400 LANARK STREET, CARLETON PLACE TRANSPORTATION IMPACT STUDY UPDATE

Project No.: CCO-22-0597

Prepared for:

Wintergreen Ridge Ltd

Prepared by:

Egis Canada Ltd.
6240 Highway 7, Suite 200
Woodbridge, ON
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September 27, 2024

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Wintergreen Ridge Ltd

Re: 400 Lanark Street, Carleton Place Transportation Impact Study Update

The enclosed Traffic Impact Study (TIS) Update report has been completed in support of the proposed subdivision at 400 Lanark Street located in Carleton Place, Ontario. The subject site is anticipated to have a 2026-year full buildout for the residential subdivision and is located on the north side of Townline Road East between Lanark Street and Edmund Street in Lanark County. The residential development comprises 204 dwellings, including a mix of detached homes, semi-detached homes, townhouses, and apartment units. Any proposed changes to the density have been thoroughly reviewed in this report.

The study focused on determining the impact of the proposed development on the surrounding transportation network and provide recommendations for mitigation measures as required.

If you have any questions, do not hesitate to contact us.

Sincerely,

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EXECUTIVE SUMMARY

Egis was retained by Wintergreen Ridge Ltd. to complete a Traffic Impact Study (TIS) for the proposed subdivision at 400 Lanark Street in Carleton Place, Ontario. The residential development includes 204 dwellings, consisting of detached homes, semi-detached homes, townhouses, and apartment units.

Based on recent feedback from the client, the density of the development has been modified. This change impacts the trip generation to and from the development site, as well as the build-out (2026) and post-build-out (2031) scenarios.

Egis reviewed a total of four intersections for both future total scenarios. The intersections evaluated include:

- Bridge Street and Townline Road
- Edmund Street and Townline Road
- Townline Road and Lanark Street
- McNeely Avenue and Townline Road

Using the ITE Trip Generation Manual, 11th Edition, Egis established the site-generated trips which were assigned to the proposed road network based on collected data and existing travel patterns. Egis conducted traffic analysis using Synchro 11 and SimTraffic software to identify capacity concerns as well as queue analysis at the study intersections.

The analysis concluded that the forecasted development site traffic can be accommodated at the boundary road intersections for both the build-out (2026) and post-build-out (2031) future horizons without significantly impacting the study area operations.

The recommendation is that the northbound right-turn (NBR) lane at McNeely Avenue and Townline Road needs to be able to accommodate a queue length of 88 meters under 2031 total conditions and 80 meters under 2031 background conditions. The queue length requirement is primarily driven by background conditions rather than development traffic. It is suggested that storage capacity should be provided if possible.

Analysis also determined that available sight distances at the proposed site accesses conform to TAC guidelines. Therefore, the proposed development has a minimal impact on boundary road operations and does not necessitate any changes to the existing roadway infrastructure.

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1.0 INTRODUCTION

Egis was retained by Wintergreen Ridge Ltd. to complete a Traffic Impact Study (TIS) in support of the proposed residential subdivision at 400 Lanark Street, located in Carleton Place, Ontario.

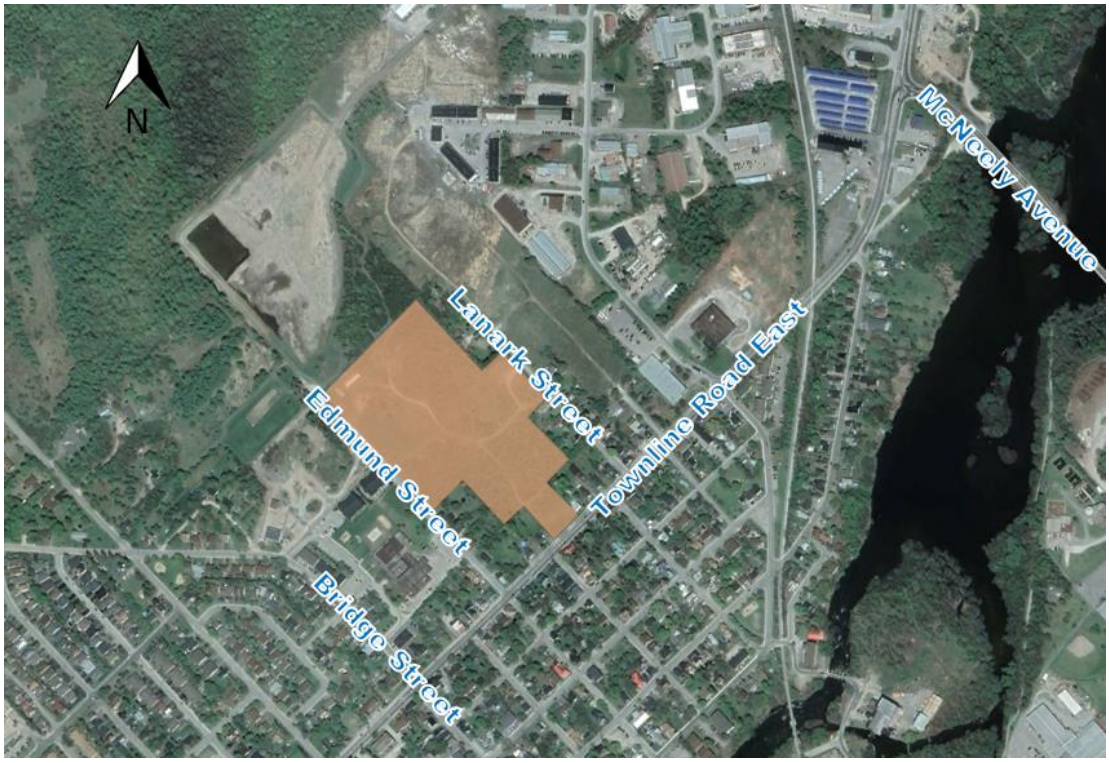
The subject site is anticipated to have a 2026-year full buildout for the residential subdivision. This traffic study provides an update on the submitted September 2023 TIS for the proposed development and consists of a reduced unit density from 250 units to 204 units, a reduction of 46 units. The updated TIS will assess the impact of site traffic from the proposed development on the boundary network during the critical weekday AM and PM peak periods.

2.0 SITE CHARACTERISTICS

2.1 Study Location

The proposed development is located on the north side of Townline Road East between Lanark Street and Edmund Street in Lanark County, as illustrated in **Figure 1**. The proposed development is located in a settlement area whose land falls under Schedule A of Lanark County's Official Plan (revised January 2017). As per the Town of Carleton Place Official Plan, the proposed development is within the residential district zoning.

Figure 1 Proposed Development and Surrounding Area



3.0 PROPOSED DEVELOPMENT

The site is expected to consist of 204 fully serviced dwelling units which include three medium density apartments with a total of 82 units, 23 single detached homes, 20 semi-detached homes, and 79 townhouses. The lands have frontage on Townline Road East to the south, Lanark Street to the east, and Edmund Street to the west. The subject property has a total area of 6.26 hectares. The site plan and detailed site statistics for the proposed development have been provided in **Appendix A**.

4.0 EXISTING CONDITIONS

The following subsections outline the existing traffic conditions and site characteristics.

4.1 Existing Site

The Town has designated these lands for residential land use. Our desktop review shows the proposed land is currently occupied by the Sobczak tree farm. In addition, there are existing residential developments to the south and west of the site. We also understand a residential development is proposed to the east fronting onto Lanark Street.

4.2 Existing Road Network

Townline Road is classified as an arterial roadway and is under the jurisdiction of Lanark County. The roadway has a three-lane cross section in the vicinity of the site, consisting of one lane per direction and a two-way center left-turn lane. To the west end of the site the two-way center left-turn lane transitions to dedicated turning lanes at Edmund Street. There are sidewalks on both sides of the road within the vicinity of the study area. However, east of Mullett Street/Industrial Avenue intersection, the sidewalk is provided only on the south side of the road. The posted speed limit is 50 km/h east of Baines Street and 40 km/h west of Baines Street.

McNeely Avenue is classified as an arterial roadway and is under the jurisdiction of Lanark County. The roadway cross section is two-lanes consisting of one lane per direction and has dedicated turning lanes near intersections. There are paved shoulders on both sides of the road and a sidewalk is provided on the west side of the roadway. The posted speed limit is 60 km/h.

Bridge Street is classified as a collector roadway and is under the jurisdiction of Carleton Place. The roadway runs generally in a north–south direction and has a two-lane cross section. The sidewalk is provided on both sides of the roadway. The posted speed limit is 50 km/h.

Edmund Street is classified as a local road and is under the jurisdiction of Carleton Place. This roadway provides access to residential neighborhoods. A sidewalk is provided on the east side of the roadway south to the Townline Road intersection and on the west side north of the Townline Road intersection. The speed limit is assumed to be 40 km/h.

Lanark Street is classified as a local road and is under the jurisdiction of the Town of Carleton Place. This roadway has a two-lane cross section and provides access to residential neighborhoods. A sidewalk is provided on the east side of the roadway. The roadway runs in a north-south direction with a posted speed limit of 40 km/h.

The existing road network is provided in **Figure 2**.

Figure 2 Existing Road Network

4.3 Existing Intersections

The existing study area intersections to be included in this report are as follows:

- Townline Road and Bridge Street;
- Townline Road and Edmund Street;
- Townline Road and Lanark Street; and
- Townline Road and McNeely Avenue.

The following is a description of the lane configurations and traffic control at these intersections:

Townline Road and Bridge Street, as illustrated in **Figure 3**, is a signalized intersection. In the westbound direction, the intersection has dedicated left, through, and right turning lanes. In the eastbound direction, the intersection has a left turn lane and a shared through-right turning lane. The northbound and southbound directions have a shared left-through-right lane. Protected pedestrian crossings are provided across all four approaches.

Figure 3 Townline Road and Bridge Street

Townline Road and Edmund Street, as illustrated in **Figure 4**, is a two-way stop-controlled intersection with stop signs on the minor legs of Edmund Street. The westbound traffic has dedicated left, through, and right turning lanes, while the eastbound traffic has a left turn lane and a shared through-right turning lane. The northbound and southbound traffic has a single shared left-through-right lane. There are no pedestrian crossings at this intersection, however a sidewalk is provided on the east side of Edmund Street south of the intersection and on the west side of Edmund Street north of the intersection.

Figure 4 Townline Road and Edmund Street

Townline Road and Lanark Street, as illustrated in **Figure 5**, is a stop-controlled T-intersection with a stop sign at the minor leg, Lanark Street. The westbound direction comprises a shared through and right-turn lane, and the eastbound direction includes a through lane with a left-turn available via the two-way left-turn (TWLT) lane along Townline Road. In the southbound direction, there is a single shared left-turn and right-turn lane. There is no protected pedestrian crossing at this intersection, however sidewalks are provided on both sides of Townline Road and on the east side of Lanark Street.

It is noted this segment of Townline Road has a continuous two-way left-turn lane.

Figure 5 Townline Road and Lanark Street

Townline Road and McNeely Avenue, as illustrated in **Figure 6,** is a signalized intersection. Movement along Townline Road is continued to be considered east-west for analysis. As such eastbound traffic has dedicated through and right turning lanes, and westbound traffic has dedicated left and through turning lanes. The northbound traffic has dedicated left and right turning lanes. Protected pedestrian crossings are provided across all three approaches.

Figure 6 Townline Road and McNeely Avenue

4.4 Existing Pedestrian and Cycling Facilities

Sidewalks are provided on both sides of Townline Road west of Mullett Street/Industrial Avenue. However, east of the Mullett Street and Industrial Avenue intersection, a sidewalk is only provided on the south side of Townline Road. Protected pedestrian crossings are present at all signalized intersections within the study area. The sidewalk locations are presented in **Figure 7**.

Figure 7 Existing Sidewalks

The existing cycling network within Carleton Place is illustrated in **Figure 8**. As shown below, in the vicinity of the proposed development, both Townline Road and McNeely Avenue are part of the existing town-recommended cycle route.

Figure 8 Existing Cycling Network

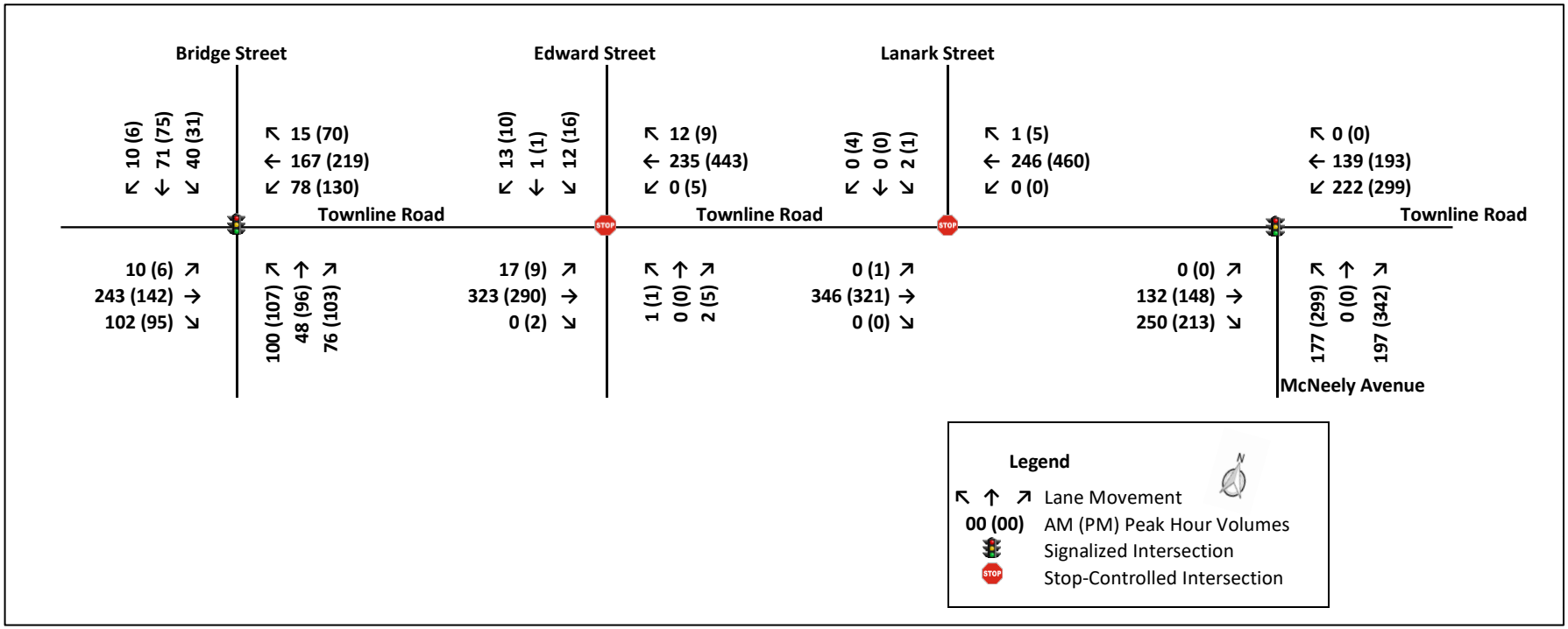
4.5 Existing Transit System

Classic Alliance Motorcoach (a division of Leduc Bus Lines Ltd.) provides commuter service between Carleton Place, adjacent municipalities, and the City of Ottawa. Leduc Bus Lines operates Routes 502 and 503 (between Almonte, Carleton Place and Perth), with a stop at Bridge Street and Townline Road.

4.6 Existing Traffic Volumes

Egis used *Appendix B1* from the Carleton Place TMP as reference for the existing condition traffic volumes for the intersection of Bridge Street at Townline Road and McNeely Avenue at Townline Road. Egis referred to the Inverness Homes development TIS located approximately 670 m west of the intersection of Townline Road and McNeely Avenue completed on November 16, 2022, by D. J. Halpenny & Associates Ltd., to obtain the turning movement count for the Lanark Street and Townline Road intersection. Egis conducted 2-hour counts for AM and PM peak hours at the intersection of Edmund Street and Townline Road on August 24, 2023. Traffic data used for this study is provided in **Appendix B** and **Appendix C**. Traffic volumes for existing study conditions are provided in **Figure 9**.

Figure 9 Existing (2023) Traffic Volumes



4.7 Existing 2024 Traffic Analysis

Intersection operations were assessed using the Synchro 11 software which utilizes the Highway Capacity Manual (HCM) 6th Edition methodology published by the Transportation Research Board National Research Council. Synchro 11 can analyze both signalized and unsignalized intersections in a road corridor or network.

Intersection operations performance metrics are reported in terms of Level of Service (LOS), delays, volume-to-capacity (v/c) ratios, and 95th percentile queues. Level of service is based on the average control delay per vehicle for a given movement. Delay is an indicator of how long a vehicle must wait to complete a movement and is represented by a letter between 'A' and 'F', with 'F' being the longest delay. **Table 1** summarizes the LOS criteria for signalized and unsignalized intersections.

Table 1 LOS Criteria for Unsignalized Intersections

Level of Service	Average Control Delay per Vehicle (seconds / vehicle)	
	Signalized Intersection[1]	Unsignalized Intersection[1]
A	≤ 10	≤ 10
B	>10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F[2]	> 80	> 50

[1] HCM 2000 Methodology

[2] *LOS F is reached if any movement exceeds capacity (i.e., v/c > 1.0)*

The existing intersection operations were analyzed for the weekday AM and weekday PM peak hours. Analysis indicates that all turning movements will operate with acceptable LOS and delay during both the AM and PM peak hour periods. A maximum queue of 65 m was observed during PM peak hour on the northbound left movement at the intersection of McNeely Avenue and Townline Road. All the study intersections are expected to have reserve capacity to accommodate any increase in traffic volume. The overall signalized and unsignalized intersection operation results are provided in **Table 2**. Detailed Synchro 11 results are provided in **Appendix D**.

Table 2 Existing (2023) Conditions Capacity Analysis Summary

Intersection	Approach	AM Peak Hour				PM Peak Hour			
		LOS	v/c Ratio	Delay (s)	Queue (m)	LOS	v/c Ratio	Delay (s)	Queue (m)
Bridge Street & Townline Road	EB-L	B	0.03	14	8	B	0.02	14	8
	EB-TR	B	0.59	19	59	B	0.40	14	43
	WB-L	A	0.18	8	22	A	0.24	8	27
	WB-T	A	0.21	10	29	B	0.27	10	37
	WB-R	A	0.02	1	8	A	0.10	3	19
	NB-LTR	B	0.49	17	42	C	0.64	22	59
	SB-LTR	B	0.26	16	23	B	0.23	16	24
Edmund Street and Townline Road	EB-L	A	0.01	8	7	A	0.01	8	5
	WB-L	A	-	-	-	A	0.00	8	3
	WB-R	-	-	-	-	-	-	-	1
	NB-LTR	B	0.01	12	5	B	0.01	11	8
	SB-LTR	B	0.06	12	9	C	0.08	16	10
Townline Road & Lanark Street	EB-L	A	-	0	0	A	0.00	8	0
	EB-T	-	-	-	2	-	-	-	2
	SB-LR	B	0.00	12	4	B	0.01	12	7
McNeely Avenue & Townline Road	EB-T	B	0.19	12	28	B	0.23	14	33
	EB-R	A	0.34	3	32	A	0.31	4	29
	WB-L	A	0.34	7	39	B	0.49	10	47
	WB-T	A	0.14	6	22	A	0.21	8	31
	NB-L	C	0.49	23	39	C	0.71	28	65
	NB-R	A	0.42	6	25	A	0.54	6	45

5.0 FUTURE CONDITIONS

Future background conditions were reviewed for a 2026 full build-out condition and a 2031, 5-year post-build condition.

