00	64	27	324	133	117	23	0	0	4	1	1	0	2	1	22	5	5	2	33	7
8:15:00	99	35	476	152	158	41	0	0	4	0	1	0	3	1	26	4	8	3	40	7
8:30:00	121	22	622	146	205	47	0	0	4	0	1	0	3	0	36	10	9	1	56	16
8:45:00	142	21	751	129	243	38	0	0	4	0	1	0	3	0	39	3	11	2	58	2
9:00:00	166	24	835	84	273	30	1	1	4	0	1	0	3	0	42	3	12	1	62	4
9:15:00	166	0	835	0	273	0	1	0	4	0	1	0	3	0	42	0	12	0	62	0
16:00:00	166	0	835	0	273	0	1	0	4	0	1	0	3	0	42	0	12	0	62	0
16:15:00	239	73	1086	251	289	16	1	0	4	0	1	0	3	0	46	4	12	0	65	3
16:30:00	298	59	1367	281	313	24	1	0	4	0	1	0	3	0	51	5	12	0	74	9
16:45:00	367	69	1684	317	338	25	1	0	4	0	1	0	4	1	53	2	12	0	85	11
17:00:00	443	76	1939	255	363	25	1	0	4	0	1	0	4	0	56	3	12	0	96	11
17:15:00	496	53	2251	312	396	33	1	0	4	0	1	0	4	0	58	2	12	0	99	3
17:30:00	568	72	2569	318	417	21	2	1	4	0	1	0	4	0	61	3	12	0	102	3
17:45:00	621	53	2852	283	441	24	3	1	4	0	2	1	5	1	63	2	12	0	113	11
18:00:00	687	66	3154	302	470	29	3	0	5	1	2	0	5	0	64	1	12	0	120	7
18:15:00	687	0	3154	0	470	0	3	0	5	0	2	0	5	0	64	0	12	0	120	0
18:15:15	687	0	3154	0	470	0	3	0	5	0	2	0	5	0	64	0	12	0	120	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 5-Apr-17 Site #: 1707200001

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	21	21	373	373	73	73	0	0	2	2	0	0	1	1	8	8	0	0	12	12
7:30:00	43	22	808	435	167	94	0	0	5	3	2	2	2	1	21	13	1	1	23	11
7:45:00	72	29	1263	455	271	104	0	0	8	3	2	0	2	0	28	7	2	1	38	15
8:00:00	110	38	1650	387	378	107	0	0	11	3	2	0	3	1	39	11	2	0	49	11
8:15:00	132	22	2070	420	484	106	0	0	15	4	2	0	3	0	59	20	4	2	64	15
8:30:00	158	26	2504	434	607	123	0	0	18	3	5	3	3	0	69	10	4	0	81	17
8:45:00	176	18	2883	379	717	110	0	0	21	3	5	0	3	0	82	13	6	2	97	16
9:00:00	209	33	3254	371	836	119	0	0	29	8	6	1	3	0	95	13	8	2	102	5
9:15:00	209	0	3254	0	836	0	0	0	29	0	6	0	3	0	95	0	8	0	102	0
16:00:00	209	0	3254	0	836	0	0	0	29	0	6	0	3	0	95	0	8	0	102	0
16:15:00	248	39	3415	161	855	19	1	1	33	4	6	0	4	1	104	9	9	1	123	21
16:30:00	299	51	3558	143	882	27	1	0	37	4	6	0	5	1	114	10	9	0	135	12
16:45:00	338	39	3711	153	902	20	1	0	40	3	7	1	6	1	131	17	9	0	156	21
17:00:00	371	33	3877	166	927	25	1	0	44	4	7	0	7	1	148	17	9	0	173	17
17:15:00	425	54	4066	189	947	20	1	0	48	4	8	1	7	0	153	5	9	0	189	16
17:30:00	472	47	4245	179	985	38	1	0	50	2	8	0	7	0	168	15	9	0	198	9
17:45:00	533	61	4430	185	1006	21	1	0	53	3	8	0	7	0	178	10	9	0	209	11
18:00:00	599	66	4581	151	1024	18	1	0	54	1	8	0	7	0	193	15	10	1	226	17
18:15:00	599	0	4581	0	1024	0	1	0	54	0	8	0	7	0	193	0	10	0	226	0
18:15:15	599	0	4581	0	1024	0	1	0	54	0	8	0	7	0	193	0	10	0	226	0

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

Municipality: Mississauga
Site #: 1707200002
Intersection: Derry Rd & St.Barbara Blvd
TFR File #: 1
Count date: 5-Apr-17

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total: 770
North Entering: 695
North Peds: 1
Peds Cross: ⋈

Heavys	5	3	8
Trucks	0	1	1
Cars	116	570	686
Totals	121	574	

St.Barbara Blvd

Heavys	6
Trucks	0
Cars	69
Totals	75

East Leg Total: 3578
East Entering: 959
East Peds: 0
Peds Cross: ⧗

Heavys	Trucks	Cars	Totals
63	27	947	1037

Derry Rd

Heavys	Trucks	Cars	Totals
4	0	28	32
58	12	1975	2045
62	12	2003	

N
W E
S

Cars	Trucks	Heavys	Totals
41	0	2	43
831	27	58	916
872	27	60	

Derry Rd

Cars	Trucks	Heavys	Totals
2545	13	61	2619

Peds Cross: ⧗
West Peds: 4
West Entering: 2077
West Leg Total: 3114

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

Municipality: Mississauga
Site #: 1707200002
Intersection: Derry Rd & St.Barbara Blvd
TFR File #: 1
Count date: 5-Apr-17

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total:	683
North Entering:	108
North Peds:	1
Peds Cross:	⋈

Heavys	0	3	3
Trucks	0	1	1
Cars	21	83	104
Totals	21	87	

Heavys	1
Trucks	0
Cars	574
Totals	575

East Leg Total:	3829
East Entering:	2767
East Peds:	1
Peds Cross:	⧗

St.Barbara Blvd

Heavys	Trucks	Cars	Totals
44	11	2214	2269

Cars	Trucks	Heavys	Totals
518	0	1	519
2193	11	44	2248
2711	11	45	

Derry Rd

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	56	56
45	13	917	975
45	13	973	

Derry Rd

Cars	Trucks	Heavys	Totals
1000	14	48	1062

Peds Cross:	⧗
West Peds:	3
West Entering:	1031
West Leg Total:	3300

Comments

Accu-Traffic Inc.

Total Count Diagram

Municipality: Mississauga
Site #: 1707200002
Intersection: Derry Rd & St.Barbara Blvd
TFR File #: 1
Count date: 5-Apr-17

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total:	2525
North Entering:	1372
North Peds:	5
Peds Cross:	⋈

Heavys	11	10	21
Trucks	0	3	3
Cars	210	1138	1348
Totals	221	1151	

Heavys	23
Trucks	2
Cars	1128
Totals	1153

East Leg Total:	14255
East Entering:	7137
East Peds:	1
Peds Cross:	⧗

St.Barbara Blvd

Heavys	Trucks	Cars	Totals
210	58	6089	6357

Cars	Trucks	Heavys	Totals
990	1	10	1001
5879	58	199	6136
6869	59	209	

Derry Rd

N
W E
S

Heavys	Trucks	Cars	Totals
13	1	138	152
196	51	5720	5967
209	52	5858	

Derry Rd

Cars	Trucks	Heavys	Totals
6858	54	206	7118

Peds Cross:	⧗
West Peds:	15
West Entering:	6119
West Leg Total:	12476

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Derry Rd & St.Barbara Blvd | **Count Date:** 5-Apr-17 | **Municipality:** Mississauga

North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*	*0*	*7:00:00*	*0*	*0*	*0*	*0*	*0*
8:00:00	*416*	*0*	*82*	*498*	*0*	*498*	*8:00:00*	*0*	*0*	*0*	*0*	*0*
9:00:00	*563*	*0*	*88*	*651*	*1*	*651*	*9:00:00*	*0*	*0*	*0*	*0*	*0*
16:00:00	*0*	*0*	*0*	*0*	*0*	*0*	*16:00:00*	*0*	*0*	*0*	*0*	*0*
17:00:00	*81*	*0*	*26*	*107*	*3*	*107*	*17:00:00*	*0*	*0*	*0*	*0*	*0*
18:00:00	*91*	*0*	*25*	*116*	*1*	*116*	*18:00:00*	*0*	*0*	*0*	*0*	*0*
Totals:	1151	0	221	1372	5	1372	S Totals:	0	0	0	0	0

East Approach Totals						East/West Total Approaches	West Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*	*0*	*7:00:00*	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*745*	*44*	*789*	*0*	*2868*	*8:00:00*	*14*	*2065*	*0*	*2079*	*4*
9:00:00	*0*	*927*	*46*	*973*	*0*	*3030*	*9:00:00*	*31*	*2026*	*0*	*2057*	*5*
16:00:00	*0*	*0*	*0*	*0*	*0*	*0*	*16:00:00*	*0*	*0*	*0*	*0*	*0*
17:00:00	*0*	*2308*	*404*	*2712*	*0*	*3638*	*17:00:00*	*39*	*887*	*0*	*926*	*3*
18:00:00	*0*	*2156*	*507*	*2663*	*1*	*3720*	*18:00:00*	*68*	*989*	*0*	*1057*	*3*
Totals:	0	6136	1001	7137	1	13256	W Totals:	152	5967	0	6119	15

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*7:00*	*8:00*	*9:00*	*16:00*	*17:00*	*18:00*	*0:00*	*0:00*
Crossing Values:	*0*	*420*	*568*	*0*	*84*	*95*	*0*	*0*

Accu-Traffic Inc.

Count Date: 5-Apr-17 Site #: 1707200002

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	52	52	0	0	9	9	1	1	0	0	0	0	0	0	0	0	1	1	0	0
7:30:00	124	72	0	0	20	11	1	0	0	0	0	0	1	1	0	0	2	1	0	0
7:45:00	273	149	0	0	35	15	1	0	0	0	0	0	2	1	0	0	5	3	0	0
8:00:00	411	138	0	0	76	41	1	0	0	0	0	0	4	2	0	0	6	1	0	0
8:15:00	577	166	0	0	116	40	2	1	0	0	0	0	4	0	0	0	8	2	0	0
8:30:00	720	143	0	0	131	15	2	0	0	0	0	0	4	0	0	0	10	2	1	1
8:45:00	843	123	0	0	151	20	2	0	0	0	0	0	5	1	0	0	10	0	1	0
9:00:00	971	128	0	0	159	8	2	0	0	0	0	0	6	1	0	0	11	1	1	0
9:15:00	971	0	0	0	159	0	2	0	0	0	0	0	6	0	0	0	11	0	1	0
16:00:00	971	0	0	0	159	0	2	0	0	0	0	0	6	0	0	0	11	0	1	0
16:15:00	986	15	0	0	166	7	2	0	0	0	0	0	6	0	0	0	11	0	1	0
16:30:00	1014	28	0	0	176	10	2	0	0	0	0	0	6	0	0	0	11	0	1	0
16:45:00	1029	15	0	0	181	5	2	0	0	0	0	0	7	1	0	0	11	0	4	3
17:00:00	1048	19	0	0	185	4	3	1	0	0	0	0	9	2	0	0	11	0	4	0
17:15:00	1071	23	0	0	191	6	3	0	0	0	0	0	10	1	0	0	11	0	4	0
17:30:00	1087	16	0	0	196	5	3	0	0	0	0	0	10	0	0	0	11	0	4	0
17:45:00	1112	25	0	0	202	6	3	0	0	0	0	0	10	0	0	0	11	0	5	1
18:00:00	1138	26	0	0	210	8	3	0	0	0	0	0	10	0	0	0	11	0	5	0
18:15:00	1138	0	0	0	210	0	3	0	0	0	0	0	10	0	0	0	11	0	5	0
18:15:15	1138	0	0	0	210	0	3	0	0	0	0	0	10	0	0	0	11	0	5	0

Accu-Traffic Inc.

Count Date: 5-Apr-17 Site #: 1707200002

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	141	141	12	12	0	0	0	0	0	0	0	0	13	13	0	0	0	0
7:30:00	0	0	300	159	21	9	0	0	4	4	0	0	0	0	22	9	3	3	0	0
7:45:00	0	0	484	184	31	10	0	0	7	3	1	1	0	0	40	18	4	1	0	0
8:00:00	0	0	681	197	39	8	0	0	11	4	1	0	0	0	53	13	4	0	0	0
8:15:00	0	0	874	193	52	13	0	0	17	6	1	0	0	0	69	16	5	1	0	0
8:30:00	0	0	1097	223	62	10	0	0	24	7	1	0	0	0	86	17	6	1	0	0
8:45:00	0	0	1315	218	72	10	0	0	34	10	1	0	0	0	98	12	6	0	0	0
9:00:00	0	0	1519	204	83	11	0	0	39	5	1	0	0	0	114	16	6	0	0	0
9:15:00	0	0	1519	0	83	0	0	0	39	0	1	0	0	0	114	0	6	0	0	0
16:00:00	0	0	1519	0	83	0	0	0	39	0	1	0	0	0	114	0	6	0	0	0
16:15:00	0	0	2077	558	151	68	0	0	45	6	1	0	0	0	126	12	7	1	0	0
16:30:00	0	0	2638	561	251	100	0	0	46	1	1	0	0	0	138	12	8	1	0	0
16:45:00	0	0	3188	550	350	99	0	0	46	0	1	0	0	0	145	7	8	0	0	0
17:00:00	0	0	3771	583	484	134	0	0	48	2	1	0	0	0	161	16	9	1	0	0
17:15:00	0	0	4308	537	592	108	0	0	53	5	1	0	0	0	169	8	9	0	0	0
17:30:00	0	0	4838	530	733	141	0	0	56	3	1	0	0	0	177	8	9	0	0	0
17:45:00	0	0	5381	543	868	135	0	0	57	1	1	0	0	0	189	12	9	0	1	1
18:00:00	0	0	5879	498	990	122	0	0	58	1	1	0	0	0	199	10	10	1	1	0
18:15:00	0	0	5879	0	990	0	0	0	58	0	1	0	0	0	199	0	10	0	1	0
18:15:15	0	0	5879	0	990	0	0	0	58	0	1	0	0	0	199	0	10	0	1	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 5-Apr-17 Site #: 1707200002

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 5-Apr-17 Site #: 1707200002

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	2	2	470	470	0	0	0	0	3	3	0	0	2	2	8	8	0	0	1	1
7:30:00	3	1	1027	557	0	0	0	0	6	3	0	0	5	3	20	12	0	0	2	1
7:45:00	4	1	1526	499	0	0	0	0	8	2	0	0	7	2	28	8	0	0	4	2
8:00:00	7	3	2013	487	0	0	0	0	12	4	0	0	7	0	40	12	0	0	4	0
8:15:00	13	6	2482	469	0	0	0	0	15	3	0	0	9	2	59	19	0	0	5	1
8:30:00	25	12	2983	501	0	0	0	0	16	1	0	0	9	0	71	12	0	0	6	1
8:45:00	32	7	3501	518	0	0	0	0	20	4	0	0	11	2	86	15	0	0	8	2
9:00:00	33	1	3965	464	0	0	0	0	26	6	0	0	12	1	100	14	0	0	9	1
9:15:00	33	0	3965	0	0	0	0	0	26	0	0	0	12	0	100	0	0	0	9	0
16:00:00	33	0	3965	0	0	0	0	0	26	0	0	0	12	0	100	0	0	0	9	0
16:15:00	40	7	4175	210	0	0	1	1	30	4	0	0	12	0	110	10	0	0	9	0
16:30:00	50	10	4369	194	0	0	1	0	34	4	0	0	13	1	119	9	0	0	12	3
16:45:00	61	11	4576	207	0	0	1	0	37	3	0	0	13	0	136	17	0	0	12	0
17:00:00	70	9	4785	209	0	0	1	0	41	4	0	0	13	0	152	16	0	0	12	0
17:15:00	87	17	5041	256	0	0	1	0	44	3	0	0	13	0	158	6	0	0	13	1
17:30:00	103	16	5271	230	0	0	1	0	46	2	0	0	13	0	172	14	0	0	14	1
17:45:00	117	14	5493	222	0	0	1	0	50	4	0	0	13	0	181	9	0	0	15	1
18:00:00	138	21	5720	227	0	0	1	0	51	1	0	0	13	0	196	15	0	0	15	0
18:15:00	138	0	5720	0	0	0	1	0	51	0	0	0	13	0	196	0	0	0	15	0
18:15:15	138	0	5720	0	0	0	1	0	51	0	0	0	13	0	196	0	0	0	15	0

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 8:00:00
To: 9:00:00

Municipality: Mississauga
Site #: 1707200003
Intersection: Derry Rd & Martiz Dr
TFR File #: 1
Count date: 5-Apr-17

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total: 423
North Entering: 113
North Peds: 0
Peds Cross: ⋈

Heavys	0	0	0	0
Trucks	1	0	0	1
Cars	24	79	9	112
Totals	25	79	9	

Heavys	0
Trucks	1
Cars	309
Totals	310

East Leg Total: 2837
East Entering: 1023
East Peds: 0
Peds Cross: ⧗

Derrycrest Dr

Heavys	Trucks	Cars	Totals
61	22	877	960

Cars	Trucks	Heavys	Totals
49	0	0	49
823	20	57	900
65	2	7	74
937	22	64	

Derry Rd

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	193	193
56	14	1715	1785
9	0	641	650
65	14	2549	

Derry Rd

Cars	Trucks	Heavys	Totals
1743	14	57	1814

Martiz Dr

Peds Cross: ⧗
West Peds: 3
West Entering: 2628
West Leg Total: 3588

Cars	785
Trucks	2
Heavys	16
Totals	803

Cars	30	67	19	116
Trucks	1	1	0	2
Heavys	4	0	1	5
Totals	35	68	20	

Peds Cross: ⋈
South Peds: 3
South Entering: 123
South Leg Total: 926

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Mississauga
Site #: 1707200003
Intersection: Derry Rd & Martiz Dr
TFR File #: 1
Count date: 5-Apr-17

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total: 544
North Entering: 219
North Peds: 0
Peds Cross: ⋈

Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	89	57	73	219
Totals	89	57	73	

Heavys	1
Trucks	2
Cars	322
Totals	325

East Leg Total: 3232
East Entering: 1974
East Peds: 0
Peds Cross: ⧗

Derrycrest Dr

Heavys	Trucks	Cars	Totals
37	6	2525	2568

Derry Rd

Cars	Trucks	Heavys	Totals
8	0	0	8
1906	6	34	1946
19	0	1	20
1933	6	35	

N
W E
S

Heavys	Trucks	Cars	Totals
1	1	22	24
53	10	981	1044
2	1	47	50
56	12	1050	

Derry Rd

Cars	Trucks	Heavys	Totals
1185	11	62	1258

Martiz Dr

Peds Cross: ⧗
West Peds: 1
West Entering: 1118
West Leg Total: 3686

Cars	123
Trucks	1
Heavys	3
Totals	127

Cars	530	292	131	953
Trucks	0	1	1	2
Heavys	3	0	9	12
Totals	533	293	141	

Peds Cross: ⋈
South Peds: 4
South Entering: 967
South Leg Total: 1094

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Total Count Diagram

Municipality: Mississauga
Site #: 1707200003
Intersection: Derry Rd & Martiz Dr
TFR File #: 1
Count date: 5-Apr-17

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total: 1587
North Entering: 589
North Peds: 1
Peds Cross: ⋈

Heavys	1	0	1	2
Trucks	1	2	0	3
Cars	219	205	160	584
Totals	221	207	161	

Heavys	4
Trucks	5
Cars	989
Totals	998

East Leg Total: 11886
East Entering: 5796
East Peds: 1
Peds Cross: ⧗

Derrycrest Dr

Heavys	Trucks	Cars	Totals
196	46	6582	6824

Derry Rd

Cars	Trucks	Heavys	Totals
118	1	2	121
5297	44	184	5525
135	2	13	150
5550	47	199	

N
W E
S

Heavys	Trucks	Cars	Totals
2	1	336	339
185	49	5418	5652
20	2	1292	1314
207	52	7046	

Derry Rd

Cars	Trucks	Heavys	Totals
5829	53	208	6090

Martiz Dr

Peds Cross: ⧗
West Peds: 4
West Entering: 7305
West Leg Total: 14129

Cars	1632
Trucks	6
Heavys	33
Totals	1671

Cars	1066	535	251	1852
Trucks	1	3	4	8
Heavys	11	0	22	33
Totals	1078	538	277	

Peds Cross: ⋈
South Peds: 8
South Entering: 1893
South Leg Total: 3564

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Derry Rd & Martiz Dr | **Count Date:** 5-Apr-17 | **Municipality:** Mississauga

North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*	*0*	*7:00:00*	*0*	*0*	*0*	*0*	*0*
8:00:00	*6*	*49*	*26*	*81*	*0*	*138*	*8:00:00*	*18*	*23*	*16*	*57*	*1*
9:00:00	*9*	*79*	*25*	*113*	*0*	*236*	*9:00:00*	*35*	*68*	*20*	*123*	*3*
16:00:00	*0*	*0*	*0*	*0*	*0*	*0*	*16:00:00*	*0*	*0*	*0*	*0*	*0*
17:00:00	*116*	*61*	*114*	*291*	*0*	*1032*	*17:00:00*	*465*	*165*	*111*	*741*	*0*
18:00:00	*30*	*18*	*56*	*104*	*1*	*1076*	*18:00:00*	*560*	*282*	*130*	*972*	*4*
Totals:	161	207	221	589	1	2482	S Totals:	1078	538	277	1893	8

East Approach Totals						East/West Total Approaches	West Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*	*0*	*7:00:00*	*0*	*0*	*0*	*0*	*0*
8:00:00	*28*	*732*	*55*	*815*	*1*	*3325*	*8:00:00*	*96*	*1858*	*556*	*2510*	*0*
9:00:00	*74*	*900*	*49*	*1023*	*0*	*3651*	*9:00:00*	*193*	*1785*	*650*	*2628*	*3*
16:00:00	*0*	*0*	*0*	*0*	*0*	*0*	*16:00:00*	*0*	*0*	*0*	*0*	*0*
17:00:00	*27*	*1978*	*10*	*2015*	*0*	*3070*	*17:00:00*	*23*	*977*	*55*	*1055*	*0*
18:00:00	*21*	*1915*	*7*	*1943*	*0*	*3055*	*18:00:00*	*27*	*1032*	*53*	*1112*	*1*
Totals:	150	5525	121	5796	1	13101	W Totals:	339	5652	1314	7305	4

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*7:00*	*8:00*	*9:00*	*16:00*	*17:00*	*18:00*	*0:00*	*0:00*
Crossing Values:	*0*	*74*	*126*	*0*	*746*	*873*	*0*	*0*

Accu-Traffic Inc.

Count Date: 5-Apr-17 Site #: 1707200003

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	1	1	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	3	3	8	7	11	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	4	1	22	14	20	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	6	2	49	27	26	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	10	4	70	21	30	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	12	2	91	21	34	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	14	2	107	16	42	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	15	1	128	21	50	8	0	0	0	0	1	1	0	0	0	0	0	0	0	0
9:15:00	15	0	128	0	50	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16:00:00	15	0	128	0	50	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
16:15:00	57	42	139	11	82	32	0	0	1	1	1	0	0	0	0	0	0	0	0	0
16:30:00	85	28	143	4	105	23	0	0	1	0	1	0	0	0	0	0	0	0	0	0
16:45:00	115	30	168	25	132	27	0	0	1	0	1	0	0	0	0	0	0	0	0	0
17:00:00	131	16	188	20	164	32	0	0	1	0	1	0	0	0	0	0	0	0	0	0
17:15:00	146	15	196	8	183	19	0	0	1	0	1	0	0	0	0	0	0	0	0	0
17:30:00	158	12	200	4	194	11	0	0	1	0	1	0	0	0	0	0	0	0	0	0
17:45:00	160	2	203	3	210	16	0	0	2	1	1	0	1	1	0	0	0	0	1	1
18:00:00	160	0	205	2	219	9	0	0	2	0	1	0	1	0	0	0	1	1	1	0
18:15:00	160	0	205	0	219	0	0	0	2	0	1	0	1	0	0	0	1	0	1	0
18:15:15	160	0	205	0	219	0	0	0	2	0	1	0	1	0	0	0	1	0	1	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 5-Apr-17 Site #: 1707200003

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	5	5	141	141	10	10	0	0	0	0	0	0	0	0	11	11	0	0	1	1
7:30:00	8	3	295	154	18	8	0	0	4	4	0	0	1	1	20	9	0	0	1	0
7:45:00	10	2	482	187	33	15	0	0	8	4	0	0	2	1	37	17	0	0	1	0
8:00:00	26	16	673	191	54	21	0	0	9	1	0	0	2	0	50	13	1	1	1	0
8:15:00	43	17	852	179	70	16	0	0	12	3	0	0	2	0	68	18	1	0	1	0
8:30:00	53	10	1078	226	81	11	1	1	19	7	0	0	4	2	83	15	1	0	1	0
8:45:00	72	19	1292	214	94	13	1	0	25	6	0	0	6	2	92	9	1	0	1	0
9:00:00	91	19	1496	204	103	9	2	1	29	4	0	0	9	3	107	15	1	0	1	0
9:15:00	91	0	1496	0	103	0	2	0	29	0	0	0	9	0	107	0	1	0	1	0
16:00:00	91	0	1496	0	103	0	2	0	29	0	0	0	9	0	107	0	1	0	1	0
16:15:00	100	9	1934	438	105	2	2	0	35	6	1	1	10	1	117	10	2	1	1	0
16:30:00	106	6	2449	515	108	3	2	0	36	1	1	0	11	1	127	10	2	0	1	0
16:45:00	110	4	2934	485	109	1	2	0	36	0	1	0	11	0	134	7	2	0	1	0
17:00:00	115	5	3427	493	111	2	2	0	36	0	1	0	12	1	147	13	2	0	1	0
17:15:00	120	5	3907	480	111	0	2	0	41	5	1	0	12	0	153	6	2	0	1	0
17:30:00	125	5	4355	448	116	5	2	0	42	1	1	0	12	0	161	8	2	0	1	0
17:45:00	129	4	4827	472	116	0	2	0	42	0	1	0	13	1	174	13	2	0	1	0
18:00:00	135	6	5297	470	118	2	2	0	44	2	1	0	13	0	184	10	2	0	1	0
18:15:00	135	0	5297	0	118	0	2	0	44	0	1	0	13	0	184	0	2	0	1	0
18:15:15	135	0	5297	0	118	0	2	0	44	0	1	0	13	0	184	0	2	0	1	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 5-Apr-17 Site #: 1707200003

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	8	8	6	6	6	6	0	0	0	0	0	0	0	0	0	0	1	1	1	1
7:30:00	11	3	8	2	10	4	0	0	0	0	0	0	1	1	0	0	3	2	1	0
7:45:00	13	2	17	9	11	1	0	0	0	0	0	0	1	0	0	0	3	0	1	0
8:00:00	17	4	23	6	11	0	0	0	0	0	0	0	1	0	0	0	5	2	1	0
8:15:00	27	10	41	18	14	3	1	1	0	0	0	0	2	1	0	0	6	1	1	0
8:30:00	29	2	65	24	15	1	1	0	0	0	0	0	4	2	0	0	6	0	1	0
8:45:00	33	4	77	12	25	10	1	0	0	0	0	0	4	0	0	0	6	0	2	1
9:00:00	47	14	90	13	30	5	1	0	1	1	0	0	5	1	0	0	6	0	4	2
9:15:00	47	0	90	0	30	0	1	0	1	0	0	0	5	0	0	0	6	0	4	0
16:00:00	47	0	90	0	30	0	1	0	1	0	0	0	5	0	0	0	6	0	4	0
16:15:00	155	108	111	21	51	21	1	0	1	0	1	1	5	0	0	0	7	1	4	0
16:30:00	259	104	137	26	69	18	1	0	1	0	1	0	8	3	0	0	10	3	4	0
16:45:00	378	119	184	47	105	36	1	0	1	0	1	0	9	1	0	0	12	2	4	0
17:00:00	507	129	255	71	130	25	1	0	1	0	2	1	10	1	0	0	15	3	4	0
17:15:00	631	124	330	75	172	42	1	0	2	1	2	0	11	1	0	0	17	2	7	3
17:30:00	789	158	429	99	200	28	1	0	2	0	2	0	11	0	0	0	19	2	8	1
17:45:00	928	139	477	48	228	28	1	0	2	0	2	0	11	0	0	0	19	0	8	0
18:00:00	1066	138	535	58	251	23	1	0	3	1	4	2	11	0	0	0	22	3	8	0
18:15:00	1066	0	535	0	251	0	1	0	3	0	4	0	11	0	0	0	22	0	8	0
18:15:15	1066	0	535	0	251	0	1	0	3	0	4	0	11	0	0	0	22	0	8	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 5-Apr-17 Site #: 1707200003

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	12	12	425	425	85	85	0	0	4	4	0	0	0	0	7	7	2	2	0	0
7:30:00	37	25	930	505	212	127	0	0	6	2	1	1	1	1	16	9	4	2	0	0
7:45:00	57	20	1393	463	373	161	0	0	8	2	1	0	1	0	23	7	6	2	0	0
8:00:00	95	38	1811	418	547	174	0	0	12	4	1	0	1	0	35	12	8	2	0	0
8:15:00	140	45	2231	420	712	165	0	0	15	3	1	0	1	0	53	18	9	1	1	1
8:30:00	194	54	2649	418	876	164	0	0	16	1	1	0	1	0	62	9	11	2	3	2
8:45:00	243	49	3106	457	1045	169	0	0	20	4	1	0	1	0	74	12	15	4	3	0
9:00:00	288	45	3526	420	1188	143	0	0	26	6	1	0	1	0	91	17	17	2	3	0
9:15:00	288	0	3526	0	1188	0	0	0	26	0	1	0	1	0	91	0	17	0	3	0
16:00:00	288	0	3526	0	1188	0	0	0	26	0	1	0	1	0	91	0	17	0	3	0
16:15:00	295	7	3742	216	1205	17	0	0	31	5	1	0	1	0	102	11	17	0	3	0
16:30:00	304	9	3974	232	1217	12	0	0	34	3	1	0	1	0	110	8	17	0	3	0
16:45:00	305	1	4224	250	1229	12	0	0	36	2	2	1	1	0	127	17	18	1	3	0
17:00:00	311	6	4436	212	1241	12	0	0	39	3	2	0	1	0	145	18	18	0	3	0
17:15:00	314	3	4723	287	1259	18	0	0	42	3	2	0	2	1	151	6	18	0	3	0
17:30:00	326	12	4955	232	1264	5	1	1	44	2	2	0	2	0	163	12	19	1	4	1
17:45:00	327	1	5189	234	1276	12	1	0	48	4	2	0	2	0	172	9	19	0	4	0
18:00:00	336	9	5418	229	1292	16	1	0	49	1	2	0	2	0	185	13	20	1	4	0
18:15:00	336	0	5418	0	1292	0	1	0	49	0	2	0	2	0	185	0	20	0	4	0
18:15:15	336	0	5418	0	1292	0	1	0	49	0	2	0	2	0	185	0	20	0	4	0

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

Municipality: Mississauga
Site #: 1707200004
Intersection: McLaughlin Rd & Novo Star Dr
TFR File #: 1
Count date: 5-Apr-17

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: McLaughlin Rd runs N/S

North Leg Total: 2770
North Entering: 1926
North Peds: 15
Peds Cross: ⋈

Heavys	7	26	2	35
Trucks	0	1	0	1
Cars	31	1847	12	1890
Totals	38	1874	14	

Heavys	29
Trucks	1
Cars	814
Totals	844

East Leg Total: 189
East Entering: 133
East Peds: 9
Peds Cross: ⧗

McLaughlin Rd

Heavys	Trucks	Cars	Totals
12	0	155	167

Cars	Trucks	Heavys	Totals
47	0	3	50
45	0	2	47
36	0	0	36
128	0	5	

Novo Star Dr

N
W E
S

Heavys	Trucks	Cars	Totals
6	0	61	67
2	0	31	33
3	0	209	212
11	0	301	

Arrowsmith Dr

Cars	Trucks	Heavys	Totals
52	0	4	56

McLaughlin Rd

Peds Cross: ⧗
West Peds: 7
West Entering: 312
West Leg Total: 479

Cars	2092
Trucks	1
Heavys	29
Totals	2122

Cars	79	706	9	794
Trucks	0	1	0	1
Heavys	3	20	0	23
Totals	82	727	9	

Peds Cross: ⋈
South Peds: 9
South Entering: 818
South Leg Total: 2940

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Mississauga
Site #: 1707200004
Intersection: McLaughlin Rd & Novo Star Dr
TFR File #: 1
Count date: 5-Apr-17

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: McLaughlin Rd runs N/S

North Leg Total:	2483
North Entering:	894
North Peds:	3
Peds Cross:	⋈

Heavys	1	11	0	12
Trucks	0	0	0	0
Cars	40	788	54	882
Totals	41	799	54	

Heavys	11
Trucks	1
Cars	1577
Totals	1589

East Leg Total:	130
East Entering:	52
East Peds:	5
Peds Cross:	⧗

McLaughlin Rd

Heavys	Trucks	Cars	Totals
2	0	173	175

Cars	Trucks	Heavys	Totals
34	0	0	34
4	0	1	5
13	0	0	13
51	0	1	

Novo Star Dr

N
W E
S

Heavys	Trucks	Cars	Totals
1	0	44	45
0	0	10	10
1	0	44	45
2	0	98	

Arrowsmith Dr

Cars	Trucks	Heavys	Totals
78	0	0	78

McLaughlin Rd

Peds Cross:	⧗
West Peds:	14
West Entering:	100
West Leg Total:	275

Cars	845
Trucks	0
Heavys	12
Totals	857

Cars	129	1499	14	1642
Trucks	0	1	0	1
Heavys	0	10	0	10
Totals	129	1510	14	

Peds Cross:	⋈
South Peds:	3
South Entering:	1653
South Leg Total:	2510

Comments

Accu-Traffic Inc.

Total Count Diagram

Municipality: Mississauga
Site #: 1707200004
Intersection: McLaughlin Rd & Novo Star Dr
TFR File #: 1
Count date: 5-Apr-17

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: McLaughlin Rd runs N/S

North Leg Total:	9835
North Entering:	5412
North Peds:	37
Peds Cross:	⋈

Heavys	14	88	4	106
Trucks	0	1	0	1
Cars	153	5030	122	5305
Totals	167	5119	126	

Heavys	88
Trucks	2
Cars	4333
Totals	4423

East Leg Total:	569
East Entering:	348
East Peds:	30
Peds Cross:	⧗

McLaughlin Rd

Heavys	Trucks	Cars	Totals
25	1	560	586

Novo Star Dr

Heavys	Trucks	Cars	Totals
8	0	160	168
6	0	50	56
7	0	423	430
21	0	633	

N
W E
S

Cars	Trucks	Heavys	Totals
185	0	6	191
64	0	4	68
88	0	1	89
337	0	11	

Arrowsmith Dr

Cars	Trucks	Heavys	Totals
211	0	10	221

McLaughlin Rd

Peds Cross:	⧗
West Peds:	37
West Entering:	654
West Leg Total:	1240

Cars	5541
Trucks	1
Heavys	96
Totals	5638

Cars	343	3988	39	4370
Trucks	1	2	0	3
Heavys	7	74	0	81
Totals	351	4064	39	

Peds Cross:	⋈
South Peds:	25
South Entering:	4454
South Leg Total:	10092

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Traffic Count Summary

Intersection: McLaughlin Rd & Novo Star Dr | **Count Date:** 5-Apr-17 | **Municipality:** Mississauga

North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*	*0*	*7:00:00*	*0*	*0*	*0*	*0*	*0*
8:00:00	*17*	*1670*	*24*	*1711*	*13*	*2204*	*8:00:00*	*35*	*451*	*7*	*493*	*5*
9:00:00	*16*	*1863*	*36*	*1915*	*12*	*2669*	*9:00:00*	*73*	*671*	*10*	*754*	*7*
16:00:00	*0*	*0*	*0*	*0*	*0*	*0*	*16:00:00*	*0*	*0*	*0*	*0*	*0*
17:00:00	*42*	*810*	*51*	*903*	*10*	*2502*	*17:00:00*	*119*	*1470*	*10*	*1599*	*9*
18:00:00	*51*	*776*	*56*	*883*	*2*	*2491*	*18:00:00*	*124*	*1472*	*12*	*1608*	*4*
Totals:	126	5119	167	5412	37	9866	S Totals:	351	4064	39	4454	25

East Approach Totals						East/West Total Approaches	West Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*	*0*	*7:00:00*	*0*	*0*	*0*	*0*	*0*
8:00:00	*34*	*30*	*58*	*122*	*5*	*310*	*8:00:00*	*27*	*14*	*147*	*188*	*9*
9:00:00	*28*	*20*	*60*	*108*	*13*	*382*	*9:00:00*	*66*	*28*	*180*	*274*	*6*
16:00:00	*0*	*0*	*0*	*0*	*0*	*0*	*16:00:00*	*0*	*0*	*0*	*0*	*0*
17:00:00	*13*	*10*	*34*	*57*	*6*	*154*	*17:00:00*	*37*	*8*	*52*	*97*	*9*
18:00:00	*14*	*8*	*39*	*61*	*6*	*156*	*18:00:00*	*38*	*6*	*51*	*95*	*13*
Totals:	89	68	191	348	30	1002	W Totals:	168	56	430	654	37

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*7:00*	*8:00*	*9:00*	*16:00*	*17:00*	*18:00*	*0:00*	*0:00*
Crossing Values:	*0*	*109*	*141*	*0*	*79*	*66*	*0*	*0*

Accu-Traffic Inc.