5.1 Background Growth

Background traffic growth is a function of the projected population growth, changes to employment, roadway network modifications and other external factors. The Carleton Place Transportation Master Plan indicates that a linear background growth rate should be applied for key corridors such as:

- McNeely Avenue – 3.0%
- Townline Road/Bridge Street – 2.5%
- Collector Streets – 1%

This growth rate is assumed to account for the background growth within the vicinity of the subject development. As such, Egis applied a 3.0% linear background traffic growth rate to McNeely Avenue and a 2.5% linear background traffic growth rate to Townline Road and Bridge Street and a 1% growth rate to the remaining roadways within the study area to remain conservative in the estimation of the future scenario traffic volumes.

5.2 Background Development

Two background developments have been identified for consideration for inclusion in this study.

The development at 28 High Street, Carleton Place is expected to include a mix of residential and restaurant land uses. The development consists of 5-storey and 7-storey residential buildings, respectively, with a total combined Gross Floor Area (GFA) of 17,839 m^2 and 213 residential units, as well as 200 m^2 of restaurant GFA. Construction for the development is proposed to be completed in a single phase with the buildout year anticipated in 2024.

The Inverness Homes Development is located 670 m west of the intersection of Townline Road East and McNeely Avenue, fronting onto Lanark Street. The development will consist of 248 semi-detached homes and townhomes. The subdivision is expected to be completed in 2026.

The anticipated site-generated traffic for both developments was extracted from completed TIS and applied to the build-out year (2026) and 5-year post build-out year (2031) future conditions.

Traffic volumes generated from these two area developments are shown in **Figure 10**.

5.3 Background Traffic Volume

Background traffic volumes were determined by adding existing volumes, background area development traffic and background growth. The Build-out (2026) background traffic volumes and Future Horizon (2031) Traffic Volumes are provided in **Figure 11** and **Figure 12.**

Figure 10 Area Development Background Traffic Volumes

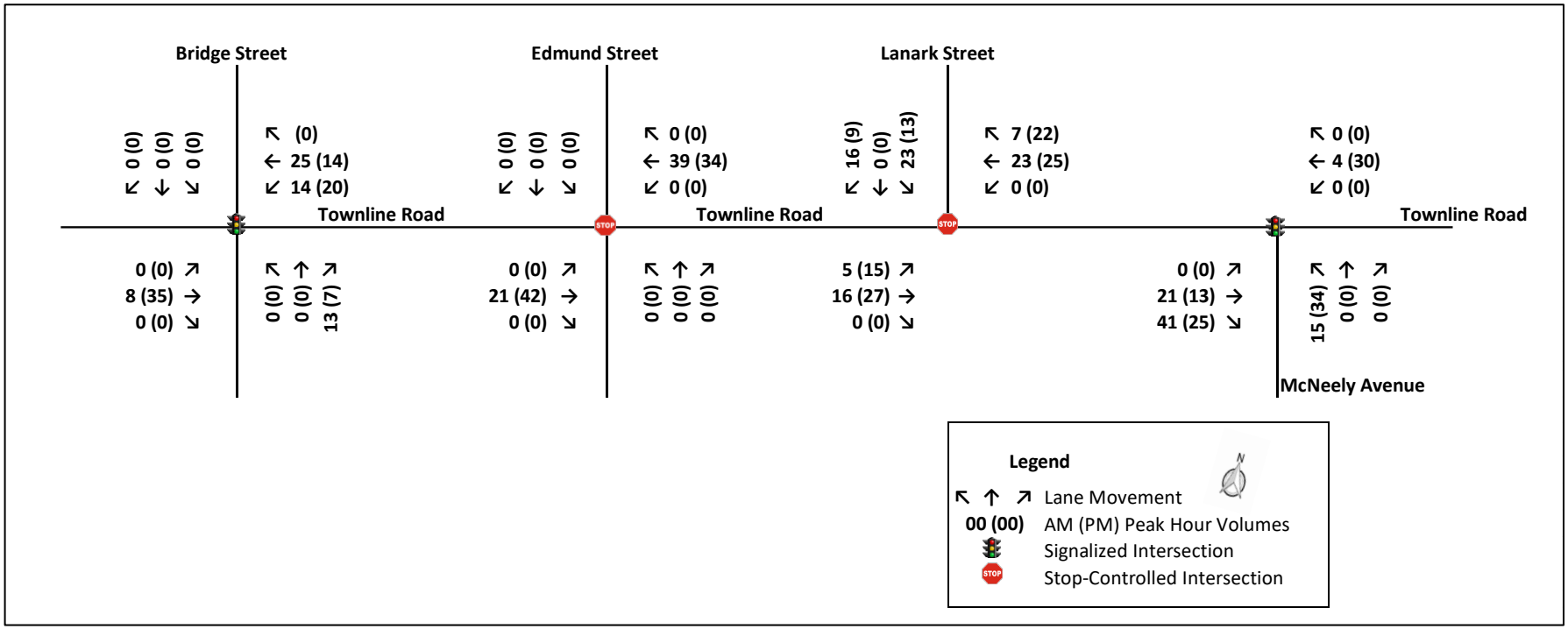


Figure 11 Background (2026) Traffic Volumes

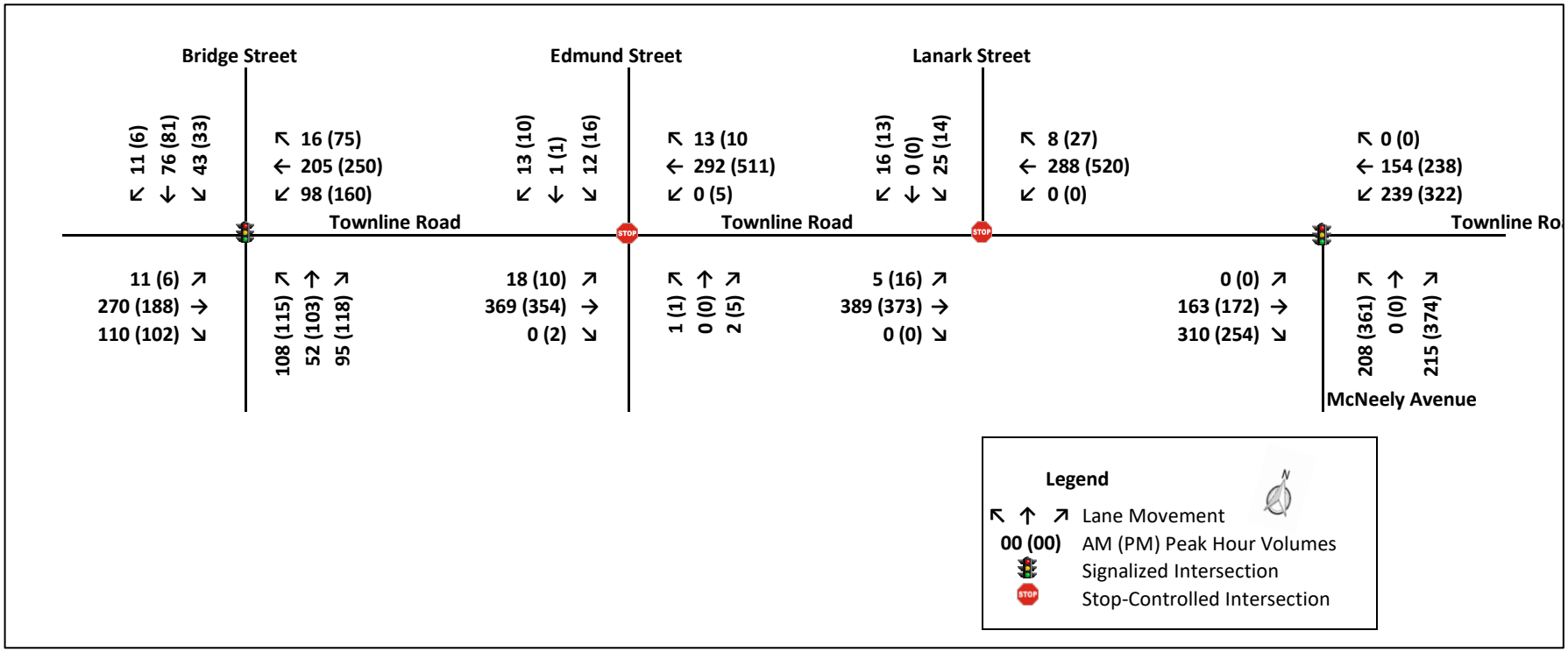
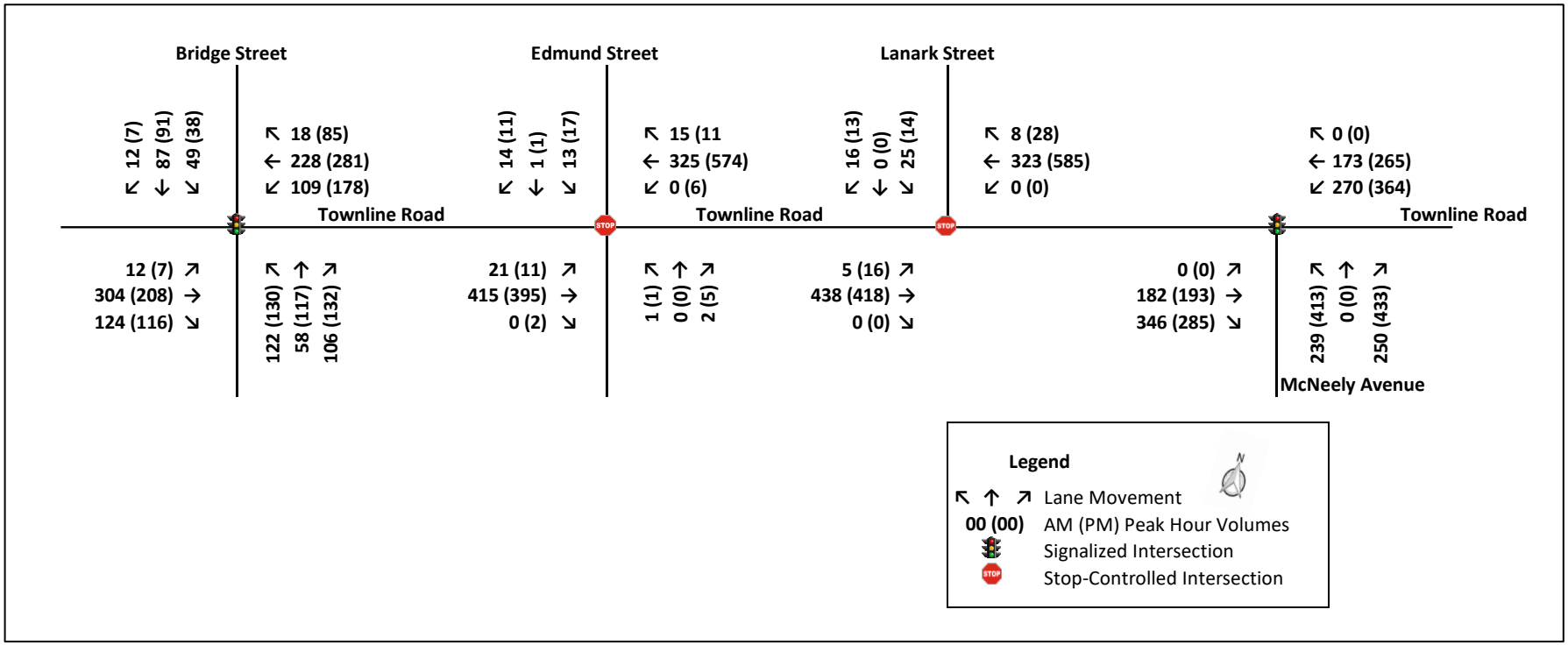


Figure 12 Background (2031) Traffic Volumes



5.4 Background (2026) Traffic Analysis

Intersection capacity analysis for background (2026) traffic conditions was completed for study area intersections to determine future operational measures of performance during the weekday AM and PM peak periods.

Intersection analysis for the 2026 background conditions indicates study intersections will continue to operate at a good level of service B or better in both the AM and PM peak hours, with minimal delay similar to existing conditions.

Analysis indicates that turning movements at all intersections will operate with significant reserve capacity. As such, network improvements would not be required under 2026 background conditions. With the increase of traffic volumes due to background conditions, the network exhibits no operational constraints. The study area has the potential to accommodate increased development given the available capacity along the boundary road network. A summary of the results is provided in **Table 3**.

Table 3 Background (2026) Conditions Capacity Analysis Summary

Intersection	Approach	AM Peak Hour				PM Peak Hour			
		LOS	v/c Ratio	Delay (s)	Queue (m)	LOS	v/c Ratio	Delay (s)	Queue (m)
Bridge Street & Townline Road	EB-L	B	0.03	14	9	B	0.02	14	8
	EB-TR	C	0.65	21	75	B	0.49	16	57
	WB-L	A	0.24	8	26	A	0.32	9	32
	WB-T	A	0.25	10	35	B	0.31	10	42
	WB-R	A	0.02	1	9	A	0.10	3	16
	NB-LTR	B	0.54	18	47	C	0.69	24	62
	SB-LTR	B	0.28	16	29	B	0.25	16	28
Edmund Street and Townline Road	EB-L	A	0.02	8	7	A	0.01	9	7
	WB-L	A	-	0	-	A	0.01	8	3
	NB-LTR	B	0.01	13	6	B	0.01	12	8
	SB-LTR	B	0.06	14	9	C	0.10	19	10
Townline Road & Lanark Street	EB-L	A	0.00	8	2	A	0.02	9	8
	EB-T	-	-	-	1	-	-	-	2
	WB-TR	-	-	-	-	-	-	-	1
	SB-LR	B	0.08	12	16	B	0.07	14	14
McNeely Avenue & Townline Road	EB-T	B	0.24	13	32	B	0.27	15	37
	EB-R	A	0.41	4	39	A	0.37	4	39
	WB-L	A	0.38	8	41	B	0.55	12	64
	WB-T	A	0.16	7	23	A	0.26	9	39
	NB-L	C	0.56	24	47	C	0.80	33	91
	NB-R	A	0.43	6	27	A	0.56	5	64

5.5 Background (2031) Traffic Analysis

Intersection analysis for the 2031 future background conditions indicates study intersections will continue to operate at a good level of service B or better in both the AM and PM peak hours, with minimal delay.

Similar to 2026 background assessment, analysis for future 2031 background conditions continue to indicate that turning movements at all intersections will operate with significant reserve capacity. Improvements for the 2031 background network would not be required based on the minimal level of development anticipated. The network exhibits no operational constraints, and the available network capacity provides potential to accommodate increased area development.

A queue length of 77 m for the northbound right-turn for the McNeely Avenue and Townline Road intersection would extend beyond the available storage, and an extension of the right-turn storage capacity should be provided if possible. A summary of the results is provided in **Table 4**.

Table 4 Background (2031) Conditions Capacity Analysis Summary

Intersection	Approach	AM Peak Hour				PM Peak Hour			
		LOS	v/c Ratio	Delay (s)	Queue (m)	LOS	v/c Ratio	Delay (s)	Queue (m)
Bridge Street & Townline Road	EB-L	B	0.03	14	14	B	0.02	14	8
	EB-TR	C	0.73	25	69	B	0.57	18	52
	WB-L	A	0.29	9	23	A	0.38	9	32
	WB-T	B	0.28	10	36	B	0.33	11	45
	WB-R	A	0.03	1	10	A	0.11	3	18
	NB-LTR	C	0.61	20	49	C	0.81	32	63
	SB-LTR	B	0.32	17	29	B	0.30	17	26
Edmund Street and Townline Road	EB-L	A	0.02	8	6	A	0.01	9	6
	WB-L	A	-	0	-	A	0.01	8	4
	NB-LTR	B	0.01	14	4	B	0.02	13	7
	SB-LTR	B	0.08	15	9	C	0.13	22	10
Townline Road & Lanark Street	EB-L	A	0.01	8	3	A	0.02	9	9
	EB-T	-	-	-	2	-	-	-	2
	SB-LR	B	0.09	13	15	B	0.07	15	13
McNeely Avenue & Townline Road	EB-T	B	0.28	14	35	B	0.31	16	36
	EB-R	A	0.45	4	39	A	0.40	4	38
	WB-L	A	0.44	9	41	B	0.65	15	66
	WB-T	A	0.18	7	25	A	0.30	9	43
	NB-L	C	0.61	25	49	D	0.87	40	115
	NB-R	A	0.46	6	33	A	0.59	6	77

6.0 FUTURE TOTAL CONDITIONS

6.1 Trip Generation

Trip generation for the proposed development was calculated in accordance with Institute of Transportation Engineers (ITE) Trip Generation 11th Edition methodologies and data. The development consists of residential developments including single detached homes (Land-Use Code 210), semi-detached homes and townhouses (Land-Use Code 215), and apartment buildings (Land-Use Code 221). All trip generation rates were taken for the weekday AM and PM peak hour of adjacent street traffic using the number of units for residential uses. A total of 84 new trips will be generated during AM peak hour and 108 trips will be generated around PM peak hour. **Table 5** summarizes the proposed development's trip generation.