Count Date: 5-Apr-17 Site #: 1707200004

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	345	345	2	2	0	0	0	0	0	0	0	0	4	4	2	2	4	4
7:30:00	8	8	760	415	8	6	0	0	0	0	0	0	0	0	9	5	4	2	5	1
7:45:00	12	4	1170	410	10	2	0	0	0	0	0	0	1	1	29	20	5	1	6	1
8:00:00	15	3	1637	467	18	8	0	0	0	0	0	0	2	1	33	4	6	1	13	7
8:15:00	18	3	2095	458	25	7	0	0	0	0	0	0	3	1	40	7	8	2	17	4
8:30:00	21	3	2567	472	35	10	0	0	1	1	0	0	3	0	49	9	11	3	18	1
8:45:00	24	3	3017	450	41	6	0	0	1	0	0	0	3	0	55	6	12	1	21	3
9:00:00	30	6	3468	451	47	6	0	0	1	0	0	0	3	0	64	9	13	1	25	4
9:15:00	30	0	3468	0	47	0	0	0	1	0	0	0	3	0	64	0	13	0	25	0
16:00:00	30	0	3468	0	47	0	0	0	1	0	0	0	3	0	64	0	13	0	25	0
16:15:00	39	9	3662	194	58	11	0	0	1	0	0	0	3	0	67	3	13	0	30	5
16:30:00	44	5	3852	190	82	24	0	0	1	0	0	0	4	1	71	4	13	0	32	2
16:45:00	61	17	4040	188	90	8	0	0	1	0	0	0	4	0	76	5	13	0	34	2
17:00:00	71	10	4264	224	98	8	0	0	1	0	0	0	4	0	78	2	13	0	35	1
17:15:00	84	13	4455	191	111	13	0	0	1	0	0	0	4	0	81	3	14	1	35	0
17:30:00	98	14	4640	185	122	11	0	0	1	0	0	0	4	0	82	1	14	0	35	0
17:45:00	107	9	4848	208	135	13	0	0	1	0	0	0	4	0	85	3	14	0	37	2
18:00:00	122	15	5030	182	153	18	0	0	1	0	0	0	4	0	88	3	14	0	37	0
18:15:00	122	0	5030	0	153	0	0	0	1	0	0	0	4	0	88	0	14	0	37	0
18:15:15	122	0	5030	0	153	0	0	0	1	0	0	0	4	0	88	0	14	0	37	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 5-Apr-17 Site #: 1707200004

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	5	5	1	1	11	11	0	0	0	0	0	0	0	0	0	0	1	1	2	2
7:30:00	15	10	2	1	30	19	0	0	0	0	0	0	0	0	0	0	2	1	2	0
7:45:00	19	4	2	0	48	18	0	0	0	0	0	0	0	0	0	0	2	0	5	3
8:00:00	34	15	30	28	55	7	0	0	0	0	0	0	0	0	0	0	3	1	5	0
8:15:00	38	4	37	7	68	13	0	0	0	0	0	0	0	0	1	1	4	1	7	2
8:30:00	44	6	44	7	78	10	0	0	0	0	0	0	0	0	1	0	5	1	12	5
8:45:00	55	11	47	3	95	17	0	0	0	0	0	0	0	0	2	1	5	0	14	2
9:00:00	61	6	48	1	112	17	0	0	0	0	0	0	1	1	2	0	6	1	18	4
9:15:00	61	0	48	0	112	0	0	0	0	0	0	0	1	0	2	0	6	0	18	0
16:00:00	61	0	48	0	112	0	0	0	0	0	0	0	1	0	2	0	6	0	18	0
16:15:00	65	4	50	2	125	13	0	0	0	0	0	0	1	0	2	0	6	0	19	1
16:30:00	67	2	55	5	129	4	0	0	0	0	0	0	1	0	2	0	6	0	23	4
16:45:00	72	5	56	1	137	8	0	0	0	0	0	0	1	0	2	0	6	0	24	1
17:00:00	74	2	57	1	146	9	0	0	0	0	0	0	1	0	3	1	6	0	24	0
17:15:00	76	2	57	0	150	4	0	0	0	0	0	0	1	0	3	0	6	0	25	1
17:30:00	80	4	59	2	163	13	0	0	0	0	0	0	1	0	3	0	6	0	28	3
17:45:00	83	3	62	3	171	8	0	0	0	0	0	0	1	0	4	1	6	0	29	1
18:00:00	88	5	64	2	185	14	0	0	0	0	0	0	1	0	4	0	6	0	30	1
18:15:00	88	0	64	0	185	0	0	0	0	0	0	0	1	0	4	0	6	0	30	0
18:15:15	88	0	64	0	185	0	0	0	0	0	0	0	1	0	4	0	6	0	30	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 5-Apr-17 Site #: 1707200004

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	2	2	85	85	2	2	1	1	0	0	0	0	0	0	4	4	0	0	0	0
7:30:00	6	4	152	67	3	1	1	0	0	0	0	0	0	0	12	8	0	0	0	0
7:45:00	10	4	257	105	7	4	1	0	0	0	0	0	2	2	22	10	0	0	3	3
8:00:00	30	20	421	164	7	0	1	0	1	1	0	0	4	2	29	7	0	0	5	2
8:15:00	49	19	614	193	11	4	1	0	1	0	0	0	4	0	31	2	0	0	10	5
8:30:00	81	32	806	192	15	4	1	0	1	0	0	0	5	1	39	8	0	0	12	2
8:45:00	89	8	963	157	16	1	1	0	1	0	0	0	5	0	42	3	0	0	12	0
9:00:00	102	13	1074	111	17	1	1	0	1	0	0	0	5	0	47	5	0	0	12	0
9:15:00	102	0	1074	0	17	0	1	0	1	0	0	0	5	0	47	0	0	0	12	0
16:00:00	102	0	1074	0	17	0	1	0	1	0	0	0	5	0	47	0	0	0	12	0
16:15:00	128	26	1393	319	18	1	1	0	1	0	0	0	7	2	52	5	0	0	14	2
16:30:00	156	28	1777	384	21	3	1	0	1	0	0	0	7	0	57	5	0	0	18	4
16:45:00	194	38	2156	379	25	4	1	0	1	0	0	0	7	0	59	2	0	0	19	1
17:00:00	219	25	2528	372	27	2	1	0	1	0	0	0	7	0	63	4	0	0	21	2
17:15:00	250	31	2890	362	31	4	1	0	1	0	0	0	7	0	64	1	0	0	21	0
17:30:00	285	35	3276	386	35	4	1	0	2	1	0	0	7	0	67	3	0	0	21	0
17:45:00	318	33	3645	369	35	0	1	0	2	0	0	0	7	0	71	4	0	0	24	3
18:00:00	343	25	3988	343	39	4	1	0	2	0	0	0	7	0	74	3	0	0	25	1
18:15:00	343	0	3988	0	39	0	1	0	2	0	0	0	7	0	74	0	0	0	25	0
18:15:15	343	0	3988	0	39	0	1	0	2	0	0	0	7	0	74	0	0	0	25	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 5-Apr-17 Site #: 1707200004

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	6	6	2	2	22	22	0	0	0	0	0	0	0	0	0	0	2	2	0	0
7:30:00	13	7	2	0	50	28	0	0	0	0	0	0	1	1	1	1	2	0	2	2
7:45:00	19	6	4	2	78	28	0	0	0	0	0	0	1	0	3	2	2	0	7	5
8:00:00	26	7	11	7	144	66	0	0	0	0	0	0	1	0	3	0	3	1	9	2
8:15:00	39	13	23	12	194	50	0	0	0	0	0	0	4	3	4	1	3	0	10	1
8:30:00	58	19	28	5	248	54	0	0	0	0	0	0	6	2	5	1	5	2	12	2
8:45:00	80	22	35	7	287	39	0	0	0	0	0	0	7	1	5	0	5	0	14	2
9:00:00	86	6	36	1	321	34	0	0	0	0	0	0	7	0	6	1	6	1	15	1
9:15:00	86	0	36	0	321	0	0	0	0	0	0	0	7	0	6	0	6	0	15	0
16:00:00	86	0	36	0	321	0	0	0	0	0	0	0	7	0	6	0	6	0	15	0
16:15:00	90	4	36	0	333	12	0	0	0	0	0	0	7	0	6	0	6	0	20	5
16:30:00	96	6	37	1	347	14	0	0	0	0	0	0	7	0	6	0	6	0	21	1
16:45:00	113	17	43	6	361	14	0	0	0	0	0	0	7	0	6	0	7	1	24	3
17:00:00	123	10	44	1	372	11	0	0	0	0	0	0	7	0	6	0	7	0	24	0
17:15:00	132	9	44	0	382	10	0	0	0	0	0	0	7	0	6	0	7	0	35	11
17:30:00	140	8	47	3	391	9	0	0	0	0	0	0	8	1	6	0	7	0	35	0
17:45:00	143	3	48	1	404	13	0	0	0	0	0	0	8	0	6	0	7	0	35	0
18:00:00	160	17	50	2	423	19	0	0	0	0	0	0	8	0	6	0	7	0	37	2
18:15:00	160	0	50	0	423	0	0	0	0	0	0	0	8	0	6	0	7	0	37	0
18:15:15	160	0	50	0	423	0	0	0	0	0	0	0	8	0	6	0	7	0	37	0

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	December 13, 2012		Prepared Date:	November 23, 2016
Database Rev	30		Completed By:	RS
Timing Card / Field rev	20		Checked By:	

Location: Derry Road at McLaughlin Road

Phase #	Direction	Vehicle Minimum (sec.)	Pedestrian Minimum (sec.) WALK	Pedestrian Minimum (sec.) FDWALK	Amber (sec.)	All Red (sec.)	TIME PERIOD (sec.) (Green+Amber+All Red) AM MAX	OFF MAX	PM MAX
1	Derry Road - WB PP LT Arrow	8.0			3.0		12.6	13.5	12.6
2	Derry Road - EB	12.0	12.0	18.0	4.6	2.2	57.4	55.4	63.0
3	McLaughlin Road - SB PP LT Arrow	8.0			3.0	2.0	25.2	16.2	16.8
4	McLaughlin Road - NB	12.0	13.0	20.0	4.0	3.1	44.8	46.2	47.6
5	Derry Road - EB PP LT Arrow	8.0			3.0		12.6	13.5	12.6
6	Derry Road - WB	12.0	12.0	18.0	4.6	2.2	57.4	55.4	63.0
7	McLaughlin Road - NB PP LT Arrow	8.0			3.0	2.0	15.4	16.2	16.8
8	St. Barbara Boulevard - SB	12.0	13.0	20.0	4.0	3.1	54.6	61.2	47.6

System Control	Yes
Local Control	No
Semi-Actuated Mode	No (Fully)

TIME (M-F)	PEAK	CYCLE LENGTH (sec.)	OFFSET (sec.)
06:00-09:30	AM	140	12.6
9:30 - 15:00 19:30 - 00:00	OFF	135	126.9
15:00 - 19:30	PM	140	1.4

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	April 25, 2016		Prepared Date:	November 23, 2016
Database Rev	9		Completed By:	RS
Timing Card / Field rev	1		Checked By:	MJY

Location: Derry Road at Maritz Road/Convention Centre

Phase #	Direction	Vehicle Minimum (sec.)	Pedestrian Minimum (sec.) WALK	Pedestrian Minimum (sec.) FDWALK	Amber (sec.)	All Red (sec.)	TIME PERIOD (sec.) (Green+Amber+All Red) AM MAX	OFF MAX	PM MAX
1	Not in Use								
2	Derry Road - EB	12.0	12.0	19.0	4.6	2.0	117.6	110.7	91.0
3	Not in Use								
4	Convention Centre - NB	8.0	16.0	25.0	4.0	3.4	22.4	24.3	49.0
5	Not in Use								
6	Derry Road - WB	12.0	12.0	19.0	4.6	2.0	117.6	110.7	91.0
7	Maritz Road - NB PP LT Arrow	5.0			3.0				28.0
8	Maritz Road - SB	8.0	16.0	25.0	4.0	3.4	22.4	24.3	21.0

System Control	Yes
Local Control	No
Semi-Actuated Mode	Yes

TIME (M-F)	PEAK	CYCLE LENGTH (sec.)	OFFSET (sec.)
06:00-09:30	AM	140	40.6
9:30 - 15:00 19:30 - 00:00	OFF	135	25.7
15:00 - 19:30	PM	140	50.4

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	April 25, 2016		Prepared Date:	November 23, 2016
Database Rev	2		Completed By:	RS
Timing Card / Field rev	1		Checked By:	MJY

Location: Derry Road at St. Barbara Boulevard

Phase #	Direction	Vehicle Minimum (sec.)	Pedestrian Minimum (sec.) WALK	Pedestrian Minimum (sec.) FDWALK	Amber (sec.)	All Red (sec.)	TIME PERIOD (sec.) (Green+Amber+All Red) AM MAX	OFF MAX	PM MAX
1	Not in Use								
2	Derry Road - EB	12.0	9.0	14.0	4.2	2.1	89.6	87.8	96.6
3	Not in Use								
4	Computer Phase	8.0	12.0	18.0	4.0	4.1	50.4	47.3	43.4
5	Not in Use								
6	Derry Road - WB	12.0	9.0	14.0	4.2	2.1	89.6	87.8	96.6
7	Not in Use								
8	St. Barbara Boulevard - SB	8.0	12.0	18.0	4.0	4.1	50.4	47.3	43.4

System Control	Yes
Local Control	No
Semi-Actuated Mode	Yes

TIME (M-F)	PEAK	CYCLE LENGTH (sec.)	OFFSET (sec.)
06:00-09:30	AM	140	33.6
9:30 - 15:00 19:30 - 00:00	OFF	135	110.7
15:00 - 19:30	PM	140	121.8

INT No.: **795**

LOCATION: **McLaughlin @ Novo Star/Arrowsmith**

SCHEDULED DATA

Mode	Cycle Length	OFF No.	Split No.	Spec Func	DUP ISEC
LO	101	2	2	2	1078

PHASING DATA

PHASE	MIN	MAX	WALK	DON'T WALK	AMBER	ALL RED
1. NBLT Arrow	5	10	-	-	3	-
2. SB McLaughlin	47	-	32	15	5	2
4. WB Arrowsmith	8	30	10	20	4	2.5
6. NB McLaughlin	47	-	32	15	5	2
8. EB Novo Star	8	30	10	20	4	2.5

* ALL VALUES IN SECONDS

APPENDIX B

Intersection Capacity Analysis Reports

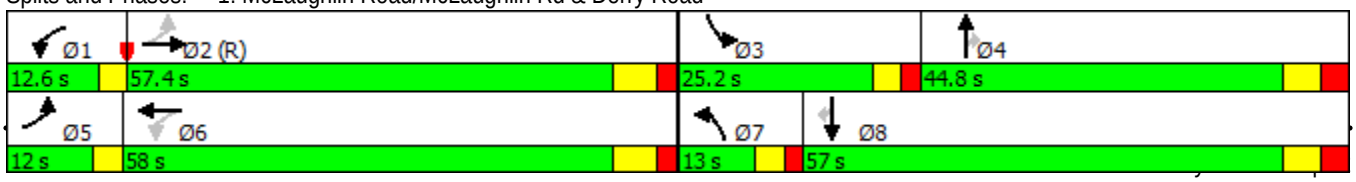
Existing (2017) Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1687	453	220	755	76	107	583	157	230	1295	94
Future Volume (vph)	105	1687	453	220	755	76	107	583	157	230	1295	94
Lane Group Flow (vph)	105	1687	453	220	755	76	107	583	157	230	1295	94
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	57.4		12.6	58.0		13.0	44.8	44.8	25.2	57.0	57.0
Total Split (%)	8.6%	41.0%		9.0%	41.4%		9.3%	32.0%	32.0%	18.0%	40.7%	40.7%
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	0.33	0.91	0.29	1.25	0.43	0.05	0.55	0.55	0.28	0.64	1.04	0.15
Control Delay	23.2	50.7	0.5	179.9	34.3	0.1	75.5	43.3	10.5	68.3	79.7	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	50.7	0.5	179.9	34.3	0.1	75.5	43.3	10.5	68.3	79.7	6.6
Queue Length 50th (m)	16.6	170.4	0.0	~62.4	60.5	0.0	15.9	74.6	5.4	33.6	~213.6	0.4
Queue Length 95th (m)	28.2	192.3	0.0	#117.6	73.3	0.0	26.4	98.5	24.1	46.8	#258.5	12.9
Internal Link Dist (m)		899.9			188.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	326	1858	1566	176	1751	1521	194	1057	559	489	1247	622
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	0.32	0.91	0.29	1.25	0.43	0.05	0.55	0.55	0.28	0.47	1.04	0.15

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 135
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: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1687	453	220	755	76	107	583	157	230	1295	94
Future Volume (vph)	105	1687	453	220	755	76	107	583	157	230	1295	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	3.0	6.8	4.0	3.0	6.8	4.0	5.0	7.1	7.1	5.0	7.1	7.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	5142	1566	1750	4768	1521	3395	3433	1521	3395	3500	1581
Flt Permitted	0.29	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	547	5142	1566	143	4768	1521	3395	3433	1521	3395	3500	1581
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)	105	1687	453	220	755	76	107	583	157	230	1295	94
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	91	0	0	59
Lane Group Flow (vph)	105	1687	453	220	755	76	107	583	66	230	1295	35
Heavy Vehicles (%)	1%	2%	2%	2%	10%	5%	2%	4%	5%	2%	2%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	59.4	50.6	140.0	61.0	51.4	140.0	8.0	43.1	43.1	14.8	49.9	49.9
Effective Green, g (s)	59.4	50.6	140.0	61.0	51.4	140.0	8.0	43.1	43.1	14.8	49.9	49.9
Actuated g/C Ratio	0.42	0.36	1.00	0.44	0.37	1.00	0.06	0.31	0.31	0.11	0.36	0.36
Clearance Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
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)	308	1858	1566	172	1750	1521	194	1056	468	358	1247	563
v/s Ratio Prot	0.02	0.33		c0.09	0.16		0.03	0.17		c0.07	c0.37	
v/s Ratio Perm	0.12		0.29	c0.47		0.05			0.04			0.02
v/c Ratio	0.34	0.91	0.29	1.28	0.43	0.05	0.55	0.55	0.14	0.64	1.04	0.06
Uniform Delay, d1	25.0	42.5	0.0	37.9	33.3	0.0	64.3	40.4	35.1	60.1	45.0	29.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	8.0	0.5	162.6	0.2	0.1	3.4	0.6	0.1	3.9	36.0	0.0
Delay (s)	25.6	50.5	0.5	200.5	33.5	0.1	67.6	41.0	35.2	64.0	81.1	29.7
Level of Service	C	D	A	F	C	A	E	D	D	E	F	C
Approach Delay (s)		39.2			66.0			43.3			75.7	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.9
Intersection Capacity Utilization	106.3%	ICU Level of Service	G
Analysis Period (min)	15		

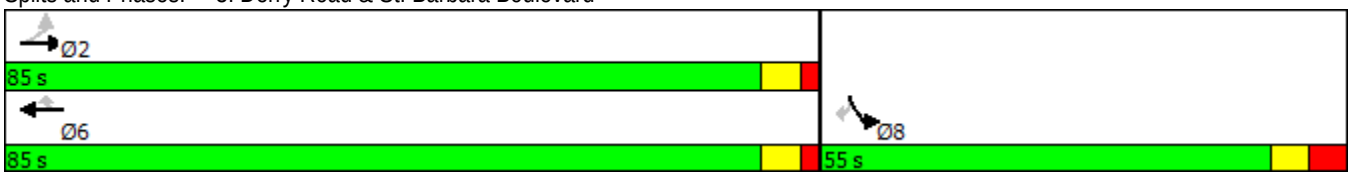
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	32	2045	916	43	574	121
Future Volume (vph)	32	2045	916	43	574	121
Lane Group Flow (vph)	32	2045	916	43	574	121
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		8	
Permitted Phases	2			6		8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	12.0	12.0	12.0	12.0	8.0	8.0
Minimum Split (s)	29.3	29.3	29.3	29.3	38.1	38.1
Total Split (s)	85.0	85.0	85.0	85.0	55.0	55.0
Total Split (%)	60.7%	60.7%	60.7%	60.7%	39.3%	39.3%
Yellow Time (s)	4.2	4.2	4.2	4.2	4.0	4.0
All-Red Time (s)	2.1	2.1	2.1	2.1	4.1	4.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	6.3	6.3	8.1	8.1
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max	Max	None	None	None	None
v/c Ratio	0.13	0.71	0.34	0.05	0.98	0.21
Control Delay	16.2	23.9	16.8	6.3	78.3	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	23.9	16.8	6.3	78.3	11.4
Queue Length 50th (m)	4.2	153.8	50.9	1.5	164.5	6.1
Queue Length 95th (m)	10.4	171.6	60.5	7.3	#242.5	21.2
Internal Link Dist (m)		161.0	621.8		772.6	
Turn Bay Length (m)	50.0			25.0	95.0	
Base Capacity (vph)	253	2873	2716	871	593	576
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.71	0.34	0.05	0.97	0.21

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 139.5
Natural Cycle: 80
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Derry Road & St. Barbara Boulevard



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	32	2045	916	43	574	121
Future Volume (vph)	32	2045	916	43	574	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)	6.3	6.3	6.3	6.3	8.1	8.1
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1580	5092	4812	1521	1767	1536
Flt Permitted	0.27	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	449	5092	4812	1521	1767	1536
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	32	2045	916	43	574	121
RTOR Reduction (vph)	0	0	0	14	0	60
Lane Group Flow (vph)	32	2045	916	29	574	61
Heavy Vehicles (%)	13%	3%	9%	5%	1%	4%
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		8	
Permitted Phases	2			6		8
Actuated Green, G (s)	78.7	78.7	78.7	78.7	46.4	46.4
Effective Green, g (s)	78.7	78.7	78.7	78.7	46.4	46.4
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.33	0.33
Clearance Time (s)	6.3	6.3	6.3	6.3	8.1	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	253	2872	2714	858	587	510
v/s Ratio Prot		c0.40	0.19		c0.32	
v/s Ratio Perm	0.07			0.02		0.04
v/c Ratio	0.13	0.71	0.34	0.03	0.98	0.12
Uniform Delay, d1	14.3	22.1	16.4	13.5	46.0	32.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	1.5	0.1	0.0	31.2	0.1
Delay (s)	15.3	23.7	16.4	13.5	77.2	32.5
Level of Service	B	C	B	B	E	C
Approach Delay (s)		23.5	16.3		69.4	
Approach LOS		C	B		E	

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	139.5	Sum of lost time (s)	14.4
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		

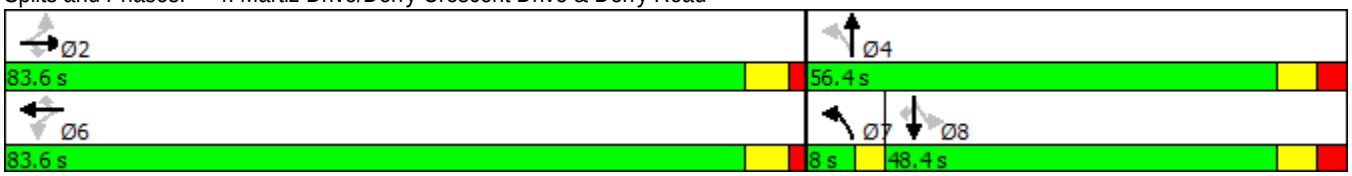
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	193	1785	650	74	900	49	35	68	9	79	25
Future Volume (vph)	193	1785	650	74	900	49	35	68	9	79	25
Lane Group Flow (vph)	193	1785	650	74	900	49	35	88	9	79	25
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases		2			6		7	4		8	
Permitted Phases	2		2	6		6	4		8		8
Detector Phase	2	2	2	6	6	6	7	4	8	8	8
Switch Phase											
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	5.0	8.0	8.0	8.0	8.0
Minimum Split (s)	37.6	37.6	37.6	37.6	37.6	37.6	8.0	48.4	48.4	48.4	48.4
Total Split (s)	83.6	83.6	83.6	83.6	83.6	83.6	8.0	56.4	48.4	48.4	48.4
Total Split (%)	59.7%	59.7%	59.7%	59.7%	59.7%	59.7%	5.7%	40.3%	34.6%	34.6%	34.6%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0	3.4	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4	7.4	7.4	7.4
Lead/Lag							Lead		Lag	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None	None
v/c Ratio	0.44	0.46	0.51	0.54	0.25	0.04	0.20	0.34	0.07	0.43	0.13
Control Delay	10.7	6.5	5.3	28.5	5.1	1.3	38.0	38.1	46.0	53.7	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	6.5	5.3	28.5	5.1	1.3	38.0	38.1	46.0	53.7	4.6
Queue Length 50th (m)	16.8	58.2	31.0	7.3	23.3	0.0	6.4	15.0	1.9	17.0	0.0
Queue Length 95th (m)	38.3	76.2	62.3	#37.8	32.6	3.0	15.3	30.0	7.0	32.7	2.9
Internal Link Dist (m)		621.8			523.2			624.4		634.6	
Turn Bay Length (m)	110.0		30.0	65.0		35.0			95.0		200.0
Base Capacity (vph)	441	3900	1284	136	3654	1248	174	851	510	746	627
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.46	0.51	0.54	0.25	0.04	0.20	0.10	0.02	0.11	0.04

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 105.8
Natural Cycle: 145
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Martiz Drive/Derry Crescent Drive & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	1785	650	74	900	49	35	68	20	9	79	25
Future Volume (vph)	193	1785	650	74	900	49	35	68	20	9	79	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	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	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1785	5043	1581	1594	4725	1597	1566	1821		1785	1921	1536
Flt Permitted	0.30	1.00	1.00	0.11	1.00	1.00	0.52	1.00		0.70	1.00	1.00
Satd. Flow (perm)	572	5043	1581	177	4725	1597	854	1821		1315	1921	1536
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)	193	1785	650	74	900	49	35	68	20	9	79	25
RTOR Reduction (vph)	0	0	70	0	0	13	0	10	0	0	0	23
Lane Group Flow (vph)	193	1785	580	74	900	36	35	78	0	9	79	2
Heavy Vehicles (%)	0%	4%	1%	12%	11%	0%	14%	1%	5%	0%	0%	4%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm
Protected Phases		2			6		7	4			8	
Permitted Phases	2		2	6		6	4			8		8
Actuated Green, G (s)	80.4	80.4	80.4	80.4	80.4	80.4	14.2	14.2		8.3	8.3	8.3
Effective Green, g (s)	80.4	80.4	80.4	80.4	80.4	80.4	14.2	14.2		8.3	8.3	8.3
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.74	0.74	0.13	0.13		0.08	0.08	0.08
Clearance Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	7.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	423	3733	1170	131	3498	1182	130	238		100	146	117
v/s Ratio Prot		0.35			0.19		0.01	c0.04			c0.04	
v/s Ratio Perm	0.34		0.37	c0.42		0.02	0.03			0.01		0.00
v/c Ratio	0.46	0.48	0.50	0.56	0.26	0.03	0.27	0.33		0.09	0.54	0.02
Uniform Delay, d1	5.5	5.7	5.8	6.3	4.5	3.7	42.0	42.9		46.6	48.3	46.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.5	0.4	1.5	5.5	0.0	0.0	1.1	0.8		0.4	4.0	0.1
Delay (s)	9.0	6.1	7.3	11.8	4.6	3.8	43.1	43.7		47.0	52.4	46.4
Level of Service	A	A	A	B	A	A	D	D		D	D	D
Approach Delay (s)		6.6			5.0			43.5			50.6	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	108.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

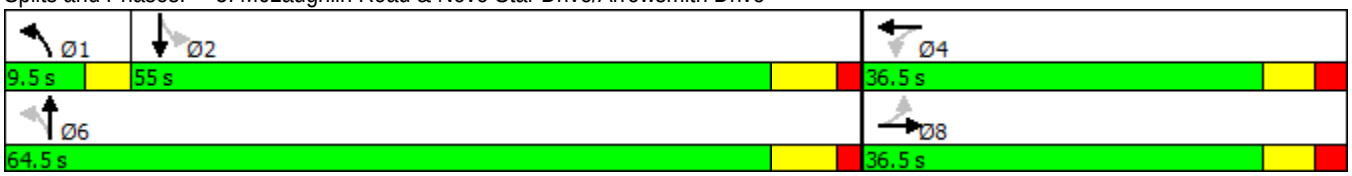
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	67	33	36	47	82	727	14	1874
Future Volume (vph)	67	33	36	47	82	727	14	1874
Lane Group Flow (vph)	67	245	36	97	82	736	14	1912
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		8		4	1	6		2
Permitted Phases	8		4		6		2	
Detector Phase	8	8	4	4	1	6	2	2
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	47.0	47.0	47.0
Minimum Split (s)	36.5	36.5	36.5	36.5	9.5	54.0	54.0	54.0
Total Split (s)	36.5	36.5	36.5	36.5	9.5	64.5	55.0	55.0
Total Split (%)	36.1%	36.1%	36.1%	36.1%	9.4%	63.9%	54.5%	54.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	3.5	7.0	7.0	7.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	Max
v/c Ratio	0.38	0.71	0.35	0.34	0.39	0.30	0.04	0.89
Control Delay	37.7	28.1	40.6	20.2	11.2	6.0	9.7	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.7	28.1	40.6	20.2	11.2	6.0	9.7	23.1
Queue Length 50th (m)	10.3	18.8	5.5	7.0	3.0	21.0	0.9	138.2
Queue Length 95th (m)	22.3	43.0	14.5	20.2	12.2	39.0	4.3	#239.4
Internal Link Dist (m)		285.8		306.4		289.1		287.3
Turn Bay Length (m)	21.0		21.0		45.0		45.0	
Base Capacity (vph)	429	657	251	625	212	2437	367	2151
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	0.16	0.37	0.14	0.16	0.39	0.30	0.04	0.89

Intersection Summary

Cycle Length: 101
Actuated Cycle Length: 83.7
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: McLaughlin Road & Novo Star Drive/Arrowsmith Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	33	212	36	47	50	82	727	9	14	1874	38
Future Volume (vph)	67	33	212	36	47	50	82	727	9	14	1874	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
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	0.92		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1638	1608		1785	1651		1716	3539		1566	3591	
Flt Permitted	0.69	1.00		0.37	1.00		0.07	1.00		0.37	1.00	
Satd. Flow (perm)	1197	1608		701	1651		135	3539		613	3591	
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)	67	33	212	36	47	50	82	727	9	14	1874	38
RTOR Reduction (vph)	0	106	0	0	43	0	0	1	0	0	1	0
Lane Group Flow (vph)	67	139	0	36	54	0	82	735	0	14	1911	0
Heavy Vehicles (%)	9%	6%	1%	0%	4%	6%	4%	3%	0%	14%	1%	18%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	12.5	12.5		12.5	12.5		58.3	58.3		50.1	50.1	
Effective Green, g (s)	12.5	12.5		12.5	12.5		58.3	58.3		50.1	50.1	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.69	0.69		0.59	0.59	
Clearance Time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	177	238		103	244		181	2447		364	2134	
v/s Ratio Prot		c0.09			0.03		c0.03	0.21			c0.53	
v/s Ratio Perm	0.06			0.05			0.29			0.02		
v/c Ratio	0.38	0.58		0.35	0.22		0.45	0.30		0.04	0.90	
Uniform Delay, d1	32.4	33.5		32.2	31.6		15.4	5.1		7.1	14.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	3.6		2.1	0.5		1.8	0.3		0.2	6.4	
Delay (s)	33.8	37.1		34.3	32.1		17.2	5.4		7.3	21.2	
Level of Service	C	D		C	C		B	A		A	C	
Approach Delay (s)		36.4			32.7			6.6			21.1	
Approach LOS		D			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	84.3	Sum of lost time (s)	17.0
Intersection Capacity Utilization	106.3%	ICU Level of Service	G
Analysis Period (min)	15		

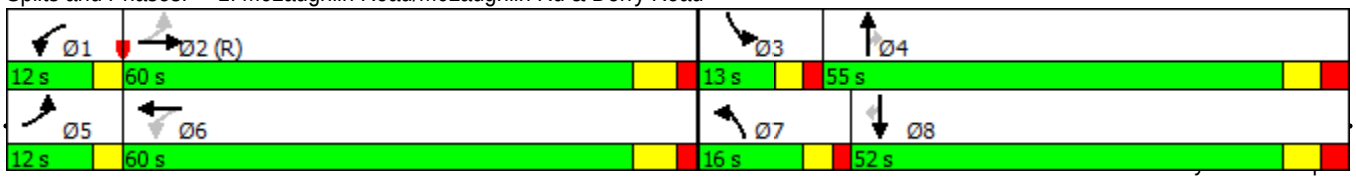
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	779	105	204	1827	311	257	1178	104	152	604	166
Future Volume (vph)	196	779	105	204	1827	311	257	1178	104	152	604	166
Lane Group Flow (vph)	196	779	105	204	1827	311	257	1178	104	152	604	166
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	60.0		12.0	60.0		16.0	55.0	55.0	13.0	52.0	52.0
Total Split (%)	8.6%	42.9%		8.6%	42.9%		11.4%	39.3%	39.3%	9.3%	37.1%	37.1%
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	1.15	0.42	0.07	0.62	0.93	0.20	0.96	0.97	0.17	0.78	0.53	0.28
Control Delay	146.6	32.9	0.1	30.4	50.7	0.3	108.1	65.8	8.5	90.9	41.1	9.0
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	146.6	32.9	0.1	30.4	50.7	0.3	108.1	65.8	8.5	90.9	41.1	9.0
Queue Length 50th (m)	~49.4	61.0	0.0	33.3	185.5	0.0	39.1	177.9	2.3	22.9	75.8	4.8
Queue Length 95th (m)	#102.2	73.7	0.0	50.3	208.1	0.0	#67.7	#227.0	15.7	#41.1	95.5	22.2
Internal Link Dist (m)		899.9			188.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	170	1845	1581	331	1973	1581	269	1209	601	195	1133	603
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	1.15	0.42	0.07	0.62	0.93	0.20	0.96	0.97	0.17	0.78	0.53	0.28

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 1.4 (1%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 135
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: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	779	105	204	1827	311	257	1178	104	152	604	166
Future Volume (vph)	196	779	105	204	1827	311	257	1178	104	152	604	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	3.0	6.8	4.0	3.0	6.8	4.0	5.0	7.1	7.1	5.0	7.1	7.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	4856	1581	1785	5193	1581	3429	3535	1581	3429	3535	1581
Flt Permitted	0.08	1.00	1.00	0.28	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	140	4856	1581	532	5193	1581	3429	3535	1581	3429	3535	1581
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)	196	779	105	204	1827	311	257	1178	104	152	604	166
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	61	0	0	96
Lane Group Flow (vph)	196	779	105	204	1827	311	257	1178	43	152	604	70
Heavy Vehicles (%)	1%	8%	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	62.2	53.2	140.0	62.2	53.2	140.0	11.0	47.9	47.9	8.0	44.9	44.9
Effective Green, g (s)	62.2	53.2	140.0	62.2	53.2	140.0	11.0	47.9	47.9	8.0	44.9	44.9
Actuated g/C Ratio	0.44	0.38	1.00	0.44	0.38	1.00	0.08	0.34	0.34	0.06	0.32	0.32
Clearance Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
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)	166	1845	1581	316	1973	1581	269	1209	540	195	1133	507
v/s Ratio Prot	c0.08	0.16		0.04	0.35		c0.07	c0.33		0.04	0.17	
v/s Ratio Perm	c0.45		0.07	0.24		c0.20			0.03			0.04
v/c Ratio	1.18	0.42	0.07	0.65	0.93	0.20	0.96	0.97	0.08	0.78	0.53	0.14
Uniform Delay, d1	37.7	32.1	0.0	25.8	41.5	0.0	64.3	45.4	31.2	65.1	39.0	33.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	126.8	0.7	0.1	4.5	8.0	0.3	42.4	19.8	0.1	17.7	0.5	0.1
Delay (s)	164.5	32.8	0.1	30.2	49.5	0.3	106.6	65.3	31.2	82.8	39.4	33.9
Level of Service	F	C	A	C	D	A	F	E	C	F	D	C
Approach Delay (s)		53.5			41.3			69.9			45.6	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	51.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.9
Intersection Capacity Utilization	104.5%	ICU Level of Service	G
Analysis Period (min)	15		

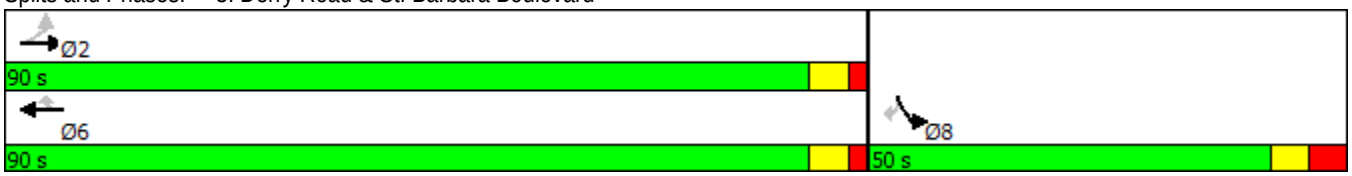
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	56	975	2248	519	87	21
Future Volume (vph)	56	975	2248	519	87	21
Lane Group Flow (vph)	56	975	2248	519	87	21
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		8	
Permitted Phases	2			6		8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	12.0	12.0	12.0	12.0	8.0	8.0
Minimum Split (s)	29.3	29.3	29.3	29.3	38.1	38.1
Total Split (s)	90.0	90.0	90.0	90.0	50.0	50.0
Total Split (%)	64.3%	64.3%	64.3%	64.3%	35.7%	35.7%
Yellow Time (s)	4.2	4.2	4.2	4.2	4.0	4.0
All-Red Time (s)	2.1	2.1	2.1	2.1	4.1	4.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	6.3	6.3	8.1	8.1
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max	Max	None	None	None	None
v/c Ratio	0.64	0.25	0.56	0.41	0.52	0.13
Control Delay	45.6	3.9	5.9	3.9	59.2	37.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	3.9	5.9	3.9	59.2	37.0
Queue Length 50th (m)	4.8	19.2	62.6	19.6	19.3	3.2
Queue Length 95th (m)	#14.8	28.1	86.3	39.6	35.4	11.0
Internal Link Dist (m)		161.0	621.8		772.6	
Turn Bay Length (m)	50.0			25.0	95.0	
Base Capacity (vph)	87	3841	4032	1277	619	585
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.25	0.56	0.41	0.14	0.04

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 115.1
Natural Cycle: 80
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Derry Road & St. Barbara Boulevard



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	56	975	2248	519	87	21
Future Volume (vph)	56	975	2248	519	87	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.5	3.5	3.5
Total Lost time (s)	6.3	6.3	6.3	6.3	8.1	8.1
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1785	4948	5193	1597	1700	1597
Flt Permitted	0.06	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	112	4948	5193	1597	1700	1597
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	975	2248	519	87	21
RTOR Reduction (vph)	0	0	0	37	0	5
Lane Group Flow (vph)	56	975	2248	482	87	16
Heavy Vehicles (%)	0%	6%	1%	0%	5%	0%
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		8	
Permitted Phases	2			6		8
Actuated Green, G (s)	89.4	89.4	89.4	89.4	11.3	11.3
Effective Green, g (s)	89.4	89.4	89.4	89.4	11.3	11.3
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.10	0.10
Clearance Time (s)	6.3	6.3	6.3	6.3	8.1	8.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	86	3843	4033	1240	166	156
v/s Ratio Prot		0.20	0.43		c0.05	
v/s Ratio Perm	c0.50			0.30		0.01
v/c Ratio	0.65	0.25	0.56	0.39	0.52	0.10
Uniform Delay, d1	5.8	3.6	5.1	4.1	49.3	47.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	32.4	0.2	0.2	0.2	3.0	0.3
Delay (s)	38.2	3.7	5.2	4.3	52.3	47.6
Level of Service	D	A	A	A	D	D
Approach Delay (s)		5.6	5.1		51.4	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	115.1	Sum of lost time (s)	14.4
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

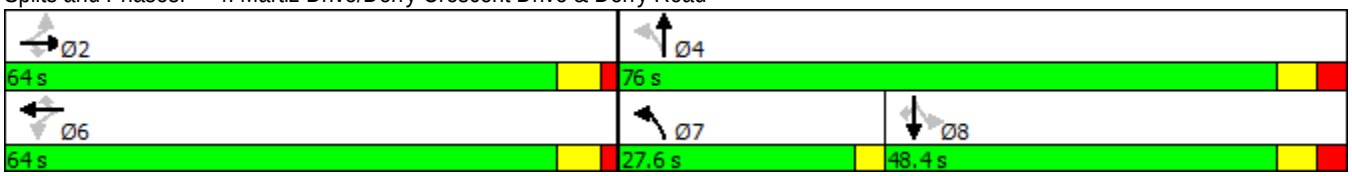
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	24	1044	50	20	1946	8	533	293	73	57	89
Future Volume (vph)	24	1044	50	20	1946	8	533	293	73	57	89
Lane Group Flow (vph)	24	1044	50	20	1946	8	533	434	73	57	89
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	NA	Perm
Protected Phases		2			6		7	4		8	
Permitted Phases	2		2	6		6	4		8		8
Detector Phase	2	2	2	6	6	6	7	4	8	8	8
Switch Phase											
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	5.0	8.0	8.0	8.0	8.0
Minimum Split (s)	37.6	37.6	37.6	37.6	37.6	37.6	8.0	48.4	48.4	48.4	48.4
Total Split (s)	64.0	64.0	64.0	64.0	64.0	64.0	27.6	76.0	48.4	48.4	48.4
Total Split (%)	45.7%	45.7%	45.7%	45.7%	45.7%	45.7%	19.7%	54.3%	34.6%	34.6%	34.6%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0	3.4	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4	7.4	7.4	7.4
Lead/Lag							Lead		Lag	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None	None
v/c Ratio	0.39	0.42	0.06	0.10	0.74	0.01	0.90	0.65	0.62	0.24	0.36
Control Delay	42.0	18.5	3.8	17.8	24.6	0.0	48.9	32.8	69.2	46.4	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	18.5	3.8	17.8	24.6	0.0	48.9	32.8	69.2	46.4	23.8
Queue Length 50th (m)	3.3	53.2	0.0	2.3	125.3	0.0	103.5	78.3	16.3	12.1	7.0
Queue Length 95th (m)	#16.5	73.4	5.9	7.9	164.3	0.0	#162.2	113.1	32.5	24.8	22.4
Internal Link Dist (m)		621.8			523.2			624.4		634.6	
Turn Bay Length (m)	110.0		30.0	65.0		35.0			95.0		200.0
Base Capacity (vph)	62	2513	794	203	2638	839	593	1093	347	697	615
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.42	0.06	0.10	0.74	0.01	0.90	0.40	0.21	0.08	0.14

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 113.2
Natural Cycle: 95
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Martiz Drive/Derry Crescent Drive & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1044	50	20	1946	8	533	293	141	73	57	89
Future Volume (vph)	24	1044	50	20	1946	8	533	293	141	73	57	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	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	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1653	4948	1507	1700	5193	1597	1767	1787		1785	1921	1597
Flt Permitted	0.07	1.00	1.00	0.22	1.00	1.00	0.59	1.00		0.51	1.00	1.00
Satd. Flow (perm)	121	4948	1507	400	5193	1597	1103	1787		959	1921	1597
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)	24	1044	50	20	1946	8	533	293	141	73	57	89
RTOR Reduction (vph)	0	0	25	0	0	4	0	15	0	0	0	49
Lane Group Flow (vph)	24	1044	25	20	1946	4	533	419	0	73	57	40
Heavy Vehicles (%)	8%	6%	6%	5%	1%	0%	1%	0%	7%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm
Protected Phases		2			6		7	4			8	
Permitted Phases	2		2	6		6	4			8		8
Actuated Green, G (s)	57.5	57.5	57.5	57.5	57.5	57.5	41.6	41.6		14.0	14.0	14.0
Effective Green, g (s)	57.5	57.5	57.5	57.5	57.5	57.5	41.6	41.6		14.0	14.0	14.0
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51	0.51	0.37	0.37		0.12	0.12	0.12
Clearance Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	7.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	61	2515	766	203	2640	811	550	657		118	237	197
v/s Ratio Prot		0.21			c0.37		c0.21	0.23			0.03	
v/s Ratio Perm	0.20		0.02	0.05		0.00	c0.15			0.08		0.03
v/c Ratio	0.39	0.42	0.03	0.10	0.74	0.01	0.97	0.64		0.62	0.24	0.20
Uniform Delay, d1	17.1	17.3	13.9	14.4	21.9	13.7	33.3	29.5		47.0	44.7	44.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	18.0	0.5	0.1	0.2	1.1	0.0	30.3	2.0		9.3	0.5	0.5
Delay (s)	35.0	17.8	14.0	14.6	23.0	13.7	63.5	31.6		56.3	45.3	45.0
Level of Service	D	B	B	B	C	B	E	C		E	D	D
Approach Delay (s)		18.0			22.8			49.2			48.9	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	113.1	Sum of lost time (s)	17.0
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		

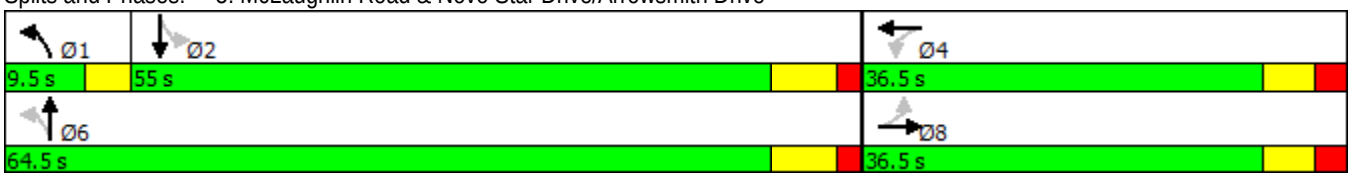
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	45	10	13	5	129	1510	54	799
Future Volume (vph)	45	10	13	5	129	1510	54	799
Lane Group Flow (vph)	45	55	13	39	129	1524	54	840
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		8		4	1	6		2
Permitted Phases	8		4		6		2	
Detector Phase	8	8	4	4	1	6	2	2
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	47.0	47.0	47.0
Minimum Split (s)	36.5	36.5	36.5	36.5	9.5	54.0	54.0	54.0
Total Split (s)	36.5	36.5	36.5	36.5	9.5	64.5	55.0	55.0
Total Split (%)	36.1%	36.1%	36.1%	36.1%	9.4%	63.9%	54.5%	54.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	3.5	7.0	7.0	7.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	Max
v/c Ratio	0.30	0.25	0.09	0.19	0.24	0.54	0.27	0.37
Control Delay	38.2	16.4	33.0	17.7	3.6	5.8	12.5	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.2	16.4	33.0	17.7	3.6	5.8	12.5	8.2
Queue Length 50th (m)	6.7	1.5	1.9	1.3	3.7	47.8	3.6	31.8
Queue Length 95th (m)	16.6	11.7	7.1	10.0	8.8	74.3	12.3	47.8
Internal Link Dist (m)		285.8		306.4		289.1		287.3
Turn Bay Length (m)	21.0		21.0		45.0		45.0	
Base Capacity (vph)	505	625	508	616	539	2797	202	2296
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	0.09	0.09	0.03	0.06	0.24	0.54	0.27	0.37

Intersection Summary

Cycle Length: 101
Actuated Cycle Length: 80
Natural Cycle: 100
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: McLaughlin Road & Novo Star Drive/Arrowsmith Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	10	45	13	5	34	129	1510	14	54	799	41
Future Volume (vph)	45	10	45	13	5	34	129	1510	14	54	799	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.88		1.00	0.87		1.00	1.00		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)	1750	1593		1785	1592		1785	3609		1785	3586	
Flt Permitted	0.73	1.00		0.72	1.00		0.30	1.00		0.17	1.00	
Satd. Flow (perm)	1348	1593		1355	1592		558	3609		316	3586	
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)	45	10	45	13	5	34	129	1510	14	54	799	41
RTOR Reduction (vph)	0	41	0	0	27	0	0	0	0	0	3	0
Lane Group Flow (vph)	45	14	0	13	12	0	129	1524	0	54	837	0
Heavy Vehicles (%)	2%	10%	2%	0%	20%	0%	0%	1%	0%	0%	1%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	7.2	7.2		7.2	7.2		60.5	60.5		51.1	51.1	
Effective Green, g (s)	7.2	7.2		7.2	7.2		60.5	60.5		51.1	51.1	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.75	0.75		0.63	0.63	
Clearance Time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	119	141		120	141		504	2688		198	2256	
v/s Ratio Prot		0.01			0.01		0.02	c0.42			0.23	
v/s Ratio Perm	c0.03			0.01			0.17			0.17		
v/c Ratio	0.38	0.10		0.11	0.08		0.26	0.57		0.27	0.37	
Uniform Delay, d1	34.9	34.0		34.0	34.0		3.2	4.6		6.7	7.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	0.3		0.4	0.3		0.3	0.9		3.4	0.5	
Delay (s)	36.9	34.3		34.4	34.2		3.4	5.4		10.1	7.7	
Level of Service	D	C		C	C		A	A		B	A	
Approach Delay (s)		35.5			34.3			5.3			7.9	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	81.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	107.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX C

Intersection Capacity Analysis Reports

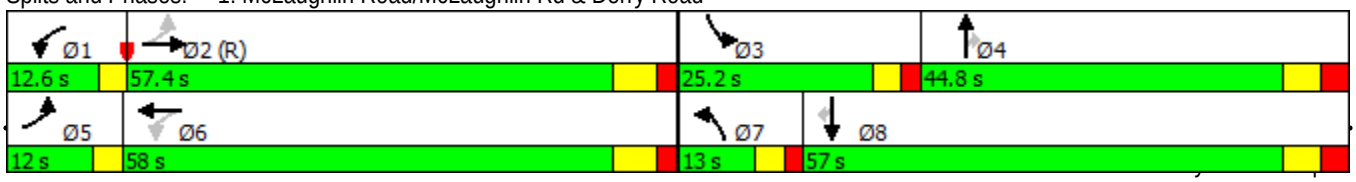
Future (2022) Background Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1798	453	221	824	79	107	598	162	240	1315	94
Future Volume (vph)	105	1798	453	221	824	79	107	598	162	240	1315	94
Lane Group Flow (vph)	105	1798	453	221	824	79	107	598	162	240	1315	94
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	57.4		12.6	58.0		13.0	44.8	44.8	25.2	57.0	57.0
Total Split (%)	8.6%	41.0%		9.0%	41.4%		9.3%	32.0%	32.0%	18.0%	40.7%	40.7%
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	0.35	0.97	0.29	1.26	0.47	0.05	0.55	0.57	0.29	0.65	1.05	0.15
Control Delay	23.7	58.4	0.5	182.0	35.0	0.1	75.5	44.0	11.2	68.2	84.4	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	58.4	0.5	182.0	35.0	0.1	75.5	44.0	11.2	68.2	84.4	6.6
Queue Length 50th (m)	16.6	187.6	0.0	~63.0	67.1	0.0	15.9	77.3	6.4	35.1	~220.0	0.4
Queue Length 95th (m)	28.2	#223.2	0.0	#118.3	80.6	0.0	26.4	101.8	25.7	48.4	#264.5	12.9
Internal Link Dist (m)		899.9			373.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	303	1858	1566	176	1751	1521	194	1047	555	489	1247	622
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	0.35	0.97	0.29	1.26	0.47	0.05	0.55	0.57	0.29	0.49	1.05	0.15

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 135
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: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1798	453	221	824	79	107	598	162	240	1315	94
Future Volume (vph)	105	1798	453	221	824	79	107	598	162	240	1315	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	3.0	6.8	4.0	3.0	6.8	4.0	5.0	7.1	7.1	5.0	7.1	7.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	5142	1566	1750	4768	1521	3395	3433	1521	3395	3500	1581
Flt Permitted	0.26	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	488	5142	1566	143	4768	1521	3395	3433	1521	3395	3500	1581
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)	105	1798	453	221	824	79	107	598	162	240	1315	94
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	91	0	0	59
Lane Group Flow (vph)	105	1798	453	221	824	79	107	598	71	240	1315	35
Heavy Vehicles (%)	1%	2%	2%	2%	10%	5%	2%	4%	5%	2%	2%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	59.4	50.6	140.0	61.0	51.4	140.0	8.0	42.7	42.7	15.2	49.9	49.9
Effective Green, g (s)	59.4	50.6	140.0	61.0	51.4	140.0	8.0	42.7	42.7	15.2	49.9	49.9
Actuated g/C Ratio	0.42	0.36	1.00	0.44	0.37	1.00	0.06	0.31	0.31	0.11	0.36	0.36
Clearance Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
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)	287	1858	1566	172	1750	1521	194	1047	463	368	1247	563
v/s Ratio Prot	0.02	0.35		c0.09	0.17		0.03	0.17		c0.07	c0.38	
v/s Ratio Perm	0.13		0.29	c0.47		0.05			0.05			0.02
v/c Ratio	0.37	0.97	0.29	1.28	0.47	0.05	0.55	0.57	0.15	0.65	1.05	0.06
Uniform Delay, d1	25.1	43.9	0.0	38.7	33.9	0.0	64.3	40.9	35.5	59.9	45.0	29.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	14.5	0.5	164.9	0.2	0.1	3.4	0.8	0.2	4.1	41.2	0.0
Delay (s)	25.9	58.4	0.5	203.5	34.1	0.1	67.6	41.7	35.6	64.0	86.2	29.7
Level of Service	C	E	A	F	C	A	E	D	D	E	F	C
Approach Delay (s)		45.8			65.0			43.8			79.8	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	58.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.9
Intersection Capacity Utilization	109.1%	ICU Level of Service	H
Analysis Period (min)	15		

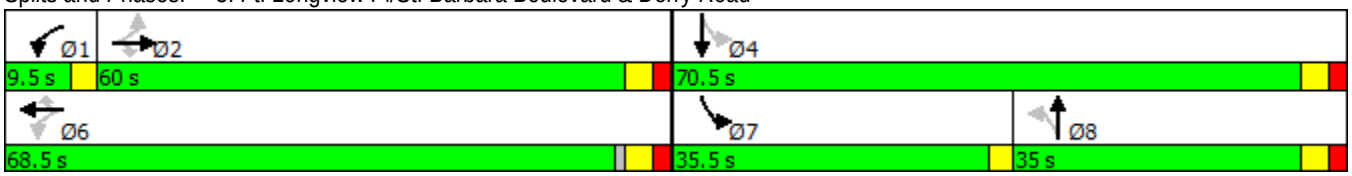
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	32	2164	26	69	962	43	35	0	574	0
Future Volume (vph)	32	2164	26	69	962	43	35	0	574	0
Lane Group Flow (vph)	32	2164	26	69	962	43	35	38	574	121
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2		1	6			8	7	4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	2	2	2	1	6	6	8	8	7	4
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	5.0	12.0	12.0	8.0	8.0	8.0	8.0
Minimum Split (s)	28.0	28.0	28.0	7.6	28.0	28.0	35.0	35.0	10.6	35.0
Total Split (s)	60.0	60.0	60.0	9.5	68.5	68.5	35.0	35.0	35.5	70.5
Total Split (%)	42.9%	42.9%	42.9%	6.8%	48.9%	48.9%	25.0%	25.0%	25.4%	50.4%
Yellow Time (s)	3.0	3.0	3.0	2.6	3.0	3.0	3.0	3.0	2.6	3.0
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	2.6	5.0	5.0	5.0	5.0	2.6	5.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.14	0.86	0.03	0.40	0.36	0.05	0.33	0.15	0.97	0.20
Control Delay	21.3	32.2	0.7	19.5	15.4	5.5	60.7	1.3	64.4	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.3	32.2	0.7	19.5	15.4	5.5	60.7	1.3	64.4	12.9
Queue Length 50th (m)	4.4	176.5	0.0	7.3	47.1	0.8	8.3	0.0	124.9	8.5
Queue Length 95th (m)	11.9	#218.1	1.3	15.4	61.2	6.7	19.5	0.0	#172.0	21.7
Internal Link Dist (m)		373.9			621.8			172.5		772.6
Turn Bay Length (m)	50.0		30.0	30.0		25.0	45.0		95.0	
Base Capacity (vph)	233	2505	816	176	2777	893	343	525	619	947
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	0.14	0.86	0.03	0.39	0.35	0.05	0.10	0.07	0.93	0.13

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 113.4
Natural Cycle: 105
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Ft. Longview Pl/St. Barbara Boulevard & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	2164	26	69	962	43	35	0	38	574	0	121
Future Volume (vph)	32	2164	26	69	962	43	35	0	38	574	0	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.7	3.7	3.5	3.7	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	5.0	5.0	5.0	2.6	5.0	5.0	5.0	5.0		2.6	5.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	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	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1580	5092	1601	1789	4812	1521	1789	1601		1767	1570	
Flt Permitted	0.29	1.00	1.00	0.07	1.00	1.00	0.68	1.00		0.54	1.00	
Satd. Flow (perm)	475	5092	1601	129	4812	1521	1279	1601		1008	1570	
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)	32	2164	26	69	962	43	35	0	38	574	0	121
RTOR Reduction (vph)	0	0	13	0	0	16	0	36	0	0	43	0
Lane Group Flow (vph)	32	2164	13	69	962	27	35	2	0	574	78	0
Heavy Vehicles (%)	13%	3%	2%	2%	9%	5%	2%	2%	2%	1%	2%	4%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	55.8	55.8	55.8	63.6	63.6	63.6	7.4	7.4		41.5	41.5	
Effective Green, g (s)	55.8	55.8	55.8	63.6	63.6	63.6	7.4	7.4		41.5	41.5	
Actuated g/C Ratio	0.48	0.48	0.48	0.55	0.55	0.55	0.06	0.06		0.36	0.36	
Clearance Time (s)	5.0	5.0	5.0	2.6	5.0	5.0	5.0	5.0		2.6	5.0	
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)	230	2468	776	146	2658	840	82	102		571	566	
v/s Ratio Prot		c0.42		c0.02	0.20			0.00		c0.27	0.05	
v/s Ratio Perm	0.07		0.01	0.24		0.02	0.03			c0.09		
v/c Ratio	0.14	0.88	0.02	0.47	0.36	0.03	0.43	0.02		1.01	0.14	
Uniform Delay, d1	16.4	26.6	15.4	21.8	14.4	11.7	51.8	50.5		35.2	24.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	4.8	0.0	2.4	0.1	0.0	3.5	0.1		39.0	0.1	
Delay (s)	17.6	31.3	15.4	24.2	14.5	11.7	55.4	50.6		74.1	24.9	
Level of Service	B	C	B	C	B	B	E	D		E	C	
Approach Delay (s)		31.0			15.0			52.9			65.6	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	115.1	Sum of lost time (s)	15.2
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		

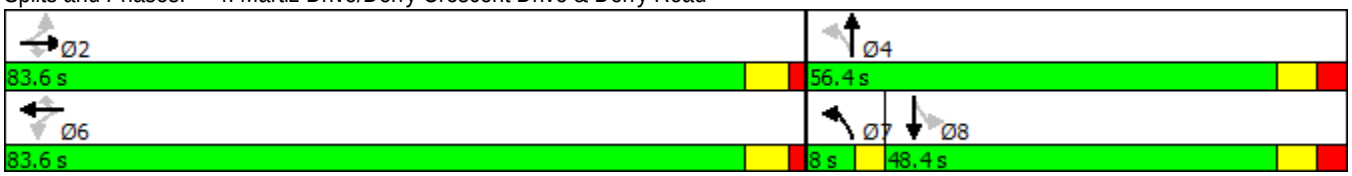
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	193	1924	650	74	1014	49	35	87	9	103
Future Volume (vph)	193	1924	650	74	1014	49	35	87	9	103
Lane Group Flow (vph)	193	1924	650	74	1014	49	35	107	9	128
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases		2			6		7	4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	7	4	8	8
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	5.0	8.0	8.0	8.0
Minimum Split (s)	37.6	37.6	37.6	37.6	37.6	37.6	8.0	48.4	48.4	48.4
Total Split (s)	83.6	83.6	83.6	83.6	83.6	83.6	8.0	56.4	48.4	48.4
Total Split (%)	59.7%	59.7%	59.7%	59.7%	59.7%	59.7%	5.7%	40.3%	34.6%	34.6%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4	7.4	7.4
Lead/Lag							Lead		Lag	Lag
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.52	0.52	0.53	0.69	0.29	0.04	0.20	0.23	0.08	0.40
Control Delay	13.2	6.9	5.5	47.0	5.3	1.2	38.5	38.0	47.2	42.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	6.9	5.5	47.0	5.3	1.2	38.5	38.0	47.2	42.1
Queue Length 50th (m)	17.2	62.4	31.6	8.2	25.8	0.0	6.4	10.0	1.9	11.8
Queue Length 95th (m)	41.9	79.5	60.4	#41.9	34.7	2.8	15.5	18.3	7.0	21.7
Internal Link Dist (m)		621.8			523.2			624.4		634.6
Turn Bay Length (m)	110.0		30.0	65.0		35.0	100.0		95.0	
Base Capacity (vph)	370	3725	1233	107	3490	1195	176	1617	497	1374
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	0.52	0.52	0.53	0.69	0.29	0.04	0.20	0.07	0.02	0.09

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 106.1
Natural Cycle: 145
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Martiz Drive/Derry Crescent Drive & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	1924	650	74	1014	49	35	87	20	9	103	25
Future Volume (vph)	193	1924	650	74	1014	49	35	87	20	9	103	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	5043	1581	1594	4725	1597	1566	3487		1785	3516	
Flt Permitted	0.27	1.00	1.00	0.09	1.00	1.00	0.50	1.00		0.68	1.00	
Satd. Flow (perm)	502	5043	1581	146	4725	1597	829	3487		1286	3516	
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)	193	1924	650	74	1014	49	35	87	20	9	103	25
RTOR Reduction (vph)	0	0	67	0	0	13	0	8	0	0	20	0
Lane Group Flow (vph)	193	1924	583	74	1014	36	35	99	0	9	108	0
Heavy Vehicles (%)	0%	4%	1%	12%	11%	0%	14%	1%	5%	0%	0%	4%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	78.4	78.4	78.4	78.4	78.4	78.4	14.9	14.9		9.0	9.0	
Effective Green, g (s)	78.4	78.4	78.4	78.4	78.4	78.4	14.9	14.9		9.0	9.0	
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.73	0.73	0.14	0.14		0.08	0.08	
Clearance Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
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)	366	3684	1155	106	3452	1166	135	484		107	294	
v/s Ratio Prot		0.38			0.21		c0.01	0.03			c0.03	
v/s Ratio Perm	0.38		0.37	c0.51		0.02	0.03			0.01		
v/c Ratio	0.53	0.52	0.50	0.70	0.29	0.03	0.26	0.21		0.08	0.37	
Uniform Delay, d1	6.3	6.3	6.2	7.9	5.0	4.0	40.7	41.0		45.3	46.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.4	0.5	1.6	18.2	0.0	0.0	1.0	0.2		0.3	0.8	
Delay (s)	11.7	6.8	7.7	26.1	5.0	4.0	41.8	41.2		45.7	47.2	
Level of Service	B	A	A	C	A	A	D	D		D	D	
Approach Delay (s)		7.4			6.3			41.3			47.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	107.3	Sum of lost time (s)	17.0
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		

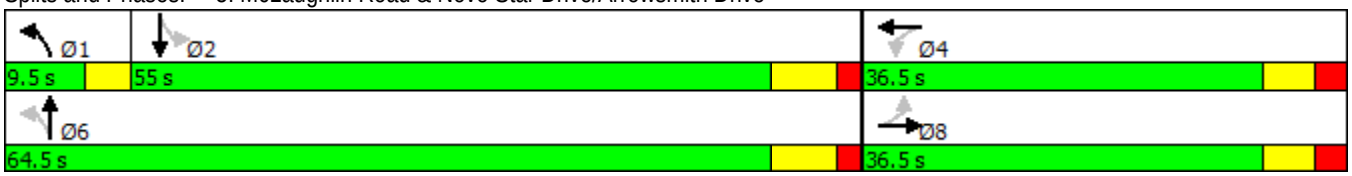
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	82	33	36	47	98	732	14	1875
Future Volume (vph)	82	33	36	47	98	732	14	1875
Lane Group Flow (vph)	82	260	36	97	98	741	14	1933
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		8		4	1	6		2
Permitted Phases	8		4		6		2	
Detector Phase	8	8	4	4	1	6	2	2
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	47.0	47.0	47.0
Minimum Split (s)	36.5	36.5	36.5	36.5	9.5	54.0	54.0	54.0
Total Split (s)	36.5	36.5	36.5	36.5	9.5	64.5	55.0	55.0
Total Split (%)	36.1%	36.1%	36.1%	36.1%	9.4%	63.9%	54.5%	54.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	3.5	7.0	7.0	7.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	Max
v/c Ratio	0.44	0.73	0.35	0.32	0.47	0.31	0.04	0.91
Control Delay	39.1	29.3	41.0	19.6	15.2	6.3	10.2	25.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	29.3	41.0	19.6	15.2	6.3	10.2	25.4
Queue Length 50th (m)	12.7	21.3	5.5	7.0	3.9	22.1	1.0	146.2
Queue Length 95th (m)	26.3	46.7	14.7	20.1	17.5	41.2	4.4	#250.8
Internal Link Dist (m)		285.8		306.4		289.1		287.3
Turn Bay Length (m)	21.0		21.0		45.0		45.0	
Base Capacity (vph)	425	652	230	619	209	2414	361	2125
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	0.19	0.40	0.16	0.16	0.47	0.31	0.04	0.91

Intersection Summary

Cycle Length: 101
Actuated Cycle Length: 84.5
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: McLaughlin Road & Novo Star Drive/Arrowsmith Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	33	227	36	47	50	98	732	9	14	1875	58
Future Volume (vph)	82	33	227	36	47	50	98	732	9	14	1875	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
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	0.92		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1638	1607		1785	1651		1716	3539		1566	3580	
Flt Permitted	0.69	1.00		0.34	1.00		0.07	1.00		0.37	1.00	
Satd. Flow (perm)	1197	1607		648	1651		135	3539		610	3580	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	82	33	227	36	47	50	98	732	9	14	1875	58
RTOR Reduction (vph)	0	105	0	0	42	0	0	1	0	0	2	0
Lane Group Flow (vph)	82	155	0	36	55	0	98	740	0	14	1931	0
Heavy Vehicles (%)	9%	6%	1%	0%	4%	6%	4%	3%	0%	14%	1%	18%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	13.3	13.3		13.3	13.3		58.4	58.4		50.2	50.2	
Effective Green, g (s)	13.3	13.3		13.3	13.3		58.4	58.4		50.2	50.2	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.69	0.69		0.59	0.59	
Clearance Time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	186	250		101	257		179	2425		359	2109	
v/s Ratio Prot		c0.10			0.03		c0.03	0.21			c0.54	
v/s Ratio Perm	0.07			0.06			0.34			0.02		
v/c Ratio	0.44	0.62		0.36	0.21		0.55	0.31		0.04	0.92	
Uniform Delay, d1	32.6	33.6		32.1	31.4		16.8	5.3		7.4	15.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	4.5		2.2	0.4		3.4	0.3		0.2	7.7	
Delay (s)	34.2	38.1		34.3	31.8		20.2	5.7		7.6	23.3	
Level of Service	C	D		C	C		C	A		A	C	
Approach Delay (s)		37.2			32.5			7.4			23.2	
Approach LOS		D			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	85.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	120.5%	ICU Level of Service	H
Analysis Period (min)	15		

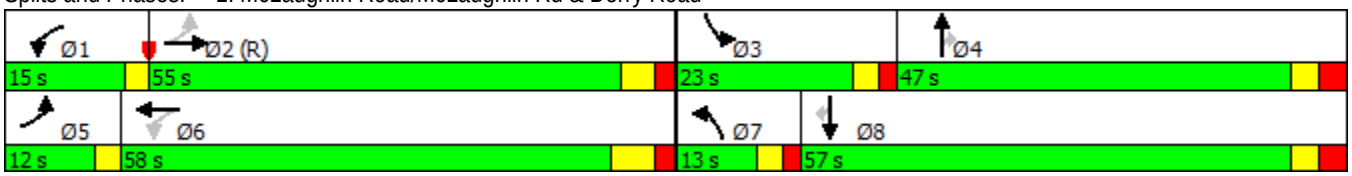
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1798	453	221	824	79	107	598	162	240	1315	94
Future Volume (vph)	105	1798	453	221	824	79	107	598	162	240	1315	94
Lane Group Flow (vph)	105	1798	453	221	824	79	107	598	162	240	1315	94
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	55.0		15.0	58.0		13.0	47.0	47.0	23.0	57.0	57.0
Total Split (%)	8.6%	39.3%		10.7%	41.4%		9.3%	33.6%	33.6%	16.4%	40.7%	40.7%
Yellow Time (s)	2.6	3.6		2.6	4.6		2.6	3.0	3.0	2.6	3.0	3.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	-1.0	-2.0		-2.0	-1.0		-1.0	-1.0	-1.0	-1.0	-2.0	-1.0
Total Lost Time (s)	1.6	3.8		0.6	5.8		3.6	5.1	5.1	3.6	4.1	5.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	0.33	0.96	0.29	0.93	0.46	0.05	0.48	0.54	0.28	0.62	0.99	0.14
Control Delay	22.5	56.1	0.5	78.7	34.1	0.1	70.3	41.5	9.0	66.0	66.3	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.5	56.1	0.5	78.7	34.1	0.1	70.3	41.5	9.0	66.0	66.3	4.4
Queue Length 50th (m)	16.3	186.3	0.0	46.8	66.3	0.0	15.7	75.3	4.0	34.8	199.8	0.0
Queue Length 95th (m)	27.6	#220.7	0.0	#99.1	79.7	0.0	26.1	98.5	21.8	48.2	#252.6	9.8
Internal Link Dist (m)		899.9			188.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	325	1880	1566	237	1791	1521	227	1110	588	470	1324	653
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	0.32	0.96	0.29	0.93	0.46	0.05	0.47	0.54	0.28	0.51	0.99	0.14

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1798	453	221	824	79	107	598	162	240	1315	94
Future Volume (vph)	105	1798	453	221	824	79	107	598	162	240	1315	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	1.6	3.8	3.0	0.6	5.8	3.0	3.6	5.1	5.1	3.6	4.1	5.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	5142	1566	1750	4768	1521	3395	3433	1521	3395	3500	1581
Flt Permitted	0.27	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	510	5142	1566	145	4768	1521	3395	3433	1521	3395	3500	1581
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)	105	1798	453	221	824	79	107	598	162	240	1315	94
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	96	0	0	59
Lane Group Flow (vph)	105	1798	453	221	824	79	107	598	66	240	1315	35
Heavy Vehicles (%)	1%	2%	2%	2%	10%	5%	2%	4%	5%	2%	2%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	58.2	49.2	140.0	63.2	51.6	140.0	8.3	44.3	44.3	15.0	51.0	51.0
Effective Green, g (s)	60.2	51.2	140.0	65.2	52.6	140.0	9.3	45.3	45.3	16.0	53.0	52.0
Actuated g/C Ratio	0.43	0.37	1.00	0.47	0.38	1.00	0.07	0.32	0.32	0.11	0.38	0.37
Clearance Time (s)	2.6	5.8		2.6	6.8		4.6	6.1	6.1	4.6	6.1	6.1
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)	309	1880	1566	232	1791	1521	225	1110	492	388	1325	587
v/s Ratio Prot	0.02	c0.35		c0.10	0.17		0.03	0.17		c0.07	c0.38	
v/s Ratio Perm	0.12		0.29	0.34		0.05			0.04			0.02
v/c Ratio	0.34	0.96	0.29	0.95	0.46	0.05	0.48	0.54	0.13	0.62	0.99	0.06
Uniform Delay, d1	24.5	43.3	0.0	42.4	33.0	0.0	63.0	38.8	33.5	59.1	43.3	28.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	12.7	0.5	45.7	0.2	0.1	1.6	0.5	0.1	2.9	22.8	0.0
Delay (s)	25.1	56.0	0.5	88.1	33.2	0.1	64.6	39.3	33.6	62.0	66.1	28.3
Level of Service	C	E	A	F	C	A	E	D	C	E	E	C
Approach Delay (s)		44.0			41.6			41.4			63.3	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	48.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.1
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
Analysis Period (min)	15		

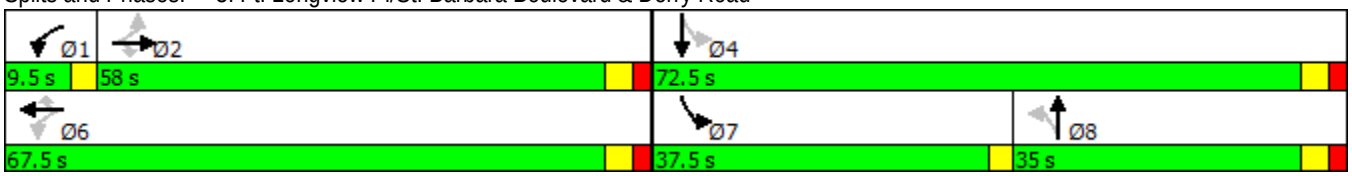
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	32	2164	26	69	962	43	35	0	574	0
Future Volume (vph)	32	2164	26	69	962	43	35	0	574	0
Lane Group Flow (vph)	32	2164	26	69	962	43	35	38	574	121
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2		1	6			8	7	4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	2	2	2	1	6	6	8	8	7	4
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	5.0	12.0	12.0	8.0	8.0	8.0	8.0
Minimum Split (s)	28.0	28.0	28.0	9.5	28.0	28.0	35.0	35.0	10.6	35.0
Total Split (s)	58.0	58.0	58.0	9.5	67.5	67.5	35.0	35.0	37.5	72.5
Total Split (%)	41.4%	41.4%	41.4%	6.8%	48.2%	48.2%	25.0%	25.0%	26.8%	51.8%
Yellow Time (s)	3.0	3.0	3.0	2.6	3.0	3.0	3.0	3.0	2.6	3.0
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)	0.0	-2.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0
Total Lost Time (s)	5.0	3.0	5.0	2.6	5.0	5.0	5.0	5.0	0.6	5.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.14	0.86	0.03	0.40	0.37	0.05	0.33	0.14	0.85	0.20
Control Delay	22.6	31.8	0.8	20.2	16.4	5.9	60.5	1.1	42.7	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	31.8	0.8	20.2	16.4	5.9	60.5	1.1	42.7	13.2
Queue Length 50th (m)	4.6	176.5	0.0	7.6	49.0	0.8	8.3	0.0	117.3	9.2
Queue Length 95th (m)	12.3	#218.1	1.3	15.9	63.5	7.0	19.5	0.0	163.5	22.1
Internal Link Dist (m)		161.0			621.8			172.5		772.6
Turn Bay Length (m)	50.0		30.0	30.0		25.0	45.0		95.0	
Base Capacity (vph)	226	2525	794	178	2712	873	346	545	714	979
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	0.14	0.86	0.03	0.39	0.35	0.05	0.10	0.07	0.80	0.12

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 112.9
Natural Cycle: 95
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Ft. Longview Pl/St. Barbara Boulevard & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	2164	26	69	962	43	35	0	38	574	0	121
Future Volume (vph)	32	2164	26	69	962	43	35	0	38	574	0	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.7	3.7	3.5	3.7	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	5.0	3.0	5.0	2.6	5.0	5.0	5.0	5.0		0.6	5.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	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	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1580	5092	1601	1789	4812	1521	1789	1601		1767	1570	
Flt Permitted	0.29	1.00	1.00	0.07	1.00	1.00	0.68	1.00		0.69	1.00	
Satd. Flow (perm)	474	5092	1601	133	4812	1521	1279	1601		1280	1570	
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)	32	2164	26	69	962	43	35	0	38	574	0	121
RTOR Reduction (vph)	0	0	14	0	0	17	0	36	0	0	38	0
Lane Group Flow (vph)	32	2164	12	69	962	26	35	2	0	574	83	0
Heavy Vehicles (%)	13%	3%	2%	2%	9%	5%	2%	2%	2%	1%	2%	4%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	54.0	54.0	54.0	61.8	61.8	61.8	7.3	7.3		42.8	42.8	
Effective Green, g (s)	54.0	56.0	54.0	61.8	61.8	61.8	7.3	7.3		44.8	42.8	
Actuated g/C Ratio	0.47	0.49	0.47	0.54	0.54	0.54	0.06	0.06		0.39	0.37	
Clearance Time (s)	5.0	5.0	5.0	2.6	5.0	5.0	5.0	5.0		2.6	5.0	
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)	223	2488	754	146	2594	820	81	101		648	586	
v/s Ratio Prot		c0.42		c0.02	0.20			0.00		c0.27	0.05	
v/s Ratio Perm	0.07		0.01	0.23		0.02	0.03			0.08		
v/c Ratio	0.14	0.87	0.02	0.47	0.37	0.03	0.43	0.02		0.89	0.14	
Uniform Delay, d1	17.2	26.1	16.1	22.8	15.2	12.4	51.7	50.3		31.5	23.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	4.5	0.0	2.4	0.1	0.0	3.7	0.1		13.7	0.1	
Delay (s)	18.5	30.5	16.2	25.2	15.3	12.4	55.3	50.4		45.2	23.9	
Level of Service	B	C	B	C	B	B	E	D		D	C	
Approach Delay (s)		30.2			15.8			52.8			41.5	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	114.6	Sum of lost time (s)	11.2
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		

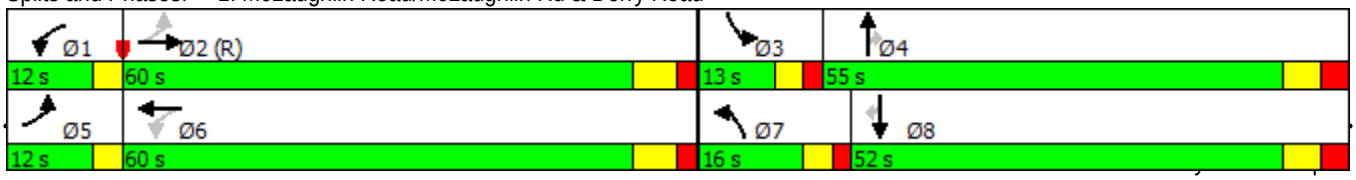
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	851	105	211	1951	331	257	1223	116	156	610	166
Future Volume (vph)	196	851	105	211	1951	331	257	1223	116	156	610	166
Lane Group Flow (vph)	196	851	105	211	1951	331	257	1223	116	156	610	166
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	60.0		12.0	60.0		16.0	55.0	55.0	13.0	52.0	52.0
Total Split (%)	8.6%	42.9%		8.6%	42.9%		11.4%	39.3%	39.3%	9.3%	37.1%	37.1%
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	1.15	0.46	0.07	0.69	0.99	0.21	0.96	1.01	0.19	0.80	0.54	0.28
Control Delay	146.6	33.6	0.1	34.8	60.7	0.3	108.1	74.2	10.1	93.1	41.2	9.0
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	146.6	33.6	0.1	34.8	60.7	0.3	108.1	74.2	10.1	93.1	41.2	9.0
Queue Length 50th (m)	~49.4	67.8	0.0	34.6	205.5	0.0	39.1	~191.6	4.7	23.6	76.8	4.8
Queue Length 95th (m)	#102.2	81.2	0.0	51.9	#243.6	0.0	#67.7	#241.6	18.9	#42.4	96.5	22.2
Internal Link Dist (m)		899.9			373.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	170	1845	1581	307	1973	1581	269	1209	601	195	1133	603
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	1.15	0.46	0.07	0.69	0.99	0.21	0.96	1.01	0.19	0.80	0.54	0.28

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 1.4 (1%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 135
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: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	851	105	211	1951	331	257	1223	116	156	610	166
Future Volume (vph)	196	851	105	211	1951	331	257	1223	116	156	610	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	3.0	6.8	4.0	3.0	6.8	4.0	5.0	7.1	7.1	5.0	7.1	7.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	4856	1581	1785	5193	1581	3429	3535	1581	3429	3535	1581
Flt Permitted	0.08	1.00	1.00	0.25	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	140	4856	1581	473	5193	1581	3429	3535	1581	3429	3535	1581
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)	196	851	105	211	1951	331	257	1223	116	156	610	166
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	61	0	0	96
Lane Group Flow (vph)	196	851	105	211	1951	331	257	1223	55	156	610	70
Heavy Vehicles (%)	1%	8%	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	62.2	53.2	140.0	62.2	53.2	140.0	11.0	47.9	47.9	8.0	44.9	44.9
Effective Green, g (s)	62.2	53.2	140.0	62.2	53.2	140.0	11.0	47.9	47.9	8.0	44.9	44.9
Actuated g/C Ratio	0.44	0.38	1.00	0.44	0.38	1.00	0.08	0.34	0.34	0.06	0.32	0.32
Clearance Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
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)	166	1845	1581	294	1973	1581	269	1209	540	195	1133	507
v/s Ratio Prot	c0.08	0.18		0.05	0.38		c0.07	c0.35		0.05	0.17	
v/s Ratio Perm	c0.45		0.07	0.27		c0.21			0.04			0.04
v/c Ratio	1.18	0.46	0.07	0.72	0.99	0.21	0.96	1.01	0.10	0.80	0.54	0.14
Uniform Delay, d1	38.5	32.6	0.0	26.7	43.1	0.0	64.3	46.0	31.4	65.2	39.0	33.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	126.8	0.8	0.1	8.1	17.5	0.3	42.4	28.8	0.1	20.5	0.5	0.1
Delay (s)	165.3	33.5	0.1	34.8	60.6	0.3	106.6	74.8	31.5	85.7	39.5	33.9
Level of Service	F	C	A	C	E	A	F	E	C	F	D	C
Approach Delay (s)		52.8			50.4			76.8			46.3	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	57.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.9
Intersection Capacity Utilization	108.1%	ICU Level of Service	G
Analysis Period (min)	15		

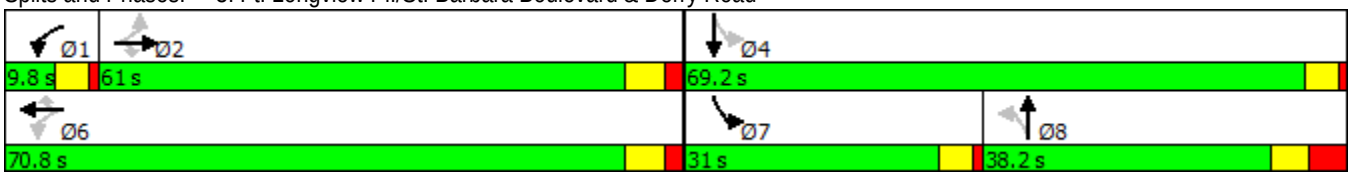
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	56	1037	21	116	2341	519	79	0	87	0
Future Volume (vph)	56	1037	21	116	2341	519	79	0	87	0
Lane Group Flow (vph)	56	1037	21	116	2341	519	79	103	87	21
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2		1	6			8	7	4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	2	2	2	1	6	6	8	8	7	4
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	5.0	12.0	12.0	8.0	8.0	5.0	5.0
Minimum Split (s)	29.3	29.3	29.3	9.5	29.3	29.3	38.1	38.1	9.5	22.5
Total Split (s)	61.0	61.0	61.0	9.8	70.8	70.8	38.2	38.2	31.0	69.2
Total Split (%)	43.6%	43.6%	43.6%	7.0%	50.6%	50.6%	27.3%	27.3%	22.1%	49.4%
Yellow Time (s)	4.2	4.2	4.2	3.5	4.2	4.2	4.0	4.0	3.5	3.5
All-Red Time (s)	2.1	2.1	2.1	1.0	2.1	2.1	4.1	4.1	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	8.1	8.1	4.5	4.5
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.79	0.39	0.02	0.35	0.72	0.50	0.51	0.22	0.26	0.04
Control Delay	89.3	16.1	0.0	11.9	16.2	11.1	57.4	1.1	29.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	16.1	0.0	11.9	16.2	11.1	57.4	1.1	29.9	0.2
Queue Length 50th (m)	9.5	47.6	0.0	9.1	120.9	43.6	16.4	0.0	14.1	0.0
Queue Length 95th (m)	#39.8	69.8	0.0	20.6	175.0	87.2	33.3	0.0	26.5	0.0
Internal Link Dist (m)		373.9			621.8			88.0		772.6
Turn Bay Length (m)	50.0		30.0	30.0		25.0	45.0		95.0	
Base Capacity (vph)	71	2636	904	331	3263	1047	410	700	479	1051
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	0.79	0.39	0.02	0.35	0.72	0.50	0.19	0.15	0.18	0.02

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 103.6
Natural Cycle: 90
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Ft. Longview Pl./St. Barbara Boulevard & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1037	21	116	2341	519	79	0	103	87	0	21
Future Volume (vph)	56	1037	21	116	2341	519	79	0	103	87	0	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.7	3.7	3.5	3.7	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	6.3	6.3	6.3	4.5	6.3	6.3	8.1	8.1		4.5	4.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	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	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	4948	1601	1789	5193	1597	1789	1601		1700	1633	
Flt Permitted	0.07	1.00	1.00	0.21	1.00	1.00	0.74	1.00		0.53	1.00	
Satd. Flow (perm)	136	4948	1601	403	5193	1597	1401	1601		950	1633	
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	1037	21	116	2341	519	79	0	103	87	0	21
RTOR Reduction (vph)	0	0	10	0	0	45	0	92	0	0	15	0
Lane Group Flow (vph)	56	1037	11	116	2341	474	79	11	0	87	6	0
Heavy Vehicles (%)	0%	6%	2%	2%	1%	0%	2%	2%	2%	5%	2%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	55.3	55.3	55.3	65.1	65.1	65.1	11.4	11.4		28.6	28.6	
Effective Green, g (s)	55.3	55.3	55.3	65.1	65.1	65.1	11.4	11.4		28.6	28.6	
Actuated g/C Ratio	0.53	0.53	0.53	0.62	0.62	0.62	0.11	0.11		0.27	0.27	
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	8.1	8.1		4.5	4.5	
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)	71	2618	847	321	3235	994	152	174		325	446	
v/s Ratio Prot		0.21		0.02	c0.45			0.01		c0.02	0.00	
v/s Ratio Perm	c0.41		0.01	0.21		0.30	c0.06			0.05		
v/c Ratio	0.79	0.40	0.01	0.36	0.72	0.48	0.52	0.06		0.27	0.01	
Uniform Delay, d1	19.9	14.7	11.7	8.7	13.5	10.6	44.0	41.8		29.2	27.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	58.6	0.5	0.0	0.7	0.8	0.4	3.0	0.2		0.4	0.0	
Delay (s)	78.4	15.1	11.7	9.4	14.3	10.9	46.9	41.9		29.6	27.7	
Level of Service	E	B	B	A	B	B	D	D		C	C	
Approach Delay (s)		18.2			13.6			44.1			29.2	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	104.5	Sum of lost time (s)	23.4
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