Table 5 Trip Generation

Site Component	Units	ITE Code	Item	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Single Detached Homes	23	Single-Family Detached Housing (210)	Directional Distribution	25%	75%	100%	63%	37%	100%
			(Fitted Curve)	T= 0.91 Ln(X) + 0.12			Ln(T) = 0.94 Ln(X) + 0.27		
			Gross Trips	5	15	20	16	9	25
Semi-Detached Homes	20	Single-Family Attached Housing (215)	Directional Distribution	25%	75%	100%	59%	41%	100%
			(Fitted Curve)	T = 0.52(X) - 5.70			T = 0.60(X) - 3.93		
			Gross Trips	1	4	5	5	3	8
Townhouse	79	Single-Family Attached Housing (215)	Directional Distribution	25%	75%	100%	59%	41%	100%
			(Fitted Curve)	T = 0.52(X) - 5.70			T = 0.60(X) - 3.93		
			Gross Trips	9	26	35	26	17	43
Apartment	82	Multifamily Housing (Mid-Rise) (221)	Directional Distribution	23%	77%	100%	61%	39%	100%
			(Fitted Curve)	T = 0.44(X) - 11.61			T = 0.39(X) + 0.34		
			Gross Trips	6	18	24	20	12	32
Total				**21**	**63**	**84**	**66**	**42**	**108**

6.2 Trip Distribution and Assignment

Site trip distribution and assignment to the study area network were developed based on the site configuration and internal connections, network connectivity, consideration of splits from Carleton Place TMP, existing traffic patterns.

Distribution of site generated trips to the study area network has been summarized in **Table 6**. The assignment of forecasted site traffic volumes has been provided in **Figure 13**.

Table 6 Trip Distribution, Origin/Destination Review

To/From	Percentage
East (Ottawa, Gatineau, Internal Carleton Place)	71%
West (Perth, Tay Valley)	3%
North (Mississippi Mills)	6%
South (Internal Carleton Place, Smith's Falls, Beckwith)	20%

6.3 Build-Out (2026) Total Traffic Volumes

The build-out (2026) total traffic volumes were derived by summing build-out (2026) background traffic volumes and forecasted site traffic volume for the AM and PM peak periods. Future (2026) total traffic volumes are presented in

Figure 14.

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Figure 13 Site Traffic Volumes

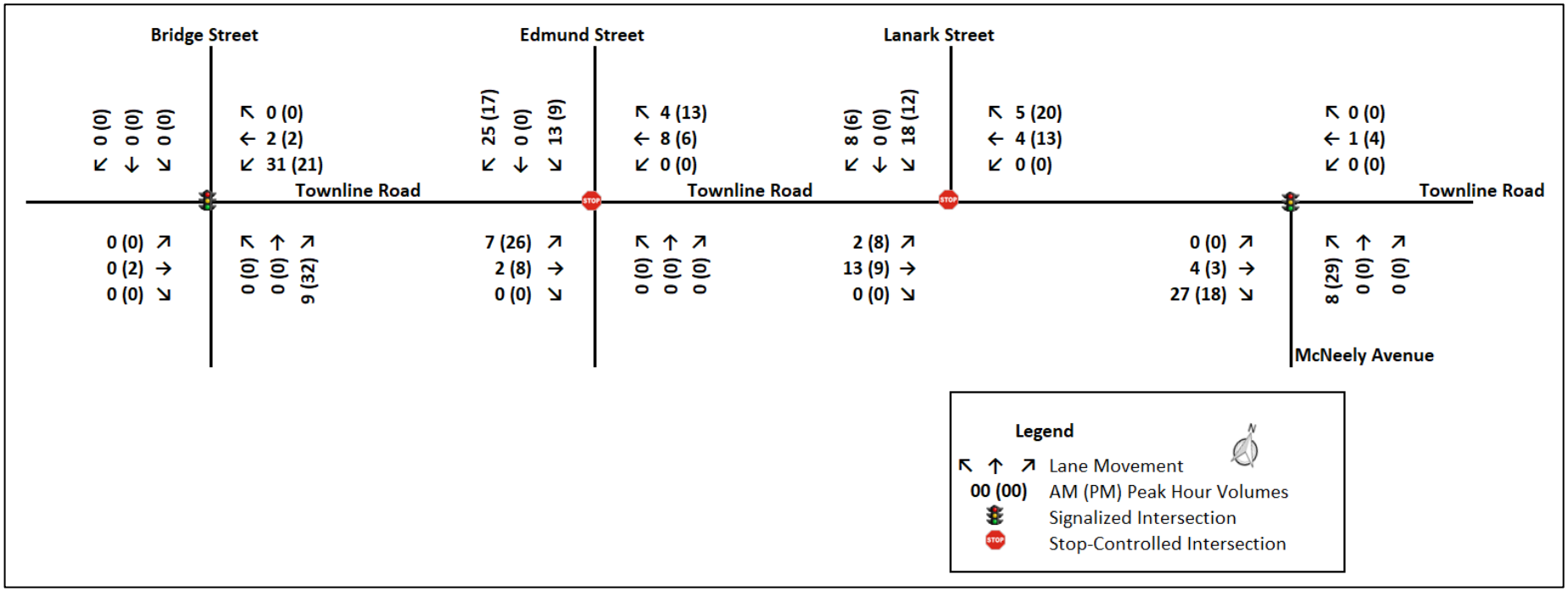
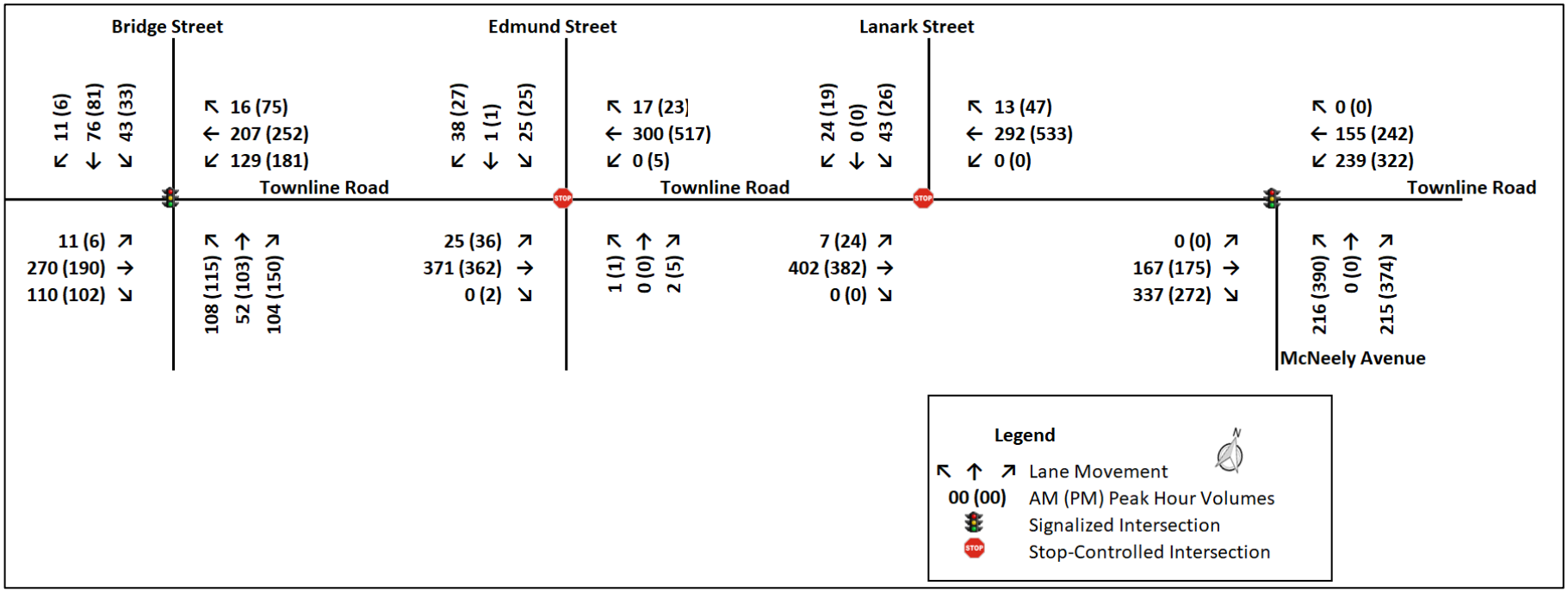


Figure 14 Future Total (2026) Traffic Volumes



6.4 Build-Out (2026) Total Traffic Analysis

Intersection capacity analysis for the build-out (2026) total traffic conditions was completed for study area intersections to determine the future operational measures of performance during the AM and PM weekday peak periods. Lane configurations remained the same as the existing conditions.

With the addition of development-generated trips to the network, peak hour traffic volumes continue to operate with significant reserve capacity without any capacity constraints or concerns. However, at the McNeely Avenue and Townline Road intersection, a 95th percentile queue of 103m is observed. The movement operates with LOS D and v/c ratio of 0.84. Based on the level of development and available capacity for the future total 2031 study horizon, no network improvements are currently proposed for the study area. A summary of the results is provided in **Table 7.**

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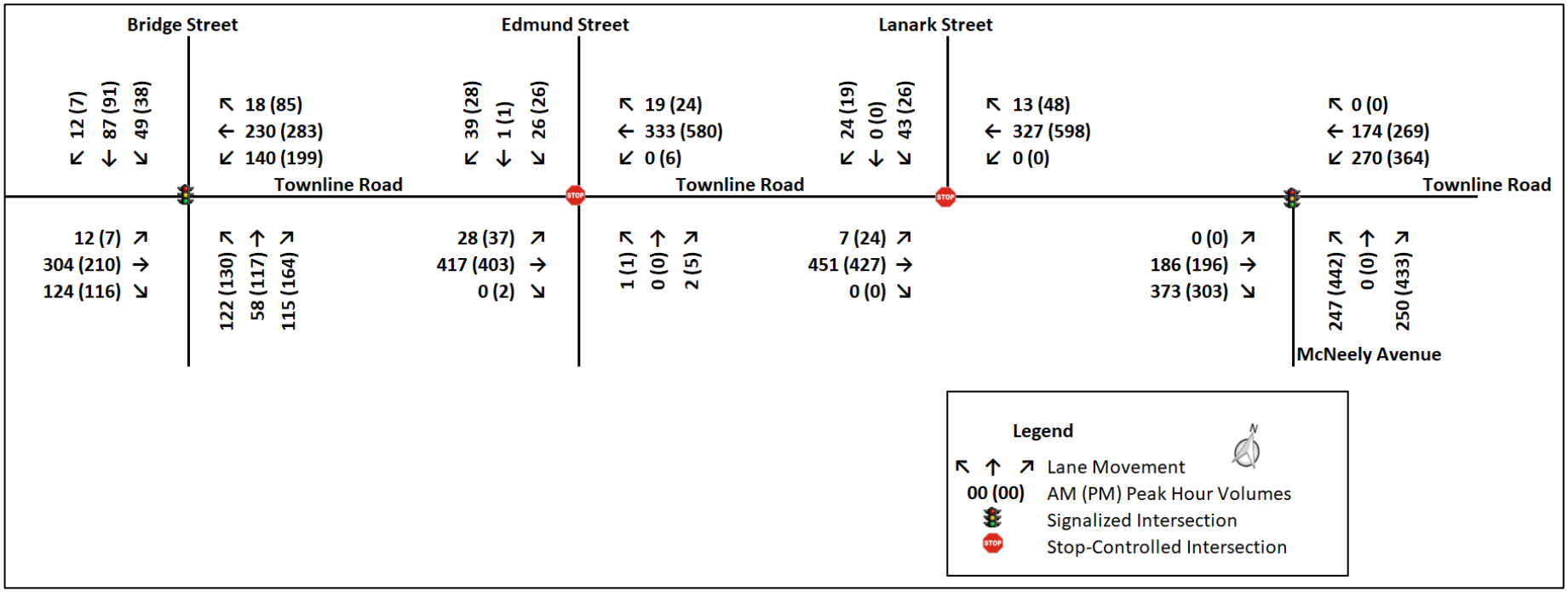
Table 7 Build-Out (2026) Total Conditions Capacity Analysis Summary

Intersection	Approach	AM Peak Hour				PM Peak Hour			
		LOS	v/c Ratio	Delay (s)	Queue (m)	LOS	v/c Ratio	Delay (s)	Queue (m)
Bridge Street & Townline Road	EB-L	B	0.03	14	9	B	0.02	14	7
	EB-TR	C	0.65	21	75	B	0.51	17	51
	WB-L	A	0.31	9	32	A	0.36	9	36
	WB-T	A	0.26	10	40	B	0.3	10	41
	WB-R	A	0.02	1	9	A	0.1	3	17
	NB-LTR	B	0.55	18	46	C	0.76	28	74
	SB-LTR	B	0.28	16	26	B	0.27	17	30
Edmund Street and Townline Road	EB-L	A	0.02	8	9	A	0.04	9	12
	WB-L	A	-	0	-	A	0.01	8	3
	WB-R	-	-	-	-	-	-	-	1
	NB-LTR	B	0.01	13	5	B	0.01	13	7
	SB-LTR	B	0.15	14	14	C	0.20	20	14
Townline Road & Lanark Street	EB-L	A	0.01	8	5	A	0.03	9	10
	EB-T	-	-	-	3				2
	WB-R	-	-	-	-	-	-	-	1
	SB-LR	B	0.14	13	18	B	0.12	15	16
McNeely Avenue & Townline Road	EB-T	B	0.25	13	36	B	0.28	15	39
	EB-R	A	0.44	4	43	A	0.39	4	38
	WB-L	A	0.39	8	39	B	0.56	12	82
	WB-T	A	0.16	7	25	A	0.27	9	67
	NB-L	C	0.57	24	44	D	0.84	37	103
	NB-R	A	0.43	6	29	A	0.55	5	73

6.5 Future (2031) Total Traffic Volumes

Future (2031) total traffic volumes were derived by summing future (2031) background traffic volumes and forecasted site traffic volumes for the AM and PM peak periods. Future (2031) total traffic volumes are presented in **Figure 15.**

Figure 15 Future Total (2031) Traffic Volumes



6.6 Future (2031) Total Traffic Analysis

Intersection capacity analysis for future (2031) total traffic conditions was completed for study area intersections to determine the future operational measures of performance during the AM and PM weekday peak periods. Lane configurations remained the same as the existing conditions.

Like the build-out (2026) total conditions, the results for 2031 total conditions show that all the study intersections will operate well under capacity. The northbound left movement at McNeely Avenue and Townline Road operates with a v/c ratio of 0.91 and a 95th percentile queue of 168 m. The northbound right turn movement would be required to accommodate a queue of 90m. Development site traffic has a minimal impact on future queuing and the queue requirement in **Table 8** is mainly due to background conditions. Storage capacity, however, should be provided where possible.

Signal timing adjustments could be implemented at McNeely Avenue and Townline Road to improve the operations at this intersection in future. The overall study network will be well situated to accommodate future development growth and increase traffic related to this growth. A summary of completed analysis is provided in **Table 8**.

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Table 8 Future (2031) Total Conditions Capacity Analysis Summary

Intersection	Approach	AM Peak Hour				PM Peak Hour			
		LOS	v/c Ratio	Delay (s)	Queue (m)	LOS	v/c Ratio	Delay (s)	Queue (m)
Bridge Street & Townline Road	EB-L	B	0.03	13.9	15	B	0.02	13.7	7
	EB-TR	C	0.73	24.5	74	B	0.57	18.3	55
	WB-L	A	0.37	9.6	31	A	0.42	9.9	36
	WB-T	B	0.28	10.2	34	B	0.34	10.6	45
	WB-R	A	0.03	1.3	9	A	0.11	2.6	19
	NB-LTR	C	0.63	20.7	49	D	0.86	36.0	87
	SB-LTR	B	0.32	17.1	27	B	0.31	17.3	28
Edmund Street and Townline Road	EB-L	A	0.03	8	10	A	0.04	9	12
	WB-L	A	-	0	-	A	0.01	8	2
	NB-LTR	B	0.01	14	4	B	0.02	14	8
	SB-LTR	C	0.17	16	13	C	0.24	24	13
Townline Road & Lanark Street	EB-L	A	0.01	8	3	A	0.03	9	11
	EB-T	-	-	-	3	-	-	-	3
	WB-TR	-	-	-	-	-	-	-	1
	SB-LR	B	0.14	13	17	C	0.13	16	18
McNeely Avenue & Townline Road	EB-T	B	0.28	14.0	33	B	0.02	13.7	40
	EB-R	A	0.47	3.9	42	B	0.57	18.3	36
	WB-L	A	0.45	9.0	46	A	0.42	9.9	73
	WB-T	A	0.18	7.4	25	B	0.34	10.6	47
	NB-L	C	0.62	25.4	50	D	0.91	46.4	168
	NB-R	A	0.46	5.4	34	A	0.59	5.4	90

7.0 FINDINGS AND RECOMMENDATIONS

7.1 Study Findings

The findings and conclusion of this Traffic Impact Study for the proposed residential development located at 400 Lanark Street are summarized as follows:

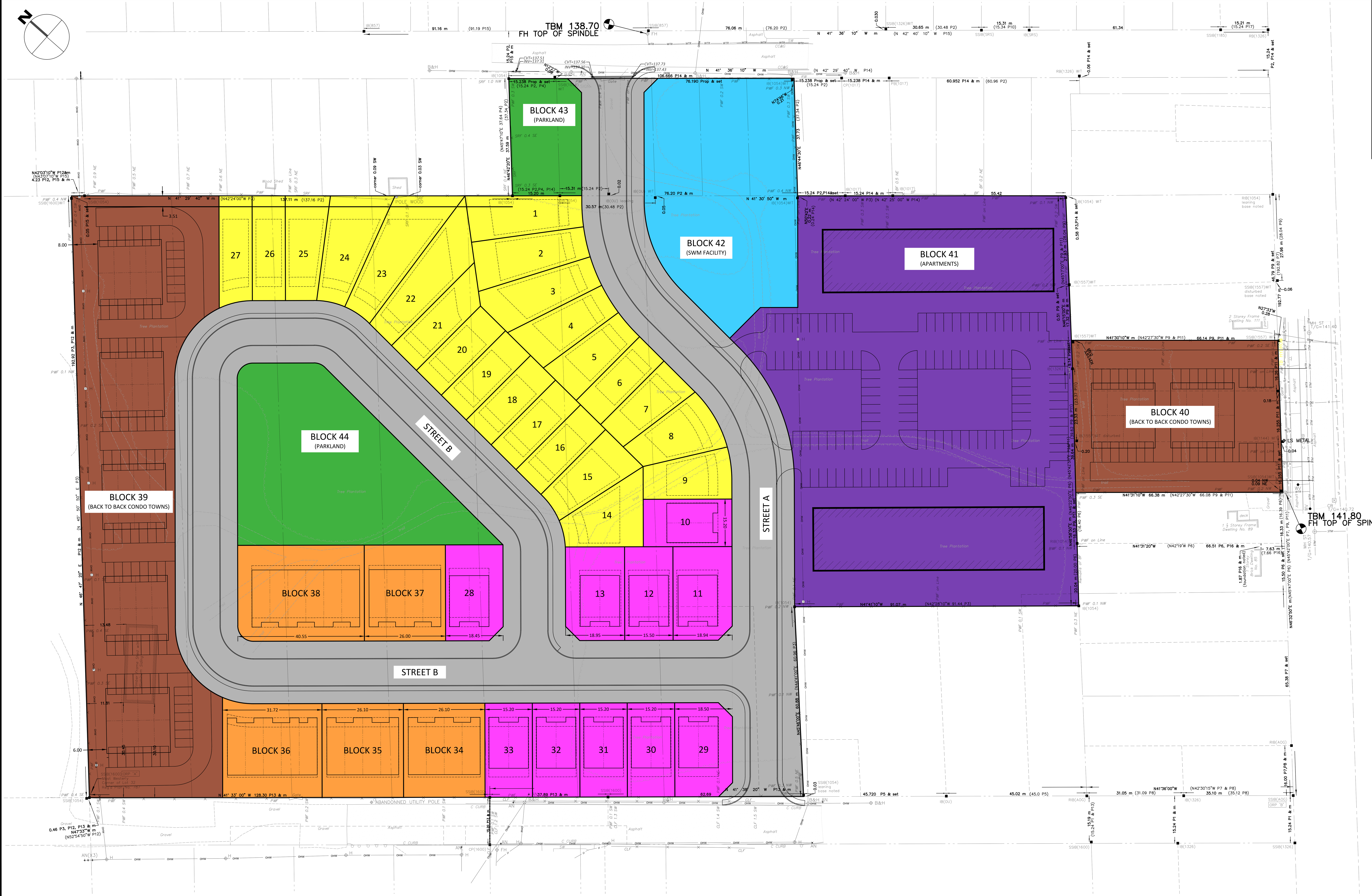
- The proposed residential development is expected to consist of 204 fully serviced dwelling units consisting of three medium density apartments with 82 units, 23 single detached homes, 20 semi-detached homes, and 79 townhouses.
- The existing transportation network within the study area currently operates well with all movements at all intersections operating at an LOS of D or better.
- The proposed development is anticipated to generate 84 trips during the AM peak hour and 108 total trips during the PM peak hour.
- The development is expected to be completed by 2026.
- The development generated trips are expected to have minimal impact on the existing roadway with all movements at all intersections operating under acceptable levels for all analysis periods.
- The northbound right-turn at McNeely Avenue and Townline Road is required to accommodate a queue of 90 m under 2031 total condition and 77 m under 2031 background conditions, indicating queue requirements are not driven by development traffic.
- Sight lines were reviewed, and no concerns were presented.