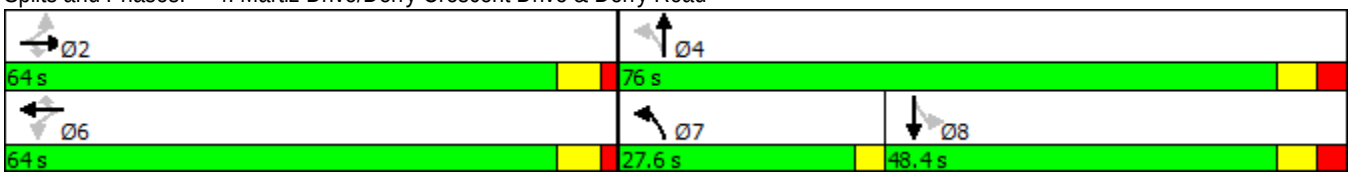
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	24	1212	50	20	2140	8	533	349	73	70
Future Volume (vph)	24	1212	50	20	2140	8	533	349	73	70
Lane Group Flow (vph)	24	1212	50	20	2140	8	533	490	73	159
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases		2			6		7	4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	7	4	8	8
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	5.0	8.0	8.0	8.0
Minimum Split (s)	37.6	37.6	37.6	37.6	37.6	37.6	8.0	48.4	48.4	48.4
Total Split (s)	64.0	64.0	64.0	64.0	64.0	64.0	27.6	76.0	48.4	48.4
Total Split (%)	45.7%	45.7%	45.7%	45.7%	45.7%	45.7%	19.7%	54.3%	34.6%	34.6%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4	7.4	7.4
Lead/Lag							Lead		Lag	Lag
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.39	0.49	0.06	0.13	0.82	0.01	0.92	0.38	0.64	0.34
Control Delay	43.0	19.9	3.8	19.4	27.7	0.0	52.5	25.8	71.6	31.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.0	19.9	3.8	19.4	27.7	0.0	52.5	25.8	71.6	31.9
Queue Length 50th (m)	3.3	65.4	0.0	2.4	148.4	0.0	103.5	41.8	16.4	12.2
Queue Length 95th (m)	#16.9	90.0	5.9	8.5	195.8	0.0	#168.7	55.8	32.6	22.5
Internal Link Dist (m)		621.8			523.2			624.4		634.6
Turn Bay Length (m)	110.0		30.0	65.0		35.0	100.0		95.0	
Base Capacity (vph)	61	2498	789	157	2622	835	577	2074	320	1238
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	0.39	0.49	0.06	0.13	0.82	0.01	0.92	0.24	0.23	0.13

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 113.9
Natural Cycle: 105
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Martiz Drive/Derry Crescent Drive & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1212	50	20	2140	8	533	349	141	73	70	89
Future Volume (vph)	24	1212	50	20	2140	8	533	349	141	73	70	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1653	4948	1507	1700	5193	1597	1767	3424		1785	3344	
Flt Permitted	0.07	1.00	1.00	0.17	1.00	1.00	0.54	1.00		0.47	1.00	
Satd. Flow (perm)	121	4948	1507	312	5193	1597	1006	3424		889	3344	
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)	24	1212	50	20	2140	8	533	349	141	73	70	89
RTOR Reduction (vph)	0	0	25	0	0	4	0	12	0	0	44	0
Lane Group Flow (vph)	24	1212	25	20	2140	4	533	478	0	73	115	0
Heavy Vehicles (%)	8%	6%	6%	5%	1%	0%	1%	0%	7%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	57.5	57.5	57.5	57.5	57.5	57.5	42.3	42.3		14.7	14.7	
Effective Green, g (s)	57.5	57.5	57.5	57.5	57.5	57.5	42.3	42.3		14.7	14.7	
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51	0.51	0.37	0.37		0.13	0.13	
Clearance Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
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)	61	2500	761	157	2623	806	538	1272		114	431	
v/s Ratio Prot		0.24			c0.41		c0.21	0.14			0.03	
v/s Ratio Perm	0.20		0.02	0.06		0.00	c0.15			0.08		
v/c Ratio	0.39	0.48	0.03	0.13	0.82	0.01	0.99	0.38		0.64	0.27	
Uniform Delay, d1	17.4	18.4	14.2	14.9	23.7	14.0	33.2	26.1		47.0	44.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.0	0.7	0.1	0.4	2.1	0.0	36.3	0.2		11.6	0.3	
Delay (s)	35.3	19.1	14.2	15.3	25.8	14.0	69.5	26.3		58.7	45.0	
Level of Service	D	B	B	B	C	B	E	C		E	D	
Approach Delay (s)		19.2			25.6			48.8			49.3	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	113.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		

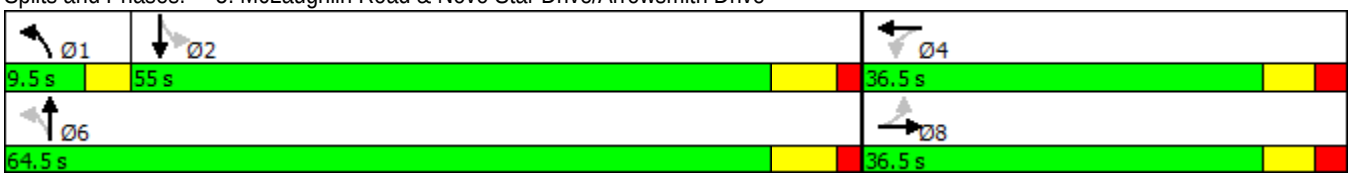
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	55	10	13	5	134	1567	54	806
Future Volume (vph)	55	10	13	5	134	1567	54	806
Lane Group Flow (vph)	55	65	13	39	134	1581	54	853
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		8		4	1	6		2
Permitted Phases	8		4		6		2	
Detector Phase	8	8	4	4	1	6	2	2
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	47.0	47.0	47.0
Minimum Split (s)	36.5	36.5	36.5	36.5	9.5	54.0	54.0	54.0
Total Split (s)	36.5	36.5	36.5	36.5	9.5	64.5	55.0	55.0
Total Split (%)	36.1%	36.1%	36.1%	36.1%	9.4%	63.9%	54.5%	54.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	3.5	7.0	7.0	7.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	Max
v/c Ratio	0.35	0.28	0.08	0.19	0.25	0.57	0.30	0.37
Control Delay	39.3	15.3	32.6	19.3	3.8	6.3	14.1	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.3	15.3	32.6	19.3	3.8	6.3	14.1	8.5
Queue Length 50th (m)	8.3	1.5	1.9	1.9	4.1	52.9	3.8	33.1
Queue Length 95th (m)	19.4	12.5	7.1	10.6	9.6	83.3	13.5	50.3
Internal Link Dist (m)		285.8		306.4		289.1		287.3
Turn Bay Length (m)	21.0		21.0		45.0		45.0	
Base Capacity (vph)	502	627	501	610	527	2782	183	2281
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	0.11	0.10	0.03	0.06	0.25	0.57	0.30	0.37

Intersection Summary

Cycle Length: 101
Actuated Cycle Length: 80.4
Natural Cycle: 100
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: McLaughlin Road & Novo Star Drive/Arrowsmith Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	10	55	13	5	34	134	1567	14	54	806	47
Future Volume (vph)	55	10	55	13	5	34	134	1567	14	54	806	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
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	1.00		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)	1750	1589		1785	1592		1785	3609		1785	3582	
Flt Permitted	0.73	1.00		0.71	1.00		0.29	1.00		0.15	1.00	
Satd. Flow (perm)	1348	1589		1343	1592		547	3609		289	3582	
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)	55	10	55	13	5	34	134	1567	14	54	806	47
RTOR Reduction (vph)	0	50	0	0	24	0	0	0	0	0	3	0
Lane Group Flow (vph)	55	15	0	13	15	0	134	1581	0	54	850	0
Heavy Vehicles (%)	2%	10%	2%	0%	20%	0%	0%	1%	0%	0%	1%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	7.7	7.7		7.7	7.7		60.6	60.6		51.2	51.2	
Effective Green, g (s)	7.7	7.7		7.7	7.7		60.6	60.6		51.2	51.2	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.74	0.74		0.63	0.63	
Clearance Time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	126	149		126	149		494	2673		180	2242	
v/s Ratio Prot		0.01			0.01		0.02	c0.44			0.24	
v/s Ratio Perm	c0.04			0.01			0.18			0.19		
v/c Ratio	0.44	0.10		0.10	0.10		0.27	0.59		0.30	0.38	
Uniform Delay, d1	35.0	33.9		33.9	33.9		3.3	4.9		7.0	7.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	0.3		0.4	0.3		0.3	1.0		4.2	0.5	
Delay (s)	37.4	34.2		34.3	34.2		3.6	5.9		11.3	8.0	
Level of Service	D	C		C	C		A	A		B	A	
Approach Delay (s)		35.7			34.2			5.7			8.2	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	81.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	109.7%	ICU Level of Service	H
Analysis Period (min)	15		

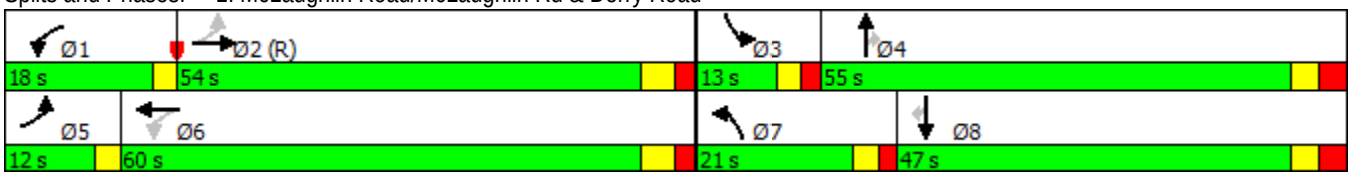
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	851	105	211	1951	331	257	1223	116	156	610	166
Future Volume (vph)	196	851	105	211	1951	331	257	1223	116	156	610	166
Lane Group Flow (vph)	196	851	105	211	1951	331	257	1223	116	156	610	166
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	54.0		18.0	60.0		21.0	55.0	55.0	13.0	47.0	47.0
Total Split (%)	8.6%	38.6%		12.9%	42.9%		15.0%	39.3%	39.3%	9.3%	33.6%	33.6%
Yellow Time (s)	2.6	3.6		2.6	3.6		2.6	3.0	3.0	2.6	3.0	3.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	-2.0	-1.0		-1.0	-2.0		-1.0	-2.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	0.6	4.8		1.6	3.8		3.6	4.1	5.1	3.6	5.1	5.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	0.98	0.48	0.07	0.59	0.94	0.21	0.66	0.95	0.19	0.68	0.56	0.28
Control Delay	92.7	35.8	0.1	26.9	49.9	0.3	68.1	59.8	8.7	79.1	43.0	8.0
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	92.7	35.8	0.1	26.9	49.9	0.3	68.1	59.8	8.7	79.1	43.0	8.0
Queue Length 50th (m)	40.8	70.6	0.0	33.8	197.9	0.0	37.3	181.8	3.4	23.3	78.8	2.7
Queue Length 95th (m)	#94.3	85.3	0.0	50.8	#221.5	0.0	52.4	#229.5	17.2	#37.0	99.7	20.2
Internal Link Dist (m)		899.9			373.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	201	1767	1581	373	2084	1581	426	1285	626	230	1094	595
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	0.98	0.48	0.07	0.57	0.94	0.21	0.60	0.95	0.19	0.68	0.56	0.28

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 1.4 (1%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	851	105	211	1951	331	257	1223	116	156	610	166
Future Volume (vph)	196	851	105	211	1951	331	257	1223	116	156	610	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	0.6	4.8	3.0	1.6	3.8	3.0	3.6	4.1	5.1	3.6	5.1	5.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	4856	1581	1785	5193	1581	3429	3535	1581	3429	3535	1581
Flt Permitted	0.08	1.00	1.00	0.23	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	143	4856	1581	424	5193	1581	3429	3535	1581	3429	3535	1581
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)	196	851	105	211	1951	331	257	1223	116	156	610	166
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	63	0	0	106
Lane Group Flow (vph)	196	851	105	211	1951	331	257	1223	53	156	610	60
Heavy Vehicles (%)	1%	8%	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	59.4	49.9	140.0	66.3	54.2	140.0	14.8	48.8	48.8	8.4	42.4	42.4
Effective Green, g (s)	63.4	50.9	140.0	67.3	56.2	140.0	15.8	50.8	49.8	9.4	43.4	43.4
Actuated g/C Ratio	0.45	0.36	1.00	0.48	0.40	1.00	0.11	0.36	0.36	0.07	0.31	0.31
Clearance Time (s)	2.6	5.8		2.6	5.8		4.6	6.1	6.1	4.6	6.1	6.1
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)	198	1765	1581	347	2084	1581	386	1282	562	230	1095	490
v/s Ratio Prot	c0.08	0.18		c0.06	0.38		c0.07	c0.35		0.05	0.17	
v/s Ratio Perm	c0.37		0.07	0.23		0.21			0.03			0.04
v/c Ratio	0.99	0.48	0.07	0.61	0.94	0.21	0.67	0.95	0.09	0.68	0.56	0.12
Uniform Delay, d1	41.2	34.4	0.0	22.7	40.2	0.0	59.6	43.5	30.1	63.8	40.3	34.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	60.4	0.9	0.1	3.0	8.6	0.3	4.3	15.4	0.1	7.7	0.6	0.1
Delay (s)	101.6	35.3	0.1	25.7	48.8	0.3	63.9	58.8	30.1	71.5	40.9	34.8
Level of Service	F	D	A	C	D	A	E	E	C	E	D	C
Approach Delay (s)		43.4			40.4			57.6			44.9	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		

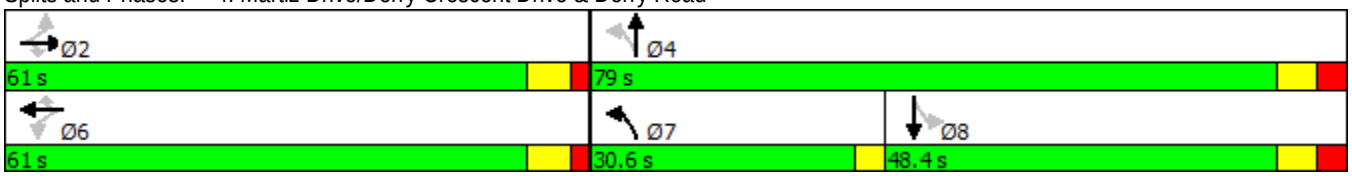
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	24	1212	50	20	2140	8	533	349	73	70
Future Volume (vph)	24	1212	50	20	2140	8	533	349	73	70
Lane Group Flow (vph)	24	1212	50	20	2140	8	533	490	73	159
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases		2			6		7	4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	7	4	8	8
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	5.0	8.0	8.0	8.0
Minimum Split (s)	37.6	37.6	37.6	37.6	37.6	37.6	8.0	48.4	48.4	48.4
Total Split (s)	61.0	61.0	61.0	61.0	61.0	61.0	30.6	79.0	48.4	48.4
Total Split (%)	43.6%	43.6%	43.6%	43.6%	43.6%	43.6%	21.9%	56.4%	34.6%	34.6%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4	7.4	7.4
Lead/Lag							Lead		Lag	Lag
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.40	0.51	0.07	0.14	0.86	0.01	0.85	0.36	0.64	0.33
Control Delay	45.5	22.0	4.2	21.8	31.5	0.0	40.8	23.8	71.6	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	22.0	4.2	21.8	31.5	0.0	40.8	23.8	71.6	28.0
Queue Length 50th (m)	3.5	69.4	0.0	2.5	157.3	0.0	98.5	40.3	16.4	10.7
Queue Length 95th (m)	#17.1	94.5	6.2	9.0	205.9	0.0	#144.3	53.7	32.6	20.9
Internal Link Dist (m)		621.8			523.2			624.4		634.6
Turn Bay Length (m)	110.0		30.0	65.0		35.0	100.0		95.0	
Base Capacity (vph)	60	2368	751	144	2485	794	624	2162	320	1246
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	0.40	0.51	0.07	0.14	0.86	0.01	0.85	0.23	0.23	0.13

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 113.9
Natural Cycle: 105
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Martiz Drive/Derry Crescent Drive & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1212	50	20	2140	8	533	349	141	73	70	89
Future Volume (vph)	24	1212	50	20	2140	8	533	349	141	73	70	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1653	4948	1507	1700	5193	1597	1767	3424		1785	3344	
Flt Permitted	0.07	1.00	1.00	0.17	1.00	1.00	0.54	1.00		0.47	1.00	
Satd. Flow (perm)	128	4948	1507	301	5193	1597	1006	3424		889	3344	
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)	24	1212	50	20	2140	8	533	349	141	73	70	89
RTOR Reduction (vph)	0	0	26	0	0	4	0	9	0	0	55	0
Lane Group Flow (vph)	24	1212	24	20	2140	4	533	481	0	73	104	0
Heavy Vehicles (%)	8%	6%	6%	5%	1%	0%	1%	0%	7%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	54.5	54.5	54.5	54.5	54.5	54.5	45.4	45.4		14.7	14.7	
Effective Green, g (s)	54.5	54.5	54.5	54.5	54.5	54.5	45.4	45.4		14.7	14.7	
Actuated g/C Ratio	0.48	0.48	0.48	0.48	0.48	0.48	0.40	0.40		0.13	0.13	
Clearance Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
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)	61	2367	721	144	2484	764	586	1364		114	431	
v/s Ratio Prot		0.24			c0.41		c0.22	0.14			0.03	
v/s Ratio Perm	0.19		0.02	0.07		0.00	c0.14			0.08		
v/c Ratio	0.39	0.51	0.03	0.14	0.86	0.01	0.91	0.35		0.64	0.24	
Uniform Delay, d1	19.1	20.5	15.7	16.6	26.4	15.5	29.8	24.0		47.1	44.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.0	0.8	0.1	0.4	3.3	0.0	18.0	0.2		11.6	0.3	
Delay (s)	37.0	21.3	15.8	17.0	29.7	15.5	47.8	24.1		58.7	44.9	
Level of Service	D	C	B	B	C	B	D	C		E	D	
Approach Delay (s)		21.4			29.5			36.5			49.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	113.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX D

Intersection Capacity Analysis Reports

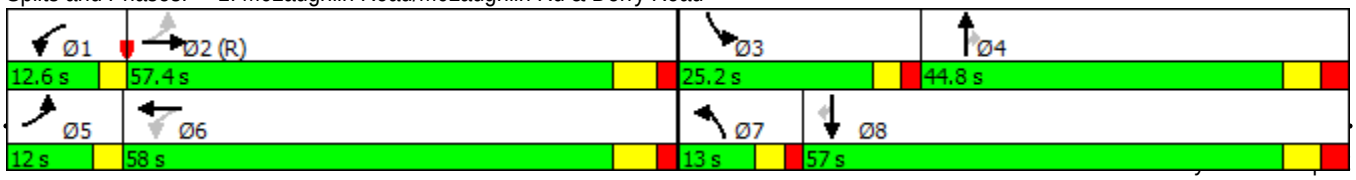
Future (2027) Background Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1851	453	221	848	79	107	598	162	240	1315	94
Future Volume (vph)	105	1851	453	221	848	79	107	598	162	240	1315	94
Lane Group Flow (vph)	105	1851	453	221	848	79	107	598	162	240	1315	94
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	57.4		12.6	58.0		13.0	44.8	44.8	25.2	57.0	57.0
Total Split (%)	8.6%	41.0%		9.0%	41.4%		9.3%	32.0%	32.0%	18.0%	40.7%	40.7%
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	0.36	1.00	0.29	1.26	0.48	0.05	0.55	0.57	0.29	0.65	1.05	0.15
Control Delay	24.0	64.4	0.5	182.0	35.3	0.1	75.5	44.0	11.2	68.2	84.4	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.0	64.4	0.5	182.0	35.3	0.1	75.5	44.0	11.2	68.2	84.4	6.6
Queue Length 50th (m)	16.6	196.4	0.0	~63.0	69.5	0.0	15.9	77.3	6.4	35.1	~220.0	0.4
Queue Length 95th (m)	28.2	#234.7	0.0	#118.3	83.3	0.0	26.4	101.8	25.7	48.4	#264.5	12.9
Internal Link Dist (m)		899.9			373.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	295	1858	1566	176	1751	1521	194	1047	555	489	1247	622
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	0.36	1.00	0.29	1.26	0.48	0.05	0.55	0.57	0.29	0.49	1.05	0.15

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 145
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: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1851	453	221	848	79	107	598	162	240	1315	94
Future Volume (vph)	105	1851	453	221	848	79	107	598	162	240	1315	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	3.0	6.8	4.0	3.0	6.8	4.0	5.0	7.1	7.1	5.0	7.1	7.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	5142	1566	1750	4768	1521	3395	3433	1521	3395	3500	1581
Flt Permitted	0.25	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	469	5142	1566	143	4768	1521	3395	3433	1521	3395	3500	1581
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)	105	1851	453	221	848	79	107	598	162	240	1315	94
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	91	0	0	59
Lane Group Flow (vph)	105	1851	453	221	848	79	107	598	71	240	1315	35
Heavy Vehicles (%)	1%	2%	2%	2%	10%	5%	2%	4%	5%	2%	2%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	59.4	50.6	140.0	61.0	51.4	140.0	8.0	42.7	42.7	15.2	49.9	49.9
Effective Green, g (s)	59.4	50.6	140.0	61.0	51.4	140.0	8.0	42.7	42.7	15.2	49.9	49.9
Actuated g/C Ratio	0.42	0.36	1.00	0.44	0.37	1.00	0.06	0.31	0.31	0.11	0.36	0.36
Clearance Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
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)	280	1858	1566	172	1750	1521	194	1047	463	368	1247	563
v/s Ratio Prot	0.02	0.36		c0.09	0.18		0.03	0.17		c0.07	c0.38	
v/s Ratio Perm	0.14		0.29	c0.47		0.05			0.05			0.02
v/c Ratio	0.38	1.00	0.29	1.28	0.48	0.05	0.55	0.57	0.15	0.65	1.05	0.06
Uniform Delay, d1	25.2	44.6	0.0	38.9	34.1	0.0	64.3	40.9	35.5	59.9	45.0	29.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	20.0	0.5	164.9	0.2	0.1	3.4	0.8	0.2	4.1	41.2	0.0
Delay (s)	26.0	64.6	0.5	203.8	34.3	0.1	67.6	41.7	35.6	64.0	86.2	29.7
Level of Service	C	E	A	F	C	A	E	D	D	E	F	C
Approach Delay (s)		50.9			64.6			43.8			79.8	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	60.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.9
Intersection Capacity Utilization	110.1%	ICU Level of Service	H
Analysis Period (min)	15		

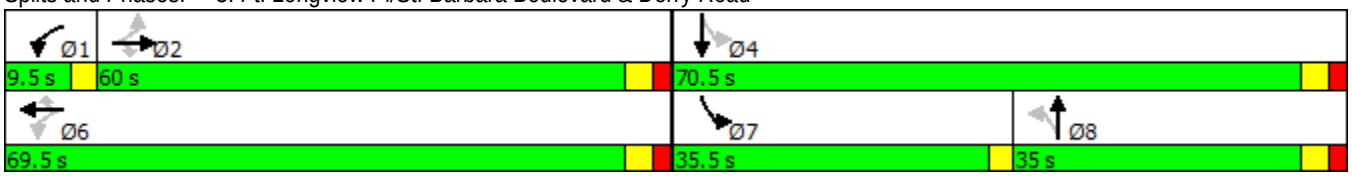
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	32	2228	26	69	991	43	35	0	574	0
Future Volume (vph)	32	2228	26	69	991	43	35	0	574	0
Lane Group Flow (vph)	32	2228	26	69	991	43	35	38	574	121
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2		1	6			8	7	4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	2	2	2	1	6	6	8	8	7	4
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	5.0	12.0	12.0	8.0	8.0	8.0	8.0
Minimum Split (s)	28.0	28.0	28.0	7.6	28.0	28.0	35.0	35.0	10.6	35.0
Total Split (s)	60.0	60.0	60.0	9.5	69.5	69.5	35.0	35.0	35.5	70.5
Total Split (%)	42.9%	42.9%	42.9%	6.8%	49.6%	49.6%	25.0%	25.0%	25.4%	50.4%
Yellow Time (s)	3.0	3.0	3.0	2.6	3.0	3.0	3.0	3.0	2.6	3.0
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	2.6	5.0	5.0	5.0	5.0	2.6	5.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.14	0.89	0.03	0.40	0.37	0.05	0.33	0.15	0.97	0.20
Control Delay	21.5	33.7	0.7	19.5	15.5	5.5	60.7	1.3	64.4	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	33.7	0.7	19.5	15.5	5.5	60.7	1.3	64.4	14.0
Queue Length 50th (m)	4.4	185.8	0.0	7.3	48.9	0.8	8.3	0.0	124.9	9.5
Queue Length 95th (m)	12.0	#238.7	1.3	15.4	63.4	6.7	19.5	0.0	#172.0	22.8
Internal Link Dist (m)		373.9			621.8			172.5		772.6
Turn Bay Length (m)	50.0		30.0	30.0		25.0	45.0		95.0	
Base Capacity (vph)	225	2505	816	176	2777	893	343	525	619	945
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	0.14	0.89	0.03	0.39	0.36	0.05	0.10	0.07	0.93	0.13

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 113.4
Natural Cycle: 115
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Ft. Longview Pl/St. Barbara Boulevard & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	2228	26	69	991	43	35	0	38	574	0	121
Future Volume (vph)	32	2228	26	69	991	43	35	0	38	574	0	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.7	3.7	3.5	3.7	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	5.0	5.0	5.0	2.6	5.0	5.0	5.0	5.0		2.6	5.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	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	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1580	5092	1601	1789	4812	1521	1789	1601		1767	1570	
Flt Permitted	0.28	1.00	1.00	0.07	1.00	1.00	0.68	1.00		0.54	1.00	
Satd. Flow (perm)	459	5092	1601	129	4812	1521	1279	1601		1008	1570	
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)	32	2228	26	69	991	43	35	0	38	574	0	121
RTOR Reduction (vph)	0	0	13	0	0	16	0	36	0	0	39	0
Lane Group Flow (vph)	32	2228	13	69	991	27	35	2	0	574	82	0
Heavy Vehicles (%)	13%	3%	2%	2%	9%	5%	2%	2%	2%	1%	2%	4%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	55.8	55.8	55.8	63.6	63.6	63.6	7.4	7.4		41.5	41.5	
Effective Green, g (s)	55.8	55.8	55.8	63.6	63.6	63.6	7.4	7.4		41.5	41.5	
Actuated g/C Ratio	0.48	0.48	0.48	0.55	0.55	0.55	0.06	0.06		0.36	0.36	
Clearance Time (s)	5.0	5.0	5.0	2.6	5.0	5.0	5.0	5.0		2.6	5.0	
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)	222	2468	776	146	2658	840	82	102		571	566	
v/s Ratio Prot		c0.44		c0.02	0.21			0.00		c0.27	0.05	
v/s Ratio Perm	0.07		0.01	0.24		0.02	0.03			c0.09		
v/c Ratio	0.14	0.90	0.02	0.47	0.37	0.03	0.43	0.02		1.01	0.14	
Uniform Delay, d1	16.4	27.2	15.4	22.6	14.5	11.7	51.8	50.5		35.2	24.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	6.0	0.0	2.4	0.1	0.0	3.5	0.1		39.0	0.1	
Delay (s)	17.8	33.1	15.4	25.0	14.6	11.7	55.4	50.6		74.1	24.9	
Level of Service	B	C	B	C	B	B	E	D		E	C	
Approach Delay (s)		32.7			15.1			52.9			65.6	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	115.1	Sum of lost time (s)	15.2
Intersection Capacity Utilization	97.3%	ICU Level of Service	F
Analysis Period (min)	15		

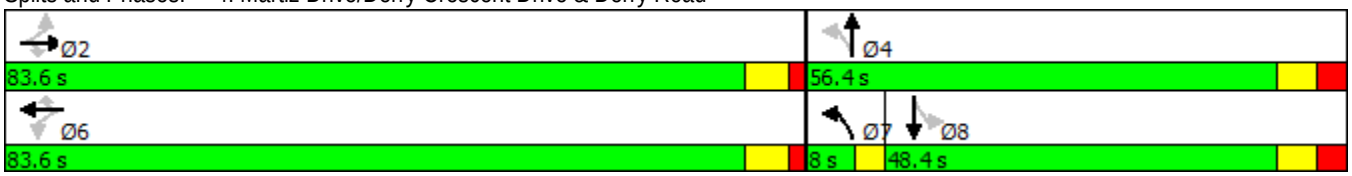
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	193	1980	650	74	1042	49	35	91	9	108
Future Volume (vph)	193	1980	650	74	1042	49	35	91	9	108
Lane Group Flow (vph)	193	1980	650	74	1042	49	35	111	9	133
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases		2			6		7	4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	7	4	8	8
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	5.0	8.0	8.0	8.0
Minimum Split (s)	37.6	37.6	37.6	37.6	37.6	37.6	8.0	48.4	48.4	48.4
Total Split (s)	83.6	83.6	83.6	83.6	83.6	83.6	8.0	56.4	48.4	48.4
Total Split (%)	59.7%	59.7%	59.7%	59.7%	59.7%	59.7%	5.7%	40.3%	34.6%	34.6%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4	7.4	7.4
Lead/Lag							Lead		Lag	Lag
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.54	0.53	0.53	0.74	0.30	0.04	0.20	0.24	0.08	0.41
Control Delay	14.1	7.2	5.7	57.0	5.4	1.2	38.4	38.5	47.1	43.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	7.2	5.7	57.0	5.4	1.2	38.4	38.5	47.1	43.2
Queue Length 50th (m)	17.6	66.0	32.7	9.0	27.0	0.0	6.4	10.5	1.9	12.6
Queue Length 95th (m)	44.2	83.6	61.9	#22.0	36.1	2.9	15.5	19.0	7.0	22.7
Internal Link Dist (m)		621.8			523.2			624.4		634.6
Turn Bay Length (m)	110.0		30.0	65.0		35.0	100.0		95.0	
Base Capacity (vph)	358	3717	1229	100	3483	1192	176	1622	496	1378
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	0.54	0.53	0.53	0.74	0.30	0.04	0.20	0.07	0.02	0.10

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 105.8
Natural Cycle: 145
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Martiz Drive/Derry Crescent Drive & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	1980	650	74	1042	49	35	91	20	9	108	25
Future Volume (vph)	193	1980	650	74	1042	49	35	91	20	9	108	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	5043	1581	1594	4725	1597	1566	3491		1785	3521	
Flt Permitted	0.26	1.00	1.00	0.08	1.00	1.00	0.50	1.00		0.68	1.00	
Satd. Flow (perm)	486	5043	1581	135	4725	1597	828	3491		1281	3521	
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)	193	1980	650	74	1042	49	35	91	20	9	108	25
RTOR Reduction (vph)	0	0	66	0	0	13	0	7	0	0	18	0
Lane Group Flow (vph)	193	1980	584	74	1042	36	35	104	0	9	115	0
Heavy Vehicles (%)	0%	4%	1%	12%	11%	0%	14%	1%	5%	0%	0%	4%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	78.0	78.0	78.0	78.0	78.0	78.0	15.0	15.0		9.1	9.1	
Effective Green, g (s)	78.0	78.0	78.0	78.0	78.0	78.0	15.0	15.0		9.1	9.1	
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.73	0.73	0.14	0.14		0.09	0.09	
Clearance Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
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)	354	3676	1152	98	3444	1164	136	489		108	299	
v/s Ratio Prot		0.39			0.22		c0.01	0.03			c0.03	
v/s Ratio Perm	0.40		0.37	c0.55		0.02	0.03			0.01		
v/c Ratio	0.55	0.54	0.51	0.76	0.30	0.03	0.26	0.21		0.08	0.38	
Uniform Delay, d1	6.5	6.5	6.2	8.7	5.0	4.0	40.5	40.8		45.1	46.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.9	0.6	1.6	27.6	0.0	0.0	1.0	0.2		0.3	0.8	
Delay (s)	12.4	7.0	7.8	36.4	5.1	4.0	41.5	41.0		45.4	47.1	
Level of Service	B	A	A	D	A	A	D	D		D	D	
Approach Delay (s)		7.6			7.0			41.1			47.0	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	107.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		

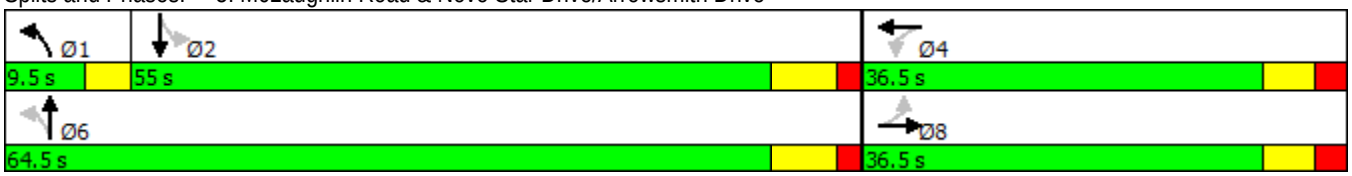
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	82	33	36	47	98	732	14	1875
Future Volume (vph)	82	33	36	47	98	732	14	1875
Lane Group Flow (vph)	82	260	36	97	98	741	14	1933
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		8		4	1	6		2
Permitted Phases	8		4		6		2	
Detector Phase	8	8	4	4	1	6	2	2
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	47.0	47.0	47.0
Minimum Split (s)	36.5	36.5	36.5	36.5	9.5	54.0	54.0	54.0
Total Split (s)	36.5	36.5	36.5	36.5	9.5	64.5	55.0	55.0
Total Split (%)	36.1%	36.1%	36.1%	36.1%	9.4%	63.9%	54.5%	54.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	3.5	7.0	7.0	7.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	Max
v/c Ratio	0.44	0.73	0.35	0.32	0.47	0.31	0.04	0.91
Control Delay	39.1	29.3	41.0	19.6	15.2	6.3	10.2	25.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	29.3	41.0	19.6	15.2	6.3	10.2	25.4
Queue Length 50th (m)	12.7	21.3	5.5	7.0	3.9	22.1	1.0	146.2
Queue Length 95th (m)	26.3	46.7	14.7	20.1	17.5	41.2	4.4	#250.8
Internal Link Dist (m)		285.8		306.4		289.1		287.3
Turn Bay Length (m)	21.0		21.0		45.0		45.0	
Base Capacity (vph)	425	652	230	619	209	2414	361	2125
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	0.19	0.40	0.16	0.16	0.47	0.31	0.04	0.91

Intersection Summary

Cycle Length: 101
Actuated Cycle Length: 84.5
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: McLaughlin Road & Novo Star Drive/Arrowsmith Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	33	227	36	47	50	98	732	9	14	1875	58
Future Volume (vph)	82	33	227	36	47	50	98	732	9	14	1875	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
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	0.92		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1638	1607		1785	1651		1716	3539		1566	3580	
Flt Permitted	0.69	1.00		0.34	1.00		0.07	1.00		0.37	1.00	
Satd. Flow (perm)	1197	1607		648	1651		135	3539		610	3580	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	82	33	227	36	47	50	98	732	9	14	1875	58
RTOR Reduction (vph)	0	105	0	0	42	0	0	1	0	0	2	0
Lane Group Flow (vph)	82	155	0	36	55	0	98	740	0	14	1931	0
Heavy Vehicles (%)	9%	6%	1%	0%	4%	6%	4%	3%	0%	14%	1%	18%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	13.3	13.3		13.3	13.3		58.4	58.4		50.2	50.2	
Effective Green, g (s)	13.3	13.3		13.3	13.3		58.4	58.4		50.2	50.2	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.69	0.69		0.59	0.59	
Clearance Time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	186	250		101	257		179	2425		359	2109	
v/s Ratio Prot		c0.10			0.03		c0.03	0.21			c0.54	
v/s Ratio Perm	0.07			0.06			0.34			0.02		
v/c Ratio	0.44	0.62		0.36	0.21		0.55	0.31		0.04	0.92	
Uniform Delay, d1	32.6	33.6		32.1	31.4		16.8	5.3		7.4	15.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	4.5		2.2	0.4		3.4	0.3		0.2	7.7	
Delay (s)	34.2	38.1		34.3	31.8		20.2	5.7		7.6	23.3	
Level of Service	C	D		C	C		C	A		A	C	
Approach Delay (s)		37.2			32.5			7.4			23.2	
Approach LOS		D			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	85.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	120.5%	ICU Level of Service	H
Analysis Period (min)	15		

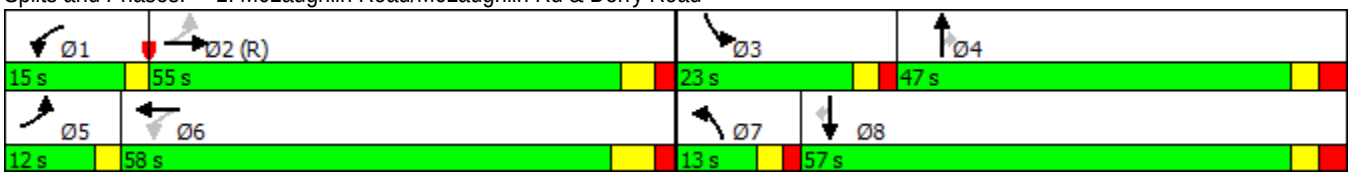
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1851	453	221	848	79	107	598	162	240	1315	94
Future Volume (vph)	105	1851	453	221	848	79	107	598	162	240	1315	94
Lane Group Flow (vph)	105	1851	453	221	848	79	107	598	162	240	1315	94
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	55.0		15.0	58.0		13.0	47.0	47.0	23.0	57.0	57.0
Total Split (%)	8.6%	39.3%		10.7%	41.4%		9.3%	33.6%	33.6%	16.4%	40.7%	40.7%
Yellow Time (s)	2.6	3.6		2.6	4.6		2.6	3.0	3.0	2.6	3.0	3.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	-1.0	-2.0		-2.0	-1.0		-1.0	-1.0	-1.0	-1.0	-2.0	-1.0
Total Lost Time (s)	1.6	3.8		0.6	5.8		3.6	5.1	5.1	3.6	4.1	5.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	0.34	0.98	0.29	0.93	0.47	0.05	0.48	0.54	0.28	0.62	0.99	0.14
Control Delay	22.7	61.3	0.5	78.7	34.3	0.1	70.3	41.5	9.0	66.0	66.3	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	61.3	0.5	78.7	34.3	0.1	70.3	41.5	9.0	66.0	66.3	4.4
Queue Length 50th (m)	16.3	195.0	0.0	46.8	68.6	0.0	15.7	75.3	4.0	34.8	199.8	0.0
Queue Length 95th (m)	27.6	#232.3	0.0	#99.1	82.3	0.0	26.1	98.5	21.8	48.2	#252.6	9.8
Internal Link Dist (m)		899.9			373.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	317	1880	1566	237	1791	1521	227	1110	588	470	1324	653
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	0.33	0.98	0.29	0.93	0.47	0.05	0.47	0.54	0.28	0.51	0.99	0.14

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1851	453	221	848	79	107	598	162	240	1315	94
Future Volume (vph)	105	1851	453	221	848	79	107	598	162	240	1315	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	1.6	3.8	3.0	0.6	5.8	3.0	3.6	5.1	5.1	3.6	4.1	5.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	5142	1566	1750	4768	1521	3395	3433	1521	3395	3500	1581
Flt Permitted	0.26	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	490	5142	1566	145	4768	1521	3395	3433	1521	3395	3500	1581
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)	105	1851	453	221	848	79	107	598	162	240	1315	94
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	96	0	0	59
Lane Group Flow (vph)	105	1851	453	221	848	79	107	598	66	240	1315	35
Heavy Vehicles (%)	1%	2%	2%	2%	10%	5%	2%	4%	5%	2%	2%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	58.2	49.2	140.0	63.2	51.6	140.0	8.3	44.3	44.3	15.0	51.0	51.0
Effective Green, g (s)	60.2	51.2	140.0	65.2	52.6	140.0	9.3	45.3	45.3	16.0	53.0	52.0
Actuated g/C Ratio	0.43	0.37	1.00	0.47	0.38	1.00	0.07	0.32	0.32	0.11	0.38	0.37
Clearance Time (s)	2.6	5.8		2.6	6.8		4.6	6.1	6.1	4.6	6.1	6.1
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)	301	1880	1566	232	1791	1521	225	1110	492	388	1325	587
v/s Ratio Prot	0.02	c0.36		c0.10	0.18		0.03	0.17		c0.07	c0.38	
v/s Ratio Perm	0.12		0.29	0.34		0.05			0.04			0.02
v/c Ratio	0.35	0.98	0.29	0.95	0.47	0.05	0.48	0.54	0.13	0.62	0.99	0.06
Uniform Delay, d1	24.5	44.0	0.0	42.4	33.2	0.0	63.0	38.8	33.5	59.1	43.3	28.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	17.4	0.5	45.7	0.2	0.1	1.6	0.5	0.1	2.9	22.8	0.0
Delay (s)	25.2	61.4	0.5	88.1	33.4	0.1	64.6	39.3	33.6	62.0	66.1	28.3
Level of Service	C	E	A	F	C	A	E	D	C	E	E	C
Approach Delay (s)		48.4			41.6			41.4			63.3	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	50.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.1
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		

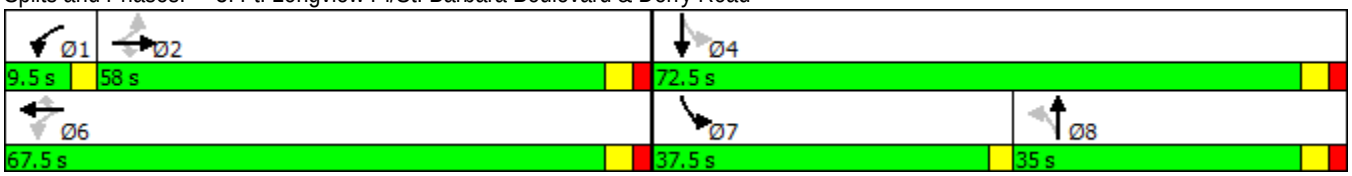
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	32	2228	26	69	991	43	35	0	574	0
Future Volume (vph)	32	2228	26	69	991	43	35	0	574	0
Lane Group Flow (vph)	32	2228	26	69	991	43	35	38	574	121
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2		1	6			8	7	4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	2	2	2	1	6	6	8	8	7	4
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	5.0	12.0	12.0	8.0	8.0	8.0	8.0
Minimum Split (s)	28.0	28.0	28.0	9.5	28.0	28.0	35.0	35.0	10.6	35.0
Total Split (s)	58.0	58.0	58.0	9.5	67.5	67.5	35.0	35.0	37.5	72.5
Total Split (%)	41.4%	41.4%	41.4%	6.8%	48.2%	48.2%	25.0%	25.0%	26.8%	51.8%
Yellow Time (s)	3.0	3.0	3.0	2.6	3.0	3.0	3.0	3.0	2.6	3.0
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)	0.0	-2.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0
Total Lost Time (s)	5.0	3.0	5.0	2.6	5.0	5.0	5.0	5.0	0.6	5.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.15	0.88	0.03	0.40	0.38	0.05	0.33	0.14	0.85	0.20
Control Delay	22.8	33.2	0.8	20.2	16.5	5.9	60.5	1.1	42.7	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	33.2	0.8	20.2	16.5	5.9	60.5	1.1	42.7	14.1
Queue Length 50th (m)	4.6	185.8	0.0	7.6	50.9	0.8	8.3	0.0	117.3	10.0
Queue Length 95th (m)	12.4	#238.7	1.3	15.9	65.8	7.0	19.5	0.0	163.5	23.0
Internal Link Dist (m)		373.9			621.8			172.5		772.6
Turn Bay Length (m)	50.0		30.0	30.0		25.0	45.0		95.0	
Base Capacity (vph)	217	2525	794	178	2712	873	346	545	714	977
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	0.15	0.88	0.03	0.39	0.37	0.05	0.10	0.07	0.80	0.12

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 112.9
Natural Cycle: 105
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Ft. Longview Pl/St. Barbara Boulevard & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	2228	26	69	991	43	35	0	38	574	0	121
Future Volume (vph)	32	2228	26	69	991	43	35	0	38	574	0	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.7	3.7	3.5	3.7	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	5.0	3.0	5.0	2.6	5.0	5.0	5.0	5.0		0.6	5.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	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	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1580	5092	1601	1789	4812	1521	1789	1601		1767	1570	
Flt Permitted	0.27	1.00	1.00	0.07	1.00	1.00	0.68	1.00		0.69	1.00	
Satd. Flow (perm)	456	5092	1601	133	4812	1521	1279	1601		1280	1570	
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)	32	2228	26	69	991	43	35	0	38	574	0	121
RTOR Reduction (vph)	0	0	14	0	0	17	0	36	0	0	35	0
Lane Group Flow (vph)	32	2228	12	69	991	26	35	2	0	574	86	0
Heavy Vehicles (%)	13%	3%	2%	2%	9%	5%	2%	2%	2%	1%	2%	4%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	54.0	54.0	54.0	61.8	61.8	61.8	7.3	7.3		42.8	42.8	
Effective Green, g (s)	54.0	56.0	54.0	61.8	61.8	61.8	7.3	7.3		44.8	42.8	
Actuated g/C Ratio	0.47	0.49	0.47	0.54	0.54	0.54	0.06	0.06		0.39	0.37	
Clearance Time (s)	5.0	5.0	5.0	2.6	5.0	5.0	5.0	5.0		2.6	5.0	
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)	214	2488	754	146	2594	820	81	101		648	586	
v/s Ratio Prot		c0.44		c0.02	0.21			0.00		c0.27	0.05	
v/s Ratio Perm	0.07		0.01	0.23		0.02	0.03			0.08		
v/c Ratio	0.15	0.90	0.02	0.47	0.38	0.03	0.43	0.02		0.89	0.15	
Uniform Delay, d1	17.2	26.6	16.1	23.6	15.3	12.4	51.7	50.3		31.5	23.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	5.5	0.0	2.4	0.1	0.0	3.7	0.1		13.7	0.1	
Delay (s)	18.7	32.2	16.2	26.0	15.4	12.4	55.3	50.4		45.2	23.9	
Level of Service	B	C	B	C	B	B	E	D		D	C	
Approach Delay (s)		31.8			16.0			52.8			41.5	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	114.6	Sum of lost time (s)	11.2
Intersection Capacity Utilization	96.5%	ICU Level of Service	F
Analysis Period (min)	15		

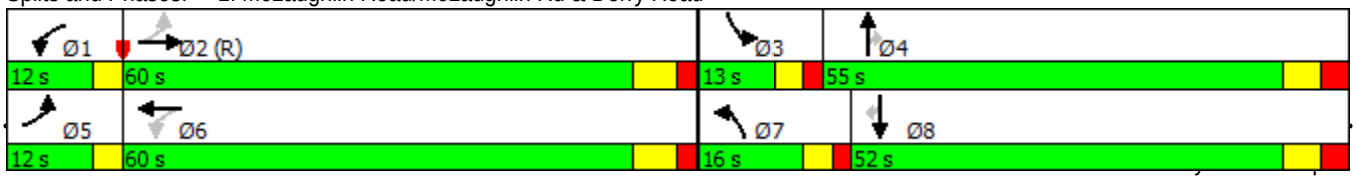
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	876	105	211	2009	331	257	1223	116	156	610	166
Future Volume (vph)	196	876	105	211	2009	331	257	1223	116	156	610	166
Lane Group Flow (vph)	196	876	105	211	2009	331	257	1223	116	156	610	166
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	60.0		12.0	60.0		16.0	55.0	55.0	13.0	52.0	52.0
Total Split (%)	8.6%	42.9%		8.6%	42.9%		11.4%	39.3%	39.3%	9.3%	37.1%	37.1%
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	1.15	0.47	0.07	0.71	1.02	0.21	0.96	1.01	0.19	0.80	0.54	0.28
Control Delay	146.6	33.9	0.1	36.2	67.7	0.3	108.1	74.2	10.1	93.1	41.2	9.0
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	146.6	33.9	0.1	36.2	67.7	0.3	108.1	74.2	10.1	93.1	41.2	9.0
Queue Length 50th (m)	~49.4	70.3	0.0	34.6	~226.4	0.0	39.1	~191.6	4.7	23.6	76.8	4.8
Queue Length 95th (m)	#102.2	83.9	0.0	51.9	#256.5	0.0	#67.7	#241.6	18.9	#42.4	96.5	22.2
Internal Link Dist (m)		899.9			373.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	170	1845	1581	299	1973	1581	269	1209	601	195	1133	603
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	1.15	0.47	0.07	0.71	1.02	0.21	0.96	1.01	0.19	0.80	0.54	0.28

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 1.4 (1%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 145
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: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	876	105	211	2009	331	257	1223	116	156	610	166
Future Volume (vph)	196	876	105	211	2009	331	257	1223	116	156	610	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	3.0	6.8	4.0	3.0	6.8	4.0	5.0	7.1	7.1	5.0	7.1	7.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	4856	1581	1785	5193	1581	3429	3535	1581	3429	3535	1581
Flt Permitted	0.08	1.00	1.00	0.24	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	140	4856	1581	454	5193	1581	3429	3535	1581	3429	3535	1581
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)	196	876	105	211	2009	331	257	1223	116	156	610	166
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	61	0	0	96
Lane Group Flow (vph)	196	876	105	211	2009	331	257	1223	55	156	610	70
Heavy Vehicles (%)	1%	8%	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	62.2	53.2	140.0	62.2	53.2	140.0	11.0	47.9	47.9	8.0	44.9	44.9
Effective Green, g (s)	62.2	53.2	140.0	62.2	53.2	140.0	11.0	47.9	47.9	8.0	44.9	44.9
Actuated g/C Ratio	0.44	0.38	1.00	0.44	0.38	1.00	0.08	0.34	0.34	0.06	0.32	0.32
Clearance Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
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)	166	1845	1581	287	1973	1581	269	1209	540	195	1133	507
v/s Ratio Prot	c0.08	0.18		0.05	0.39		c0.07	c0.35		0.05	0.17	
v/s Ratio Perm	c0.45		0.07	0.28		c0.21			0.04			0.04
v/c Ratio	1.18	0.47	0.07	0.74	1.02	0.21	0.96	1.01	0.10	0.80	0.54	0.14
Uniform Delay, d1	38.5	32.8	0.0	26.9	43.4	0.0	64.3	46.0	31.4	65.2	39.0	33.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	126.8	0.9	0.1	9.4	25.0	0.3	42.4	28.8	0.1	20.5	0.5	0.1
Delay (s)	165.3	33.7	0.1	36.3	68.4	0.3	106.6	74.8	31.5	85.7	39.5	33.9
Level of Service	F	C	A	D	E	A	F	E	C	F	D	C
Approach Delay (s)		52.6			56.9			76.8			46.3	
Approach LOS		D			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	59.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.9
Intersection Capacity Utilization	109.2%	ICU Level of Service	H
Analysis Period (min)	15		

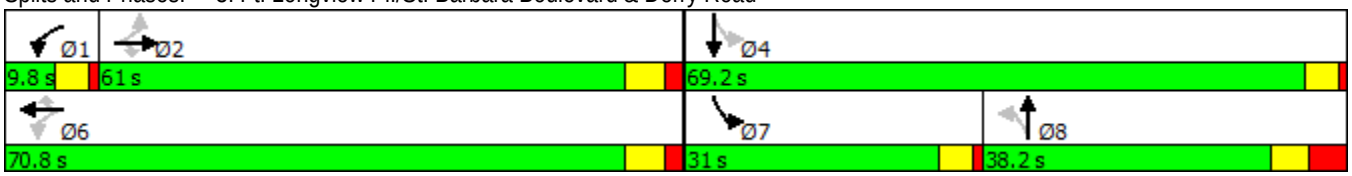
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	56	1068	21	116	2412	519	79	0	87	0
Future Volume (vph)	56	1068	21	116	2412	519	79	0	87	0
Lane Group Flow (vph)	56	1068	21	116	2412	519	79	103	87	21
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2		1	6			8	7	4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	2	2	2	1	6	6	8	8	7	4
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	5.0	12.0	12.0	8.0	8.0	5.0	5.0
Minimum Split (s)	29.3	29.3	29.3	9.5	29.3	29.3	38.1	38.1	9.5	22.5
Total Split (s)	61.0	61.0	61.0	9.8	70.8	70.8	38.2	38.2	31.0	69.2
Total Split (%)	43.6%	43.6%	43.6%	7.0%	50.6%	50.6%	27.3%	27.3%	22.1%	49.4%
Yellow Time (s)	4.2	4.2	4.2	3.5	4.2	4.2	4.0	4.0	3.5	3.5
All-Red Time (s)	2.1	2.1	2.1	1.0	2.1	2.1	4.1	4.1	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	8.1	8.1	4.5	4.5
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.79	0.41	0.02	0.36	0.74	0.50	0.51	0.22	0.26	0.04
Control Delay	89.3	16.3	0.0	12.1	16.8	11.2	57.4	1.1	29.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	16.3	0.0	12.1	16.8	11.2	57.4	1.1	29.9	0.2
Queue Length 50th (m)	9.5	49.5	0.0	9.1	127.5	44.1	16.4	0.0	14.1	0.0
Queue Length 95th (m)	#39.8	72.2	0.0	20.6	184.7	88.0	33.3	0.0	26.5	0.0
Internal Link Dist (m)		373.9			621.8			88.0		772.6
Turn Bay Length (m)	50.0		30.0	30.0		25.0	45.0		95.0	
Base Capacity (vph)	71	2636	904	321	3263	1045	410	699	479	1051
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	0.79	0.41	0.02	0.36	0.74	0.50	0.19	0.15	0.18	0.02

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 103.6
Natural Cycle: 100
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Ft. Longview Pl./St. Barbara Boulevard & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1068	21	116	2412	519	79	0	103	87	0	21
Future Volume (vph)	56	1068	21	116	2412	519	79	0	103	87	0	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.7	3.7	3.5	3.7	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	6.3	6.3	6.3	4.5	6.3	6.3	8.1	8.1		4.5	4.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	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	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	4948	1601	1789	5193	1597	1789	1601		1700	1633	
Flt Permitted	0.07	1.00	1.00	0.20	1.00	1.00	0.74	1.00		0.53	1.00	
Satd. Flow (perm)	136	4948	1601	386	5193	1597	1401	1601		950	1633	
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	1068	21	116	2412	519	79	0	103	87	0	21
RTOR Reduction (vph)	0	0	10	0	0	43	0	92	0	0	15	0
Lane Group Flow (vph)	56	1068	11	116	2412	476	79	11	0	87	6	0
Heavy Vehicles (%)	0%	6%	2%	2%	1%	0%	2%	2%	2%	5%	2%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	55.3	55.3	55.3	65.1	65.1	65.1	11.4	11.4		28.6	28.6	
Effective Green, g (s)	55.3	55.3	55.3	65.1	65.1	65.1	11.4	11.4		28.6	28.6	
Actuated g/C Ratio	0.53	0.53	0.53	0.62	0.62	0.62	0.11	0.11		0.27	0.27	
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	8.1	8.1		4.5	4.5	
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)	71	2618	847	311	3235	994	152	174		325	446	
v/s Ratio Prot		0.22		0.02	c0.46			0.01		c0.02	0.00	
v/s Ratio Perm	0.41		0.01	0.21		0.30	c0.06			0.05		
v/c Ratio	0.79	0.41	0.01	0.37	0.75	0.48	0.52	0.06		0.27	0.01	
Uniform Delay, d1	19.9	14.8	11.7	8.8	13.9	10.6	44.0	41.8		29.2	27.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	58.6	0.5	0.0	0.8	1.0	0.4	3.0	0.2		0.4	0.0	
Delay (s)	78.4	15.2	11.7	9.6	14.8	10.9	46.9	41.9		29.6	27.7	
Level of Service	E	B	B	A	B	B	D	D		C	C	
Approach Delay (s)		18.3			14.0			44.1			29.2	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	104.5	Sum of lost time (s)	23.4
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		

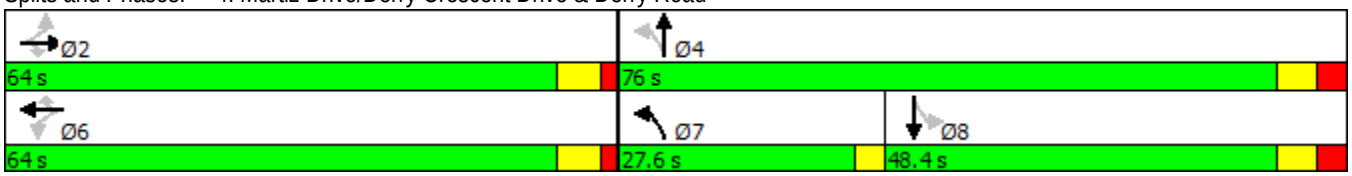
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	24	1245	50	20	2201	8	533	366	73	74
Future Volume (vph)	24	1245	50	20	2201	8	533	366	73	74
Lane Group Flow (vph)	24	1245	50	20	2201	8	533	507	73	163
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases		2			6		7	4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	7	4	8	8
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	5.0	8.0	8.0	8.0
Minimum Split (s)	37.6	37.6	37.6	37.6	37.6	37.6	8.0	48.4	48.4	48.4
Total Split (s)	64.0	64.0	64.0	64.0	64.0	64.0	27.6	76.0	48.4	48.4
Total Split (%)	45.7%	45.7%	45.7%	45.7%	45.7%	45.7%	19.7%	54.3%	34.6%	34.6%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4	7.4	7.4
Lead/Lag							Lead		Lag	Lag
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.39	0.50	0.06	0.13	0.84	0.01	0.92	0.39	0.65	0.34
Control Delay	43.3	20.2	3.8	19.9	28.8	0.0	52.4	26.1	72.1	32.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.3	20.2	3.8	19.9	28.8	0.0	52.4	26.1	72.1	32.2
Queue Length 50th (m)	3.4	68.1	0.0	2.4	156.4	0.0	103.5	43.8	16.5	12.7
Queue Length 95th (m)	#17.0	93.5	5.9	8.6	206.2	0.0	#167.6	58.0	32.7	23.0
Internal Link Dist (m)		621.8			523.2			624.4		634.6
Turn Bay Length (m)	110.0		30.0	65.0		35.0	100.0		95.0	
Base Capacity (vph)	61	2494	788	149	2618	834	577	2074	314	1238
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	0.39	0.50	0.06	0.13	0.84	0.01	0.92	0.24	0.23	0.13

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 114.1
Natural Cycle: 105
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Martiz Drive/Derry Crescent Drive & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1245	50	20	2201	8	533	366	141	73	74	89
Future Volume (vph)	24	1245	50	20	2201	8	533	366	141	73	74	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1653	4948	1507	1700	5193	1597	1767	3431		1785	3351	
Flt Permitted	0.07	1.00	1.00	0.17	1.00	1.00	0.54	1.00		0.47	1.00	
Satd. Flow (perm)	121	4948	1507	297	5193	1597	1005	3431		875	3351	
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)	24	1245	50	20	2201	8	533	366	141	73	74	89
RTOR Reduction (vph)	0	0	25	0	0	4	0	11	0	0	43	0
Lane Group Flow (vph)	24	1245	25	20	2201	4	533	496	0	73	120	0
Heavy Vehicles (%)	8%	6%	6%	5%	1%	0%	1%	0%	7%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	57.5	57.5	57.5	57.5	57.5	57.5	42.6	42.6		14.9	14.9	
Effective Green, g (s)	57.5	57.5	57.5	57.5	57.5	57.5	42.6	42.6		14.9	14.9	
Actuated g/C Ratio	0.50	0.50	0.50	0.50	0.50	0.50	0.37	0.37		0.13	0.13	
Clearance Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
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)	60	2493	759	149	2616	804	540	1280		114	437	
v/s Ratio Prot		0.25			c0.42		c0.21	0.14			0.04	
v/s Ratio Perm	0.20		0.02	0.07		0.00	c0.15			0.08		
v/c Ratio	0.40	0.50	0.03	0.13	0.84	0.01	0.99	0.39		0.64	0.27	
Uniform Delay, d1	17.6	18.8	14.3	15.1	24.4	14.1	33.1	26.2		47.1	44.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.7	0.7	0.1	0.4	2.6	0.0	35.1	0.2		11.6	0.3	
Delay (s)	36.3	19.5	14.4	15.5	27.0	14.1	68.2	26.4		58.7	45.1	
Level of Service	D	B	B	B	C	B	E	C		E	D	
Approach Delay (s)		19.6			26.8			47.8			49.3	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	114.1	Sum of lost time (s)	17.0
Intersection Capacity Utilization	93.7%	ICU Level of Service	F
Analysis Period (min)	15		

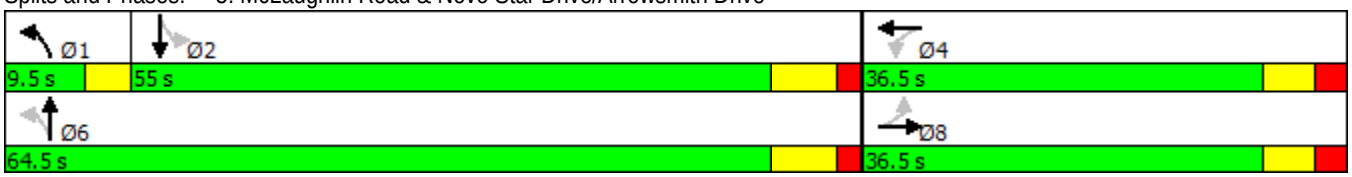
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	55	10	13	5	134	1567	54	806
Future Volume (vph)	55	10	13	5	134	1567	54	806
Lane Group Flow (vph)	55	65	13	39	134	1581	54	853
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		8		4	1	6		2
Permitted Phases	8		4		6		2	
Detector Phase	8	8	4	4	1	6	2	2
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	47.0	47.0	47.0
Minimum Split (s)	36.5	36.5	36.5	36.5	9.5	54.0	54.0	54.0
Total Split (s)	36.5	36.5	36.5	36.5	9.5	64.5	55.0	55.0
Total Split (%)	36.1%	36.1%	36.1%	36.1%	9.4%	63.9%	54.5%	54.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	3.5	7.0	7.0	7.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	Max
v/c Ratio	0.35	0.28	0.08	0.19	0.25	0.57	0.30	0.37
Control Delay	39.3	15.3	32.6	19.3	3.8	6.3	14.1	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.3	15.3	32.6	19.3	3.8	6.3	14.1	8.5
Queue Length 50th (m)	8.3	1.5	1.9	1.9	4.1	52.9	3.8	33.1
Queue Length 95th (m)	19.4	12.5	7.1	10.6	9.6	83.3	13.5	50.3
Internal Link Dist (m)		285.8		306.4		289.1		287.3
Turn Bay Length (m)	21.0		21.0		45.0		45.0	
Base Capacity (vph)	502	627	501	610	527	2782	183	2281
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	0.11	0.10	0.03	0.06	0.25	0.57	0.30	0.37

Intersection Summary

Cycle Length: 101
Actuated Cycle Length: 80.4
Natural Cycle: 100
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: McLaughlin Road & Novo Star Drive/Arrowsmith Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	10	55	13	5	34	134	1567	14	54	806	47
Future Volume (vph)	55	10	55	13	5	34	134	1567	14	54	806	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
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	1.00		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)	1750	1589		1785	1592		1785	3609		1785	3582	
Flt Permitted	0.73	1.00		0.71	1.00		0.29	1.00		0.15	1.00	
Satd. Flow (perm)	1348	1589		1343	1592		547	3609		289	3582	
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)	55	10	55	13	5	34	134	1567	14	54	806	47
RTOR Reduction (vph)	0	50	0	0	24	0	0	0	0	0	3	0
Lane Group Flow (vph)	55	15	0	13	15	0	134	1581	0	54	850	0
Heavy Vehicles (%)	2%	10%	2%	0%	20%	0%	0%	1%	0%	0%	1%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	7.7	7.7		7.7	7.7		60.6	60.6		51.2	51.2	
Effective Green, g (s)	7.7	7.7		7.7	7.7		60.6	60.6		51.2	51.2	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.74	0.74		0.63	0.63	
Clearance Time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	126	149		126	149		494	2673		180	2242	
v/s Ratio Prot		0.01			0.01		0.02	c0.44			0.24	
v/s Ratio Perm	c0.04			0.01			0.18			0.19		
v/c Ratio	0.44	0.10		0.10	0.10		0.27	0.59		0.30	0.38	
Uniform Delay, d1	35.0	33.9		33.9	33.9		3.3	4.9		7.0	7.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	0.3		0.4	0.3		0.3	1.0		4.2	0.5	
Delay (s)	37.4	34.2		34.3	34.2		3.6	5.9		11.3	8.0	
Level of Service	D	C		C	C		A	A		B	A	
Approach Delay (s)		35.7			34.2			5.7			8.2	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	81.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	109.7%	ICU Level of Service	H
Analysis Period (min)	15		

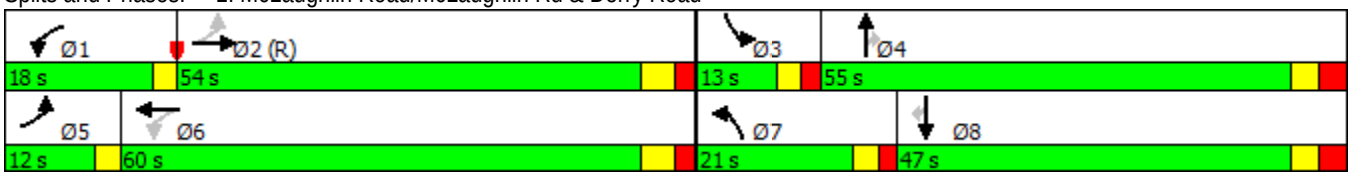
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	876	105	211	2009	331	257	1223	116	156	610	166
Future Volume (vph)	196	876	105	211	2009	331	257	1223	116	156	610	166
Lane Group Flow (vph)	196	876	105	211	2009	331	257	1223	116	156	610	166
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	54.0		18.0	60.0		21.0	55.0	55.0	13.0	47.0	47.0
Total Split (%)	8.6%	38.6%		12.9%	42.9%		15.0%	39.3%	39.3%	9.3%	33.6%	33.6%
Yellow Time (s)	2.6	3.6		2.6	3.6		2.6	3.0	3.0	2.6	3.0	3.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	-2.0	-1.0		-1.0	-2.0		-1.0	-2.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	0.6	4.8		1.6	3.8		3.6	4.1	5.1	3.6	5.1	5.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	0.98	0.50	0.07	0.60	0.96	0.21	0.66	0.95	0.19	0.68	0.56	0.28
Control Delay	92.7	36.0	0.1	27.5	53.8	0.3	68.1	59.8	8.7	79.1	43.0	8.0
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	92.7	36.0	0.1	27.5	53.8	0.3	68.1	59.8	8.7	79.1	43.0	8.0
Queue Length 50th (m)	40.8	73.2	0.0	33.8	207.6	0.0	37.3	181.8	3.4	23.3	78.8	2.7
Queue Length 95th (m)	#94.3	88.0	0.0	50.8	#244.2	0.0	52.4	#229.5	17.2	#37.0	99.7	20.2
Internal Link Dist (m)		899.9			373.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	201	1767	1581	365	2084	1581	426	1285	626	230	1094	595
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	0.98	0.50	0.07	0.58	0.96	0.21	0.60	0.95	0.19	0.68	0.56	0.28

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 1.4 (1%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	876	105	211	2009	331	257	1223	116	156	610	166
Future Volume (vph)	196	876	105	211	2009	331	257	1223	116	156	610	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	0.6	4.8	3.0	1.6	3.8	3.0	3.6	4.1	5.1	3.6	5.1	5.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	4856	1581	1785	5193	1581	3429	3535	1581	3429	3535	1581
Flt Permitted	0.08	1.00	1.00	0.22	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	143	4856	1581	406	5193	1581	3429	3535	1581	3429	3535	1581
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)	196	876	105	211	2009	331	257	1223	116	156	610	166
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	63	0	0	106
Lane Group Flow (vph)	196	876	105	211	2009	331	257	1223	53	156	610	60
Heavy Vehicles (%)	1%	8%	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	59.4	49.9	140.0	66.3	54.2	140.0	14.8	48.8	48.8	8.4	42.4	42.4
Effective Green, g (s)	63.4	50.9	140.0	67.3	56.2	140.0	15.8	50.8	49.8	9.4	43.4	43.4
Actuated g/C Ratio	0.45	0.36	1.00	0.48	0.40	1.00	0.11	0.36	0.36	0.07	0.31	0.31
Clearance Time (s)	2.6	5.8		2.6	5.8		4.6	6.1	6.1	4.6	6.1	6.1
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)	198	1765	1581	340	2084	1581	386	1282	562	230	1095	490
v/s Ratio Prot	c0.08	0.18		c0.07	c0.39		c0.07	c0.35		0.05	0.17	
v/s Ratio Perm	0.37		0.07	0.23		0.21			0.03			0.04
v/c Ratio	0.99	0.50	0.07	0.62	0.96	0.21	0.67	0.95	0.09	0.68	0.56	0.12
Uniform Delay, d1	41.3	34.6	0.0	22.9	40.9	0.0	59.6	43.5	30.1	63.8	40.3	34.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	60.4	1.0	0.1	3.5	12.3	0.3	4.3	15.4	0.1	7.7	0.6	0.1
Delay (s)	101.7	35.6	0.1	26.4	53.2	0.3	63.9	58.8	30.1	71.5	40.9	34.8
Level of Service	F	D	A	C	D	A	E	E	C	E	D	C
Approach Delay (s)		43.4			44.1			57.6			44.9	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	47.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		

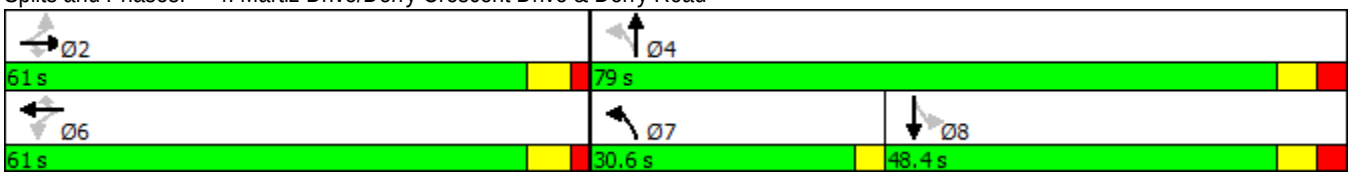
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	24	1245	50	20	2201	8	533	366	73	74
Future Volume (vph)	24	1245	50	20	2201	8	533	366	73	74
Lane Group Flow (vph)	24	1245	50	20	2201	8	533	507	73	163
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases		2			6		7	4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	7	4	8	8
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	5.0	8.0	8.0	8.0
Minimum Split (s)	37.6	37.6	37.6	37.6	37.6	37.6	8.0	48.4	48.4	48.4
Total Split (s)	61.0	61.0	61.0	61.0	61.0	61.0	30.6	79.0	48.4	48.4
Total Split (%)	43.6%	43.6%	43.6%	43.6%	43.6%	43.6%	21.9%	56.4%	34.6%	34.6%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4	7.4	7.4
Lead/Lag							Lead		Lag	Lag
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.40	0.53	0.07	0.15	0.89	0.01	0.85	0.37	0.65	0.33
Control Delay	45.7	22.4	4.2	22.3	33.1	0.0	40.7	24.0	72.1	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.7	22.4	4.2	22.3	33.1	0.0	40.7	24.0	72.1	28.7
Queue Length 50th (m)	3.5	72.1	0.0	2.6	165.8	0.0	98.5	42.1	16.5	11.3
Queue Length 95th (m)	#17.2	98.3	6.2	9.1	#230.6	0.0	#143.4	55.6	32.7	21.5
Internal Link Dist (m)		621.8			523.2			624.4		634.6
Turn Bay Length (m)	110.0		30.0	65.0		35.0	100.0		95.0	
Base Capacity (vph)	60	2364	750	136	2481	793	624	2162	314	1246
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	0.40	0.53	0.07	0.15	0.89	0.01	0.85	0.23	0.23	0.13

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 114.1
Natural Cycle: 105
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Martiz Drive/Derry Crescent Drive & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1245	50	20	2201	8	533	366	141	73	74	89
Future Volume (vph)	24	1245	50	20	2201	8	533	366	141	73	74	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1653	4948	1507	1700	5193	1597	1767	3431		1785	3351	
Flt Permitted	0.07	1.00	1.00	0.16	1.00	1.00	0.54	1.00		0.47	1.00	
Satd. Flow (perm)	128	4948	1507	285	5193	1597	1005	3431		875	3351	
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)	24	1245	50	20	2201	8	533	366	141	73	74	89
RTOR Reduction (vph)	0	0	26	0	0	4	0	8	0	0	54	0
Lane Group Flow (vph)	24	1245	24	20	2201	4	533	499	0	73	109	0
Heavy Vehicles (%)	8%	6%	6%	5%	1%	0%	1%	0%	7%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	54.5	54.5	54.5	54.5	54.5	54.5	45.6	45.6		14.9	14.9	
Effective Green, g (s)	54.5	54.5	54.5	54.5	54.5	54.5	45.6	45.6		14.9	14.9	
Actuated g/C Ratio	0.48	0.48	0.48	0.48	0.48	0.48	0.40	0.40		0.13	0.13	
Clearance Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
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)	61	2363	719	136	2480	762	586	1371		114	437	
v/s Ratio Prot		0.25			c0.42		c0.22	0.15			0.03	
v/s Ratio Perm	0.19		0.02	0.07		0.00	c0.14			0.08		
v/c Ratio	0.39	0.53	0.03	0.15	0.89	0.01	0.91	0.36		0.64	0.25	
Uniform Delay, d1	19.2	20.8	15.8	16.7	27.0	15.6	29.7	24.1		47.1	44.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.0	0.8	0.1	0.5	4.3	0.0	18.0	0.2		11.6	0.3	
Delay (s)	37.1	21.6	15.9	17.2	31.3	15.6	47.7	24.2		58.7	44.9	
Level of Service	D	C	B	B	C	B	D	C		E	D	
Approach Delay (s)		21.7			31.1			36.3			49.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	114.1	Sum of lost time (s)	17.0
Intersection Capacity Utilization	93.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX E

Intersection Capacity Analysis Reports

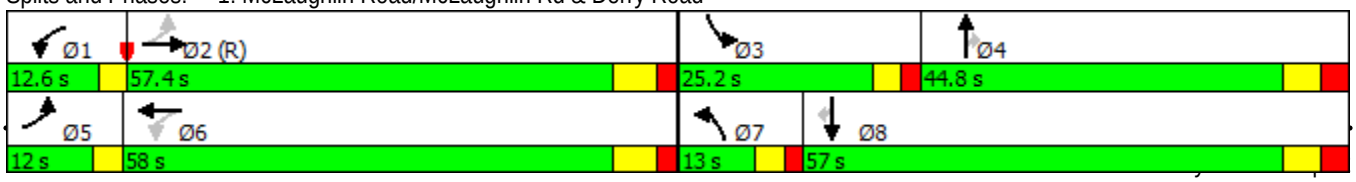
Future (2022) Total Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1799	453	230	828	83	107	598	175	241	1315	94
Future Volume (vph)	105	1799	453	230	828	83	107	598	175	241	1315	94
Lane Group Flow (vph)	105	1799	453	230	828	83	107	598	175	241	1315	94
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	57.4		12.6	58.0		13.0	44.8	44.8	25.2	57.0	57.0
Total Split (%)	8.6%	41.0%		9.0%	41.4%		9.3%	32.0%	32.0%	18.0%	40.7%	40.7%
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	0.35	0.97	0.29	1.31	0.47	0.05	0.55	0.57	0.32	0.65	1.05	0.15
Control Delay	23.8	58.5	0.5	201.3	35.1	0.1	75.5	44.1	12.9	68.2	84.4	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	58.5	0.5	201.3	35.1	0.1	75.5	44.1	12.9	68.2	84.4	6.6
Queue Length 50th (m)	16.6	187.9	0.0	~68.6	67.5	0.0	15.9	77.3	9.2	35.3	~220.0	0.4
Queue Length 95th (m)	28.2	#223.4	0.0	#124.4	81.1	0.0	26.4	102.0	30.1	48.5	#264.5	12.9
Internal Link Dist (m)		899.9			188.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	302	1858	1566	176	1751	1521	194	1046	554	489	1247	622
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	0.35	0.97	0.29	1.31	0.47	0.05	0.55	0.57	0.32	0.49	1.05	0.15

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 145
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: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1799	453	230	828	83	107	598	175	241	1315	94
Future Volume (vph)	105	1799	453	230	828	83	107	598	175	241	1315	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	3.0	6.8	4.0	3.0	6.8	4.0	5.0	7.1	7.1	5.0	7.1	7.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	5142	1566	1750	4768	1521	3395	3433	1521	3395	3500	1581
Flt Permitted	0.26	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	485	5142	1566	143	4768	1521	3395	3433	1521	3395	3500	1581
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)	105	1799	453	230	828	83	107	598	175	241	1315	94
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	91	0	0	59
Lane Group Flow (vph)	105	1799	453	230	828	83	107	598	84	241	1315	35
Heavy Vehicles (%)	1%	2%	2%	2%	10%	5%	2%	4%	5%	2%	2%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	59.4	50.6	140.0	61.0	51.4	140.0	8.0	42.7	42.7	15.2	49.9	49.9
Effective Green, g (s)	59.4	50.6	140.0	61.0	51.4	140.0	8.0	42.7	42.7	15.2	49.9	49.9
Actuated g/C Ratio	0.42	0.36	1.00	0.44	0.37	1.00	0.06	0.31	0.31	0.11	0.36	0.36
Clearance Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
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)	286	1858	1566	172	1750	1521	194	1047	463	368	1247	563
v/s Ratio Prot	0.02	0.35		c0.09	0.17		0.03	0.17		c0.07	c0.38	
v/s Ratio Perm	0.13		0.29	c0.49		0.05			0.06			0.02
v/c Ratio	0.37	0.97	0.29	1.34	0.47	0.05	0.55	0.57	0.18	0.65	1.05	0.06
Uniform Delay, d1	25.1	43.9	0.0	38.7	33.9	0.0	64.3	40.9	35.8	59.9	45.0	29.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	14.6	0.5	185.7	0.2	0.1	3.4	0.8	0.2	4.2	41.2	0.0
Delay (s)	25.9	58.5	0.5	224.3	34.1	0.1	67.6	41.7	36.0	64.0	86.2	29.7
Level of Service	C	E	A	F	C	A	E	D	D	E	F	C
Approach Delay (s)		45.9			70.0			43.7			79.8	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	59.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.9
Intersection Capacity Utilization	109.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	2200	15	0	1135	0	46
Future Volume (Veh/h)	2200	15	0	1135	0	46
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2200	15	0	1135	0	46
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	213			185		
pX, platoon unblocked			0.66		0.71	0.66
vC, conflicting volume			2215		2578	733
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1021		808	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	94
cM capacity (veh/h)			444		226	712

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1
Volume Total	733	733	733	15	378	378	378	46
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	15	0	0	0	46
cSH	1700	1700	1700	1700	1700	1700	1700	712
Volume to Capacity	0.43	0.43	0.43	0.01	0.22	0.22	0.22	0.06
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.4
Lane LOS								B
Approach Delay (s)	0.0				0.0			10.4
Approach LOS								B

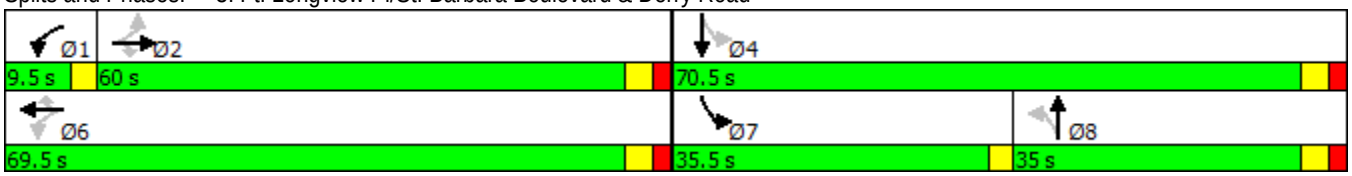
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	49	2193	26	69	962	43	35	0	574	0
Future Volume (vph)	49	2193	26	69	962	43	35	0	574	0
Lane Group Flow (vph)	49	2193	26	69	962	43	35	38	574	121
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2		1	6			8	7	4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	2	2	2	1	6	6	8	8	7	4
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	5.0	12.0	12.0	8.0	8.0	8.0	8.0
Minimum Split (s)	28.0	28.0	28.0	7.6	28.0	28.0	35.0	35.0	10.6	35.0
Total Split (s)	60.0	60.0	60.0	9.5	69.5	69.5	35.0	35.0	35.5	70.5
Total Split (%)	42.9%	42.9%	42.9%	6.8%	49.6%	49.6%	25.0%	25.0%	25.4%	50.4%
Yellow Time (s)	3.0	3.0	3.0	2.6	3.0	3.0	3.0	3.0	2.6	3.0
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	2.6	5.0	5.0	5.0	5.0	2.6	5.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.21	0.88	0.03	0.40	0.36	0.05	0.33	0.15	0.97	0.20
Control Delay	23.1	32.9	0.7	19.5	15.4	5.5	60.7	1.3	64.4	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	32.9	0.7	19.5	15.4	5.5	60.7	1.3	64.4	12.9
Queue Length 50th (m)	7.0	180.7	0.0	7.3	47.1	0.8	8.3	0.0	124.9	8.5
Queue Length 95th (m)	17.3	#232.1	1.3	15.4	61.2	6.7	19.5	0.0	#172.0	21.7
Internal Link Dist (m)		161.0			621.8			172.5		772.6
Turn Bay Length (m)	50.0		30.0	30.0		25.0	45.0		95.0	
Base Capacity (vph)	233	2505	816	176	2777	893	343	525	619	947
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	0.21	0.88	0.03	0.39	0.35	0.05	0.10	0.07	0.93	0.13

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 113.4
Natural Cycle: 105
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Ft. Longview Pl/St. Barbara Boulevard & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	2193	26	69	962	43	35	0	38	574	0	121
Future Volume (vph)	49	2193	26	69	962	43	35	0	38	574	0	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.7	3.7	3.5	3.7	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	5.0	5.0	5.0	2.6	5.0	5.0	5.0	5.0		2.6	5.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	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	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1580	5092	1601	1789	4812	1521	1789	1601		1767	1570	
Flt Permitted	0.29	1.00	1.00	0.07	1.00	1.00	0.68	1.00		0.54	1.00	
Satd. Flow (perm)	475	5092	1601	129	4812	1521	1279	1601		1008	1570	
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)	49	2193	26	69	962	43	35	0	38	574	0	121
RTOR Reduction (vph)	0	0	13	0	0	16	0	36	0	0	43	0
Lane Group Flow (vph)	49	2193	13	69	962	27	35	2	0	574	78	0
Heavy Vehicles (%)	13%	3%	2%	2%	9%	5%	2%	2%	2%	1%	2%	4%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	55.8	55.8	55.8	63.6	63.6	63.6	7.4	7.4		41.5	41.5	
Effective Green, g (s)	55.8	55.8	55.8	63.6	63.6	63.6	7.4	7.4		41.5	41.5	
Actuated g/C Ratio	0.48	0.48	0.48	0.55	0.55	0.55	0.06	0.06		0.36	0.36	
Clearance Time (s)	5.0	5.0	5.0	2.6	5.0	5.0	5.0	5.0		2.6	5.0	
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)	230	2468	776	146	2658	840	82	102		571	566	
v/s Ratio Prot		c0.43		c0.02	0.20			0.00		c0.27	0.05	
v/s Ratio Perm	0.10		0.01	0.24		0.02	0.03			c0.09		
v/c Ratio	0.21	0.89	0.02	0.47	0.36	0.03	0.43	0.02		1.01	0.14	
Uniform Delay, d1	17.0	26.8	15.4	22.1	14.4	11.7	51.8	50.5		35.2	24.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	5.3	0.0	2.4	0.1	0.0	3.5	0.1		39.0	0.1	
Delay (s)	19.1	32.1	15.4	24.6	14.5	11.7	55.4	50.6		74.1	24.9	
Level of Service	B	C	B	C	B	B	E	D		E	C	
Approach Delay (s)		31.6			15.0			52.9			65.6	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	115.1	Sum of lost time (s)	15.2
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		