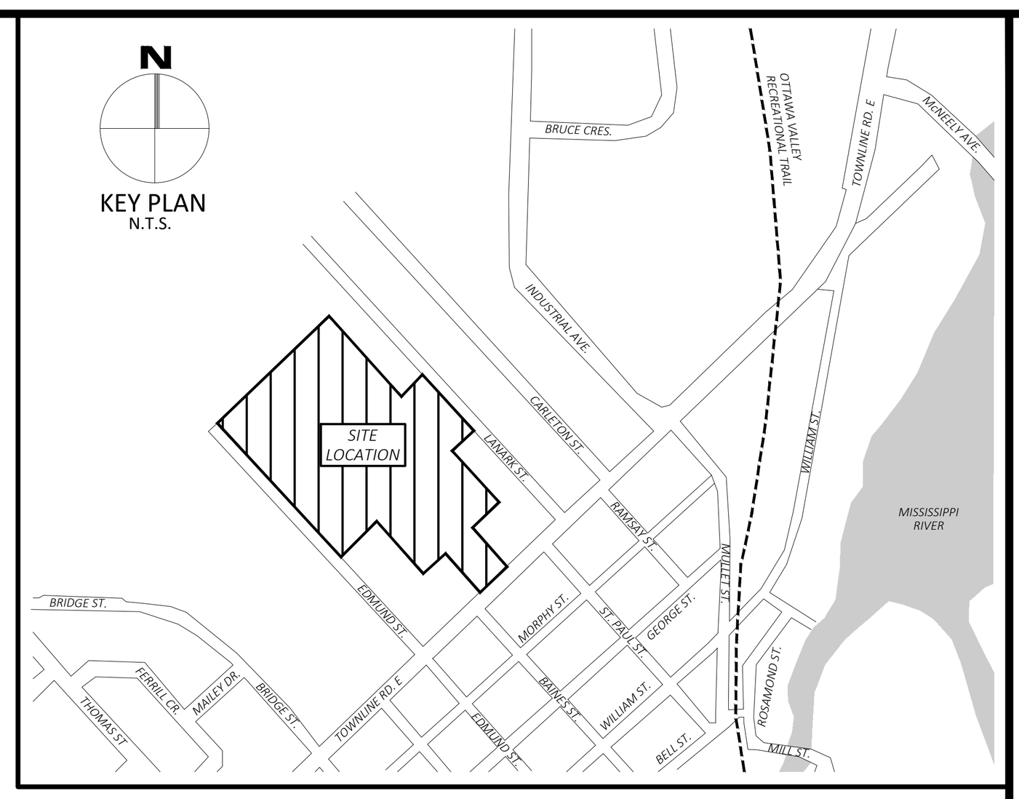
7.2 Conclusions

Forecasted development site traffic can be accommodated at boundary road intersections for both the build-out (2026) and post-build-out (2031) future horizons without significant impact on study area operations.

Reviews of available sight distances at the proposed site accesses indicate sightline requirements are in conformance with TAC guidelines to accommodate turning movements. Furthermore, the proposed development has a minimal impact on boundary road operation, and site-generated traffic does not trigger changes to the existing roadway infrastructure.

APPENDIX A – SITE PLAN





CONCEPTUAL PLAN OF SUBDIVISION

OF
LOTS 17, 20, 23, 26, 29 & 32
AND PART OF LOTS 4 & 12,
REGISTERED PLAN NO. 787,
(ALSO KNOWN AS REGISTERED PLAN NO. 970)
AND LOTS 89 TO 94 INCLUSIVE,
REGISTERED PLAN NO. 3469
TOWN OF CARLETON PLACE
COUNTY OF LANARK

TO BE SUBDIVIDED INTO:

LOTS 1 TO 9, 14 TO 27 FOR SINGLE DETACHED DWELLINGS
LOTS 10 TO 13, 28 TO 33 FOR SEMI-DETACHED DWELLINGS
BLOCKS 34 TO 38 FOR TOWNHOME DWELLINGS
BLOCKS 39 AND 40 FOR BACK TO BACK CONDO DWELLINGS
BLOCK 41 FOR APARTMENTS
BLOCK 42 FOR STORMWATER MANAGEMENT FACILITIES
BLOCKS 43 AND 44 FOR PARKLAND

STREET A - 20 METRES WIDE ROAD ALLOWANCE
STREET B - 20 METRES WIDE ROAD ALLOWANCE

APPLICANT AND PROPERTY OWNER

WINTERGREEN RIDGE LTD.
C/O ????
MAILING ADDRESS???

OWNER'S CERTIFICATE

I HEREBY AUTHORIZE THE PREPARATION AND SUBMISSION OF THIS PLAN TO THE COUNCIL OF THE COUNTY OF LANARK.

DATE

NATALIE McGUIRE
I HAVE AUTHORITY TO BIND THE CORPORATION

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJOINING LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE

JOHN GAUTHIER, O.L.S.

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51 (17) OF THE PLANNING ACT

A. AS SHOWN ON THE DRAFT PLAN
B. AS SHOWN ON THE DRAFT PLAN
C. AS SHOWN ON THE DRAFT PLAN
D. AS DESCRIBED ON THE TITLE BLOCK
E. AS SHOWN ON THE DRAFT PLAN
F. AS SHOWN ON THE DRAFT PLAN
G. AS SHOWN ON THE DRAFT PLAN
H. PIPED MUNICIPAL WATER SUPPLY IS AVAILABLE TO SERVICE THE PROPERTY
I. GENERALLY SANDY/SILTY SOILS, WITH GRAVEL AND SHALLOW BEDROCK
J. AS SHOWN ON THE DRAFT PLAN
K. PIPED MUNICIPAL WATER AND WASTEWATER SERVICES ARE AVAILABLE TO SERVICE THE PROPERTY
L. NO RESTRICTIONS APPLY

SCHEDULE OF AREAS

LOT/BLOCK	AREA (m^2)	TYPE
1	457	SINGLE DETACHED
2	471	SINGLE DETACHED
3	469	SINGLE DETACHED
4	408	SINGLE DETACHED
5	365	SINGLE DETACHED
6	317	SINGLE DETACHED
7	348	SINGLE DETACHED
8	417	SINGLE DETACHED
9	386	SINGLE DETACHED
10	432	SEMI-DETACHED
11	558	SEMI-DETACHED
12	465	SEMI-DETACHED
13	558	SEMI-DETACHED
14	449	SINGLE DETACHED
15	408	SINGLE DETACHED
16	330	SINGLE DETACHED
17	330	SINGLE DETACHED
18	329	SINGLE DETACHED
19	329	SINGLE DETACHED
20	328	SINGLE DETACHED
21	376	SINGLE DETACHED
22	575	SINGLE DETACHED
23	639	SINGLE DETACHED
24	521	SINGLE DETACHED
25	411	SINGLE DETACHED
26	356	SINGLE DETACHED
27	365	SINGLE DETACHED
28	557	SEMI-DETACHED
29	538	SEMI-DETACHED
30	458	SEMI-DETACHED
31	458	SEMI-DETACHED
32	458	SEMI-DETACHED
33	458	SEMI-DETACHED
BLOCK 34	786	4-UNIT TOWNHOME
BLOCK 35	785	4-UNIT TOWNHOME
BLOCK 36	964	5-UNIT TOWNHOME
BLOCK 37	799	4-UNIT TOWNHOME
BLOCK 38	1,241	6-UNIT TOWNHOME
BLOCK 39	7,033	BACK TO BACK CONDOS
BLOCK 40	3,226	BACK TO BACK CONDOS
BLOCK 41	12,144	APARTMENTS
BLOCK 42	3,491	SWM FACILITY
BLOCK 43	844	PARKLAND
BLOCK 44	3,254	PARKLAND
TOTAL LOT/BLOCK AREA (m^2)		48,895

STREET	AREA (m^2)	LENGTH (m)
STREET A	5,028	260
STREET B	8,637	440
TOTAL SUBDIVISION AREA (m^2)		62,560

DISTANCES:

DISTANCES SHOWN ON THIS PLAN ARE GROUND DISTANCES AND CAN BE USED TO COMPUTE GRID DISTANCES BY MULTIPLYING BY A COMBINED SCALE FACTOR OF 0.999683.

BEARINGS:

BEARINGS ARE UTM GRID BEARINGS, DERIVED BY REAL TIME NETWORK GPS OBSERVATIONS ON OBSERVED REFERENCE POINTS 'A' AND 'B' SHOWN HEREON, AND ARE REFERRED TO THE NAD83 CSRS 2010 UTM ZONE 18 COORDINATE SYSTEM.

ELEVATIONS:

ELEVATIONS ARE CANADA GEODETIC VERTICAL DATUM DERIVED BY REAL TIME NETWORK GPS OBSERVATIONS REFERENCED TO THE CANADA HT_2 GEOID MODEL.

THE CONTOUR INTERVAL IS 0.25 METRES.

SCALE 1 : 500

0 10 20 30 40 50 Metres

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

REVISIONS

No.	DESCRIPTION	DATE	BY

egis
3240 Drummond Concession 5A,
R.R.7 Perth, ON K7H 3C9
Tel: 613-267-6524
Fax: 613-267-7992
www.egis-group.com

PROJECT				DRAWN:
400 LANARK STREET				CHECKED:
DATE: JUNE 27, 2024	PAPER SIZE: 24" x 48"	SCALE: 1:500	PROJECT No.: CCO-22-0957	DWG. No.: 01

U:\PERTH\MPCE JOBS\MPCE PROJECTS\2022\CCO\CCO-22-0957 - WINTERGREEN - DRAFT PLAN OF SUBDIVISION - 400 LANARK STREET\05 - DRAWINGS\01-DRAFT PLAN\CCO-22-0957-CONCEPT DRAFT PLAN(WORKING).DWG
June 27, 2024 2:39:52 PM

APPENDIX B – TRAFFIC DATA

Figure B1-1: Existing Peak Hour Traffic Volumes

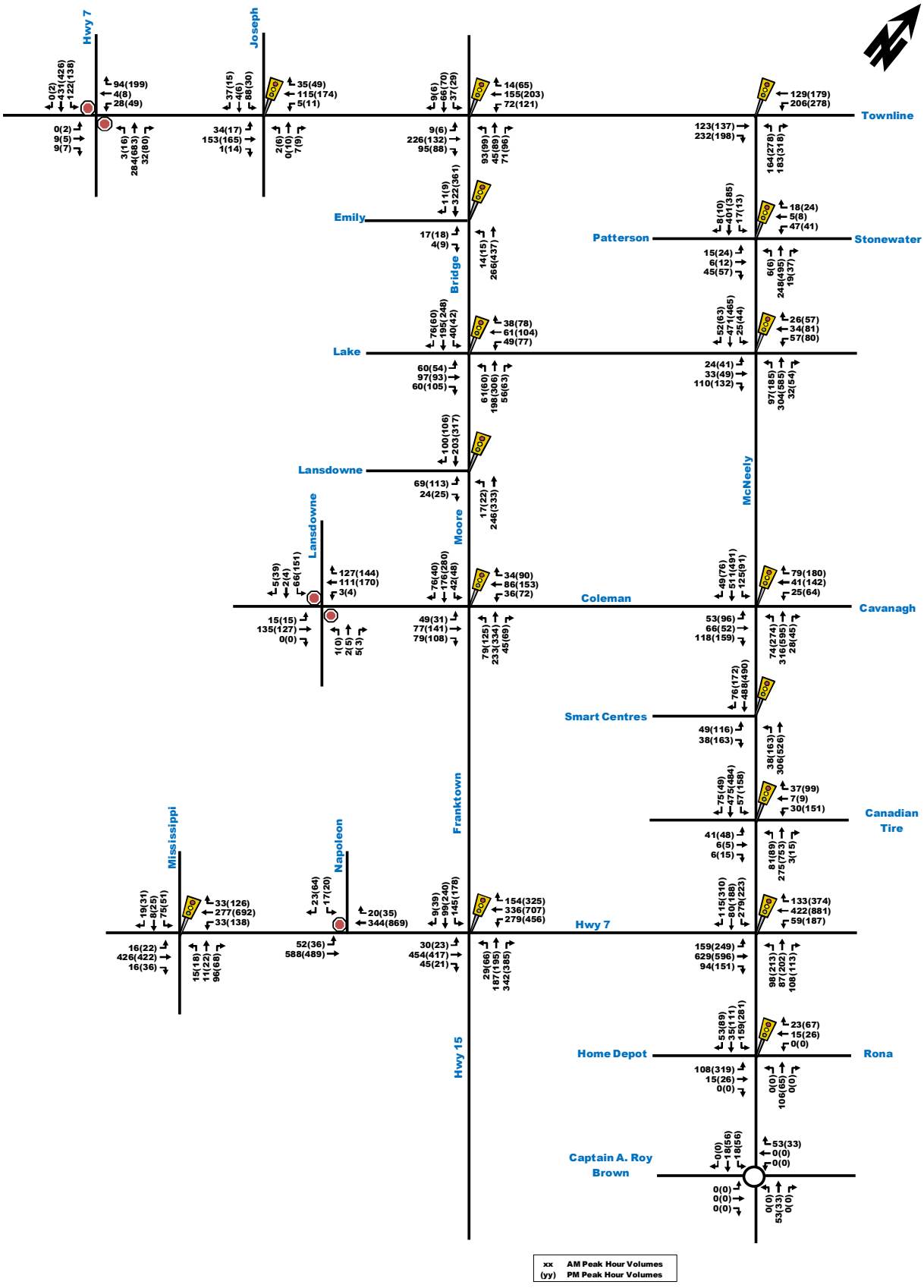
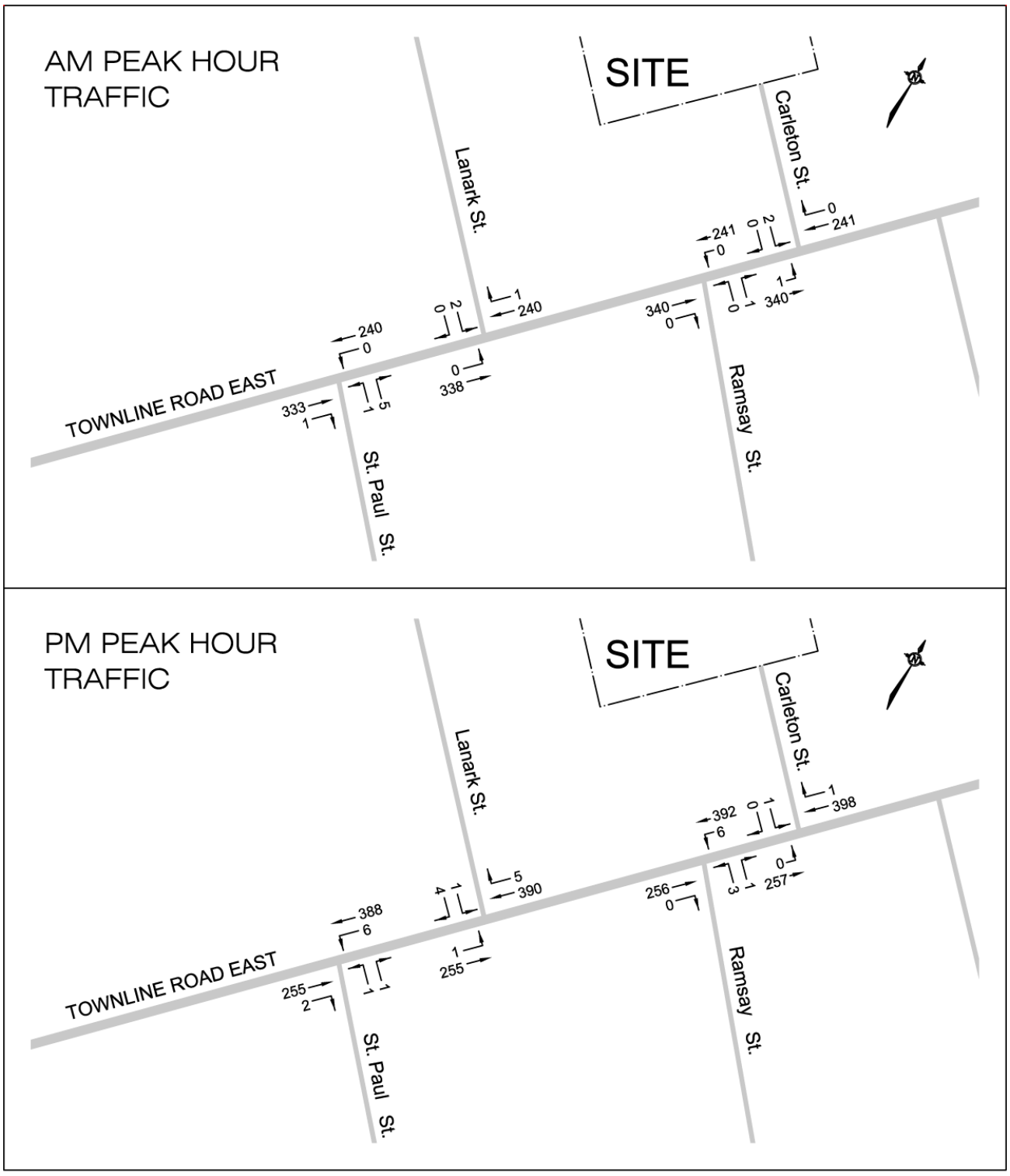