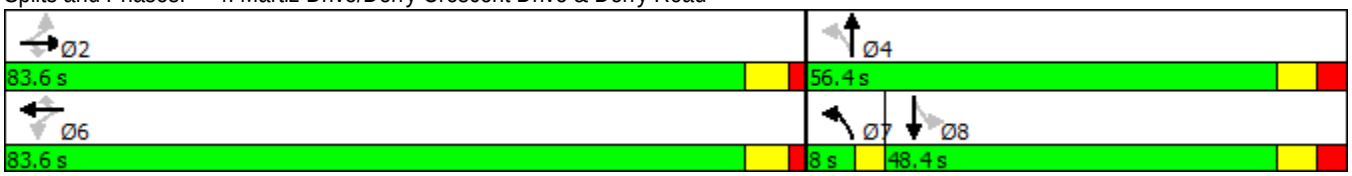
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	193	1953	650	74	1014	49	35	87	9	103
Future Volume (vph)	193	1953	650	74	1014	49	35	87	9	103
Lane Group Flow (vph)	193	1953	650	74	1014	49	35	107	9	128
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases		2			6		7	4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	7	4	8	8
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	5.0	8.0	8.0	8.0
Minimum Split (s)	37.6	37.6	37.6	37.6	37.6	37.6	8.0	48.4	48.4	48.4
Total Split (s)	83.6	83.6	83.6	83.6	83.6	83.6	8.0	56.4	48.4	48.4
Total Split (%)	59.7%	59.7%	59.7%	59.7%	59.7%	59.7%	5.7%	40.3%	34.6%	34.6%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4	7.4	7.4
Lead/Lag							Lead		Lag	Lag
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.52	0.52	0.53	0.72	0.29	0.04	0.20	0.23	0.08	0.40
Control Delay	13.2	7.0	5.6	51.9	5.3	1.2	38.5	38.4	47.2	42.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	7.0	5.6	51.9	5.3	1.2	38.5	38.4	47.2	42.1
Queue Length 50th (m)	17.2	63.8	32.0	8.5	25.8	0.0	6.4	10.1	1.9	11.8
Queue Length 95th (m)	41.9	81.1	60.8	#42.7	34.7	2.8	15.5	18.4	7.0	21.7
Internal Link Dist (m)		621.8			523.2			624.4		634.6
Turn Bay Length (m)	110.0		30.0	65.0		35.0	100.0		95.0	
Base Capacity (vph)	370	3725	1232	103	3490	1195	176	1616	497	1374
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	0.52	0.52	0.53	0.72	0.29	0.04	0.20	0.07	0.02	0.09

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 106.1
Natural Cycle: 145
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Martiz Drive/Derry Crescent Drive & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	1953	650	74	1014	49	35	87	20	9	103	25
Future Volume (vph)	193	1953	650	74	1014	49	35	87	20	9	103	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	5043	1581	1594	4725	1597	1566	3487		1785	3516	
Flt Permitted	0.27	1.00	1.00	0.08	1.00	1.00	0.50	1.00		0.68	1.00	
Satd. Flow (perm)	502	5043	1581	141	4725	1597	829	3487		1286	3516	
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)	193	1953	650	74	1014	49	35	87	20	9	103	25
RTOR Reduction (vph)	0	0	67	0	0	13	0	7	0	0	20	0
Lane Group Flow (vph)	193	1953	583	74	1014	36	35	100	0	9	108	0
Heavy Vehicles (%)	0%	4%	1%	12%	11%	0%	14%	1%	5%	0%	0%	4%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	78.4	78.4	78.4	78.4	78.4	78.4	14.9	14.9		9.0	9.0	
Effective Green, g (s)	78.4	78.4	78.4	78.4	78.4	78.4	14.9	14.9		9.0	9.0	
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.73	0.73	0.14	0.14		0.08	0.08	
Clearance Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
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)	366	3684	1155	103	3452	1166	135	484		107	294	
v/s Ratio Prot		0.39			0.21		c0.01	0.03			c0.03	
v/s Ratio Perm	0.38		0.37	c0.53		0.02	0.03			0.01		
v/c Ratio	0.53	0.53	0.51	0.72	0.29	0.03	0.26	0.21		0.08	0.37	
Uniform Delay, d1	6.3	6.4	6.2	8.2	5.0	4.0	40.7	41.0		45.3	46.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.4	0.5	1.6	21.2	0.0	0.0	1.0	0.2		0.3	0.8	
Delay (s)	11.7	6.9	7.7	29.4	5.0	4.0	41.8	41.2		45.7	47.2	
Level of Service	B	A	A	C	A	A	D	D		D	D	
Approach Delay (s)		7.4			6.5			41.3			47.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	107.3	Sum of lost time (s)	17.0
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		

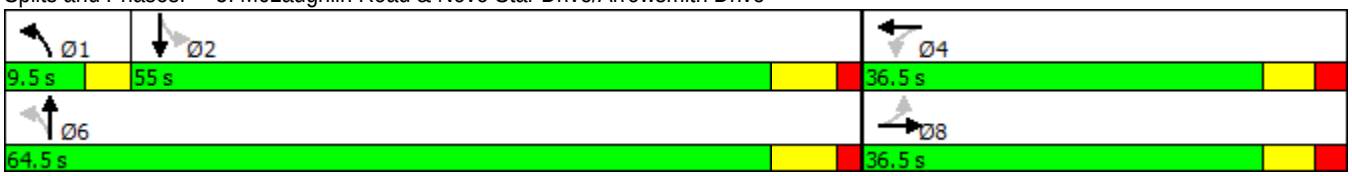
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	82	33	36	47	98	745	14	1884
Future Volume (vph)	82	33	36	47	98	745	14	1884
Lane Group Flow (vph)	82	260	36	97	98	754	14	1942
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		8		4	1	6		2
Permitted Phases	8		4		6		2	
Detector Phase	8	8	4	4	1	6	2	2
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	47.0	47.0	47.0
Minimum Split (s)	36.5	36.5	36.5	36.5	9.5	54.0	54.0	54.0
Total Split (s)	36.5	36.5	36.5	36.5	9.5	64.5	55.0	55.0
Total Split (%)	36.1%	36.1%	36.1%	36.1%	9.4%	63.9%	54.5%	54.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	3.5	7.0	7.0	7.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	Max
v/c Ratio	0.44	0.73	0.35	0.32	0.47	0.31	0.04	0.91
Control Delay	39.1	29.3	41.0	19.6	15.2	6.4	10.2	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	29.3	41.0	19.6	15.2	6.4	10.2	25.6
Queue Length 50th (m)	12.7	21.3	5.5	7.0	3.9	22.7	1.0	147.8
Queue Length 95th (m)	26.3	46.7	14.7	20.1	17.5	42.2	4.4	#252.5
Internal Link Dist (m)		285.8		306.4		289.1		287.3
Turn Bay Length (m)	21.0		21.0		45.0		45.0	
Base Capacity (vph)	425	652	230	619	209	2414	357	2127
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	0.19	0.40	0.16	0.16	0.47	0.31	0.04	0.91

Intersection Summary

Cycle Length: 101
Actuated Cycle Length: 84.5
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: McLaughlin Road & Novo Star Drive/Arrowsmith Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	33	227	36	47	50	98	745	9	14	1884	58
Future Volume (vph)	82	33	227	36	47	50	98	745	9	14	1884	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
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	0.92		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1638	1607		1785	1651		1716	3539		1566	3580	
Flt Permitted	0.69	1.00		0.34	1.00		0.07	1.00		0.37	1.00	
Satd. Flow (perm)	1197	1607		648	1651		135	3539		602	3580	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	82	33	227	36	47	50	98	745	9	14	1884	58
RTOR Reduction (vph)	0	105	0	0	42	0	0	1	0	0	2	0
Lane Group Flow (vph)	82	155	0	36	55	0	98	753	0	14	1940	0
Heavy Vehicles (%)	9%	6%	1%	0%	4%	6%	4%	3%	0%	14%	1%	18%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	13.3	13.3		13.3	13.3		58.4	58.4		50.2	50.2	
Effective Green, g (s)	13.3	13.3		13.3	13.3		58.4	58.4		50.2	50.2	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.69	0.69		0.59	0.59	
Clearance Time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	186	250		101	257		179	2425		354	2109	
v/s Ratio Prot		c0.10			0.03		c0.03	0.21			c0.54	
v/s Ratio Perm	0.07			0.06			0.34			0.02		
v/c Ratio	0.44	0.62		0.36	0.21		0.55	0.31		0.04	0.92	
Uniform Delay, d1	32.6	33.6		32.1	31.4		17.0	5.4		7.4	15.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	4.5		2.2	0.4		3.4	0.3		0.2	8.0	
Delay (s)	34.2	38.1		34.3	31.8		20.4	5.7		7.6	23.7	
Level of Service	C	D		C	C		C	A		A	C	
Approach Delay (s)		37.2			32.5			7.4			23.6	
Approach LOS		D			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	85.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	120.5%	ICU Level of Service	H
Analysis Period (min)	15		

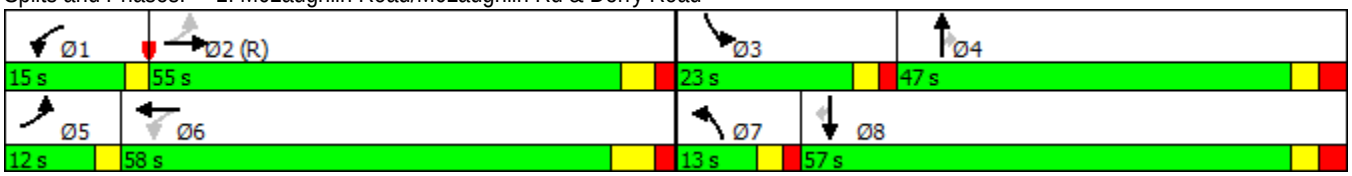
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1799	453	230	828	83	107	598	175	241	1315	94
Future Volume (vph)	105	1799	453	230	828	83	107	598	175	241	1315	94
Lane Group Flow (vph)	105	1799	453	230	828	83	107	598	175	241	1315	94
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	55.0		15.0	58.0		13.0	47.0	47.0	23.0	57.0	57.0
Total Split (%)	8.6%	39.3%		10.7%	41.4%		9.3%	33.6%	33.6%	16.4%	40.7%	40.7%
Yellow Time (s)	2.6	3.6		2.6	4.6		2.6	3.0	3.0	2.6	3.0	3.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	-1.0	-2.0		-2.0	-1.0		-1.0	-1.0	-1.0	-1.0	-2.0	-1.0
Total Lost Time (s)	1.6	3.8		0.6	5.8		3.6	5.1	5.1	3.6	4.1	5.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	0.33	0.96	0.29	0.97	0.46	0.05	0.48	0.54	0.30	0.62	0.99	0.14
Control Delay	22.6	56.1	0.5	87.6	34.1	0.1	70.3	41.5	10.4	66.1	66.3	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	56.1	0.5	87.6	34.1	0.1	70.3	41.5	10.4	66.1	66.3	4.4
Queue Length 50th (m)	16.3	186.4	0.0	49.9	66.7	0.0	15.7	75.3	6.7	35.0	199.8	0.0
Queue Length 95th (m)	27.6	#220.9	0.0	#105.2	80.1	0.0	26.1	98.5	26.1	48.5	#252.6	9.8
Internal Link Dist (m)		899.9			188.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	324	1880	1566	237	1791	1521	227	1110	588	470	1324	653
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	0.32	0.96	0.29	0.97	0.46	0.05	0.47	0.54	0.30	0.51	0.99	0.14

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1799	453	230	828	83	107	598	175	241	1315	94
Future Volume (vph)	105	1799	453	230	828	83	107	598	175	241	1315	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	1.6	3.8	3.0	0.6	5.8	3.0	3.6	5.1	5.1	3.6	4.1	5.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	5142	1566	1750	4768	1521	3395	3433	1521	3395	3500	1581
Flt Permitted	0.27	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	506	5142	1566	145	4768	1521	3395	3433	1521	3395	3500	1581
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)	105	1799	453	230	828	83	107	598	175	241	1315	94
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	96	0	0	59
Lane Group Flow (vph)	105	1799	453	230	828	83	107	598	79	241	1315	35
Heavy Vehicles (%)	1%	2%	2%	2%	10%	5%	2%	4%	5%	2%	2%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	58.2	49.2	140.0	63.2	51.6	140.0	8.3	44.3	44.3	15.0	51.0	51.0
Effective Green, g (s)	60.2	51.2	140.0	65.2	52.6	140.0	9.3	45.3	45.3	16.0	53.0	52.0
Actuated g/C Ratio	0.43	0.37	1.00	0.47	0.38	1.00	0.07	0.32	0.32	0.11	0.38	0.37
Clearance Time (s)	2.6	5.8		2.6	6.8		4.6	6.1	6.1	4.6	6.1	6.1
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)	307	1880	1566	232	1791	1521	225	1110	492	388	1325	587
v/s Ratio Prot	0.02	c0.35		c0.10	0.17		0.03	0.17		c0.07	c0.38	
v/s Ratio Perm	0.12		0.29	0.36		0.05			0.05			0.02
v/c Ratio	0.34	0.96	0.29	0.99	0.46	0.05	0.48	0.54	0.16	0.62	0.99	0.06
Uniform Delay, d1	24.5	43.3	0.0	43.5	33.0	0.0	63.0	38.8	33.8	59.1	43.3	28.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	12.8	0.5	56.5	0.2	0.1	1.6	0.5	0.2	3.1	22.8	0.0
Delay (s)	25.2	56.1	0.5	100.0	33.2	0.1	64.6	39.3	33.9	62.2	66.1	28.3
Level of Service	C	E	A	F	C	A	E	D	C	E	E	C
Approach Delay (s)		44.1			44.2			41.3			63.4	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	49.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.1
Intersection Capacity Utilization	103.9%	ICU Level of Service	G
Analysis Period (min)	15		

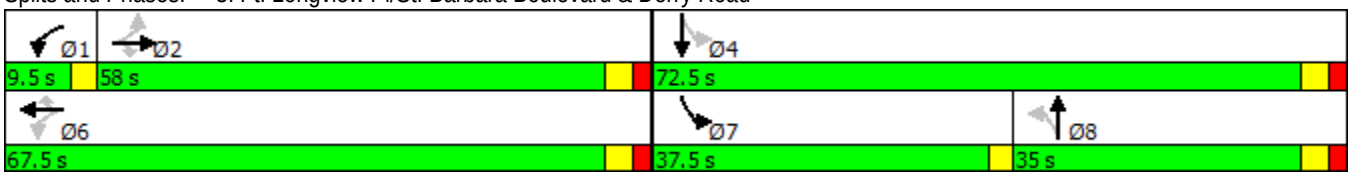
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	49	2193	26	69	962	43	35	0	574	0
Future Volume (vph)	49	2193	26	69	962	43	35	0	574	0
Lane Group Flow (vph)	49	2193	26	69	962	43	35	38	574	121
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2		1	6			8	7	4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	2	2	2	1	6	6	8	8	7	4
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	5.0	12.0	12.0	8.0	8.0	8.0	8.0
Minimum Split (s)	28.0	28.0	28.0	9.5	28.0	28.0	35.0	35.0	10.6	35.0
Total Split (s)	58.0	58.0	58.0	9.5	67.5	67.5	35.0	35.0	37.5	72.5
Total Split (%)	41.4%	41.4%	41.4%	6.8%	48.2%	48.2%	25.0%	25.0%	26.8%	51.8%
Yellow Time (s)	3.0	3.0	3.0	2.6	3.0	3.0	3.0	3.0	2.6	3.0
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)	0.0	-2.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0
Total Lost Time (s)	5.0	3.0	5.0	2.6	5.0	5.0	5.0	5.0	0.6	5.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.22	0.87	0.03	0.40	0.37	0.05	0.33	0.14	0.85	0.20
Control Delay	24.6	32.4	0.8	20.2	16.4	5.9	60.5	1.1	42.7	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	32.4	0.8	20.2	16.4	5.9	60.5	1.1	42.7	13.2
Queue Length 50th (m)	7.2	180.7	0.0	7.6	49.0	0.8	8.3	0.0	117.3	9.2
Queue Length 95th (m)	17.8	#232.1	1.3	15.9	63.5	7.0	19.5	0.0	163.5	22.1
Internal Link Dist (m)		161.0			621.8			172.5		772.6
Turn Bay Length (m)	50.0		30.0	30.0		25.0	45.0		95.0	
Base Capacity (vph)	226	2525	794	178	2712	873	346	545	714	979
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	0.22	0.87	0.03	0.39	0.35	0.05	0.10	0.07	0.80	0.12

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 112.9
Natural Cycle: 105
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Ft. Longview Pl/St. Barbara Boulevard & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	2193	26	69	962	43	35	0	38	574	0	121
Future Volume (vph)	49	2193	26	69	962	43	35	0	38	574	0	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.7	3.7	3.5	3.7	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	5.0	3.0	5.0	2.6	5.0	5.0	5.0	5.0		0.6	5.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	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	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1580	5092	1601	1789	4812	1521	1789	1601		1767	1570	
Flt Permitted	0.29	1.00	1.00	0.07	1.00	1.00	0.68	1.00		0.69	1.00	
Satd. Flow (perm)	474	5092	1601	133	4812	1521	1279	1601		1280	1570	
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)	49	2193	26	69	962	43	35	0	38	574	0	121
RTOR Reduction (vph)	0	0	14	0	0	17	0	36	0	0	38	0
Lane Group Flow (vph)	49	2193	12	69	962	26	35	2	0	574	83	0
Heavy Vehicles (%)	13%	3%	2%	2%	9%	5%	2%	2%	2%	1%	2%	4%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	54.0	54.0	54.0	61.8	61.8	61.8	7.3	7.3		42.8	42.8	
Effective Green, g (s)	54.0	56.0	54.0	61.8	61.8	61.8	7.3	7.3		44.8	42.8	
Actuated g/C Ratio	0.47	0.49	0.47	0.54	0.54	0.54	0.06	0.06		0.39	0.37	
Clearance Time (s)	5.0	5.0	5.0	2.6	5.0	5.0	5.0	5.0		2.6	5.0	
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)	223	2488	754	146	2594	820	81	101		648	586	
v/s Ratio Prot		c0.43		c0.02	0.20			0.00		c0.27	0.05	
v/s Ratio Perm	0.10		0.01	0.23		0.02	0.03			0.08		
v/c Ratio	0.22	0.88	0.02	0.47	0.37	0.03	0.43	0.02		0.89	0.14	
Uniform Delay, d1	17.9	26.3	16.1	23.2	15.2	12.4	51.7	50.3		31.5	23.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	4.9	0.0	2.4	0.1	0.0	3.7	0.1		13.7	0.1	
Delay (s)	20.1	31.2	16.2	25.6	15.3	12.4	55.3	50.4		45.2	23.9	
Level of Service	C	C	B	C	B	B	E	D		D	C	
Approach Delay (s)		30.8			15.8			52.8			41.5	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	114.6	Sum of lost time (s)	11.2
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		

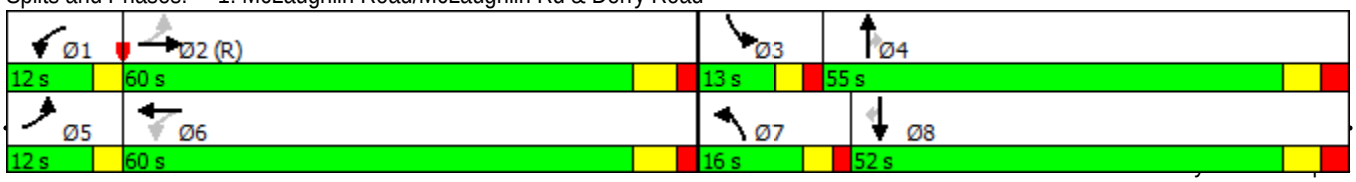
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	854	105	213	1952	334	257	1223	155	160	610	166
Future Volume (vph)	196	854	105	213	1952	334	257	1223	155	160	610	166
Lane Group Flow (vph)	196	854	105	213	1952	334	257	1223	155	160	610	166
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	60.0		12.0	60.0		16.0	55.0	55.0	13.0	52.0	52.0
Total Split (%)	8.6%	42.9%		8.6%	42.9%		11.4%	39.3%	39.3%	9.3%	37.1%	37.1%
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	1.15	0.46	0.07	0.70	0.99	0.21	0.96	1.01	0.26	0.82	0.54	0.28
Control Delay	146.6	33.7	0.1	35.4	60.8	0.3	108.1	74.2	15.0	95.6	41.2	9.0
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	146.6	33.7	0.1	35.4	60.8	0.3	108.1	74.2	15.0	95.6	41.2	9.0
Queue Length 50th (m)	~49.4	68.1	0.0	35.0	205.6	0.0	39.1	~191.6	12.6	24.2	76.8	4.8
Queue Length 95th (m)	#102.2	81.5	0.0	52.5	#244.1	0.0	#67.7	#241.6	30.2	#43.9	96.5	22.2
Internal Link Dist (m)		899.9			188.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	170	1845	1581	306	1973	1581	269	1209	601	195	1133	603
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	1.15	0.46	0.07	0.70	0.99	0.21	0.96	1.01	0.26	0.82	0.54	0.28

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 1.4 (1%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 145
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: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	854	105	213	1952	334	257	1223	155	160	610	166
Future Volume (vph)	196	854	105	213	1952	334	257	1223	155	160	610	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	3.0	6.8	4.0	3.0	6.8	4.0	5.0	7.1	7.1	5.0	7.1	7.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	4856	1581	1785	5193	1581	3429	3535	1581	3429	3535	1581
Flt Permitted	0.08	1.00	1.00	0.25	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	140	4856	1581	471	5193	1581	3429	3535	1581	3429	3535	1581
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)	196	854	105	213	1952	334	257	1223	155	160	610	166
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	61	0	0	96
Lane Group Flow (vph)	196	854	105	213	1952	334	257	1223	94	160	610	70
Heavy Vehicles (%)	1%	8%	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	62.2	53.2	140.0	62.2	53.2	140.0	11.0	47.9	47.9	8.0	44.9	44.9
Effective Green, g (s)	62.2	53.2	140.0	62.2	53.2	140.0	11.0	47.9	47.9	8.0	44.9	44.9
Actuated g/C Ratio	0.44	0.38	1.00	0.44	0.38	1.00	0.08	0.34	0.34	0.06	0.32	0.32
Clearance Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
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)	166	1845	1581	293	1973	1581	269	1209	540	195	1133	507
v/s Ratio Prot	c0.08	0.18		0.05	0.38		c0.07	c0.35		0.05	0.17	
v/s Ratio Perm	c0.45		0.07	0.28		c0.21			0.06			0.04
v/c Ratio	1.18	0.46	0.07	0.73	0.99	0.21	0.96	1.01	0.17	0.82	0.54	0.14
Uniform Delay, d1	38.5	32.7	0.0	26.9	43.1	0.0	64.3	46.0	32.2	65.3	39.0	33.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	126.8	0.8	0.1	8.7	17.6	0.3	42.4	28.8	0.2	23.3	0.5	0.1
Delay (s)	165.3	33.5	0.1	35.6	60.7	0.3	106.6	74.8	32.4	88.6	39.5	33.9
Level of Service	F	C	A	D	E	A	F	E	C	F	D	C
Approach Delay (s)		52.8			50.5			75.8			46.9	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	57.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.9
Intersection Capacity Utilization	108.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1123	46	0	2446	0	26
Future Volume (Veh/h)	1123	46	0	2446	0	26
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1123	46	0	2446	0	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	213			185		
pX, platoon unblocked			0.88		0.73	0.88
vC, conflicting volume			1169		1938	374
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			709		0	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	97
cM capacity (veh/h)			778		751	953

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1
Volume Total	374	374	374	46	815	815	815	26
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	46	0	0	0	26
cSH	1700	1700	1700	1700	1700	1700	1700	953
Volume to Capacity	0.22	0.22	0.22	0.03	0.48	0.48	0.48	0.03
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9
Lane LOS								A
Approach Delay (s)	0.0				0.0			8.9
Approach LOS								A

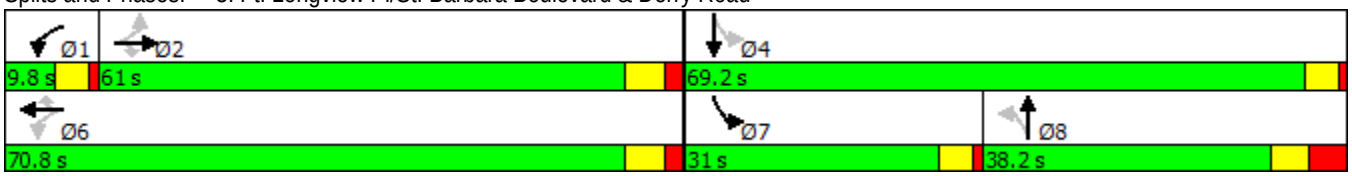
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	62	1056	21	116	2341	519	79	0	87	0
Future Volume (vph)	62	1056	21	116	2341	519	79	0	87	0
Lane Group Flow (vph)	62	1056	21	116	2341	519	79	103	87	21
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2		1	6			8	7	4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	2	2	2	1	6	6	8	8	7	4
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	5.0	12.0	12.0	8.0	8.0	5.0	5.0
Minimum Split (s)	29.3	29.3	29.3	9.5	29.3	29.3	38.1	38.1	9.5	22.5
Total Split (s)	61.0	61.0	61.0	9.8	70.8	70.8	38.2	38.2	31.0	69.2
Total Split (%)	43.6%	43.6%	43.6%	7.0%	50.6%	50.6%	27.3%	27.3%	22.1%	49.4%
Yellow Time (s)	4.2	4.2	4.2	3.5	4.2	4.2	4.0	4.0	3.5	3.5
All-Red Time (s)	2.1	2.1	2.1	1.0	2.1	2.1	4.1	4.1	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	8.1	8.1	4.5	4.5
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.87	0.40	0.02	0.36	0.72	0.50	0.51	0.22	0.26	0.04
Control Delay	107.2	16.2	0.0	12.0	16.2	11.1	57.4	1.1	29.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	107.2	16.2	0.0	12.0	16.2	11.1	57.4	1.1	29.9	0.2
Queue Length 50th (m)	11.4	48.7	0.0	9.1	120.9	43.6	16.4	0.0	14.1	0.0
Queue Length 95th (m)	#44.3	71.3	0.0	20.6	175.0	87.2	33.3	0.0	26.5	0.0
Internal Link Dist (m)		161.0			621.8			88.0		772.6
Turn Bay Length (m)	50.0		30.0	30.0		25.0	45.0		95.0	
Base Capacity (vph)	71	2636	904	325	3263	1047	410	699	479	1051
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	0.87	0.40	0.02	0.36	0.72	0.50	0.19	0.15	0.18	0.02

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 103.6
Natural Cycle: 90
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Ft. Longview Pl/St. Barbara Boulevard & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	1056	21	116	2341	519	79	0	103	87	0	21
Future Volume (vph)	62	1056	21	116	2341	519	79	0	103	87	0	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.7	3.7	3.5	3.7	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	6.3	6.3	6.3	4.5	6.3	6.3	8.1	8.1		4.5	4.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	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	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	4948	1601	1789	5193	1597	1789	1601		1700	1633	
Flt Permitted	0.07	1.00	1.00	0.21	1.00	1.00	0.74	1.00		0.53	1.00	
Satd. Flow (perm)	136	4948	1601	392	5193	1597	1401	1601		950	1633	
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)	62	1056	21	116	2341	519	79	0	103	87	0	21
RTOR Reduction (vph)	0	0	10	0	0	45	0	92	0	0	15	0
Lane Group Flow (vph)	62	1056	11	116	2341	474	79	11	0	87	6	0
Heavy Vehicles (%)	0%	6%	2%	2%	1%	0%	2%	2%	2%	5%	2%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	55.3	55.3	55.3	65.1	65.1	65.1	11.4	11.4		28.6	28.6	
Effective Green, g (s)	55.3	55.3	55.3	65.1	65.1	65.1	11.4	11.4		28.6	28.6	
Actuated g/C Ratio	0.53	0.53	0.53	0.62	0.62	0.62	0.11	0.11		0.27	0.27	
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	8.1	8.1		4.5	4.5	
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)	71	2618	847	315	3235	994	152	174		325	446	
v/s Ratio Prot		0.21		0.02	c0.45			0.01		c0.02	0.00	
v/s Ratio Perm	c0.46		0.01	0.21		0.30	c0.06			0.05		
v/c Ratio	0.87	0.40	0.01	0.37	0.72	0.48	0.52	0.06		0.27	0.01	
Uniform Delay, d1	21.5	14.7	11.7	8.8	13.5	10.6	44.0	41.8		29.2	27.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	75.3	0.5	0.0	0.7	0.8	0.4	3.0	0.2		0.4	0.0	
Delay (s)	96.8	15.2	11.7	9.5	14.3	10.9	46.9	41.9		29.6	27.7	
Level of Service	F	B	B	A	B	B	D	D		C	C	
Approach Delay (s)		19.6			13.6			44.1			29.2	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	104.5	Sum of lost time (s)	23.4
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

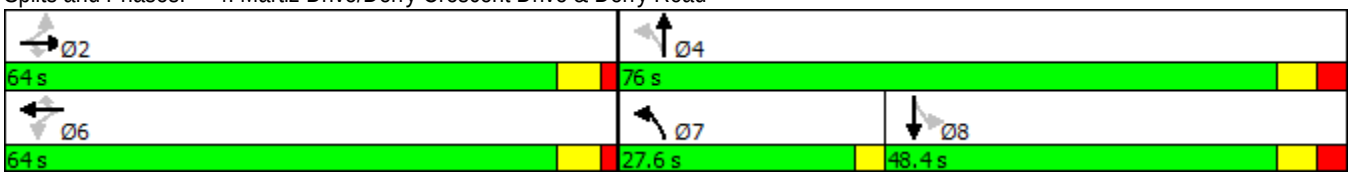
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	24	1232	50	20	2140	8	533	349	73	70
Future Volume (vph)	24	1232	50	20	2140	8	533	349	73	70
Lane Group Flow (vph)	24	1232	50	20	2140	8	533	490	73	159
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases		2			6		7	4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	7	4	8	8
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	5.0	8.0	8.0	8.0
Minimum Split (s)	37.6	37.6	37.6	37.6	37.6	37.6	8.0	48.4	48.4	48.4
Total Split (s)	64.0	64.0	64.0	64.0	64.0	64.0	27.6	76.0	48.4	48.4
Total Split (%)	45.7%	45.7%	45.7%	45.7%	45.7%	45.7%	19.7%	54.3%	34.6%	34.6%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4	7.4	7.4
Lead/Lag							Lead		Lag	Lag
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.39	0.49	0.06	0.13	0.82	0.01	0.92	0.38	0.64	0.34
Control Delay	43.0	20.0	3.8	19.7	27.7	0.0	52.5	25.8	71.6	31.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.0	20.0	3.8	19.7	27.7	0.0	52.5	25.8	71.6	31.9
Queue Length 50th (m)	3.3	66.8	0.0	2.4	148.4	0.0	103.5	41.9	16.4	12.2
Queue Length 95th (m)	#16.9	91.9	5.9	8.5	195.8	0.0	#168.7	55.9	32.6	22.5
Internal Link Dist (m)		621.8			523.2			624.4		634.6
Turn Bay Length (m)	110.0		30.0	65.0		35.0	100.0		95.0	
Base Capacity (vph)	61	2498	789	152	2622	835	577	2073	320	1238
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	0.39	0.49	0.06	0.13	0.82	0.01	0.92	0.24	0.23	0.13

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 113.9
Natural Cycle: 105
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Martiz Drive/Derry Crescent Drive & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1232	50	20	2140	8	533	349	141	73	70	89
Future Volume (vph)	24	1232	50	20	2140	8	533	349	141	73	70	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1653	4948	1507	1700	5193	1597	1767	3424		1785	3344	
Flt Permitted	0.07	1.00	1.00	0.17	1.00	1.00	0.54	1.00		0.47	1.00	
Satd. Flow (perm)	121	4948	1507	303	5193	1597	1006	3424		889	3344	
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)	24	1232	50	20	2140	8	533	349	141	73	70	89
RTOR Reduction (vph)	0	0	25	0	0	4	0	11	0	0	44	0
Lane Group Flow (vph)	24	1232	25	20	2140	4	533	479	0	73	115	0
Heavy Vehicles (%)	8%	6%	6%	5%	1%	0%	1%	0%	7%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	57.5	57.5	57.5	57.5	57.5	57.5	42.3	42.3		14.7	14.7	
Effective Green, g (s)	57.5	57.5	57.5	57.5	57.5	57.5	42.3	42.3		14.7	14.7	
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51	0.51	0.37	0.37		0.13	0.13	
Clearance Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
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)	61	2500	761	153	2623	806	538	1272		114	431	
v/s Ratio Prot		0.25			c0.41		c0.21	0.14			0.03	
v/s Ratio Perm	0.20		0.02	0.07		0.00	c0.15			0.08		
v/c Ratio	0.39	0.49	0.03	0.13	0.82	0.01	0.99	0.38		0.64	0.27	
Uniform Delay, d1	17.4	18.5	14.2	14.9	23.7	14.0	33.2	26.1		47.0	44.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.0	0.7	0.1	0.4	2.1	0.0	36.3	0.2		11.6	0.3	
Delay (s)	35.3	19.2	14.2	15.3	25.8	14.0	69.5	26.3		58.7	45.0	
Level of Service	D	B	B	B	C	B	E	C		E	D	
Approach Delay (s)		19.3			25.6			48.8			49.3	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	113.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		

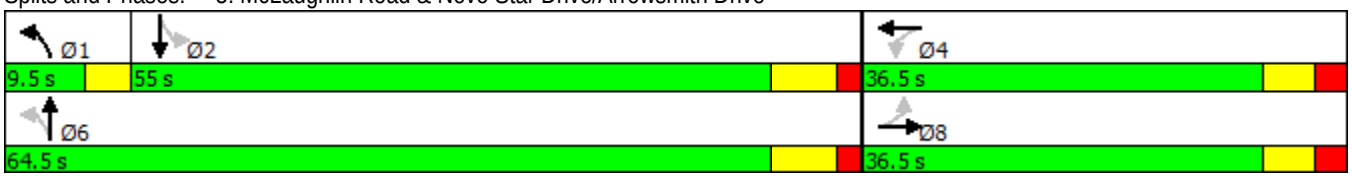
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	55	10	13	5	134	1606	54	808
Future Volume (vph)	55	10	13	5	134	1606	54	808
Lane Group Flow (vph)	55	65	13	39	134	1620	54	855
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		8		4	1	6		2
Permitted Phases	8		4		6		2	
Detector Phase	8	8	4	4	1	6	2	2
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	47.0	47.0	47.0
Minimum Split (s)	36.5	36.5	36.5	36.5	9.5	54.0	54.0	54.0
Total Split (s)	36.5	36.5	36.5	36.5	9.5	64.5	55.0	55.0
Total Split (%)	36.1%	36.1%	36.1%	36.1%	9.4%	63.9%	54.5%	54.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	3.5	7.0	7.0	7.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	Max
v/c Ratio	0.35	0.28	0.08	0.19	0.26	0.58	0.31	0.37
Control Delay	39.3	15.3	32.6	20.3	3.8	6.4	15.0	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.3	15.3	32.6	20.3	3.8	6.4	15.0	8.5
Queue Length 50th (m)	8.3	1.5	1.9	2.2	4.1	55.4	3.8	33.2
Queue Length 95th (m)	19.4	12.5	7.1	10.9	9.6	87.0	14.1	50.4
Internal Link Dist (m)		285.8		306.4		289.1		287.3
Turn Bay Length (m)	21.0		21.0		45.0		45.0	
Base Capacity (vph)	502	627	501	608	526	2782	173	2281
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	0.11	0.10	0.03	0.06	0.25	0.58	0.31	0.37

Intersection Summary

Cycle Length: 101
Actuated Cycle Length: 80.4
Natural Cycle: 100
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: McLaughlin Road & Novo Star Drive/Arrowsmith Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	10	55	13	5	34	134	1606	14	54	808	47
Future Volume (vph)	55	10	55	13	5	34	134	1606	14	54	808	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
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	1.00		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)	1750	1589		1785	1592		1785	3610		1785	3582	
Flt Permitted	0.73	1.00		0.71	1.00		0.29	1.00		0.15	1.00	
Satd. Flow (perm)	1348	1589		1343	1592		546	3610		273	3582	
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)	55	10	55	13	5	34	134	1606	14	54	808	47
RTOR Reduction (vph)	0	50	0	0	22	0	0	0	0	0	3	0
Lane Group Flow (vph)	55	15	0	13	17	0	134	1620	0	54	852	0
Heavy Vehicles (%)	2%	10%	2%	0%	20%	0%	0%	1%	0%	0%	1%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	7.7	7.7		7.7	7.7		60.6	60.6		51.2	51.2	
Effective Green, g (s)	7.7	7.7		7.7	7.7		60.6	60.6		51.2	51.2	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.74	0.74		0.63	0.63	
Clearance Time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	126	149		126	149		493	2674		170	2242	
v/s Ratio Prot		0.01			0.01		0.02	c0.45			0.24	
v/s Ratio Perm	c0.04			0.01			0.18			0.20		
v/c Ratio	0.44	0.10		0.10	0.12		0.27	0.61		0.32	0.38	
Uniform Delay, d1	35.0	33.9		33.9	33.9		3.3	5.0		7.1	7.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	0.3		0.4	0.3		0.3	1.0		4.9	0.5	
Delay (s)	37.4	34.2		34.3	34.3		3.6	6.0		12.0	8.0	
Level of Service	D	C		C	C		A	A		B	A	
Approach Delay (s)		35.7			34.3			5.8			8.2	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	81.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	110.8%	ICU Level of Service	H
Analysis Period (min)	15		

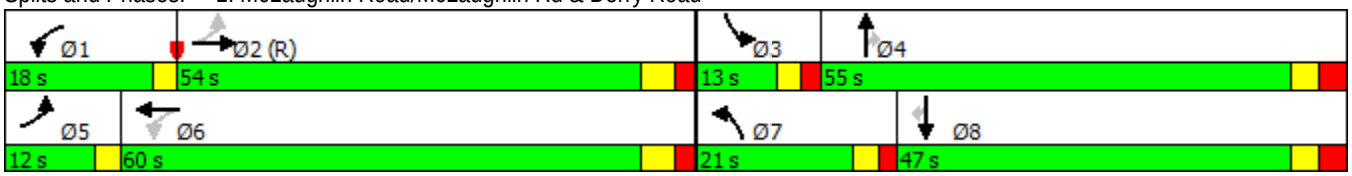
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	854	105	213	1952	334	257	1223	155	160	610	166
Future Volume (vph)	196	854	105	213	1952	334	257	1223	155	160	610	166
Lane Group Flow (vph)	196	854	105	213	1952	334	257	1223	155	160	610	166
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	54.0		18.0	60.0		21.0	55.0	55.0	13.0	47.0	47.0
Total Split (%)	8.6%	38.6%		12.9%	42.9%		15.0%	39.3%	39.3%	9.3%	33.6%	33.6%
Yellow Time (s)	2.6	3.6		2.6	3.6		2.6	3.0	3.0	2.6	3.0	3.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	-2.0	-1.0		-1.0	-2.0		-1.0	-2.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	0.6	4.8		1.6	3.8		3.6	4.1	5.1	3.6	5.1	5.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	0.98	0.48	0.07	0.60	0.94	0.21	0.66	0.95	0.25	0.70	0.56	0.28
Control Delay	93.0	35.8	0.1	27.1	49.9	0.3	68.1	59.8	13.4	80.1	43.0	8.0
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	93.0	35.8	0.1	27.1	49.9	0.3	68.1	59.8	13.4	80.1	43.0	8.0
Queue Length 50th (m)	40.8	71.0	0.0	34.2	198.0	0.0	37.3	181.8	11.1	23.9	78.8	2.7
Queue Length 95th (m)	#94.3	85.6	0.0	51.4	#222.2	0.0	52.4	#229.5	28.1	#38.6	99.7	20.2
Internal Link Dist (m)		899.9			188.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	201	1766	1581	372	2084	1581	426	1285	626	230	1094	595
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	0.98	0.48	0.07	0.57	0.94	0.21	0.60	0.95	0.25	0.70	0.56	0.28

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 1.4 (1%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	854	105	213	1952	334	257	1223	155	160	610	166
Future Volume (vph)	196	854	105	213	1952	334	257	1223	155	160	610	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	0.6	4.8	3.0	1.6	3.8	3.0	3.6	4.1	5.1	3.6	5.1	5.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	4856	1581	1785	5193	1581	3429	3535	1581	3429	3535	1581
Flt Permitted	0.08	1.00	1.00	0.22	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	143	4856	1581	422	5193	1581	3429	3535	1581	3429	3535	1581
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)	196	854	105	213	1952	334	257	1223	155	160	610	166
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	63	0	0	106
Lane Group Flow (vph)	196	854	105	213	1952	334	257	1223	92	160	610	60
Heavy Vehicles (%)	1%	8%	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	59.4	49.9	140.0	66.3	54.2	140.0	14.8	48.8	48.8	8.4	42.4	42.4
Effective Green, g (s)	63.4	50.9	140.0	67.3	56.2	140.0	15.8	50.8	49.8	9.4	43.4	43.4
Actuated g/C Ratio	0.45	0.36	1.00	0.48	0.40	1.00	0.11	0.36	0.36	0.07	0.31	0.31
Clearance Time (s)	2.6	5.8		2.6	5.8		4.6	6.1	6.1	4.6	6.1	6.1
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)	198	1765	1581	346	2084	1581	386	1282	562	230	1095	490
v/s Ratio Prot	c0.08	0.18		c0.06	0.38		c0.07	c0.35		0.05	0.17	
v/s Ratio Perm	c0.37		0.07	0.23		0.21			0.06			0.04
v/c Ratio	0.99	0.48	0.07	0.62	0.94	0.21	0.67	0.95	0.16	0.70	0.56	0.12
Uniform Delay, d1	41.2	34.4	0.0	22.8	40.2	0.0	59.6	43.5	30.9	63.9	40.3	34.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	60.4	1.0	0.1	3.2	8.7	0.3	4.3	15.4	0.1	8.8	0.6	0.1
Delay (s)	101.6	35.4	0.1	26.0	48.9	0.3	63.9	58.8	31.0	72.7	40.9	34.8
Level of Service	F	D	A	C	D	A	E	E	C	E	D	C
Approach Delay (s)		43.4			40.4			57.0			45.3	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	102.5%	ICU Level of Service	G
Analysis Period (min)	15		

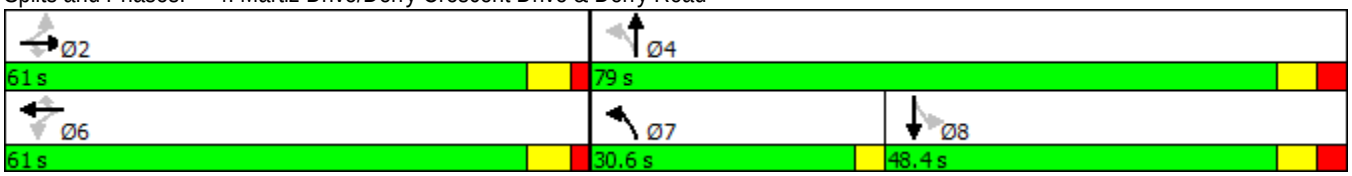
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	24	1232	50	20	2140	8	533	349	73	70
Future Volume (vph)	24	1232	50	20	2140	8	533	349	73	70
Lane Group Flow (vph)	24	1232	50	20	2140	8	533	490	73	159
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases		2			6		7	4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	7	4	8	8
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	5.0	8.0	8.0	8.0
Minimum Split (s)	37.6	37.6	37.6	37.6	37.6	37.6	8.0	48.4	48.4	48.4
Total Split (s)	61.0	61.0	61.0	61.0	61.0	61.0	30.6	79.0	48.4	48.4
Total Split (%)	43.6%	43.6%	43.6%	43.6%	43.6%	43.6%	21.9%	56.4%	34.6%	34.6%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4	7.4	7.4
Lead/Lag							Lead		Lag	Lag
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.40	0.52	0.07	0.14	0.86	0.01	0.85	0.36	0.64	0.33
Control Delay	45.5	22.2	4.2	21.9	31.5	0.0	40.8	23.9	71.6	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	22.2	4.2	21.9	31.5	0.0	40.8	23.9	71.6	28.0
Queue Length 50th (m)	3.5	70.8	0.0	2.6	157.3	0.0	98.5	40.4	16.4	10.7
Queue Length 95th (m)	#17.1	96.6	6.2	9.0	205.9	0.0	#144.3	53.7	32.6	20.9
Internal Link Dist (m)		621.8			523.2			624.4		634.6
Turn Bay Length (m)	110.0		30.0	65.0		35.0	100.0		95.0	
Base Capacity (vph)	60	2368	751	139	2485	794	624	2162	320	1246
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	0.40	0.52	0.07	0.14	0.86	0.01	0.85	0.23	0.23	0.13

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 113.9
Natural Cycle: 105
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Martiz Drive/Derry Crescent Drive & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1232	50	20	2140	8	533	349	141	73	70	89
Future Volume (vph)	24	1232	50	20	2140	8	533	349	141	73	70	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1653	4948	1507	1700	5193	1597	1767	3424		1785	3344	
Flt Permitted	0.07	1.00	1.00	0.16	1.00	1.00	0.54	1.00		0.47	1.00	
Satd. Flow (perm)	128	4948	1507	291	5193	1597	1006	3424		889	3344	
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)	24	1232	50	20	2140	8	533	349	141	73	70	89
RTOR Reduction (vph)	0	0	26	0	0	4	0	8	0	0	55	0
Lane Group Flow (vph)	24	1232	24	20	2140	4	533	482	0	73	104	0
Heavy Vehicles (%)	8%	6%	6%	5%	1%	0%	1%	0%	7%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	54.5	54.5	54.5	54.5	54.5	54.5	45.4	45.4		14.7	14.7	
Effective Green, g (s)	54.5	54.5	54.5	54.5	54.5	54.5	45.4	45.4		14.7	14.7	
Actuated g/C Ratio	0.48	0.48	0.48	0.48	0.48	0.48	0.40	0.40		0.13	0.13	
Clearance Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
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)	61	2367	721	139	2484	764	586	1364		114	431	
v/s Ratio Prot		0.25			c0.41		c0.22	0.14			0.03	
v/s Ratio Perm	0.19		0.02	0.07		0.00	c0.14			0.08		
v/c Ratio	0.39	0.52	0.03	0.14	0.86	0.01	0.91	0.35		0.64	0.24	
Uniform Delay, d1	19.1	20.6	15.7	16.6	26.4	15.5	29.8	24.0		47.1	44.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.0	0.8	0.1	0.5	3.3	0.0	18.0	0.2		11.6	0.3	
Delay (s)	37.0	21.4	15.8	17.1	29.7	15.5	47.8	24.1		58.7	44.9	
Level of Service	D	C	B	B	C	B	D	C		E	D	
Approach Delay (s)		21.5			29.5			36.5			49.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	113.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX F

Intersection Capacity Analysis Reports

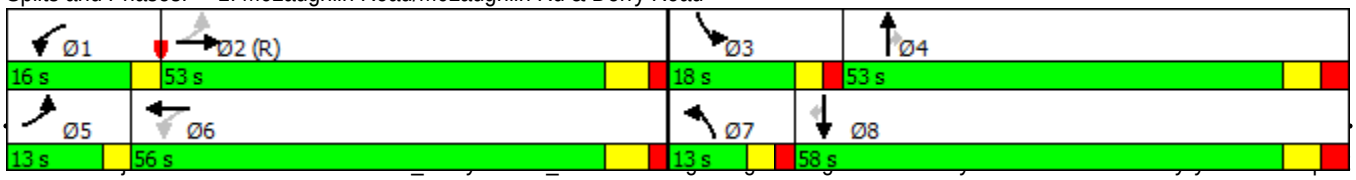
Future (2027) Total Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1829	453	221	852	83	107	598	162	241	1302	94
Future Volume (vph)	105	1829	453	221	852	83	107	598	162	241	1302	94
Lane Group Flow (vph)	105	1829	453	221	852	83	107	598	162	241	1302	94
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	13.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	13.0	53.0		16.0	56.0		13.0	53.0	53.0	18.0	58.0	58.0
Total Split (%)	9.3%	37.9%		11.4%	40.0%		9.3%	37.9%	37.9%	12.9%	41.4%	41.4%
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	0.0
Total Lost Time (s)	2.0	5.8		2.0	5.8		4.0	6.1	6.1	4.0	6.1	7.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	0.35	1.06	0.29	0.96	0.49	0.05	0.49	0.52	0.27	0.73	1.00	0.15
Control Delay	23.7	82.4	0.5	84.9	35.9	0.1	71.4	39.2	9.5	75.0	69.6	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	82.4	0.5	84.9	35.9	0.1	71.4	39.2	9.5	75.0	69.6	6.4
Queue Length 50th (m)	16.6	~213.1	0.0	47.4	70.7	0.0	15.8	73.7	5.9	35.6	~200.2	0.4
Queue Length 95th (m)	28.2	#243.6	0.0	#101.3	84.7	0.0	26.2	93.1	23.0	50.7	#252.7	12.7
Internal Link Dist (m)		899.9			188.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	312	1733	1566	231	1731	1521	218	1159	601	339	1297	633
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	0.34	1.06	0.29	0.96	0.49	0.05	0.49	0.52	0.27	0.71	1.00	0.15

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 125
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: 1: McLaughlin Road/McLaughlin Rd & Derry Road

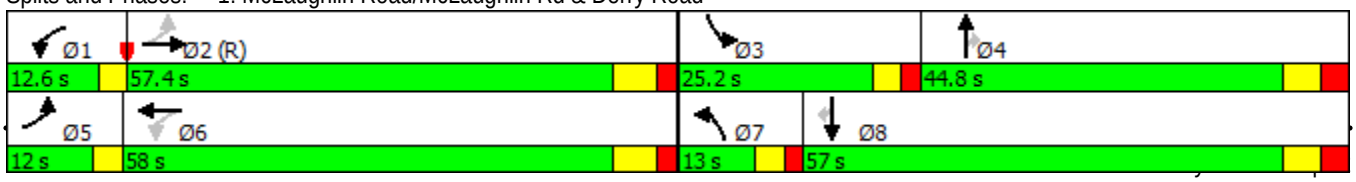


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1852	453	221	852	83	107	598	162	241	1315	94
Future Volume (vph)	105	1852	453	221	852	83	107	598	162	241	1315	94
Lane Group Flow (vph)	105	1852	453	221	852	83	107	598	162	241	1315	94
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	57.4		12.6	58.0		13.0	44.8	44.8	25.2	57.0	57.0
Total Split (%)	8.6%	41.0%		9.0%	41.4%		9.3%	32.0%	32.0%	18.0%	40.7%	40.7%
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	0.36	1.00	0.29	1.26	0.49	0.05	0.55	0.57	0.29	0.65	1.05	0.15
Control Delay	24.0	64.5	0.5	182.0	35.3	0.1	75.5	44.1	11.2	68.2	84.4	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.0	64.5	0.5	182.0	35.3	0.1	75.5	44.1	11.2	68.2	84.4	6.6
Queue Length 50th (m)	16.6	196.6	0.0	~63.0	69.9	0.0	15.9	77.3	6.4	35.3	~220.0	0.4
Queue Length 95th (m)	28.2	#234.9	0.0	#118.3	83.8	0.0	26.4	102.0	25.7	48.5	#264.5	12.9
Internal Link Dist (m)		899.9			373.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	294	1858	1566	176	1751	1521	194	1046	554	489	1247	622
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	0.36	1.00	0.29	1.26	0.49	0.05	0.55	0.57	0.29	0.49	1.05	0.15

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 145
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: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1852	453	221	852	83	107	598	162	241	1315	94
Future Volume (vph)	105	1852	453	221	852	83	107	598	162	241	1315	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	3.0	6.8	4.0	3.0	6.8	4.0	5.0	7.1	7.1	5.0	7.1	7.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	5142	1566	1750	4768	1521	3395	3433	1521	3395	3500	1581
Flt Permitted	0.25	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	466	5142	1566	143	4768	1521	3395	3433	1521	3395	3500	1581
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)	105	1852	453	221	852	83	107	598	162	241	1315	94
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	91	0	0	59
Lane Group Flow (vph)	105	1852	453	221	852	83	107	598	71	241	1315	35
Heavy Vehicles (%)	1%	2%	2%	2%	10%	5%	2%	4%	5%	2%	2%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	59.4	50.6	140.0	61.0	51.4	140.0	8.0	42.7	42.7	15.2	49.9	49.9
Effective Green, g (s)	59.4	50.6	140.0	61.0	51.4	140.0	8.0	42.7	42.7	15.2	49.9	49.9
Actuated g/C Ratio	0.42	0.36	1.00	0.44	0.37	1.00	0.06	0.31	0.31	0.11	0.36	0.36
Clearance Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
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)	279	1858	1566	172	1750	1521	194	1047	463	368	1247	563
v/s Ratio Prot	0.02	0.36		c0.09	0.18		0.03	0.17		c0.07	c0.38	
v/s Ratio Perm	0.14		0.29	c0.47		0.05			0.05			0.02
v/c Ratio	0.38	1.00	0.29	1.28	0.49	0.05	0.55	0.57	0.15	0.65	1.05	0.06
Uniform Delay, d1	25.2	44.6	0.0	38.9	34.1	0.0	64.3	40.9	35.5	59.9	45.0	29.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	20.1	0.5	164.9	0.2	0.1	3.4	0.8	0.2	4.2	41.2	0.0
Delay (s)	26.0	64.8	0.5	203.8	34.4	0.1	67.6	41.7	35.6	64.0	86.2	29.7
Level of Service	C	E	A	F	C	A	E	D	D	E	F	C
Approach Delay (s)		51.0			64.3			43.8			79.8	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	60.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.9
Intersection Capacity Utilization	110.1%	ICU Level of Service	H
Analysis Period (min)	15		

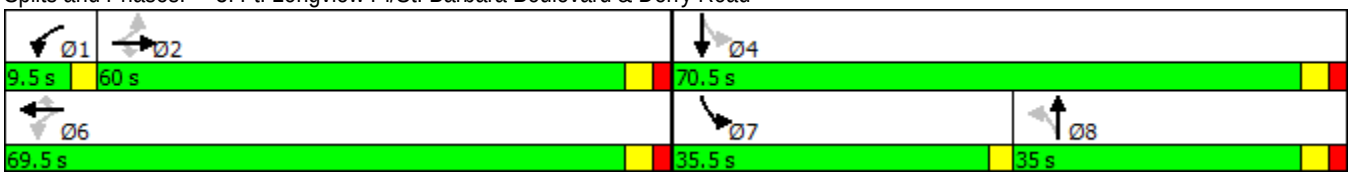
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	32	2228	28	81	991	43	43	0	574	0
Future Volume (vph)	32	2228	28	81	991	43	43	0	574	0
Lane Group Flow (vph)	32	2228	28	81	991	43	43	68	574	121
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2		1	6			8	7	4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	2	2	2	1	6	6	8	8	7	4
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	5.0	12.0	12.0	8.0	8.0	8.0	8.0
Minimum Split (s)	28.0	28.0	28.0	7.6	28.0	28.0	35.0	35.0	10.6	35.0
Total Split (s)	60.0	60.0	60.0	9.5	69.5	69.5	35.0	35.0	35.5	70.5
Total Split (%)	42.9%	42.9%	42.9%	6.8%	49.6%	49.6%	25.0%	25.0%	25.4%	50.4%
Yellow Time (s)	3.0	3.0	3.0	2.6	3.0	3.0	3.0	3.0	2.6	3.0
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	2.6	5.0	5.0	5.0	5.0	2.6	5.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.14	0.90	0.03	0.47	0.38	0.05	0.39	0.26	0.96	0.20
Control Delay	22.0	35.0	1.2	23.4	16.0	5.6	62.4	2.5	60.9	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	35.0	1.2	23.4	16.0	5.6	62.4	2.5	60.9	13.8
Queue Length 50th (m)	4.5	188.3	0.0	8.8	49.7	0.8	10.3	0.0	124.9	9.5
Queue Length 95th (m)	12.3	#243.2	1.7	20.0	64.9	6.7	22.7	0.0	#170.3	22.8
Internal Link Dist (m)		373.9			621.8			172.5		772.6
Turn Bay Length (m)	50.0		30.0	30.0		25.0	45.0		95.0	
Base Capacity (vph)	222	2473	806	175	2741	881	339	519	615	933
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	0.14	0.90	0.03	0.46	0.36	0.05	0.13	0.13	0.93	0.13

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 114.7
Natural Cycle: 115
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Ft. Longview Pl/St. Barbara Boulevard & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	2228	28	81	991	43	43	0	68	574	0	121
Future Volume (vph)	32	2228	28	81	991	43	43	0	68	574	0	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.7	3.7	3.5	3.7	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	5.0	5.0	5.0	2.6	5.0	5.0	5.0	5.0		2.6	5.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	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	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1580	5092	1601	1789	4812	1521	1789	1601		1767	1570	
Flt Permitted	0.27	1.00	1.00	0.07	1.00	1.00	0.68	1.00		0.54	1.00	
Satd. Flow (perm)	457	5092	1601	129	4812	1521	1279	1601		1001	1570	
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)	32	2228	28	81	991	43	43	0	68	574	0	121
RTOR Reduction (vph)	0	0	15	0	0	16	0	63	0	0	39	0
Lane Group Flow (vph)	32	2228	13	81	991	27	43	5	0	574	82	0
Heavy Vehicles (%)	13%	3%	2%	2%	9%	5%	2%	2%	2%	1%	2%	4%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	55.7	55.7	55.7	63.6	63.6	63.6	8.0	8.0		42.9	42.9	
Effective Green, g (s)	55.7	55.7	55.7	63.6	63.6	63.6	8.0	8.0		42.9	42.9	
Actuated g/C Ratio	0.48	0.48	0.48	0.55	0.55	0.55	0.07	0.07		0.37	0.37	
Clearance Time (s)	5.0	5.0	5.0	2.6	5.0	5.0	5.0	5.0		2.6	5.0	
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)	218	2434	765	145	2626	830	87	109		580	578	
v/s Ratio Prot		c0.44		c0.03	0.21			0.00		c0.27	0.05	
v/s Ratio Perm	0.07		0.01	0.28		0.02	0.03			c0.09		
v/c Ratio	0.15	0.92	0.02	0.56	0.38	0.03	0.49	0.04		0.99	0.14	
Uniform Delay, d1	17.1	28.2	16.0	23.7	15.1	12.2	52.3	50.7		34.8	24.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	6.8	0.0	4.6	0.1	0.0	4.4	0.2		34.3	0.1	
Delay (s)	18.5	35.0	16.0	28.3	15.2	12.2	56.7	50.8		69.1	24.7	
Level of Service	B	D	B	C	B	B	E	D		E	C	
Approach Delay (s)		34.5			16.1			53.1			61.4	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	34.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	116.5	Sum of lost time (s)	15.2
Intersection Capacity Utilization	97.7%	ICU Level of Service	F
Analysis Period (min)	15		

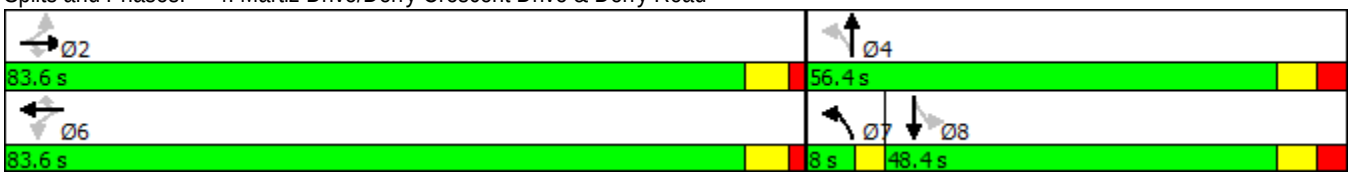
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	193	2010	650	74	1054	49	35	91	9	108
Future Volume (vph)	193	2010	650	74	1054	49	35	91	9	108
Lane Group Flow (vph)	193	2010	650	74	1054	49	35	111	9	133
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases		2			6		7	4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	7	4	8	8
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	5.0	8.0	8.0	8.0
Minimum Split (s)	37.6	37.6	37.6	37.6	37.6	37.6	8.0	48.4	48.4	48.4
Total Split (s)	83.6	83.6	83.6	83.6	83.6	83.6	8.0	56.4	48.4	48.4
Total Split (%)	59.7%	59.7%	59.7%	59.7%	59.7%	59.7%	5.7%	40.3%	34.6%	34.6%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4	7.4	7.4
Lead/Lag							Lead		Lag	Lag
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.55	0.54	0.53	0.77	0.30	0.04	0.20	0.24	0.08	0.41
Control Delay	14.5	7.2	5.7	63.5	5.4	1.2	38.4	38.9	47.1	43.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	7.2	5.7	63.5	5.4	1.2	38.4	38.9	47.1	43.2
Queue Length 50th (m)	17.8	67.6	33.1	9.4	27.3	0.0	6.4	10.6	1.9	12.6
Queue Length 95th (m)	45.3	85.6	62.3	#23.7	36.4	2.9	15.5	19.1	7.0	22.7
Internal Link Dist (m)		621.8			523.2			624.4		634.6
Turn Bay Length (m)	110.0		30.0	65.0		35.0	100.0		95.0	
Base Capacity (vph)	353	3717	1228	96	3483	1192	176	1622	496	1378
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	0.55	0.54	0.53	0.77	0.30	0.04	0.20	0.07	0.02	0.10

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 105.8
Natural Cycle: 145
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Martiz Drive/Derry Crescent Drive & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	2010	650	74	1054	49	35	91	20	9	108	25
Future Volume (vph)	193	2010	650	74	1054	49	35	91	20	9	108	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	5043	1581	1594	4725	1597	1566	3491		1785	3521	
Flt Permitted	0.25	1.00	1.00	0.08	1.00	1.00	0.50	1.00		0.68	1.00	
Satd. Flow (perm)	479	5043	1581	130	4725	1597	828	3491		1281	3521	
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)	193	2010	650	74	1054	49	35	91	20	9	108	25
RTOR Reduction (vph)	0	0	65	0	0	13	0	6	0	0	18	0
Lane Group Flow (vph)	193	2010	585	74	1054	36	35	105	0	9	115	0
Heavy Vehicles (%)	0%	4%	1%	12%	11%	0%	14%	1%	5%	0%	0%	4%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	78.0	78.0	78.0	78.0	78.0	78.0	15.0	15.0		9.1	9.1	
Effective Green, g (s)	78.0	78.0	78.0	78.0	78.0	78.0	15.0	15.0		9.1	9.1	
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.73	0.73	0.14	0.14		0.09	0.09	
Clearance Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
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)	349	3676	1152	94	3444	1164	136	489		108	299	
v/s Ratio Prot		0.40			0.22		c0.01	0.03			c0.03	
v/s Ratio Perm	0.40		0.37	c0.57		0.02	0.03			0.01		
v/c Ratio	0.55	0.55	0.51	0.79	0.31	0.03	0.26	0.21		0.08	0.38	
Uniform Delay, d1	6.6	6.5	6.2	9.2	5.1	4.0	40.5	40.8		45.1	46.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.2	0.6	1.6	34.1	0.1	0.0	1.0	0.2		0.3	0.8	
Delay (s)	12.8	7.1	7.8	43.3	5.1	4.0	41.5	41.0		45.4	47.1	
Level of Service	B	A	A	D	A	A	D	D		D	D	
Approach Delay (s)		7.7			7.5			41.1			47.0	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	107.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		

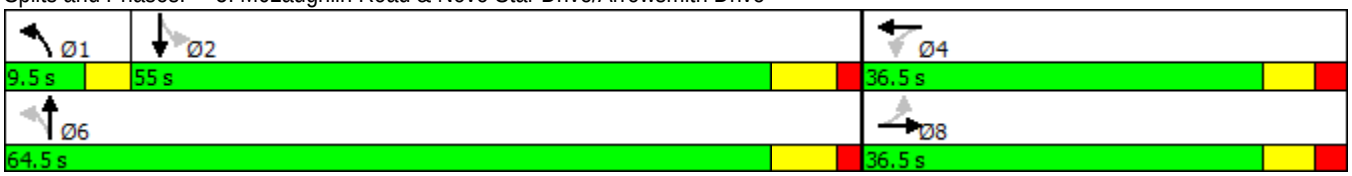
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	82	33	45	47	98	732	14	1875
Future Volume (vph)	82	33	45	47	98	732	14	1875
Lane Group Flow (vph)	82	260	45	97	98	743	14	1933
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		8		4	1	6		2
Permitted Phases	8		4		6		2	
Detector Phase	8	8	4	4	1	6	2	2
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	47.0	47.0	47.0
Minimum Split (s)	36.5	36.5	36.5	36.5	9.5	54.0	54.0	54.0
Total Split (s)	36.5	36.5	36.5	36.5	9.5	64.5	55.0	55.0
Total Split (%)	36.1%	36.1%	36.1%	36.1%	9.4%	63.9%	54.5%	54.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	3.5	7.0	7.0	7.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	Max
v/c Ratio	0.44	0.73	0.44	0.32	0.47	0.31	0.04	0.91
Control Delay	39.1	29.3	45.7	19.6	15.2	6.3	10.2	25.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	29.3	45.7	19.6	15.2	6.3	10.2	25.4
Queue Length 50th (m)	12.7	21.3	7.0	7.0	3.9	22.2	1.0	146.2
Queue Length 95th (m)	26.3	46.7	17.7	20.1	17.5	41.4	4.4	#250.8
Internal Link Dist (m)		285.8		306.4		289.1		287.3
Turn Bay Length (m)	21.0		21.0		45.0		45.0	
Base Capacity (vph)	425	652	230	619	209	2414	361	2125
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	0.19	0.40	0.20	0.16	0.47	0.31	0.04	0.91

Intersection Summary

Cycle Length: 101
Actuated Cycle Length: 84.5
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: McLaughlin Road & Novo Star Drive/Arrowsmith Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	33	227	45	47	50	98	732	11	14	1875	58
Future Volume (vph)	82	33	227	45	47	50	98	732	11	14	1875	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
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	0.92		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1638	1607		1785	1651		1716	3537		1566	3580	
Flt Permitted	0.69	1.00		0.34	1.00		0.07	1.00		0.37	1.00	
Satd. Flow (perm)	1197	1607		648	1651		135	3537		609	3580	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	82	33	227	45	47	50	98	732	11	14	1875	58
RTOR Reduction (vph)	0	105	0	0	42	0	0	1	0	0	2	0
Lane Group Flow (vph)	82	155	0	45	55	0	98	742	0	14	1931	0
Heavy Vehicles (%)	9%	6%	1%	0%	4%	6%	4%	3%	0%	14%	1%	18%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	13.3	13.3		13.3	13.3		58.4	58.4		50.2	50.2	
Effective Green, g (s)	13.3	13.3		13.3	13.3		58.4	58.4		50.2	50.2	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.69	0.69		0.59	0.59	
Clearance Time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	186	250		101	257		179	2424		358	2109	
v/s Ratio Prot		c0.10			0.03		c0.03	0.21			c0.54	
v/s Ratio Perm	0.07			0.07			0.34			0.02		
v/c Ratio	0.44	0.62		0.45	0.21		0.55	0.31		0.04	0.92	
Uniform Delay, d1	32.6	33.6		32.6	31.4		16.8	5.3		7.4	15.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	4.5		3.1	0.4		3.4	0.3		0.2	7.7	
Delay (s)	34.2	38.1		35.7	31.8		20.2	5.7		7.6	23.3	
Level of Service	C	D		D	C		C	A		A	C	
Approach Delay (s)		37.2			33.0			7.4			23.2	
Approach LOS		D			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	85.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	120.5%	ICU Level of Service	H
Analysis Period (min)	15		

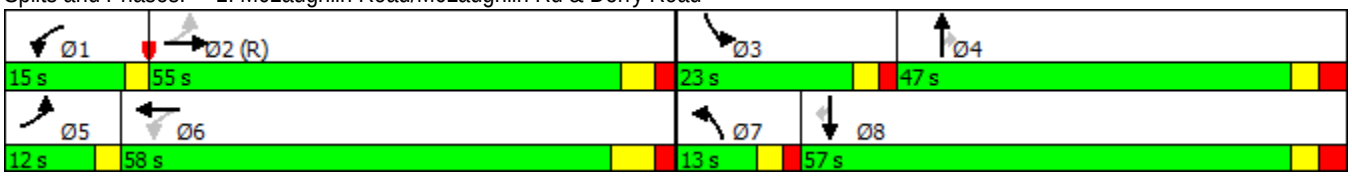
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1852	453	221	852	83	107	598	162	241	1315	94
Future Volume (vph)	105	1852	453	221	852	83	107	598	162	241	1315	94
Lane Group Flow (vph)	105	1852	453	221	852	83	107	598	162	241	1315	94
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	55.0		15.0	58.0		13.0	47.0	47.0	23.0	57.0	57.0
Total Split (%)	8.6%	39.3%		10.7%	41.4%		9.3%	33.6%	33.6%	16.4%	40.7%	40.7%
Yellow Time (s)	2.6	3.6		2.6	4.6		2.6	3.0	3.0	2.6	3.0	3.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	-1.0	-2.0		-2.0	-1.0		-1.0	-1.0	-1.0	-1.0	-2.0	-1.0
Total Lost Time (s)	1.6	3.8		0.6	5.8		3.6	5.1	5.1	3.6	4.1	5.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	0.34	0.99	0.29	0.93	0.48	0.05	0.48	0.54	0.28	0.62	0.99	0.14
Control Delay	22.7	61.4	0.5	78.7	34.4	0.1	70.3	41.5	9.0	66.1	66.3	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	61.4	0.5	78.7	34.4	0.1	70.3	41.5	9.0	66.1	66.3	4.4
Queue Length 50th (m)	16.3	195.1	0.0	46.8	69.1	0.0	15.7	75.3	4.0	35.0	199.8	0.0
Queue Length 95th (m)	27.6	#232.5	0.0	#99.1	82.7	0.0	26.1	98.5	21.8	48.5	#252.6	9.8
Internal Link Dist (m)		899.9			373.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	317	1880	1566	237	1791	1521	227	1110	588	470	1324	653
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	0.33	0.99	0.29	0.93	0.48	0.05	0.47	0.54	0.28	0.51	0.99	0.14

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	1852	453	221	852	83	107	598	162	241	1315	94
Future Volume (vph)	105	1852	453	221	852	83	107	598	162	241	1315	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	1.6	3.8	3.0	0.6	5.8	3.0	3.6	5.1	5.1	3.6	4.1	5.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	5142	1566	1750	4768	1521	3395	3433	1521	3395	3500	1581
Flt Permitted	0.26	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	487	5142	1566	145	4768	1521	3395	3433	1521	3395	3500	1581
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)	105	1852	453	221	852	83	107	598	162	241	1315	94
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	96	0	0	59
Lane Group Flow (vph)	105	1852	453	221	852	83	107	598	66	241	1315	35
Heavy Vehicles (%)	1%	2%	2%	2%	10%	5%	2%	4%	5%	2%	2%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	58.2	49.2	140.0	63.2	51.6	140.0	8.3	44.3	44.3	15.0	51.0	51.0
Effective Green, g (s)	60.2	51.2	140.0	65.2	52.6	140.0	9.3	45.3	45.3	16.0	53.0	52.0
Actuated g/C Ratio	0.43	0.37	1.00	0.47	0.38	1.00	0.07	0.32	0.32	0.11	0.38	0.37
Clearance Time (s)	2.6	5.8		2.6	6.8		4.6	6.1	6.1	4.6	6.1	6.1
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)	300	1880	1566	232	1791	1521	225	1110	492	388	1325	587
v/s Ratio Prot	0.02	c0.36		c0.10	0.18		0.03	0.17		c0.07	c0.38	
v/s Ratio Perm	0.13		0.29	0.34		0.05			0.04			0.02
v/c Ratio	0.35	0.99	0.29	0.95	0.48	0.05	0.48	0.54	0.13	0.62	0.99	0.06
Uniform Delay, d1	24.5	44.0	0.0	42.4	33.2	0.0	63.0	38.8	33.5	59.1	43.3	28.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	17.5	0.5	45.7	0.2	0.1	1.6	0.5	0.1	3.1	22.8	0.0
Delay (s)	25.3	61.5	0.5	88.1	33.4	0.1	64.6	39.3	33.6	62.2	66.1	28.3
Level of Service	C	E	A	F	C	A	E	D	C	E	E	C
Approach Delay (s)		48.5			41.5			41.4			63.4	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	50.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.1
Intersection Capacity Utilization	104.5%	ICU Level of Service	G
Analysis Period (min)	15		

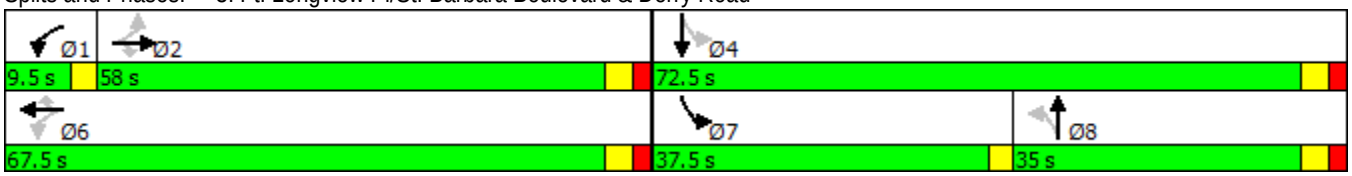
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	32	2228	28	81	991	43	43	0	574	0
Future Volume (vph)	32	2228	28	81	991	43	43	0	574	0
Lane Group Flow (vph)	32	2228	28	81	991	43	43	68	574	121
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2		1	6			8	7	4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	2	2	2	1	6	6	8	8	7	4
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	5.0	12.0	12.0	8.0	8.0	8.0	8.0
Minimum Split (s)	28.0	28.0	28.0	9.5	28.0	28.0	35.0	35.0	10.6	35.0
Total Split (s)	58.0	58.0	58.0	9.5	67.5	67.5	35.0	35.0	37.5	72.5
Total Split (%)	41.4%	41.4%	41.4%	6.8%	48.2%	48.2%	25.0%	25.0%	26.8%	51.8%
Yellow Time (s)	3.0	3.0	3.0	2.6	3.0	3.0	3.0	3.0	2.6	3.0
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)	0.0	-2.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0
Total Lost Time (s)	5.0	3.0	5.0	2.6	5.0	5.0	5.0	5.0	0.6	5.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.15	0.89	0.04	0.47	0.39	0.05	0.39	0.24	0.84	0.19
Control Delay	23.4	34.4	1.3	23.8	17.0	6.0	62.3	2.1	41.6	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	34.4	1.3	23.8	17.0	6.0	62.3	2.1	41.6	13.9
Queue Length 50th (m)	4.6	188.3	0.0	9.1	51.7	0.8	10.3	0.0	117.3	10.0
Queue Length 95th (m)	12.7	#243.2	1.7	20.0	67.3	7.0	22.7	0.0	163.1	23.0
Internal Link Dist (m)		373.9			621.8			172.5		772.6
Turn Bay Length (m)	50.0		30.0	30.0		25.0	45.0		95.0	
Base Capacity (vph)	213	2493	784	176	2677	862	341	539	708	965
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	0.15	0.89	0.04	0.46	0.37	0.05	0.13	0.13	0.81	0.13

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 114.1
Natural Cycle: 105
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Ft. Longview Pl/St. Barbara Boulevard & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	2228	28	81	991	43	43	0	68	574	0	121
Future Volume (vph)	32	2228	28	81	991	43	43	0	68	574	0	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.7	3.7	3.5	3.7	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	5.0	3.0	5.0	2.6	5.0	5.0	5.0	5.0		0.6	5.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	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	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1580	5092	1601	1789	4812	1521	1789	1601		1767	1570	
Flt Permitted	0.27	1.00	1.00	0.07	1.00	1.00	0.68	1.00		0.67	1.00	
Satd. Flow (perm)	453	5092	1601	134	4812	1521	1279	1601		1250	1570	
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)	32	2228	28	81	991	43	43	0	68	574	0	121
RTOR Reduction (vph)	0	0	15	0	0	17	0	63	0	0	35	0
Lane Group Flow (vph)	32	2228	13	81	991	26	43	5	0	574	86	0
Heavy Vehicles (%)	13%	3%	2%	2%	9%	5%	2%	2%	2%	1%	2%	4%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	53.8	53.8	53.8	61.6	61.6	61.6	7.9	7.9		44.1	44.1	
Effective Green, g (s)	53.8	55.8	53.8	61.6	61.6	61.6	7.9	7.9		46.1	44.1	
Actuated g/C Ratio	0.46	0.48	0.46	0.53	0.53	0.53	0.07	0.07		0.40	0.38	
Clearance Time (s)	5.0	5.0	5.0	2.6	5.0	5.0	5.0	5.0		2.6	5.0	
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)	210	2455	744	145	2561	809	87	109		657	598	
v/s Ratio Prot		c0.44		c0.02	0.21			0.00		c0.27	0.05	
v/s Ratio Perm	0.07		0.01	0.27		0.02	0.03			0.08		
v/c Ratio	0.15	0.91	0.02	0.56	0.39	0.03	0.49	0.04		0.87	0.14	
Uniform Delay, d1	17.8	27.6	16.7	24.6	15.9	12.9	52.0	50.4		31.0	23.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	6.3	0.0	4.6	0.1	0.0	4.4	0.2		12.3	0.1	
Delay (s)	19.4	33.8	16.7	29.2	16.0	12.9	56.3	50.5		43.3	23.6	
Level of Service	B	C	B	C	B	B	E	D		D	C	
Approach Delay (s)		33.4			16.9			52.8			39.9	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	115.7	Sum of lost time (s)	11.2
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		

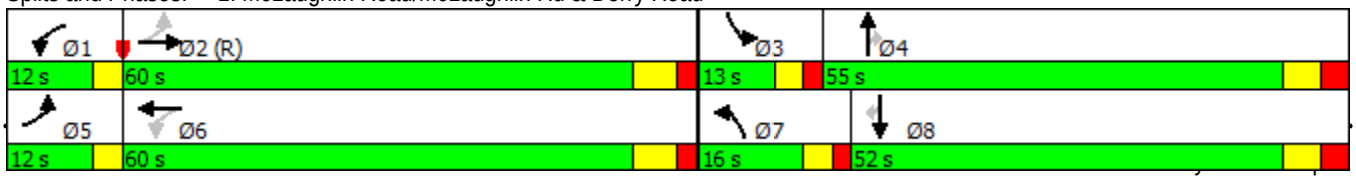
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	880	105	211	2011	334	257	1223	116	160	610	166
Future Volume (vph)	196	880	105	211	2011	334	257	1223	116	160	610	166
Lane Group Flow (vph)	196	880	105	211	2011	334	257	1223	116	160	610	166
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	60.0		12.0	60.0		16.0	55.0	55.0	13.0	52.0	52.0
Total Split (%)	8.6%	42.9%		8.6%	42.9%		11.4%	39.3%	39.3%	9.3%	37.1%	37.1%
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	1.15	0.48	0.07	0.71	1.02	0.21	0.96	1.01	0.19	0.82	0.54	0.28
Control Delay	146.6	33.9	0.1	36.4	67.9	0.3	108.1	74.2	10.1	95.6	41.2	9.0
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	146.6	33.9	0.1	36.4	67.9	0.3	108.1	74.2	10.1	95.6	41.2	9.0
Queue Length 50th (m)	~49.4	70.7	0.0	34.6	~226.8	0.0	39.1	~191.6	4.7	24.2	76.8	4.8
Queue Length 95th (m)	#102.2	84.3	0.0	#52.1	#256.9	0.0	#67.7	#241.6	18.9	#43.9	96.5	22.2
Internal Link Dist (m)		899.9			373.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	170	1845	1581	298	1973	1581	269	1209	601	195	1133	603
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	1.15	0.48	0.07	0.71	1.02	0.21	0.96	1.01	0.19	0.82	0.54	0.28

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 1.4 (1%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 145
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: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	880	105	211	2011	334	257	1223	116	160	610	166
Future Volume (vph)	196	880	105	211	2011	334	257	1223	116	160	610	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	3.0	6.8	4.0	3.0	6.8	4.0	5.0	7.1	7.1	5.0	7.1	7.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	4856	1581	1785	5193	1581	3429	3535	1581	3429	3535	1581
Flt Permitted	0.08	1.00	1.00	0.24	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	140	4856	1581	451	5193	1581	3429	3535	1581	3429	3535	1581
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)	196	880	105	211	2011	334	257	1223	116	160	610	166
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	61	0	0	96
Lane Group Flow (vph)	196	880	105	211	2011	334	257	1223	55	160	610	70
Heavy Vehicles (%)	1%	8%	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	62.2	53.2	140.0	62.2	53.2	140.0	11.0	47.9	47.9	8.0	44.9	44.9
Effective Green, g (s)	62.2	53.2	140.0	62.2	53.2	140.0	11.0	47.9	47.9	8.0	44.9	44.9
Actuated g/C Ratio	0.44	0.38	1.00	0.44	0.38	1.00	0.08	0.34	0.34	0.06	0.32	0.32
Clearance Time (s)	3.0	6.8		3.0	6.8		5.0	7.1	7.1	5.0	7.1	7.1
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)	166	1845	1581	286	1973	1581	269	1209	540	195	1133	507
v/s Ratio Prot	c0.08	0.18		0.05	0.39		c0.07	c0.35		0.05	0.17	
v/s Ratio Perm	c0.45		0.07	0.28		c0.21			0.04			0.04
v/c Ratio	1.18	0.48	0.07	0.74	1.02	0.21	0.96	1.01	0.10	0.82	0.54	0.14
Uniform Delay, d1	38.5	32.9	0.0	27.0	43.4	0.0	64.3	46.0	31.4	65.3	39.0	33.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	126.8	0.9	0.1	9.5	25.2	0.3	42.4	28.8	0.1	23.3	0.5	0.1
Delay (s)	165.3	33.8	0.1	36.5	68.6	0.3	106.6	74.8	31.5	88.6	39.5	33.9
Level of Service	F	C	A	D	E	A	F	E	C	F	D	C
Approach Delay (s)		52.6			57.1			76.8			46.9	
Approach LOS		D			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	59.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.9
Intersection Capacity Utilization	109.3%	ICU Level of Service	H
Analysis Period (min)	15		