FIGURE 2.1
EXISTING PEAK AM AND PM HOUR TRAFFIC COUNTS



NOT TO SCALE

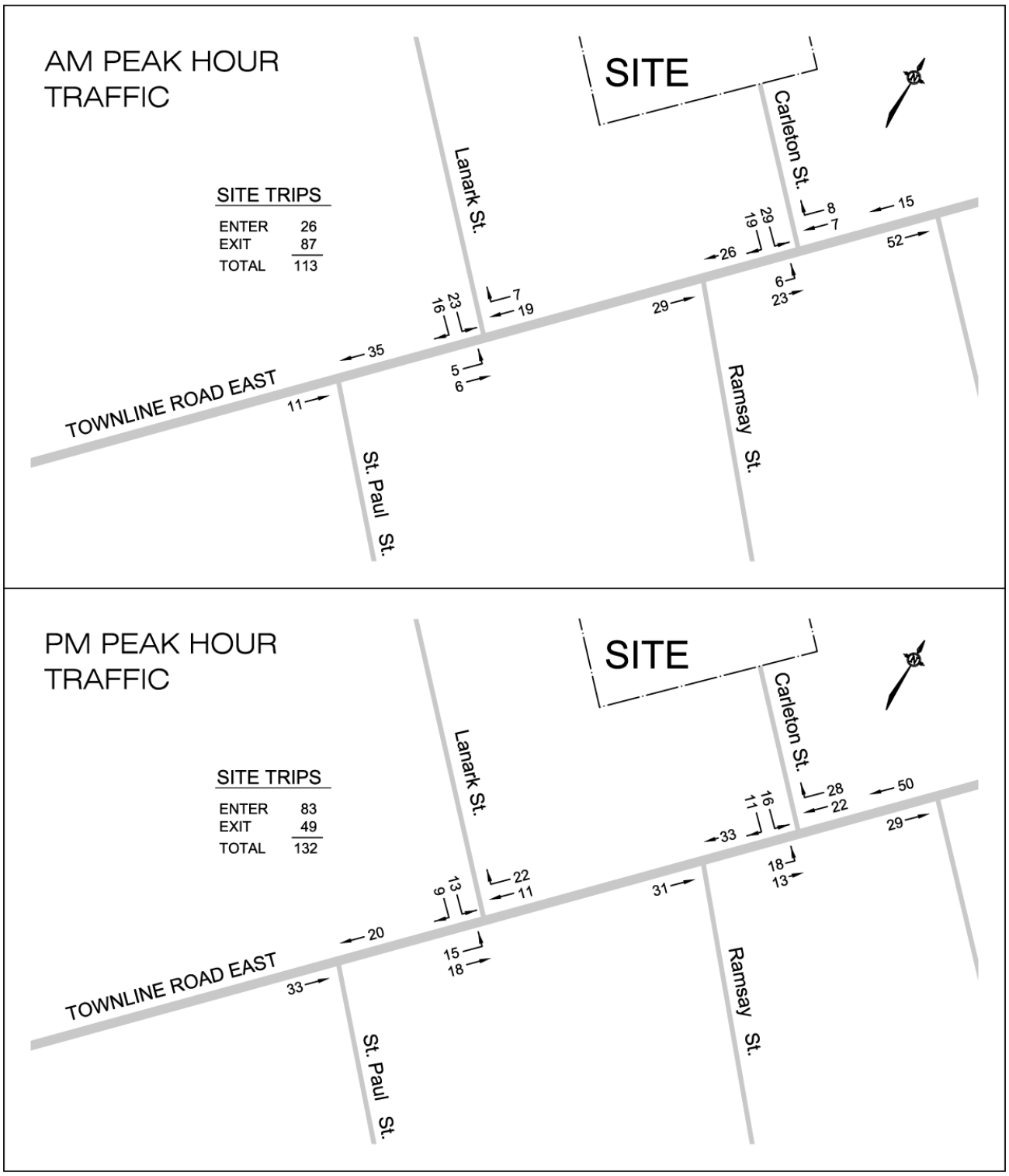
Townline and Edmund Street
Townline (Eastbound)
August 23rd 2023

Vehicles

Time	Eastbound			Westbound			Northbound			Southbound			Total
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
8:00	1	48	0	0	33	0	0	0	0	1	0	1	84
Heavy %	0%	2%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	
8:15	1	56	0	1	46	0	0	0	0	3	0	2	109
Heavy %	0%	4%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	
8:30	4	79	0	0	44	1	1	0	0	4	0	2	135
Heavy %	0%	3%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	
8:45	5	71	0	0	47	2	0	0	1	2	0	3	131
Heavy %	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	
9:00	5	60	0	0	34	5	0	0	0	3	1	3	111
Heavy %	0%	2%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	
9:15	3	53	0	0	50	4	0	0	1	3	0	5	119
Heavy %	33%	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	
9:30	3	66	1	1	36	2	0	1	1	0	1	0	112
Heavy %	0%	5%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	
9:45	1	47	0	0	38	2	1	1	1	1	0	4	96
Heavy %	0%	2%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	
3:00	1	61	0	1	81	1	1	0	1	3	2	2	154
Heavy %	0%	3%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	
3:15	2	79	0	1	82	2	0	0	0	0	0	3	169
Heavy %	50%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
3:30	3	64	0	2	129	0	1	0	2	5	0	2	208
Heavy %	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	
3:45	2	60	1	0	91	6	0	0	0	4	0	2	166
Heavy %	0%	0%	0%	0%	0%	17%	0%	0%	0%	0%	0%	0%	
4:00	3	87	1	2	122	1	0	0	2	5	1	3	227
Heavy %	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	
4:15	1	79	0	1	101	2	0	0	1	2	0	3	190
Heavy %	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
4:30	1	65	0	1	92	1	0	0	0	1	0	2	163
Heavy %	0%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	
4:45	2	68	0	0	89	2	1	0	1	2	1	3	169
Heavy %	0%	3%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	

APPENDIX C – TRAFFIC DATA (BACKGROUND DEVELOPMENT)

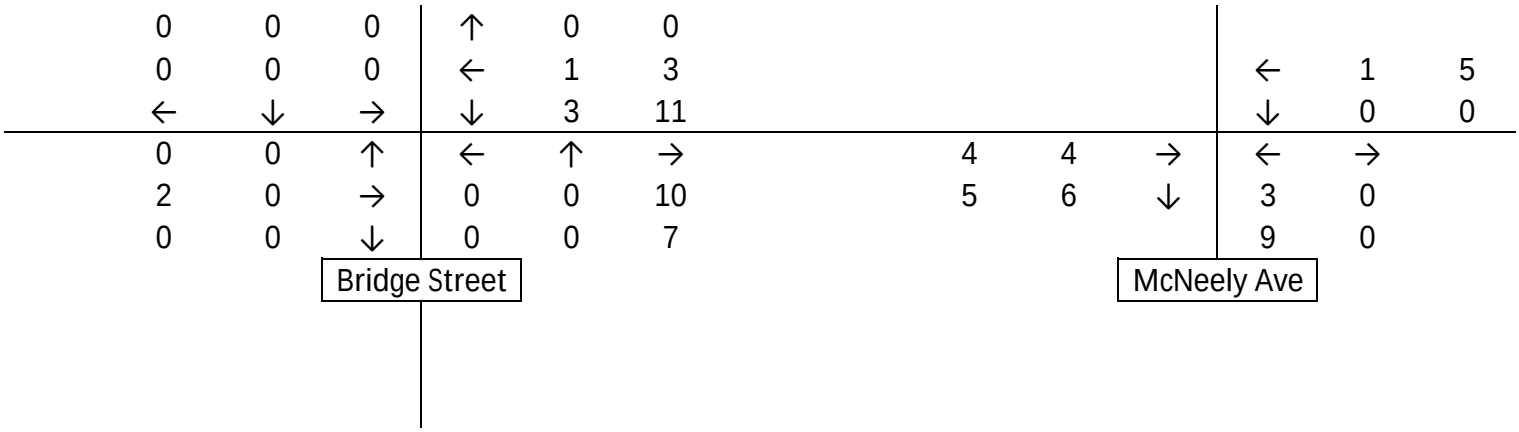
FIGURE 4.1
PEAK AM AND PM HOUR SITE GENERATED TRIPS



Development Generated Trip Assignment

AM Peak XX

PM Peak XX



APPENDIX D: CAPACITY ANALYSIS RESULTS

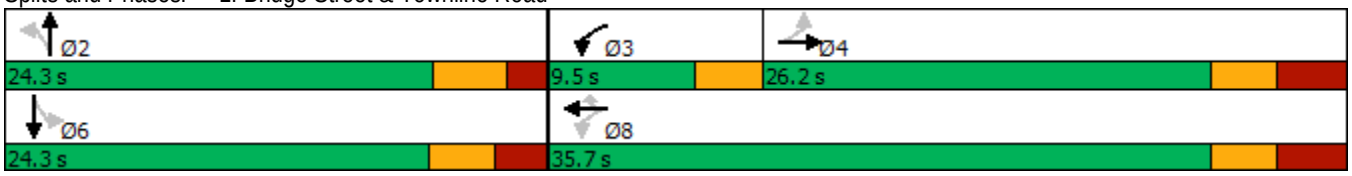
2023 Existing Condition (AM/PM)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	243	102	78	167	15	100	48	76	40	71	10
Future Volume (vph)	10	243	102	78	167	15	100	48	76	40	71	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. 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
Frt		0.956				0.850		0.954			0.989	
Flt Protected	0.950			0.950				0.978			0.984	
Satd. Flow (prot)	1770	1781	0	1770	1863	1583	0	1738	0	0	1813	0
Flt Permitted	0.643			0.376				0.800			0.841	
Satd. Flow (perm)	1198	1781	0	700	1863	1583	0	1422	0	0	1549	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38				44		45			8	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	264	111	85	182	16	109	52	83	43	77	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	375	0	85	182	16	0	244	0	0	131	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.1	20.1		30.6	27.4	27.4		19.2			19.0	
Actuated g/C Ratio	0.35	0.35		0.53	0.47	0.47		0.33			0.33	
v/c Ratio	0.03	0.59		0.18	0.21	0.02		0.49			0.26	
Control Delay	13.8	19.1		7.5	9.5	0.9		17.3			16.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.8	19.1		7.5	9.5	0.9		17.3			16.1	
LOS	B	B		A	A	A		B			B	
Approach Delay		18.9			8.4			17.3			16.1	
Approach LOS		B			A			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 58			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 15.3		Intersection LOS: B	
Intersection Capacity Utilization 67.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Bridge Street & Townline Road

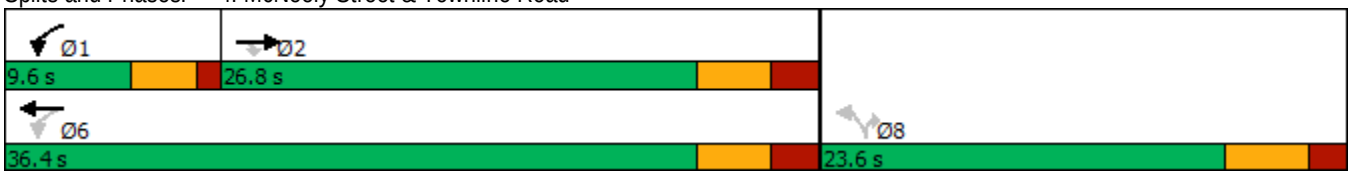


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	132	250	222	139	177	197
Future Volume (vph)	132	250	222	139	177	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.561		0.950	
Satd. Flow (perm)	1863	1583	1045	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		272				214
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	143	272	241	151	192	214
Shared Lane Traffic (%)						
Lane Group Flow (vph)	143	272	241	151	192	214
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.3	21.3	32.4	30.9	11.8	11.8
Actuated g/C Ratio	0.40	0.40	0.60	0.58	0.22	0.22
v/c Ratio	0.19	0.34	0.34	0.14	0.49	0.42
Control Delay	12.1	3.4	6.9	6.2	23.1	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	3.4	6.9	6.2	23.1	5.9
LOS	B	A	A	A	C	A
Approach Delay	6.4			6.6	14.0	
Approach LOS	A			A	B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 53.7			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 9.0		Intersection LOS: A	
Intersection Capacity Utilization 42.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: McNeely Street & Townline Road



Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	323	0	0	235	12	1	0	2	12	1	13
Future Vol, veh/h	17	323	0	0	235	12	1	0	2	12	1	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	351	0	0	255	13	1	0	2	13	1	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	268	0	0	351	0	0	656	655	351	643	642	255
Stage 1	-	-	-	-	-	-	387	387	-	255	255	-
Stage 2	-	-	-	-	-	-	269	268	-	388	387	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1296	-	-	1208	-	-	379	386	692	386	392	784
Stage 1	-	-	-	-	-	-	637	610	-	749	696	-
Stage 2	-	-	-	-	-	-	737	687	-	636	610	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1296	-	-	1208	-	-	367	381	692	381	387	784
Mov Cap-2 Maneuver	-	-	-	-	-	-	367	381	-	381	387	-
Stage 1	-	-	-	-	-	-	628	601	-	739	696	-
Stage 2	-	-	-	-	-	-	723	687	-	625	601	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	11.8	12.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	534	1296	-	-	1208	-	-	513
HCM Lane V/C Ratio	0.006	0.014	-	-	-	-	-	0.055
HCM Control Delay (s)	11.8	7.8	-	-	0	-	-	12.4
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	346	246	1	2	0
Future Vol, veh/h	0	346	246	1	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	376	267	1	2	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	268	0	-	0	644	268
Stage 1	-	-	-	-	268	-
Stage 2	-	-	-	-	376	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1296	-	-	-	437	771
Stage 1	-	-	-	-	777	-
Stage 2	-	-	-	-	694	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1296	-	-	-	437	771
Mov Cap-2 Maneuver	-	-	-	-	532	-
Stage 1	-	-	-	-	777	-
Stage 2	-	-	-	-	694	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1296	-	-	-	532
HCM Lane V/C Ratio	-	-	-	-	0.004
HCM Control Delay (s)	0	-	-	-	11.8
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	8:25	8:25	8:25	8:25	8:25	8:25
End Time	9:45	9:45	9:45	9:45	9:45	9:45
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1588	1648	1657	1613	1620	1626
Vehs Exited	1597	1656	1669	1626	1609	1632
Starting Vehs	62	52	53	47	54	54
Ending Vehs	53	44	41	34	65	46
Travel Distance (km)	1863	1960	1928	1909	1875	1907
Travel Time (hr)	49.2	51.7	50.5	50.4	49.1	50.2
Total Delay (hr)	8.9	9.4	8.8	9.0	8.4	8.9
Total Stops	1412	1493	1417	1420	1365	1420
Fuel Used (l)	149.3	156.7	153.7	152.1	150.0	152.4

Interval #0 Information Seeding

Start Time	8:25
End Time	8:45
Total Time (min)	20

Volumes adjusted by PHF, Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	8:45
End Time	9:45
Total Time (min)	60

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1588	1648	1657	1613	1620	1626
Vehs Exited	1597	1656	1669	1626	1609	1632
Starting Vehs	62	52	53	47	54	54
Ending Vehs	53	44	41	34	65	46
Travel Distance (km)	1863	1960	1928	1909	1875	1907
Travel Time (hr)	49.2	51.7	50.5	50.4	49.1	50.2
Total Delay (hr)	8.9	9.4	8.8	9.0	8.4	8.9
Total Stops	1412	1493	1417	1420	1365	1420
Fuel Used (l)	149.3	156.7	153.7	152.1	150.0	152.4

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	10.2	63.0	25.7	35.0	10.6	51.3	27.9
Average Queue (m)	2.0	35.3	11.2	14.5	2.0	23.2	11.9
95th Queue (m)	8.1	58.5	21.7	28.7	8.3	41.8	22.8
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				0			
Queuing Penalty (veh)				0			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (m)	10.4	9.1	7.7
Average Queue (m)	1.5	0.8	4.0
95th Queue (m)	7.0	5.1	9.1
Link Distance (m)		297.5	217.5
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	31.0		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Townline Road & Lanark Street

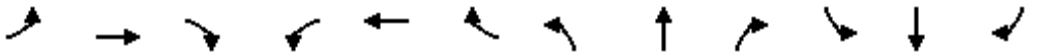
Movement	EB	SB
Directions Served	T	LR
Maximum Queue (m)	4.6	7.1
Average Queue (m)	0.2	0.4
95th Queue (m)	2.2	3.5
Link Distance (m)	21.4	301.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	32.4	42.0	47.4	27.4	50.4	29.8
Average Queue (m)	14.3	18.1	22.3	10.2	23.7	14.7
95th Queue (m)	27.7	32.2	38.6	22.3	39.2	24.7
Link Distance (m)	118.3	118.3		300.2	602.7	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			1	0	0	
Queuing Penalty (veh)			1	0	1	

Network Summary

Network wide Queuing Penalty: 2

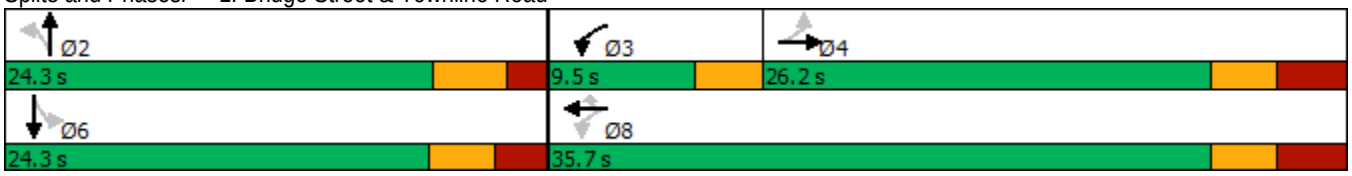


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	142	95	130	219	70	107	96	103	31	75	6
Future Volume (vph)	6	142	95	130	219	70	107	96	103	31	75	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. 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
Frt		0.940				0.850		0.954			0.992	
Flt Protected	0.950			0.950				0.983			0.986	
Satd. Flow (prot)	1770	1751	0	1770	1863	1583	0	1747	0	0	1822	0
Flt Permitted	0.611			0.516				0.837			0.870	
Satd. Flow (perm)	1138	1751	0	961	1863	1583	0	1487	0	0	1608	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		60				76		45			5	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	154	103	141	238	76	116	104	112	34	82	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	257	0	141	238	76	0	332	0	0	123	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.1	20.1		30.7	27.5	27.5		19.2			19.0	
Actuated g/C Ratio	0.35	0.35		0.53	0.47	0.47		0.33			0.33	
v/c Ratio	0.02	0.40		0.24	0.27	0.10		0.64			0.23	
Control Delay	13.7	13.8		7.9	10.0	2.8		21.7			16.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.7	13.8		7.9	10.0	2.8		21.7			16.2	
LOS	B	B		A	B	A		C			B	
Approach Delay		13.8			8.2			21.7			16.2	
Approach LOS		B			A			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 58.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 14.1		Intersection LOS: B	
Intersection Capacity Utilization 71.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Bridge Street & Townline Road

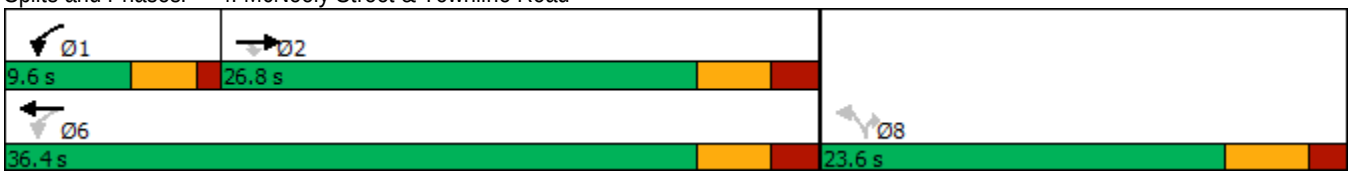


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	148	213	299	193	299	342
Future Volume (vph)	148	213	299	193	299	342
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.552		0.950	
Satd. Flow (perm)	1863	1583	1028	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		232				372
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	161	232	325	210	325	372
Shared Lane Traffic (%)						
Lane Group Flow (vph)	161	232	325	210	325	372
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.4	21.4	32.5	31.0	14.8	14.8
Actuated g/C Ratio	0.38	0.38	0.57	0.55	0.26	0.26
v/c Ratio	0.23	0.31	0.49	0.21	0.71	0.54
Control Delay	14.1	3.7	10.2	8.0	28.1	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	3.7	10.2	8.0	28.1	5.5
LOS	B	A	B	A	C	A
Approach Delay	7.9			9.3	16.1	
Approach LOS	A			A	B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 56.8			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 11.9		Intersection LOS: B	
Intersection Capacity Utilization 54.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: McNeely Street & Townline Road



Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	290	2	5	443	9	1	0	5	16	1	10
Future Vol, veh/h	9	290	2	5	443	9	1	0	5	16	1	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	315	2	5	482	10	1	0	5	17	1	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	492	0	0	317	0	0	839	838	316	831	829	482
Stage 1	-	-	-	-	-	-	336	336	-	492	492	-
Stage 2	-	-	-	-	-	-	503	502	-	339	337	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1071	-	-	1243	-	-	285	302	724	289	306	584
Stage 1	-	-	-	-	-	-	678	642	-	558	548	-
Stage 2	-	-	-	-	-	-	551	542	-	676	641	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1071	-	-	1243	-	-	276	298	724	284	302	584
Mov Cap-2 Maneuver	-	-	-	-	-	-	276	298	-	284	302	-
Stage 1	-	-	-	-	-	-	672	636	-	553	546	-
Stage 2	-	-	-	-	-	-	537	540	-	665	635	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.1	11.4	16.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	570	1071	-	-	1243	-	-	352
HCM Lane V/C Ratio	0.011	0.009	-	-	0.004	-	-	0.083
HCM Control Delay (s)	11.4	8.4	-	-	7.9	-	-	16.2
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	321	460	5	1	4
Future Vol, veh/h	1	321	460	5	1	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	349	500	5	1	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	505	0	-	0	854	503
Stage 1	-	-	-	-	503	-
Stage 2	-	-	-	-	351	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1060	-	-	-	329	569
Stage 1	-	-	-	-	607	-
Stage 2	-	-	-	-	713	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1060	-	-	-	329	569
Mov Cap-2 Maneuver	-	-	-	-	447	-
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	713	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1060	-	-	-	540
HCM Lane V/C Ratio	0.001	-	-	-	0.01
HCM Control Delay (s)	8.4	-	-	-	11.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:10	3:10	3:10	3:10	3:10	3:10
End Time	4:30	4:30	4:30	4:30	4:30	4:30
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2109	2145	2089	2024	2062	2085
Vehs Exited	2091	2151	2081	2020	2058	2079
Starting Vehs	57	70	63	66	69	61
Ending Vehs	75	64	71	70	73	71
Travel Distance (km)	2502	2549	2500	2375	2460	2477
Travel Time (hr)	68.9	70.1	68.5	64.9	68.3	68.1
Total Delay (hr)	13.9	14.1	13.7	12.6	14.1	13.7
Total Stops	1947	2020	1957	1829	1957	1943
Fuel Used (l)	200.4	205.5	199.9	191.1	197.5	198.9

Interval #0 Information Seeding

Start Time	3:10
End Time	3:30
Total Time (min)	20

Volumes adjusted by PHF, Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	3:30
End Time	4:30
Total Time (min)	60

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2109	2145	2089	2024	2062	2085
Vehs Exited	2091	2151	2081	2020	2058	2079
Starting Vehs	57	70	63	66	69	61
Ending Vehs	75	64	71	70	73	71
Travel Distance (km)	2502	2549	2500	2375	2460	2477
Travel Time (hr)	68.9	70.1	68.5	64.9	68.3	68.1
Total Delay (hr)	13.9	14.1	13.7	12.6	14.1	13.7
Total Stops	1947	2020	1957	1829	1957	1943
Fuel Used (l)	200.4	205.5	199.9	191.1	197.5	198.9

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	8.8	49.1	32.8	43.3	23.5	67.4	29.9
Average Queue (m)	1.8	25.3	15.1	19.8	8.1	35.2	12.1
95th Queue (m)	7.5	42.5	27.4	37.0	18.6	59.3	24.1
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				1			
Queuing Penalty (veh)				1			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	WB	WB	NB	SB
Directions Served	L	L	R	LTR	LTR
Maximum Queue (m)	8.9	5.4	1.3	10.5	10.2
Average Queue (m)	0.8	0.4	0.0	2.0	4.1
95th Queue (m)	4.9	3.2	0.9	8.3	9.6
Link Distance (m)				297.5	217.5
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)	31.0	39.0	17.0		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Townline Road & Lanark Street

Movement	EB	SB
Directions Served	T	LR
Maximum Queue (m)	3.0	9.0
Average Queue (m)	0.1	1.3
95th Queue (m)	1.9	6.5
Link Distance (m)	21.4	301.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	40.7	37.6	53.3	37.2	77.0	64.7
Average Queue (m)	18.6	17.9	29.6	16.3	40.1	24.7
95th Queue (m)	33.2	29.4	47.4	31.0	65.1	45.1
Link Distance (m)	118.3	118.3		300.2	602.7	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			3	0	6	0
Queuing Penalty (veh)			6	0	23	1

Network Summary

Network wide Queuing Penalty: 32

APPENDIX D: CAPACITY ANALYSIS RESULTS

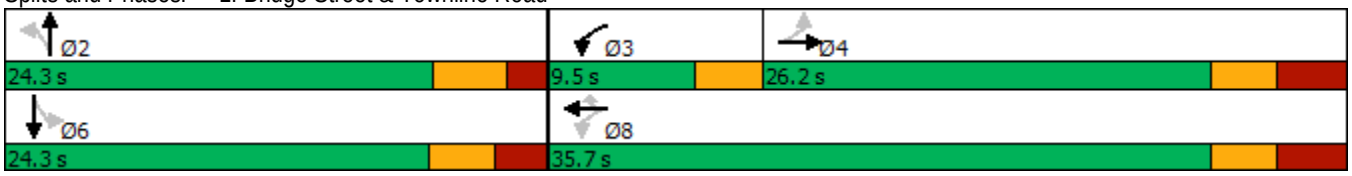
2026 Background Condition (AM/PM)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	270	110	98	205	16	108	52	95	43	76	11
Future Volume (vph)	11	270	110	98	205	16	108	52	95	43	76	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. 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
Frt		0.956				0.850		0.950			0.989	
Flt Protected	0.950			0.950				0.979			0.984	
Satd. Flow (prot)	1770	1781	0	1770	1863	1583	0	1732	0	0	1813	0
Flt Permitted	0.619			0.333				0.819			0.848	
Satd. Flow (perm)	1153	1781	0	620	1863	1583	0	1449	0	0	1562	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37				44		52			8	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	293	120	107	223	17	117	57	103	47	83	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	413	0	107	223	17	0	277	0	0	142	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.1	20.1		30.7	27.5	27.5		19.2			19.0	
Actuated g/C Ratio	0.35	0.35		0.53	0.47	0.47		0.33			0.33	
v/c Ratio	0.03	0.65		0.24	0.25	0.02		0.54			0.28	
Control Delay	13.9	20.8		8.0	9.9	1.1		18.2			16.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.9	20.8		8.0	9.9	1.1		18.2			16.4	
LOS	B	C		A	A	A		B			B	
Approach Delay		20.6			8.9			18.2			16.4	
Approach LOS		C			A			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 58.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 16.1		Intersection LOS: B	
Intersection Capacity Utilization 69.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Bridge Street & Townline Road

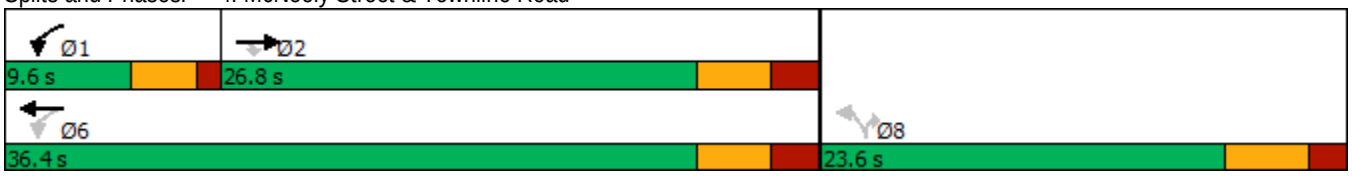


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	163	310	238	154	208	215
Future Volume (vph)	163	310	238	154	208	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.544		0.950	
Satd. Flow (perm)	1863	1583	1013	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		337				234
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	177	337	259	167	226	234
Shared Lane Traffic (%)						
Lane Group Flow (vph)	177	337	259	167	226	234
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.4	21.4	32.5	31.0	12.6	12.6
Actuated g/C Ratio	0.39	0.39	0.60	0.57	0.23	0.23
v/c Ratio	0.24	0.41	0.38	0.16	0.56	0.43
Control Delay	13.1	3.6	7.7	6.8	24.0	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	3.6	7.7	6.8	24.0	5.6
LOS	B	A	A	A	C	A
Approach Delay	6.9			7.4	14.7	
Approach LOS	A			A	B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 54.6			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 9.6		Intersection LOS: A	
Intersection Capacity Utilization 45.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: McNeely Street & Townline Road



Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	369	0	0	292	13	1	0	2	12	1	13
Future Vol, veh/h	18	369	0	0	292	13	1	0	2	12	1	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	401	0	0	317	14	1	0	2	13	1	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	331	0	0	401	0	0	773	772	401	759	758	317
Stage 1	-	-	-	-	-	-	441	441	-	317	317	-
Stage 2	-	-	-	-	-	-	332	331	-	442	441	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1228	-	-	1158	-	-	316	330	649	323	336	724
Stage 1	-	-	-	-	-	-	595	577	-	694	654	-
Stage 2	-	-	-	-	-	-	681	645	-	594	577	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1228	-	-	1158	-	-	305	325	649	318	331	724
Mov Cap-2 Maneuver	-	-	-	-	-	-	305	325	-	318	331	-
Stage 1	-	-	-	-	-	-	585	568	-	683	654	-
Stage 2	-	-	-	-	-	-	667	645	-	582	568	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	12.7	13.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	472	1228	-	-	1158	-	-	443
HCM Lane V/C Ratio	0.007	0.016	-	-	-	-	-	0.064
HCM Control Delay (s)	12.7	8	-	-	0	-	-	13.7
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	389	288	8	25	16
Future Vol, veh/h	5	389	288	8	25	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	423	313	9	27	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	322	0	-	0	751	318
Stage 1	-	-	-	-	318	-
Stage 2	-	-	-	-	433	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1238	-	-	-	378	723
Stage 1	-	-	-	-	738	-
Stage 2	-	-	-	-	654	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1238	-	-	-	376	723
Mov Cap-2 Maneuver	-	-	-	-	486	-
Stage 1	-	-	-	-	735	-
Stage 2	-	-	-	-	654	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1238	-	-	-	557
HCM Lane V/C Ratio	0.004	-	-	-	0.08
HCM Control Delay (s)	7.9	-	-	-	12
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	8:25	8:25	8:25	8:25	8:25	8:25
End Time	9:45	9:45	9:45	9:45	9:45	9:45
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1954	1939	1924	1890	1911	1922
Vehs Exited	1965	1939	1930	1899	1923	1932
Starting Vehs	72	61	67	67	70	67
Ending Vehs	61	61	61	58	58	56
Travel Distance (km)	2335	2310	2288	2303	2325	2312
Travel Time (hr)	64.0	62.9	63.2	63.3	64.3	63.5
Total Delay (hr)	12.1	11.7	12.2	12.0	12.5	12.1
Total Stops	1821	1791	1829	1777	1838	1809
Fuel Used (l)	189.6	187.4	184.5	186.5	189.9	187.6

Interval #0 Information Seeding

Start Time	8:25
End Time	8:45
Total Time (min)	20

Volumes adjusted by PHF, Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	8:45
End Time	9:45
Total Time (min)	60

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1954	1939	1924	1890	1911	1922
Vehs Exited	1965	1939	1930	1899	1923	1932
Starting Vehs	72	61	67	67	70	67
Ending Vehs	61	61	61	58	58	56
Travel Distance (km)	2335	2310	2288	2303	2325	2312
Travel Time (hr)	64.0	62.9	63.2	63.3	64.3	63.5
Total Delay (hr)	12.1	11.7	12.2	12.0	12.5	12.1
Total Stops	1821	1791	1829	1777	1838	1809
Fuel Used (l)	189.6	187.4	184.5	186.5	189.9	187.6

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	12.8	97.1	29.0	44.1	10.4	53.4	33.4
Average Queue (m)	2.5	42.7	14.3	18.9	2.2	28.2	14.8
95th Queue (m)	9.4	74.6	25.5	34.6	8.5	47.0	29.3
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				0			
Queuing Penalty (veh)				0			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (m)	9.0	9.1	11.6
Average Queue (m)	1.6	1.1	3.8
95th Queue (m)	7.1	5.8	9.4
Link Distance (m)		297.5	217.5
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	31.0		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Townline Road & Lanark Street

Movement	EB	EB	SB
Directions Served	L	T	LR
Maximum Queue (m)	3.6	1.7	20.7
Average Queue (m)	0.1	0.1	8.4
95th Queue (m)	1.8	1.2	16.4
Link Distance (m)	21.4	21.4	301.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	38.8	54.0	52.6	26.5	51.5	32.4
Average Queue (m)	17.0	22.6	23.2	11.1	28.4	16.3
95th Queue (m)	31.5	39.1	40.6	23.1	46.6	27.3
Link Distance (m)	118.3	118.3		300.2	602.7	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			1		1	
Queuing Penalty (veh)			2		3	

Network Summary

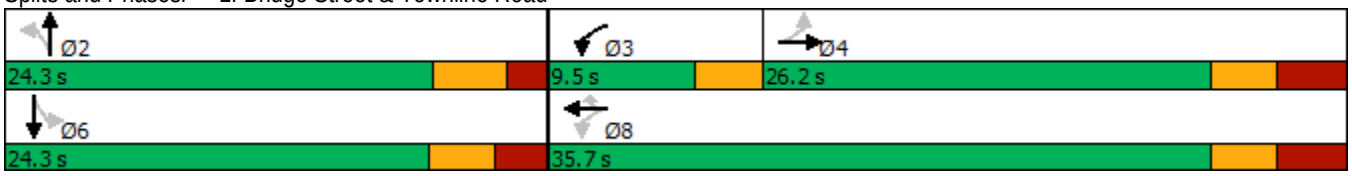
Network wide Queuing Penalty: 5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	188	102	160	250	75	115	103	118	33	81	6
Future Volume (vph)	6	188	102	160	250	75	115	103	118	33	81	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. 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
Frt		0.947				0.850		0.953			0.993	
Flt Protected	0.950			0.950				0.983			0.986	
Satd. Flow (prot)	1770	1764	0	1770	1863	1583	0	1745	0	0	1824	0
Flt Permitted	0.592			0.446				0.846			0.860	
Satd. Flow (perm)	1103	1764	0	831	1863	1583	0	1502	0	0	1591	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		49				82		48			5	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	204	111	174	272	82	125	112	128	36	88	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	315	0	174	272	82	0	365	0	0	131	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.1	20.1		30.7	27.5	27.5		19.2			19.0	
Actuated g/C Ratio	0.35	0.35		0.53	0.47	0.47		0.33			0.33	
v/c Ratio	0.02	0.49		0.32	0.31	0.10		0.69			0.25	
Control Delay	13.7	16.4		8.7	10.4	2.7		24.1			16.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.7	16.4		8.7	10.4	2.7		24.1			16.4	
LOS	B	B		A	B	A		C			B	
Approach Delay		16.3			8.7			24.1			16.4	
Approach LOS		B			A			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 58.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 73.7%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Bridge Street & Townline Road