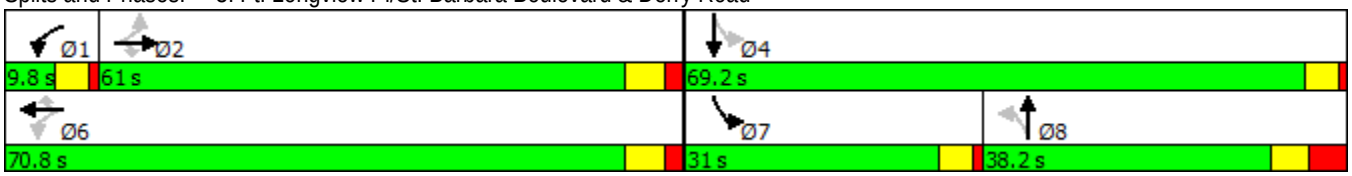
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	56	1068	29	154	2412	519	84	0	87	0
Future Volume (vph)	56	1068	29	154	2412	519	84	0	87	0
Lane Group Flow (vph)	56	1068	29	154	2412	519	84	128	87	21
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		2		1	6			8	7	4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	2	2	2	1	6	6	8	8	7	4
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	5.0	12.0	12.0	8.0	8.0	5.0	5.0
Minimum Split (s)	29.3	29.3	29.3	9.5	29.3	29.3	38.1	38.1	9.5	22.5
Total Split (s)	61.0	61.0	61.0	9.8	70.8	70.8	38.2	38.2	31.0	69.2
Total Split (%)	43.6%	43.6%	43.6%	7.0%	50.6%	50.6%	27.3%	27.3%	22.1%	49.4%
Yellow Time (s)	4.2	4.2	4.2	3.5	4.2	4.2	4.0	4.0	3.5	3.5
All-Red Time (s)	2.1	2.1	2.1	1.0	2.1	2.1	4.1	4.1	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	8.1	8.1	4.5	4.5
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.79	0.41	0.03	0.48	0.74	0.50	0.54	0.27	0.26	0.04
Control Delay	90.6	16.5	0.1	14.8	17.1	11.4	58.0	1.4	29.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.6	16.5	0.1	14.8	17.1	11.4	58.0	1.4	29.8	0.2
Queue Length 50th (m)	9.6	49.9	0.0	12.5	129.0	44.7	17.5	0.0	14.1	0.0
Queue Length 95th (m)	#40.2	73.1	0.0	26.8	187.4	89.1	34.9	0.0	26.5	0.0
Internal Link Dist (m)		373.9			621.8			88.0		772.6
Turn Bay Length (m)	50.0		30.0	30.0		25.0	45.0		95.0	
Base Capacity (vph)	71	2627	901	320	3251	1042	409	697	480	1048
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	0.79	0.41	0.03	0.48	0.74	0.50	0.21	0.18	0.18	0.02

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 104
Natural Cycle: 100
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Ft. Longview Pl/St. Barbara Boulevard & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1068	29	154	2412	519	84	0	128	87	0	21
Future Volume (vph)	56	1068	29	154	2412	519	84	0	128	87	0	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.7	3.7	3.7	3.5	3.7	3.7	3.7	3.5	3.7	3.5
Total Lost time (s)	6.3	6.3	6.3	4.5	6.3	6.3	8.1	8.1		4.5	4.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	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	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	4948	1601	1789	5193	1597	1789	1601		1700	1633	
Flt Permitted	0.07	1.00	1.00	0.20	1.00	1.00	0.74	1.00		0.52	1.00	
Satd. Flow (perm)	136	4948	1601	385	5193	1597	1401	1601		933	1633	
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	1068	29	154	2412	519	84	0	128	87	0	21
RTOR Reduction (vph)	0	0	14	0	0	44	0	114	0	0	15	0
Lane Group Flow (vph)	56	1068	15	154	2412	475	84	14	0	87	6	0
Heavy Vehicles (%)	0%	6%	2%	2%	1%	0%	2%	2%	2%	5%	2%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	55.3	55.3	55.3	65.1	65.1	65.1	11.7	11.7		28.9	28.9	
Effective Green, g (s)	55.3	55.3	55.3	65.1	65.1	65.1	11.7	11.7		28.9	28.9	
Actuated g/C Ratio	0.53	0.53	0.53	0.62	0.62	0.62	0.11	0.11		0.28	0.28	
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	8.1	8.1		4.5	4.5	
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)	71	2610	844	310	3225	992	156	178		323	450	
v/s Ratio Prot		0.22		0.03	c0.46			0.01		c0.02	0.00	
v/s Ratio Perm	0.41		0.01	0.28		0.30	c0.06			0.05		
v/c Ratio	0.79	0.41	0.02	0.50	0.75	0.48	0.54	0.08		0.27	0.01	
Uniform Delay, d1	20.0	14.9	11.8	9.2	14.0	10.7	44.0	41.7		29.1	27.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	58.6	0.5	0.0	1.3	1.0	0.4	3.5	0.2		0.5	0.0	
Delay (s)	78.6	15.4	11.8	10.5	15.0	11.1	47.5	41.9		29.5	27.6	
Level of Service	E	B	B	B	B	B	D	D		C	C	
Approach Delay (s)		18.4			14.1			44.1			29.1	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	104.8	Sum of lost time (s)	23.4
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		

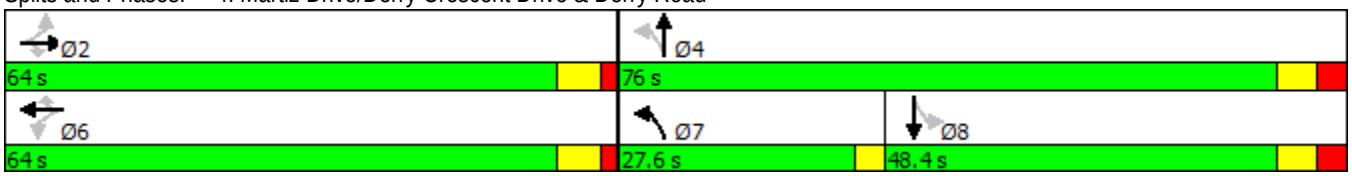
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	24	1270	50	20	2239	8	533	366	73	74
Future Volume (vph)	24	1270	50	20	2239	8	533	366	73	74
Lane Group Flow (vph)	24	1270	50	20	2239	8	533	507	73	163
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases		2			6		7	4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	7	4	8	8
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	5.0	8.0	8.0	8.0
Minimum Split (s)	37.6	37.6	37.6	37.6	37.6	37.6	8.0	48.4	48.4	48.4
Total Split (s)	64.0	64.0	64.0	64.0	64.0	64.0	27.6	76.0	48.4	48.4
Total Split (%)	45.7%	45.7%	45.7%	45.7%	45.7%	45.7%	19.7%	54.3%	34.6%	34.6%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4	7.4	7.4
Lead/Lag							Lead		Lag	Lag
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.39	0.51	0.06	0.14	0.86	0.01	0.92	0.39	0.65	0.34
Control Delay	43.3	20.3	3.8	20.2	29.5	0.0	52.4	26.1	72.1	32.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.3	20.3	3.8	20.2	29.5	0.0	52.4	26.1	72.1	32.2
Queue Length 50th (m)	3.4	69.9	0.0	2.4	161.2	0.0	103.5	43.9	16.5	12.7
Queue Length 95th (m)	#17.0	95.8	5.9	8.7	212.3	0.0	#167.6	58.1	32.7	23.0
Internal Link Dist (m)		621.8			523.2			624.4		634.6
Turn Bay Length (m)	110.0		30.0	65.0		35.0	100.0		95.0	
Base Capacity (vph)	61	2494	788	144	2618	834	577	2073	314	1238
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	0.39	0.51	0.06	0.14	0.86	0.01	0.92	0.24	0.23	0.13

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 114.1
Natural Cycle: 115
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Martiz Drive/Derry Crescent Drive & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1270	50	20	2239	8	533	366	141	73	74	89
Future Volume (vph)	24	1270	50	20	2239	8	533	366	141	73	74	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1653	4948	1507	1700	5193	1597	1767	3431		1785	3351	
Flt Permitted	0.07	1.00	1.00	0.16	1.00	1.00	0.54	1.00		0.47	1.00	
Satd. Flow (perm)	121	4948	1507	286	5193	1597	1005	3431		875	3351	
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)	24	1270	50	20	2239	8	533	366	141	73	74	89
RTOR Reduction (vph)	0	0	25	0	0	4	0	10	0	0	43	0
Lane Group Flow (vph)	24	1270	25	20	2239	4	533	497	0	73	120	0
Heavy Vehicles (%)	8%	6%	6%	5%	1%	0%	1%	0%	7%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	57.5	57.5	57.5	57.5	57.5	57.5	42.6	42.6		14.9	14.9	
Effective Green, g (s)	57.5	57.5	57.5	57.5	57.5	57.5	42.6	42.6		14.9	14.9	
Actuated g/C Ratio	0.50	0.50	0.50	0.50	0.50	0.50	0.37	0.37		0.13	0.13	
Clearance Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
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)	60	2493	759	144	2616	804	540	1280		114	437	
v/s Ratio Prot		0.26			c0.43		c0.21	0.14			0.04	
v/s Ratio Perm	0.20		0.02	0.07		0.00	c0.15			0.08		
v/c Ratio	0.40	0.51	0.03	0.14	0.86	0.01	0.99	0.39		0.64	0.27	
Uniform Delay, d1	17.6	18.9	14.3	15.1	24.7	14.1	33.1	26.2		47.1	44.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.7	0.7	0.1	0.4	3.0	0.0	35.1	0.2		11.6	0.3	
Delay (s)	36.3	19.6	14.4	15.5	27.7	14.1	68.2	26.4		58.7	45.1	
Level of Service	D	B	B	B	C	B	E	C		E	D	
Approach Delay (s)		19.7			27.5			47.8			49.3	
Approach LOS		B			C			D			D	

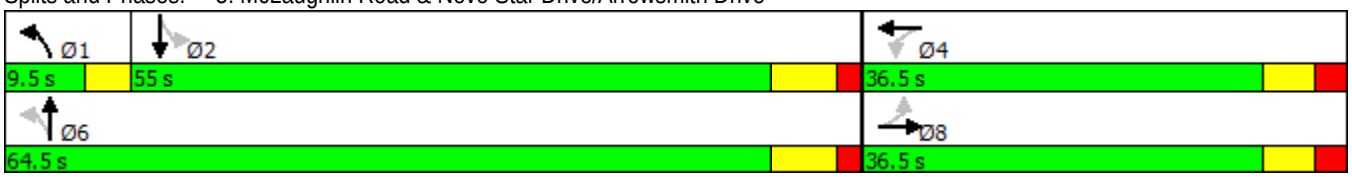
Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	114.1	Sum of lost time (s)	17.0
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	55	10	16	5	134	1567	54	806
Future Volume (vph)	55	10	16	5	134	1567	54	806
Lane Group Flow (vph)	55	65	16	39	134	1586	54	853
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		8		4	1	6		2
Permitted Phases	8		4		6		2	
Detector Phase	8	8	4	4	1	6	2	2
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	47.0	47.0	47.0
Minimum Split (s)	36.5	36.5	36.5	36.5	9.5	54.0	54.0	54.0
Total Split (s)	36.5	36.5	36.5	36.5	9.5	64.5	55.0	55.0
Total Split (%)	36.1%	36.1%	36.1%	36.1%	9.4%	63.9%	54.5%	54.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	3.5	7.0	7.0	7.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	Max
v/c Ratio	0.35	0.28	0.10	0.19	0.25	0.57	0.30	0.37
Control Delay	39.3	15.3	33.0	19.3	3.8	6.3	14.1	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.3	15.3	33.0	19.3	3.8	6.3	14.1	8.5
Queue Length 50th (m)	8.3	1.5	2.4	1.9	4.1	53.2	3.8	33.1
Queue Length 95th (m)	19.4	12.5	8.0	10.6	9.6	83.6	13.5	50.3
Internal Link Dist (m)		285.8		306.4		289.1		287.3
Turn Bay Length (m)	21.0		21.0		45.0		45.0	
Base Capacity (vph)	502	627	501	610	527	2779	182	2281
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	0.11	0.10	0.03	0.06	0.25	0.57	0.30	0.37

Intersection Summary
Cycle Length: 101
Actuated Cycle Length: 80.4
Natural Cycle: 100
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: McLaughlin Road & Novo Star Drive/Arrowsmith Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	10	55	16	5	34	134	1567	19	54	806	47
Future Volume (vph)	55	10	55	16	5	34	134	1567	19	54	806	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
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	1.00		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)	1750	1589		1785	1592		1785	3608		1785	3582	
Flt Permitted	0.73	1.00		0.71	1.00		0.29	1.00		0.15	1.00	
Satd. Flow (perm)	1348	1589		1343	1592		547	3608		287	3582	
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)	55	10	55	16	5	34	134	1567	19	54	806	47
RTOR Reduction (vph)	0	50	0	0	24	0	0	1	0	0	3	0
Lane Group Flow (vph)	55	15	0	16	15	0	134	1585	0	54	850	0
Heavy Vehicles (%)	2%	10%	2%	0%	20%	0%	0%	1%	0%	0%	1%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	7.7	7.7		7.7	7.7		60.6	60.6		51.2	51.2	
Effective Green, g (s)	7.7	7.7		7.7	7.7		60.6	60.6		51.2	51.2	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.74	0.74		0.63	0.63	
Clearance Time (s)	6.5	6.5		6.5	6.5		3.5	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	126	149		126	149		494	2672		179	2242	
v/s Ratio Prot		0.01			0.01		0.02	c0.44			0.24	
v/s Ratio Perm	c0.04			0.01			0.18			0.19		
v/c Ratio	0.44	0.10		0.13	0.10		0.27	0.59		0.30	0.38	
Uniform Delay, d1	35.0	33.9		34.0	33.9		3.3	4.9		7.1	7.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	0.3		0.5	0.3		0.3	1.0		4.3	0.5	
Delay (s)	37.4	34.2		34.4	34.2		3.6	5.9		11.3	8.0	
Level of Service	D	C		C	C		A	A		B	A	
Approach Delay (s)		35.7			34.3			5.7			8.2	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	81.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	109.9%	ICU Level of Service	H
Analysis Period (min)	15		

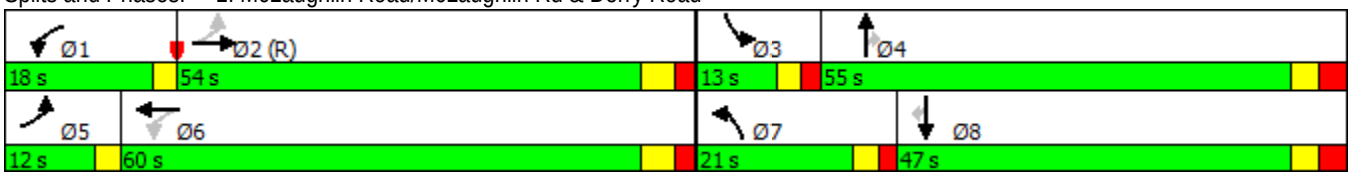
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	880	105	211	2011	334	257	1223	116	160	610	166
Future Volume (vph)	196	880	105	211	2011	334	257	1223	116	160	610	166
Lane Group Flow (vph)	196	880	105	211	2011	334	257	1223	116	160	610	166
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	8.0	12.0		8.0	12.0		8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	12.0	36.8		11.0	36.8		13.0	40.7	40.7	13.0	40.7	40.7
Total Split (s)	12.0	54.0		18.0	60.0		21.0	55.0	55.0	13.0	47.0	47.0
Total Split (%)	8.6%	38.6%		12.9%	42.9%		15.0%	39.3%	39.3%	9.3%	33.6%	33.6%
Yellow Time (s)	2.6	3.6		2.6	3.6		2.6	3.0	3.0	2.6	3.0	3.0
All-Red Time (s)	0.0	2.2		0.0	2.2		2.0	3.1	3.1	2.0	3.1	3.1
Lost Time Adjust (s)	-2.0	-1.0		-1.0	-2.0		-1.0	-2.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	0.6	4.8		1.6	3.8		3.6	4.1	5.1	3.6	5.1	5.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
v/c Ratio	0.98	0.50	0.07	0.61	0.96	0.21	0.66	0.95	0.19	0.70	0.56	0.28
Control Delay	92.7	36.1	0.1	27.5	54.0	0.3	68.1	59.8	8.7	80.1	43.0	8.0
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	92.7	36.1	0.1	27.5	54.0	0.3	68.1	59.8	8.7	80.1	43.0	8.0
Queue Length 50th (m)	40.8	73.6	0.0	33.8	207.8	0.0	37.3	181.8	3.4	23.9	78.8	2.7
Queue Length 95th (m)	#94.3	88.4	0.0	50.8	#244.6	0.0	52.4	#229.5	17.2	#38.6	99.7	20.2
Internal Link Dist (m)		899.9			373.9			287.3			789.2	
Turn Bay Length (m)	95.0		60.0	135.0		105.0	80.0		45.0	95.0		105.0
Base Capacity (vph)	201	1767	1581	364	2084	1581	426	1285	626	230	1094	595
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	0.98	0.50	0.07	0.58	0.96	0.21	0.60	0.95	0.19	0.70	0.56	0.28

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 1.4 (1%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: McLaughlin Road/McLaughlin Rd & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	880	105	211	2011	334	257	1223	116	160	610	166
Future Volume (vph)	196	880	105	211	2011	334	257	1223	116	160	610	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	0.6	4.8	3.0	1.6	3.8	3.0	3.6	4.1	5.1	3.6	5.1	5.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	1767	4856	1581	1785	5193	1581	3429	3535	1581	3429	3535	1581
Flt Permitted	0.08	1.00	1.00	0.21	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	143	4856	1581	403	5193	1581	3429	3535	1581	3429	3535	1581
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)	196	880	105	211	2011	334	257	1223	116	160	610	166
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	63	0	0	106
Lane Group Flow (vph)	196	880	105	211	2011	334	257	1223	53	160	610	60
Heavy Vehicles (%)	1%	8%	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		Free	6		Free			4			8
Actuated Green, G (s)	59.4	49.9	140.0	66.3	54.2	140.0	14.8	48.8	48.8	8.4	42.4	42.4
Effective Green, g (s)	63.4	50.9	140.0	67.3	56.2	140.0	15.8	50.8	49.8	9.4	43.4	43.4
Actuated g/C Ratio	0.45	0.36	1.00	0.48	0.40	1.00	0.11	0.36	0.36	0.07	0.31	0.31
Clearance Time (s)	2.6	5.8		2.6	5.8		4.6	6.1	6.1	4.6	6.1	6.1
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)	198	1765	1581	339	2084	1581	386	1282	562	230	1095	490
v/s Ratio Prot	c0.08	0.18		c0.07	c0.39		c0.07	c0.35		0.05	0.17	
v/s Ratio Perm	0.37		0.07	0.23		0.21			0.03			0.04
v/c Ratio	0.99	0.50	0.07	0.62	0.96	0.21	0.67	0.95	0.09	0.70	0.56	0.12
Uniform Delay, d1	41.3	34.6	0.0	22.9	40.9	0.0	59.6	43.5	30.1	63.9	40.3	34.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	60.4	1.0	0.1	3.5	12.4	0.3	4.3	15.4	0.1	8.8	0.6	0.1
Delay (s)	101.7	35.6	0.1	26.4	53.4	0.3	63.9	58.8	30.1	72.7	40.9	34.8
Level of Service	F	D	A	C	D	A	E	E	C	E	D	C
Approach Delay (s)		43.4			44.2			57.6			45.3	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	47.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		

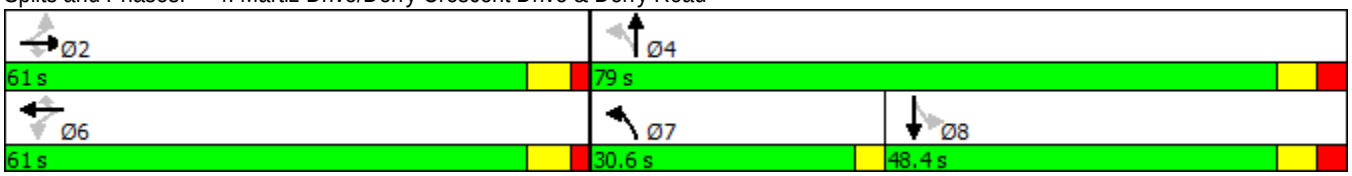
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	24	1270	50	20	2239	8	533	366	73	74
Future Volume (vph)	24	1270	50	20	2239	8	533	366	73	74
Lane Group Flow (vph)	24	1270	50	20	2239	8	533	507	73	163
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases		2			6		7	4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	7	4	8	8
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	5.0	8.0	8.0	8.0
Minimum Split (s)	37.6	37.6	37.6	37.6	37.6	37.6	8.0	48.4	48.4	48.4
Total Split (s)	61.0	61.0	61.0	61.0	61.0	61.0	30.6	79.0	48.4	48.4
Total Split (%)	43.6%	43.6%	43.6%	43.6%	43.6%	43.6%	21.9%	56.4%	34.6%	34.6%
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0	3.4	3.4	3.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4	7.4	7.4
Lead/Lag							Lead		Lag	Lag
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	None	None	None	None	None	None	None
v/c Ratio	0.40	0.54	0.07	0.15	0.90	0.01	0.85	0.37	0.65	0.33
Control Delay	45.7	22.6	4.2	22.6	34.2	0.0	40.7	24.1	72.1	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.7	22.6	4.2	22.6	34.2	0.0	40.7	24.1	72.1	28.7
Queue Length 50th (m)	3.5	74.0	0.0	2.6	170.8	0.0	98.5	42.3	16.5	11.3
Queue Length 95th (m)	#17.2	100.8	6.2	9.2	#237.9	0.0	#143.4	55.9	32.7	21.5
Internal Link Dist (m)		621.8			523.2			624.4		634.6
Turn Bay Length (m)	110.0		30.0	65.0		35.0	100.0		95.0	
Base Capacity (vph)	60	2364	750	131	2481	793	624	2161	314	1246
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	0.40	0.54	0.07	0.15	0.90	0.01	0.85	0.23	0.23	0.13

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 114.1
Natural Cycle: 115
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Martiz Drive/Derry Crescent Drive & Derry Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1270	50	20	2239	8	533	366	141	73	74	89
Future Volume (vph)	24	1270	50	20	2239	8	533	366	141	73	74	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1653	4948	1507	1700	5193	1597	1767	3431		1785	3351	
Flt Permitted	0.07	1.00	1.00	0.15	1.00	1.00	0.54	1.00		0.47	1.00	
Satd. Flow (perm)	128	4948	1507	274	5193	1597	1005	3431		875	3351	
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)	24	1270	50	20	2239	8	533	366	141	73	74	89
RTOR Reduction (vph)	0	0	26	0	0	4	0	7	0	0	54	0
Lane Group Flow (vph)	24	1270	24	20	2239	4	533	500	0	73	109	0
Heavy Vehicles (%)	8%	6%	6%	5%	1%	0%	1%	0%	7%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	54.5	54.5	54.5	54.5	54.5	54.5	45.6	45.6		14.9	14.9	
Effective Green, g (s)	54.5	54.5	54.5	54.5	54.5	54.5	45.6	45.6		14.9	14.9	
Actuated g/C Ratio	0.48	0.48	0.48	0.48	0.48	0.48	0.40	0.40		0.13	0.13	
Clearance Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	3.0	7.4		7.4	7.4	
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)	61	2363	719	130	2480	762	586	1371		114	437	
v/s Ratio Prot		0.26			c0.43		c0.22	0.15			0.03	
v/s Ratio Perm	0.19		0.02	0.07		0.00	c0.14			0.08		
v/c Ratio	0.39	0.54	0.03	0.15	0.90	0.01	0.91	0.36		0.64	0.25	
Uniform Delay, d1	19.2	20.9	15.8	16.8	27.4	15.6	29.7	24.1		47.1	44.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.0	0.9	0.1	0.6	5.1	0.0	18.0	0.2		11.6	0.3	
Delay (s)	37.1	21.8	15.9	17.4	32.4	15.6	47.7	24.2		58.7	44.9	
Level of Service	D	C	B	B	C	B	D	C		E	D	
Approach Delay (s)		21.9			32.3			36.3			49.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	114.1	Sum of lost time (s)	17.0
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX G
Existing Transit Routes

6 Hwy 407 Park & Ride • James Potter Road • Queen Street W

NORTHBOUND: Monday-Friday

Hwy 407 Park & Ride	Mavis Rd & Derry Rd W	Steeles Ave W & Chinguacousy Rd	James Potter Rd & Queen St W
A	B	C	D
6:02	6:09	6:15	6:25
6:27	6:34	6:40	6:50
7:02	7:10	7:16	7:26
7:32	7:40	7:46	7:56
8:02	8:10	8:16	8:26
8:32	8:40	8:46	8:56
9:02	9:09	9:15	9:25
9:34	9:41	9:47	9:57
10:02	10:09	10:16	10:26
10:32	10:39	10:46	10:56
11:02	11:09	11:16	11:26
11:32	11:39	11:46	11:56
12:02	12:09	12:16	12:26
12:32	12:39	12:46	12:56
1:02	1:09	1:16	1:26
1:32	1:39	1:46	1:56
2:02	2:09	2:16	2:26
2:32	2:39	2:46	2:56
3:02	3:10	3:17	3:27
3:32	3:40	3:47	3:57
4:02	4:10	4:18	4:28
4:32	4:40	4:48	4:58
5:02	5:10	5:18	5:28
5:32	5:40	5:48	5:58
6:02	6:10	6:17	6:27
6:32	6:40	6:47	6:57
7:02	7:10	7:17	7:27
8:02	8:09	8:16	8:26

SOUTHBOUND: Monday-Friday

James Potter Rd & Queen St W	Chinguacousy Rd & Queen St W	James Potter Rd & Queen St W	Steeles Ave W & Chinguacousy Rd	Mavis Rd & Derry Rd W	Hwy 407 Park & Ride
D	E	D	C	B	A
5:30	5:33	5:35	5:43	5:49	5:57
5:56	5:59	6:01	6:10	6:16	6:24
6:30	6:33	6:35	6:44	6:50	6:58
6:55	6:58	7:00	7:09	7:17	7:25
7:30	7:33	7:35	7:44	7:52	8:00
8:00	8:04	8:06	8:15	8:23	8:31
8:30	8:34	8:36	8:45	8:53	9:01
9:05	9:08	9:10	9:19	9:25	9:33
9:30	9:33	9:35	9:44	9:50	9:58
10:00	10:03	10:05	10:14	10:20	10:28
10:30	10:33	10:35	10:44	10:50	10:58
11:00	11:03	11:05	11:14	11:20	11:28
11:30	11:33	11:35	11:44	11:50	11:58
12:00	12:03	12:05	12:13	12:19	12:27
12:30	12:33	12:35	12:43	12:49	12:57
1:00	1:03	1:05	1:13	1:19	1:27
1:30	1:33	1:35	1:43	1:49	1:57
2:00	2:03	2:05	2:14	2:20	2:28
2:30	2:33	2:35	2:44	2:50	2:58
3:00	3:03	3:05	3:14	3:20	3:28
3:30	3:33	3:35	3:44	3:50	3:58
4:00	4:03	4:05	4:14	4:20	4:28
4:30	4:33	4:35	4:44	4:50	4:58
5:00	5:03	5:05	5:14	5:20	5:28
5:30	5:33	5:35	5:44	5:50	5:58
6:00	6:04	6:06	6:15	6:21	6:29
6:30	6:34	6:36	6:45	6:51	6:59
7:30	7:34	7:36	7:45	7:51	7:59

NORTHBOUND: Saturday

Hwy 407 Park & Ride	Mavis Rd & Derry Rd W	Steeles Ave W & Chinguacousy Rd	James Potter Rd & Queen St W
A	B	C	D
8:32	8:39	8:45	8:55
9:32	9:39	9:45	9:55
10:32	10:39	10:45	10:55
11:02	11:09	11:15	11:25
11:32	11:39	11:45	11:55
12:02	12:09	12:15	12:25
12:32	12:39	12:45	12:55
1:02	1:09	1:15	1:25
1:32	1:39	1:45	1:55
2:02	2:09	2:15	2:25
2:32	2:39	2:45	2:55
3:02	3:09	3:15	3:25
3:32	3:39	3:45	3:55
4:02	4:09	4:16	4:26
4:32	4:39	4:46	4:56
5:02	5:09	5:16	5:26
5:32	5:39	5:46	5:56
6:02	6:09	6:16	6:26
6:32	6:39	6:46	6:56
7:02	7:09	7:16	7:26

SOUTHBOUND: Saturday

James Potter Rd & Queen St W	Chinguacousy Rd & Queen St W	James Potter Rd & Queen St W	Steeles Ave W & Chinguacousy Rd	Mavis Rd & Derry Rd W	Hwy 407 Park & Ride
D	E	D	C	B	A
8:00	8:03	8:05	8:14	8:20	8:28
9:00	9:03	9:05	9:14	9:20	9:28
10:00	10:03	10:05	10:14	10:20	10:28
10:30	10:33	10:35	10:44	10:50	10:58
11:00	11:03	11:05	11:14	11:20	11:28
11:30	11:33	11:35	11:44	11:50	11:58
12:00	12:03	12:05	12:14	12:20	12:28
12:30	12:33	12:35	12:44	12:50	12:58
1:00	1:03	1:05	1:14	1:20	1:28
1:30	1:33	1:35	1:44	1:50	1:58
2:00	2:03	2:05	2:13	2:19	2:27
2:30	2:33	2:35	2:43	2:49	2:57
3:00	3:03	3:05	3:13	3:19	3:27
3:30	3:33	3:35	3:43	3:49	3:57
4:00	4:03	4:05	4:13	4:19	4:27
4:30	4:33	4:35	4:43	4:49	4:57
5:00	5:03	5:05	5:13	5:19	5:27
5:30	5:33	5:35	5:43	5:49	5:57
6:00	6:03	6:05	6:13	6:19	6:27
6:30	6:33	6:35	6:43	6:49	6:57

6 Hwy 407 Park & Ride • James Potter Road • Queen Street W

NORTHBOUND: Sunday / Holidays			
Hwy 407 Park & Ride	Mavis Rd & Derry Rd W	Steeles Ave W & Chinguacousy Rd	James Potter Rd & Queen St W
A	B	C	D
8:32	8:39	8:45	8:55
9:32	9:39	9:46	9:56
10:32	10:39	10:46	10:56
11:32	11:39	11:46	11:56
12:32	12:39	12:46	12:56
1:32	1:39	1:46	1:56
2:32	2:39	2:46	2:56
3:32	3:39	3:46	3:56
4:32	4:39	4:46	4:56
5:32	5:39	5:46	5:56
6:32	6:39	6:46	6:56

SOUTHBOUND: Sunday / Holidays					
James Potter Rd & Queen St W	Chinguacousy Rd & Queen St W	James Potter Rd & Queen St W	Steeles Ave W & Chinguacousy Rd	Mavis Rd & Derry Rd W	Hwy 407 Park & Ride
D	E	D	C	B	A
8:00	8:03	8:05	8:14	8:20	8:28
9:00	9:03	9:05	9:14	9:20	9:28
10:00	10:03	10:05	10:14	10:20	10:28
11:00	11:03	11:05	11:14	11:20	11:28
12:00	12:03	12:06	12:15	12:21	12:29
1:00	1:03	1:05	1:14	1:20	1:28
2:00	2:03	2:05	2:14	2:20	2:28
3:00	3:03	3:05	3:14	3:20	3:28
4:00	4:03	4:05	4:14	4:20	4:28
5:00	5:03	5:05	5:14	5:20	5:28
6:00	6:03	6:05	6:14	6:20	6:28

While every effort will be made to keep to the timetables, Brampton Transit does not undertake that its buses will be operated in accordance with them, or at all. Brampton Transit will not be responsible for any loss, damage or inconvenience caused by any operating failure or in consequence of any inaccuracies in this timetable.

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Monday to Friday	7:00 a.m. to 9:00 p.m.
Saturday	7:00 a.m. to 7:00 p.m.
Sunday	9:00 a.m. to 6:00 p.m.

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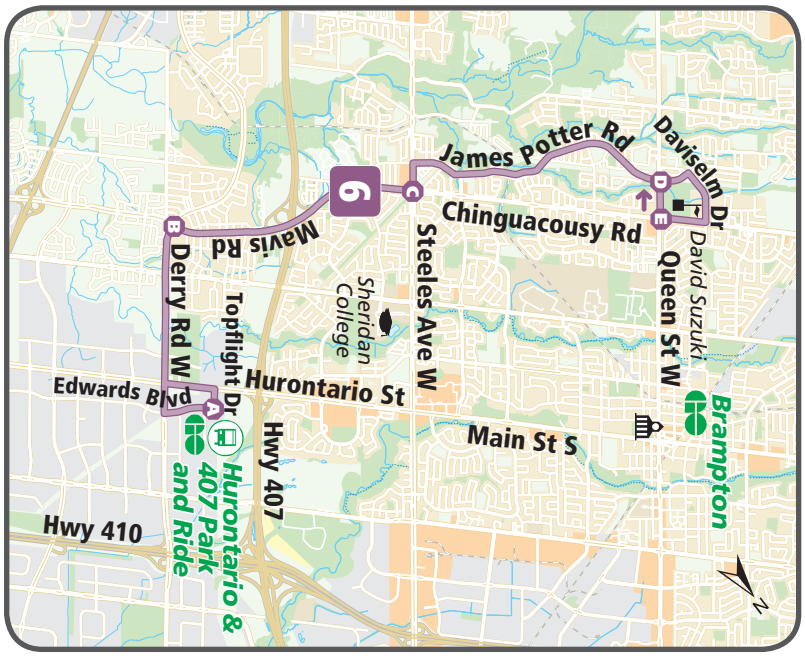

James Potter

Monday – Sunday

Effective: March 6, 2017

6

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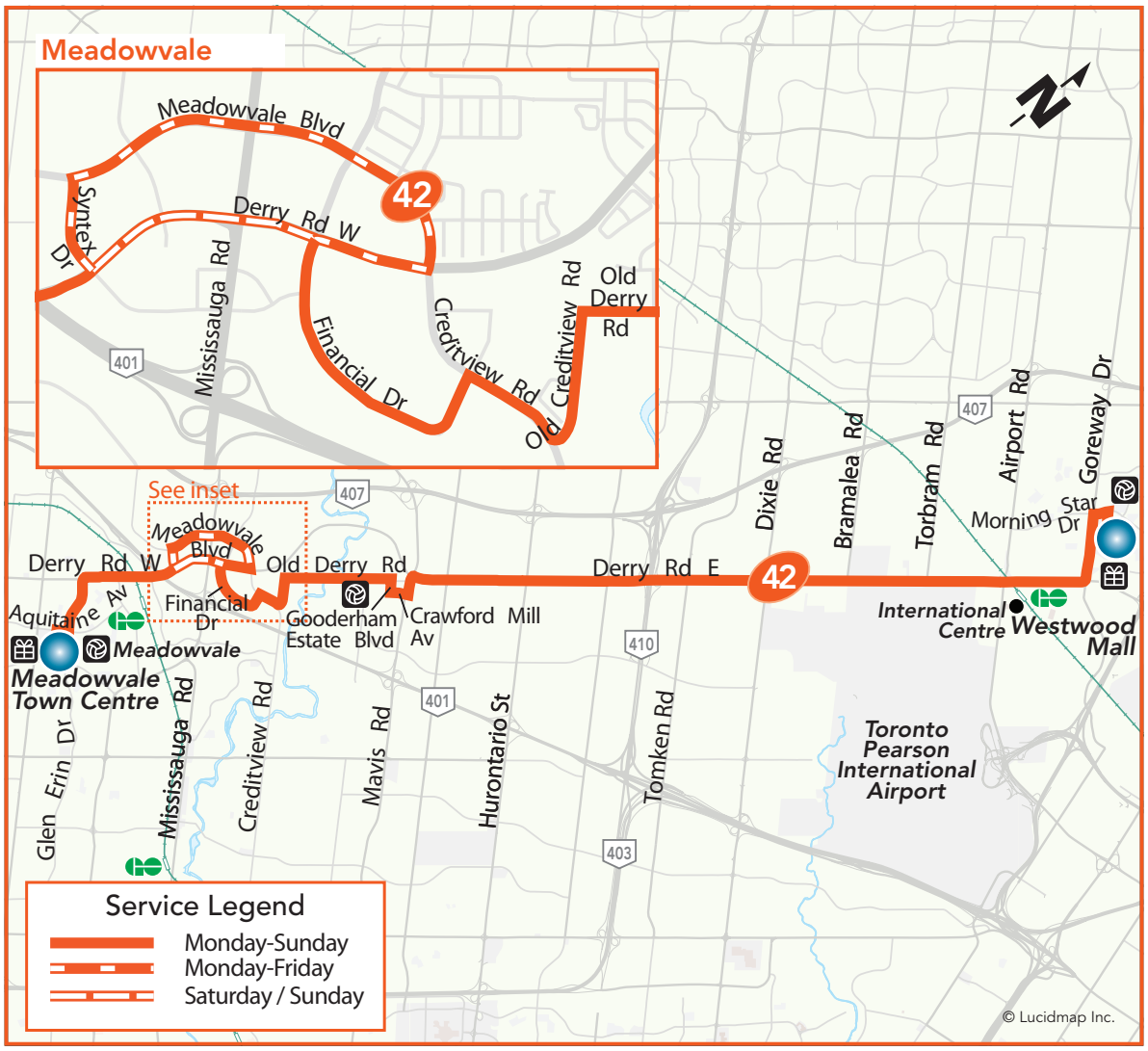
42 Derry

Monday-Sunday Service

Effective: January 28, 2013



Legend

Islington	TTC Subway Station		Major Transit Terminal		Shopping Centre		Public Library
Clarkson	GO Train Station		Hospital		High School, University or College		Living Arts Centre
	Transitway Station		Ice Rink		Recreation or Community Centre		Civic Centre (City Hall)

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citylink 905-615-4BUS(4287)

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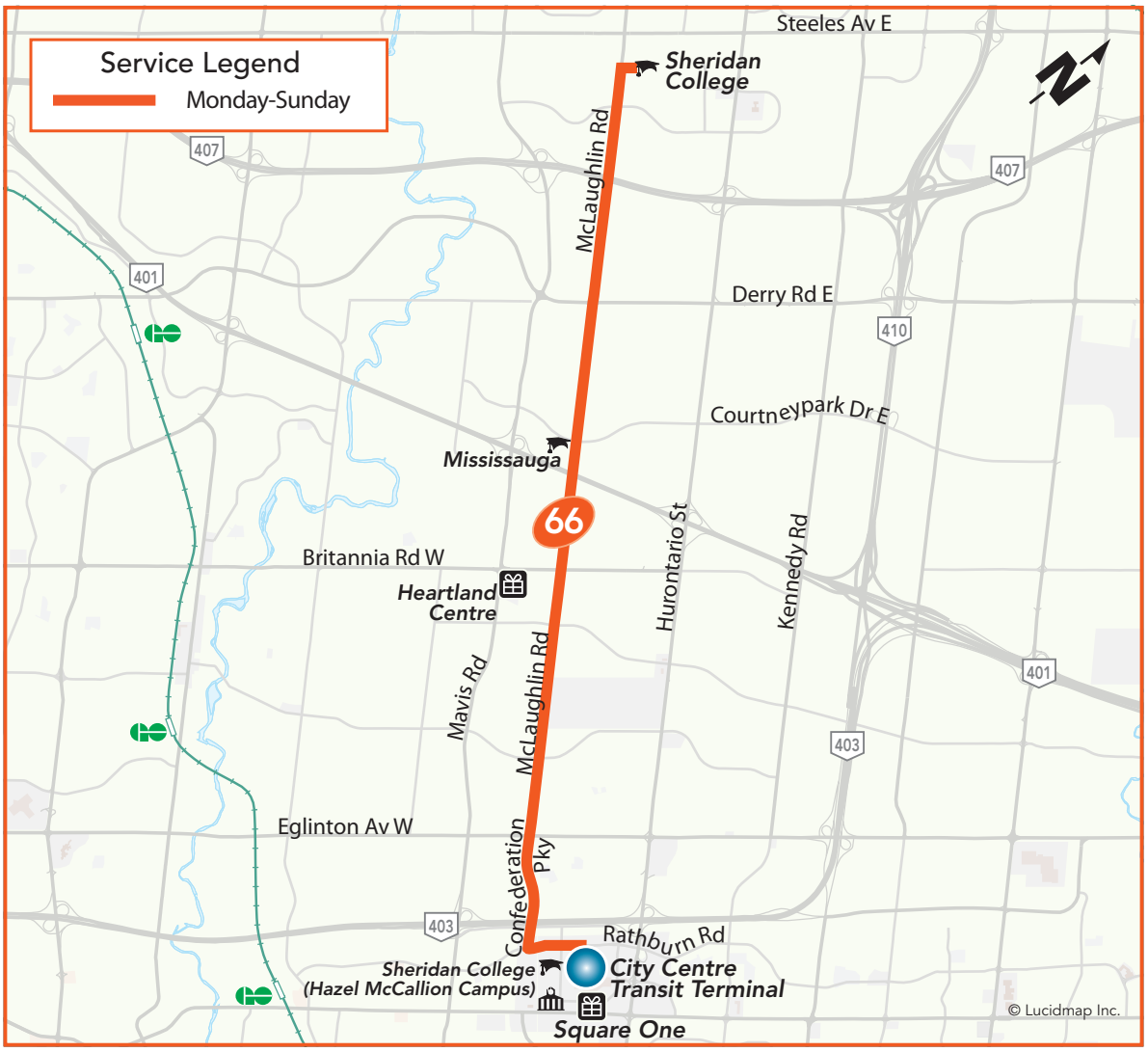
66 McLaughlin

Monday-Sunday Service

Effective: September 5, 2016



Legend

Islington — TTC Subway Station	Major Transit Terminal	Shopping Centre	Public Library
Clarkson — GO Train Station	Hospital	High School, University or College	Living Arts Centre
Transitway Station	Ice Rink	Recreation or Community Centre	Civic Centre (City Hall)

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