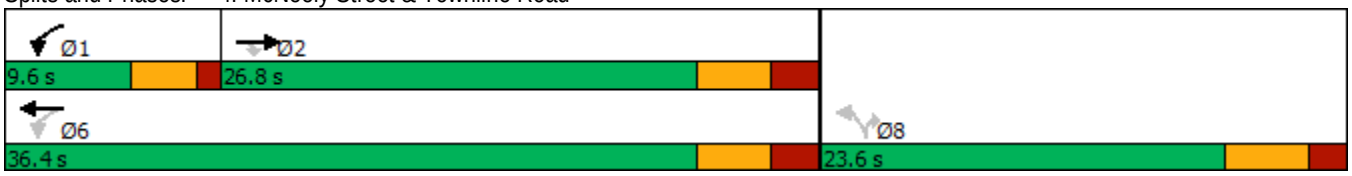


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	172	254	322	238	361	374
Future Volume (vph)	172	254	322	238	361	374
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.539		0.950	
Satd. Flow (perm)	1863	1583	1004	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		276				407
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	276	350	259	392	407
Shared Lane Traffic (%)						
Lane Group Flow (vph)	187	276	350	259	392	407
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.4	21.4	32.5	31.0	16.2	16.2
Actuated g/C Ratio	0.37	0.37	0.56	0.53	0.28	0.28
v/c Ratio	0.27	0.37	0.55	0.26	0.80	0.56
Control Delay	15.0	3.7	11.8	8.8	33.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	3.7	11.8	8.8	33.4	5.4
LOS	B	A	B	A	C	A
Approach Delay	8.3			10.5	19.1	
Approach LOS	A			B	B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 58.2			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 13.6		Intersection LOS: B	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: McNeely Street & Townline Road



Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	354	2	5	511	10	1	0	5	16	1	10
Future Vol, veh/h	10	354	2	5	511	10	1	0	5	16	1	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	385	2	5	555	11	1	0	5	17	1	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	566	0	0	387	0	0	985	984	386	976	974	555
Stage 1	-	-	-	-	-	-	408	408	-	565	565	-
Stage 2	-	-	-	-	-	-	577	576	-	411	409	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1006	-	-	1171	-	-	227	248	662	230	252	531
Stage 1	-	-	-	-	-	-	620	597	-	510	508	-
Stage 2	-	-	-	-	-	-	502	502	-	618	596	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1006	-	-	1171	-	-	219	244	662	225	248	531
Mov Cap-2 Maneuver	-	-	-	-	-	-	219	244	-	225	248	-
Stage 1	-	-	-	-	-	-	613	590	-	504	506	-
Stage 2	-	-	-	-	-	-	489	500	-	606	589	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	12.4	19
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	495	1006	-	-	1171	-	-	287
HCM Lane V/C Ratio	0.013	0.011	-	-	0.005	-	-	0.102
HCM Control Delay (s)	12.4	8.6	-	-	8.1	-	-	19
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	373	520	27	14	13
Future Vol, veh/h	16	373	520	27	14	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	405	565	29	15	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	594	0	-	0	1019	580
Stage 1	-	-	-	-	580	-
Stage 2	-	-	-	-	439	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	982	-	-	-	263	514
Stage 1	-	-	-	-	560	-
Stage 2	-	-	-	-	650	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	982	-	-	-	259	514
Mov Cap-2 Maneuver	-	-	-	-	389	-
Stage 1	-	-	-	-	550	-
Stage 2	-	-	-	-	650	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	982	-	-	-	441
HCM Lane V/C Ratio	0.018	-	-	-	0.067
HCM Control Delay (s)	8.7	-	-	-	13.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:10	3:10	3:10	3:10	3:10	3:10
End Time	4:30	4:30	4:30	4:30	4:30	4:30
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2356	2349	2356	2340	2310	2343
Vehs Exited	2359	2351	2352	2349	2312	2345
Starting Vehs	86	87	87	90	76	87
Ending Vehs	83	85	91	81	74	81
Travel Distance (km)	2846	2893	2878	2869	2857	2868
Travel Time (hr)	79.5	84.7	81.2	81.0	81.0	81.5
Total Delay (hr)	16.9	21.0	18.0	17.5	18.2	18.3
Total Stops	2302	2551	2397	2332	2314	2378
Fuel Used (l)	230.9	237.2	234.8	232.1	230.9	233.2

Interval #0 Information Seeding

Start Time	3:10
End Time	3:30
Total Time (min)	20

Volumes adjusted by PHF, Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	3:30
End Time	4:30
Total Time (min)	60

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2356	2349	2356	2340	2310	2343
Vehs Exited	2359	2351	2352	2349	2312	2345
Starting Vehs	86	87	87	90	76	87
Ending Vehs	83	85	91	81	74	81
Travel Distance (km)	2846	2893	2878	2869	2857	2868
Travel Time (hr)	79.5	84.7	81.2	81.0	81.0	81.5
Total Delay (hr)	16.9	21.0	18.0	17.5	18.2	18.3
Total Stops	2302	2551	2397	2332	2314	2378
Fuel Used (l)	230.9	237.2	234.8	232.1	230.9	233.2

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	10.2	64.8	37.6	51.6	18.6	72.6	38.3
Average Queue (m)	1.8	33.3	18.5	23.7	7.8	36.1	13.0
95th Queue (m)	7.5	57.0	32.4	41.6	16.4	61.9	27.7
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				1			
Queuing Penalty (veh)				2			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (m)	9.0	7.1	9.1	12.9
Average Queue (m)	1.4	0.4	2.0	4.5
95th Queue (m)	6.6	3.2	8.2	10.4
Link Distance (m)			297.5	217.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	31.0	39.0		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Townline Road & Lanark Street

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (m)	9.0	3.4	1.3	17.2
Average Queue (m)	1.7	0.1	0.0	6.1
95th Queue (m)	7.5	1.8	0.9	14.3
Link Distance (m)	21.4	21.4	163.7	301.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	42.6	48.7	76.3	49.0	103.2	73.6
Average Queue (m)	21.9	22.5	36.6	20.9	52.0	31.5
95th Queue (m)	36.5	39.1	63.5	38.6	90.6	64.1
Link Distance (m)	118.3	118.3		300.2	602.7	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			11	1	14	1
Queuing Penalty (veh)			29	2	57	4

Network Summary

Network wide Queuing Penalty: 95

APPENDIX D: CAPACITY ANALYSIS RESULTS

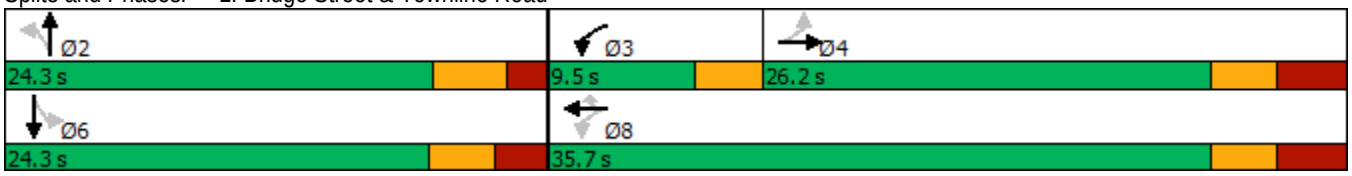
2031 Background Condition (AM/PM)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	304	124	109	228	18	122	58	106	49	87	12
Future Volume (vph)	12	304	124	109	228	18	122	58	106	49	87	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. 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
Frt		0.956				0.850		0.950			0.989	
Flt Protected	0.950			0.950				0.979			0.984	
Satd. Flow (prot)	1770	1781	0	1770	1863	1583	0	1732	0	0	1813	0
Flt Permitted	0.605			0.276				0.812			0.833	
Satd. Flow (perm)	1127	1781	0	514	1863	1583	0	1437	0	0	1535	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37				44		52			8	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	330	135	118	248	20	133	63	115	53	95	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	465	0	118	248	20	0	311	0	0	161	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.1	20.1		30.7	27.5	27.5		19.2			19.0	
Actuated g/C Ratio	0.35	0.35		0.53	0.47	0.47		0.33			0.33	
v/c Ratio	0.03	0.73		0.29	0.28	0.03		0.61			0.32	
Control Delay	13.9	24.5		8.6	10.1	1.3		20.3			17.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.9	24.5		8.6	10.1	1.3		20.3			17.0	
LOS	B	C		A	B	A		C			B	
Approach Delay		24.2			9.2			20.3			17.0	
Approach LOS		C			A			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 58.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 18.1		Intersection LOS: B	
Intersection Capacity Utilization 71.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Bridge Street & Townline Road

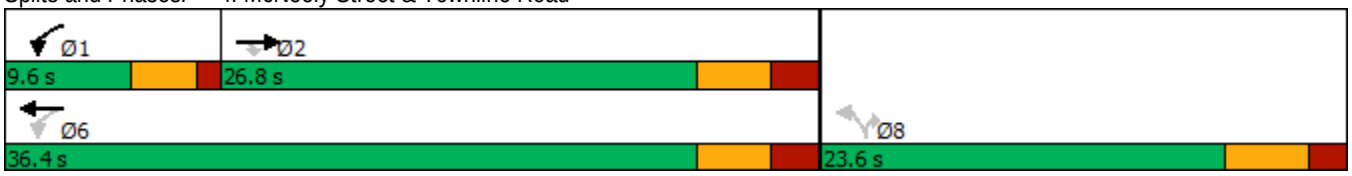


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	182	346	270	173	239	250
Future Volume (vph)	182	346	270	173	239	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.534		0.950	
Satd. Flow (perm)	1863	1583	995	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		376				272
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	198	376	293	188	260	272
Shared Lane Traffic (%)						
Lane Group Flow (vph)	198	376	293	188	260	272
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.4	21.4	32.5	31.0	13.4	13.4
Actuated g/C Ratio	0.39	0.39	0.59	0.56	0.24	0.24
v/c Ratio	0.28	0.45	0.44	0.18	0.61	0.46
Control Delay	13.9	3.8	8.9	7.3	25.1	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	3.8	8.9	7.3	25.1	5.5
LOS	B	A	A	A	C	A
Approach Delay	7.3			8.3	15.1	
Approach LOS	A			A	B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 55.4			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 10.2		Intersection LOS: B	
Intersection Capacity Utilization 50.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: McNeely Street & Townline Road



Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	415	0	0	325	15	1	0	2	13	1	14
Future Vol, veh/h	21	415	0	0	325	15	1	0	2	13	1	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	451	0	0	353	16	1	0	2	14	1	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	369	0	0	451	0	0	866	866	451	851	850	353
Stage 1	-	-	-	-	-	-	497	497	-	353	353	-
Stage 2	-	-	-	-	-	-	369	369	-	498	497	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1190	-	-	1109	-	-	274	291	608	280	298	691
Stage 1	-	-	-	-	-	-	555	545	-	664	631	-
Stage 2	-	-	-	-	-	-	651	621	-	554	545	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1190	-	-	1109	-	-	263	285	608	275	292	691
Mov Cap-2 Maneuver	-	-	-	-	-	-	263	285	-	275	292	-
Stage 1	-	-	-	-	-	-	544	535	-	651	631	-
Stage 2	-	-	-	-	-	-	636	621	-	541	535	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	13.6	14.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	423	1190	-	-	1109	-	-	395
HCM Lane V/C Ratio	0.008	0.019	-	-	-	-	-	0.077
HCM Control Delay (s)	13.6	8.1	-	-	0	-	-	14.9
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	438	323	8	25	16
Future Vol, veh/h	5	438	323	8	25	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	476	351	9	27	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	360	0	-	0	842	356
Stage 1	-	-	-	-	356	-
Stage 2	-	-	-	-	486	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1199	-	-	-	334	688
Stage 1	-	-	-	-	709	-
Stage 2	-	-	-	-	618	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1199	-	-	-	333	688
Mov Cap-2 Maneuver	-	-	-	-	451	-
Stage 1	-	-	-	-	706	-
Stage 2	-	-	-	-	618	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1199	-	-	-	521
HCM Lane V/C Ratio	0.005	-	-	-	0.086
HCM Control Delay (s)	8	-	-	-	12.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	8:25	8:25	8:25	8:25	8:25	8:25
End Time	9:45	9:45	9:45	9:45	9:45	9:45
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1907	1992	1952	1881	1927	1934
Vehs Exited	1900	2003	1941	1868	1948	1932
Starting Vehs	46	66	63	42	71	56
Ending Vehs	53	55	74	55	50	55
Travel Distance (km)	2271	2344	2327	2277	2328	2310
Travel Time (hr)	62.5	65.2	63.5	62.1	64.1	63.5
Total Delay (hr)	11.8	13.0	12.1	11.7	12.3	12.2
Total Stops	1760	1874	1850	1801	1845	1825
Fuel Used (l)	185.9	193.5	189.4	184.7	189.3	188.6

Interval #0 Information Seeding

Start Time	8:25
End Time	8:45
Total Time (min)	20

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	8:45
End Time	9:45
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1907	1992	1952	1881	1927	1934
Vehs Exited	1900	2003	1941	1868	1948	1932
Starting Vehs	46	66	63	42	71	56
Ending Vehs	53	55	74	55	50	55
Travel Distance (km)	2271	2344	2327	2277	2328	2310
Travel Time (hr)	62.5	65.2	63.5	62.1	64.1	63.5
Total Delay (hr)	11.8	13.0	12.1	11.7	12.3	12.2
Total Stops	1760	1874	1850	1801	1845	1825
Fuel Used (l)	185.9	193.5	189.4	184.7	189.3	188.6

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	22.8	84.8	27.3	44.1	10.6	62.6	39.0
Average Queue (m)	2.6	40.8	13.1	19.4	2.8	26.9	14.1
95th Queue (m)	13.9	69.3	23.3	36.2	9.9	49.1	28.9
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				0			
Queuing Penalty (veh)				0			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (m)	9.0	9.1	8.8
Average Queue (m)	1.0	0.6	4.1
95th Queue (m)	5.6	4.3	9.2
Link Distance (m)		297.5	217.5
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	31.0		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Townline Road & Lanark Street

Movement	EB	EB	SB
Directions Served	L	T	LR
Maximum Queue (m)	5.4	1.9	15.6
Average Queue (m)	0.4	0.1	7.1
95th Queue (m)	3.4	1.8	14.5
Link Distance (m)	21.4	21.4	301.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	B15	WB	WB	NB	NB
Directions Served	T	R	T	L	T	L	R
Maximum Queue (m)	44.2	50.7	1.6	47.5	31.2	62.3	46.9
Average Queue (m)	17.9	22.8	0.1	25.0	12.3	29.0	17.8
95th Queue (m)	35.3	38.8	1.1	41.3	24.7	49.0	32.9
Link Distance (m)	118.3	118.3	365.8		300.2	602.7	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)				38.0			45.0
Storage Blk Time (%)				1	0	1	0
Queuing Penalty (veh)				3	0	4	0

Network Summary

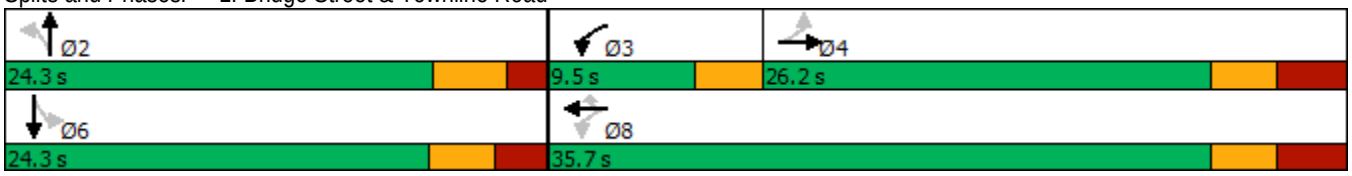
Network wide Queuing Penalty: 7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	208	116	178	281	85	130	117	132	38	91	7
Future Volume (vph)	7	208	116	178	281	85	130	117	132	38	91	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. 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
Frt		0.946				0.850		0.953			0.993	
Flt Protected	0.950			0.950				0.983			0.986	
Satd. Flow (prot)	1770	1762	0	1770	1863	1583	0	1745	0	0	1824	0
Flt Permitted	0.574			0.394				0.847			0.828	
Satd. Flow (perm)	1069	1762	0	734	1863	1583	0	1504	0	0	1532	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50				92		47			5	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	226	126	193	305	92	141	127	143	41	99	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	352	0	193	305	92	0	411	0	0	148	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.0	20.0		32.7	29.5	29.5		19.1			18.9	
Actuated g/C Ratio	0.33	0.33		0.54	0.49	0.49		0.32			0.32	
v/c Ratio	0.02	0.57		0.38	0.33	0.11		0.81			0.30	
Control Delay	13.7	18.2		9.3	10.6	2.6		31.6			17.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.7	18.2		9.3	10.6	2.6		31.6			17.2	
LOS	B	B		A	B	A		C			B	
Approach Delay		18.1			8.9			31.6			17.2	
Approach LOS		B			A			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 18.1		Intersection LOS: B	
Intersection Capacity Utilization 76.1%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Bridge Street & Townline Road

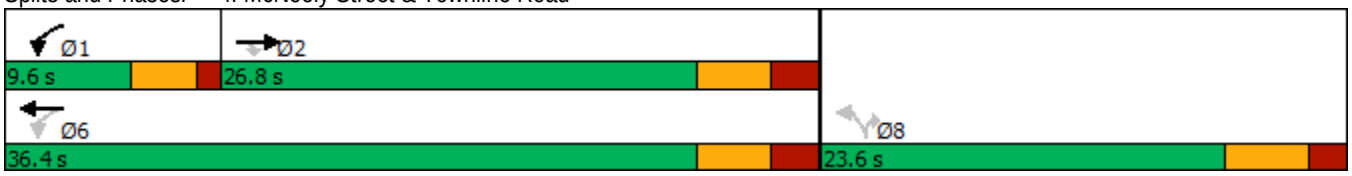


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	193	285	364	265	413	433
Future Volume (vph)	193	285	364	265	413	433
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.527		0.950	
Satd. Flow (perm)	1863	1583	982	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		310				471
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	210	310	396	288	449	471
Shared Lane Traffic (%)						
Lane Group Flow (vph)	210	310	396	288	449	471
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.3	21.3	32.4	30.9	17.3	17.3
Actuated g/C Ratio	0.36	0.36	0.55	0.52	0.29	0.29
v/c Ratio	0.31	0.40	0.65	0.30	0.87	0.59
Control Delay	15.6	3.8	14.5	9.3	40.2	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.6	3.8	14.5	9.3	40.2	5.5
LOS	B	A	B	A	D	A
Approach Delay	8.6			12.3	22.4	
Approach LOS	A			B	C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 59.2			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 15.8		Intersection LOS: B	
Intersection Capacity Utilization 65.7%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: McNeely Street & Townline Road



Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	395	2	6	574	11	1	0	5	17	1	11
Future Vol, veh/h	11	395	2	6	574	11	1	0	5	17	1	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	429	2	7	624	12	1	0	5	18	1	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	636	0	0	431	0	0	1105	1104	430	1095	1093	624
Stage 1	-	-	-	-	-	-	454	454	-	638	638	-
Stage 2	-	-	-	-	-	-	651	650	-	457	455	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	947	-	-	1129	-	-	188	211	625	191	214	485
Stage 1	-	-	-	-	-	-	586	569	-	465	471	-
Stage 2	-	-	-	-	-	-	457	465	-	583	569	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	947	-	-	1129	-	-	180	207	625	187	210	485
Mov Cap-2 Maneuver	-	-	-	-	-	-	180	207	-	187	210	-
Stage 1	-	-	-	-	-	-	578	562	-	459	468	-
Stage 2	-	-	-	-	-	-	442	462	-	571	562	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	13.2	21.9
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	443	947	-	-	1129	-	-	245
HCM Lane V/C Ratio	0.015	0.013	-	-	0.006	-	-	0.129
HCM Control Delay (s)	13.2	8.8	-	-	8.2	-	-	21.9
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.4

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	418	585	28	14	13
Future Vol, veh/h	16	418	585	28	14	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	454	636	30	15	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	666	0	-	0	1139	651
Stage 1	-	-	-	-	651	-
Stage 2	-	-	-	-	488	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	923	-	-	-	223	469
Stage 1	-	-	-	-	519	-
Stage 2	-	-	-	-	617	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	923	-	-	-	219	469
Mov Cap-2 Maneuver	-	-	-	-	353	-
Stage 1	-	-	-	-	510	-
Stage 2	-	-	-	-	617	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	14.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	923	-	-	-	401
HCM Lane V/C Ratio	0.019	-	-	-	0.073
HCM Control Delay (s)	9	-	-	-	14.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:10	3:10	3:10	3:10	3:10	3:10
End Time	4:30	4:30	4:30	4:30	4:30	4:30
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2429	2495	2493	2489	2493	2481
Vehs Exited	2429	2500	2482	2487	2505	2481
Starting Vehs	90	94	87	91	104	88
Ending Vehs	90	89	98	93	92	92
Travel Distance (km)	2999	2996	3029	3010	3007	3008
Travel Time (hr)	85.5	85.7	88.2	86.4	85.0	86.1
Total Delay (hr)	19.4	19.7	21.7	19.9	18.9	19.9
Total Stops	2531	2475	2635	2484	2478	2520
Fuel Used (l)	242.5	243.0	246.7	245.3	243.1	244.1

Interval #0 Information Seeding

Start Time	3:10
End Time	3:30
Total Time (min)	20

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	3:30
End Time	4:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2429	2495	2493	2489	2493	2481
Vehs Exited	2429	2500	2482	2487	2505	2481
Starting Vehs	90	94	87	91	104	88
Ending Vehs	90	89	98	93	92	92
Travel Distance (km)	2999	2996	3029	3010	3007	3008
Travel Time (hr)	85.5	85.7	88.2	86.4	85.0	86.1
Total Delay (hr)	19.4	19.7	21.7	19.9	18.9	19.9
Total Stops	2531	2475	2635	2484	2478	2520
Fuel Used (l)	242.5	243.0	246.7	245.3	243.1	244.1

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	11.4	61.2	38.4	51.5	19.8	70.9	33.0
Average Queue (m)	1.7	31.7	19.5	25.1	8.0	39.2	13.1
95th Queue (m)	7.7	51.8	32.4	44.7	17.5	63.0	26.2
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				1			
Queuing Penalty (veh)				3			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (m)	9.0	5.4	9.1	10.4
Average Queue (m)	1.3	0.5	1.7	3.9
95th Queue (m)	6.3	3.8	7.4	9.8
Link Distance (m)			297.5	217.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	31.0	39.0		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Townline Road & Lanark Street

Movement	EB	EB	SB
Directions Served	L	T	LR
Maximum Queue (m)	11.6	3.7	14.6
Average Queue (m)	2.3	0.1	5.7
95th Queue (m)	9.1	1.9	13.4
Link Distance (m)	21.4	21.4	301.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	43.0	52.3	84.8	67.5	141.6	85.0
Average Queue (m)	20.9	22.2	37.5	20.4	60.2	38.5
95th Queue (m)	36.2	37.9	65.7	43.1	115.0	76.6
Link Distance (m)	118.3	118.3		300.2	602.7	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			10	0	20	2
Queuing Penalty (veh)			26	1	87	8

Network Summary

Network wide Queuing Penalty: 125

APPENDIX D: CAPACITY ANALYSIS RESULTS

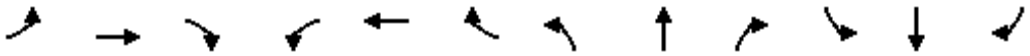
2026 Build-Out Condition (AM/PM)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	167	337	239	155	216	215
Future Volume (vph)	167	337	239	155	216	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.541		0.950	
Satd. Flow (perm)	1863	1583	1008	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		366				234
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	366	260	168	235	234
Shared Lane Traffic (%)						
Lane Group Flow (vph)	182	366	260	168	235	234
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

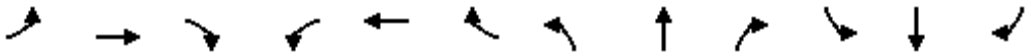
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.4	21.4	32.5	31.0	12.9	12.9
Actuated g/C Ratio	0.39	0.39	0.59	0.56	0.23	0.23
v/c Ratio	0.25	0.44	0.39	0.16	0.57	0.43
Control Delay	13.4	3.7	7.9	6.9	24.2	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	3.7	7.9	6.9	24.2	5.5
LOS	B	A	A	A	C	A
Approach Delay	6.9			7.5	14.9	
Approach LOS	A			A	B	
Queue Length 50th (m)	12.0	0.0	10.7	7.0	21.7	0.0
Queue Length 95th (m)	27.8	15.0	26.1	18.2	39.6	13.4
Internal Link Dist (m)	493.7			287.7	591.9	
Turn Bay Length (m)			38.0			45.0
Base Capacity (vph)	725	839	674	1052	585	680
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	0.25	0.44	0.39	0.16	0.40	0.34

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 54.9			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 9.7		Intersection LOS: A	
Intersection Capacity Utilization 46.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: McNeely Street & Townline Road



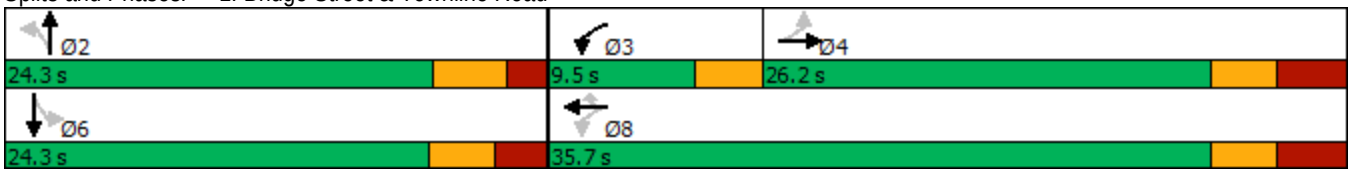
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	270	110	98	205	16	108	52	95	43	76	11
Future Volume (vph)	11	270	110	98	205	16	108	52	95	43	76	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. 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
Frt		0.956				0.850		0.950			0.989	
Flt Protected	0.950			0.950				0.979			0.984	
Satd. Flow (prot)	1770	1781	0	1770	1863	1583	0	1732	0	0	1813	0
Flt Permitted	0.619			0.333				0.819			0.848	
Satd. Flow (perm)	1153	1781	0	620	1863	1583	0	1449	0	0	1562	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37				44		52			8	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	293	120	107	223	17	117	57	103	47	83	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	413	0	107	223	17	0	277	0	0	142	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.1	20.1		30.7	27.5	27.5		19.2			19.0	
Actuated g/C Ratio	0.35	0.35		0.53	0.47	0.47		0.33			0.33	
v/c Ratio	0.03	0.65		0.24	0.25	0.02		0.54			0.28	
Control Delay	13.9	20.8		8.0	9.9	1.1		18.2			16.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.9	20.8		8.0	9.9	1.1		18.2			16.4	
LOS	B	C		A	A	A		B			B	
Approach Delay		20.6			8.9			18.2			16.4	
Approach LOS		C			A			B			B	
Queue Length 50th (m)	0.9	36.3		5.4	13.8	0.0		20.7			11.4	
Queue Length 95th (m)	4.0	64.3		11.6	25.3	1.1		42.3			24.0	
Internal Link Dist (m)		312.7			152.5			207.3			120.8	
Turn Bay Length (m)				119.0		40.0						
Base Capacity (vph)	398	640		456	950	829		513			515	
Starvation Cap Reductn	0	0		0	0	0		0			0	
Spillback Cap Reductn	0	0		0	0	0		0			0	
Storage Cap Reductn	0	0		0	0	0		0			0	
Reduced v/c Ratio	0.03	0.65		0.23	0.23	0.02		0.54			0.28	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 58.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 16.1		Intersection LOS: B	
Intersection Capacity Utilization 69.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Bridge Street & Townline Road



Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	371	0	0	300	17	1	0	2	25	1	38
Future Vol, veh/h	25	371	0	0	300	17	1	0	2	25	1	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	403	0	0	326	18	1	0	2	27	1	41

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	344	0	0	403	0	0	813	801	403	784	783	326
Stage 1	-	-	-	-	-	-	457	457	-	326	326	-
Stage 2	-	-	-	-	-	-	356	344	-	458	457	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1215	-	-	1156	-	-	297	318	647	311	325	715
Stage 1	-	-	-	-	-	-	583	568	-	687	648	-
Stage 2	-	-	-	-	-	-	661	637	-	583	568	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1215	-	-	1156	-	-	274	311	647	305	318	715
Mov Cap-2 Maneuver	-	-	-	-	-	-	274	311	-	305	318	-
Stage 1	-	-	-	-	-	-	570	556	-	672	648	-
Stage 2	-	-	-	-	-	-	622	637	-	568	556	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0	13.2	14.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	445	1215	-	-	1156	-	-	463
HCM Lane V/C Ratio	0.007	0.022	-	-	-	-	-	0.15
HCM Control Delay (s)	13.2	8	-	-	0	-	-	14.1
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.5

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	402	292	13	43	24
Future Vol, veh/h	7	402	292	13	43	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	437	317	14	47	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	331	0	-	0	777	324
Stage 1	-	-	-	-	324	-
Stage 2	-	-	-	-	453	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1228	-	-	-	365	717
Stage 1	-	-	-	-	733	-
Stage 2	-	-	-	-	640	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1228	-	-	-	362	717
Mov Cap-2 Maneuver	-	-	-	-	475	-
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	640	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1228	-	-	-	540
HCM Lane V/C Ratio	0.006	-	-	-	0.135
HCM Control Delay (s)	8	-	-	-	12.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.5

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	8:25	8:25	8:25	8:25	8:25	8:25
End Time	9:45	9:45	9:45	9:45	9:45	9:45
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1947	2018	1961	1946	1975	1968
Vehs Exited	1927	2027	1947	1928	1974	1961
Starting Vehs	50	75	60	51	63	59
Ending Vehs	70	66	74	69	64	67
Travel Distance (km)	2278	2431	2312	2320	2351	2338
Travel Time (hr)	63.1	68.5	63.2	64.2	64.6	64.7
Total Delay (hr)	12.1	14.0	12.0	12.5	12.2	12.5
Total Stops	1907	2109	1859	1931	1898	1939
Fuel Used (l)	186.2	201.4	187.8	189.1	189.8	190.8

Interval #0 Information Seeding

Start Time	8:25
End Time	8:45
Total Time (min)	20

Volumes adjusted by PHF, Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	8:45
End Time	9:45
Total Time (min)	60

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1947	2018	1961	1946	1975	1968
Vehs Exited	1927	2027	1947	1928	1974	1961
Starting Vehs	50	75	60	51	63	59
Ending Vehs	70	66	74	69	64	67
Travel Distance (km)	2278	2431	2312	2320	2351	2338
Travel Time (hr)	63.1	68.5	63.2	64.2	64.6	64.7
Total Delay (hr)	12.1	14.0	12.0	12.5	12.2	12.5
Total Stops	1907	2109	1859	1931	1898	1939
Fuel Used (l)	186.2	201.4	187.8	189.1	189.8	190.8

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	12.6	89.3	39.8	50.4	13.1	53.0	31.1
Average Queue (m)	2.3	42.9	17.3	21.1	2.4	27.5	13.1
95th Queue (m)	9.2	75.1	32.1	39.9	9.1	45.9	26.0
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				1			
Queuing Penalty (veh)				1			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (m)	13.7	9.1	15.5
Average Queue (m)	2.1	0.9	7.2
95th Queue (m)	9.0	5.3	13.5
Link Distance (m)		297.5	217.5
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	31.0		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Townline Road & Lanark Street

Movement	EB	EB	SB
Directions Served	L	T	LR
Maximum Queue (m)	9.0	5.4	22.8
Average Queue (m)	0.7	0.2	10.0
95th Queue (m)	4.6	2.9	18.2
Link Distance (m)	21.4	21.4	301.8
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

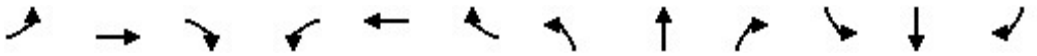
Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	45.9	57.8	48.2	29.5	48.2	38.3
Average Queue (m)	18.2	24.7	23.5	12.0	27.9	16.4
95th Queue (m)	35.8	43.1	38.7	24.7	44.3	29.1
Link Distance (m)	118.3	118.3		300.2	602.7	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			1	0	1	0
Queuing Penalty (veh)			2	0	1	0

Network Summary

Network wide Queuing Penalty: 4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	190	102	181	252	75	115	103	150	33	81	6
Future Volume (vph)	6	190	102	181	252	75	115	103	150	33	81	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. 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
Frt		0.948				0.850		0.945			0.993	
Flt Protected	0.950			0.950				0.985			0.986	
Satd. Flow (prot)	1770	1766	0	1770	1863	1583	0	1734	0	0	1824	0
Flt Permitted	0.591			0.435				0.860			0.843	
Satd. Flow (perm)	1101	1766	0	810	1863	1583	0	1514	0	0	1559	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48				82		61			5	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	207	111	197	274	82	125	112	163	36	88	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	318	0	197	274	82	0	400	0	0	131	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

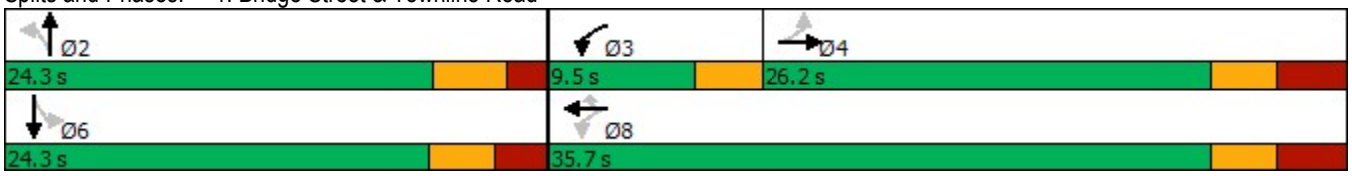


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.0	20.0		32.7	29.5	29.5		19.1			18.9	
Actuated g/C Ratio	0.33	0.33		0.54	0.49	0.49		0.32			0.32	
v/c Ratio	0.02	0.51		0.36	0.30	0.10		0.76			0.27	
Control Delay	13.7	17.0		9.1	10.2	2.7		27.6			16.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.7	17.0		9.1	10.2	2.7		27.6			16.6	
LOS	B	B		A	B	A		C			B	
Approach Delay		17.0			8.7			27.6			16.6	
Approach LOS		B			A			C			B	
Queue Length 50th (m)	0.5	24.1		10.5	17.5	0.0		34.7			10.7	
Queue Length 95th (m)	2.9	45.4		19.8	31.1	5.5		#76.8			22.6	
Internal Link Dist (m)		312.7			152.5			207.3			120.8	
Turn Bay Length (m)				119.0		40.0						
Base Capacity (vph)	367	620		545	915	819		523			494	
Starvation Cap Reductn	0	0		0	0	0		0			0	
Spillback Cap Reductn	0	0		0	0	0		0			0	
Storage Cap Reductn	0	0		0	0	0		0			0	
Reduced v/c Ratio	0.02	0.51		0.36	0.30	0.10		0.76			0.27	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 16.7 Intersection LOS: B
Intersection Capacity Utilization 75.6% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Bridge Street & Townline Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	175	272	322	242	390	374
Future Volume (vph)	175	272	322	242	390	374
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.537		0.950	
Satd. Flow (perm)	1863	1583	1000	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		296				407
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	190	296	350	263	424	407
Shared Lane Traffic (%)						
Lane Group Flow (vph)	190	296	350	263	424	407
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.3	21.3	32.4	30.9	16.7	16.7
Actuated g/C Ratio	0.36	0.36	0.55	0.53	0.28	0.28
v/c Ratio	0.28	0.39	0.56	0.27	0.84	0.55
Control Delay	15.2	3.8	12.1	8.9	37.1	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	3.8	12.1	8.9	37.1	5.3
LOS	B	A	B	A	D	A
Approach Delay	8.2			10.7	21.5	
Approach LOS	A			B	C	
Queue Length 50th (m)	15.4	0.0	21.0	15.7	44.4	0.0
Queue Length 95th (m)	29.0	13.7	36.3	28.2	#87.2	17.3
Internal Link Dist (m)	493.7			287.7	591.9	
Turn Bay Length (m)			38.0			45.0
Base Capacity (vph)	676	763	626	982	546	769
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	0.28	0.39	0.56	0.27	0.78	0.53

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 58.7			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 14.7		Intersection LOS: B	
Intersection Capacity Utilization 61.2%		ICU Level of Service B	
Analysis Period (min) 15			

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

Splits and Phases: 4: McNeely Street & Townline Road

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	362	2	5	517	23	1	0	5	25	1	27
Future Vol, veh/h	36	362	2	5	517	23	1	0	5	25	1	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	39	393	2	5	562	25	1	0	5	27	1	29

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	587	0	0	395	0	0	1072	1069	394	1047	1045	562
Stage 1	-	-	-	-	-	-	472	472	-	572	572	-
Stage 2	-	-	-	-	-	-	600	597	-	475	473	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	988	-	-	1164	-	-	198	221	655	206	229	526
Stage 1	-	-	-	-	-	-	573	559	-	505	504	-
Stage 2	-	-	-	-	-	-	488	491	-	570	558	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	988	-	-	1164	-	-	180	211	655	198	219	526
Mov Cap-2 Maneuver	-	-	-	-	-	-	180	211	-	198	219	-
Stage 1	-	-	-	-	-	-	551	537	-	485	502	-
Stage 2	-	-	-	-	-	-	458	489	-	543	536	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.1	13	20.4
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	455	988	-	-	1164	-	-	291
HCM Lane V/C Ratio	0.014	0.04	-	-	0.005	-	-	0.198
HCM Control Delay (s)	13	8.8	-	-	8.1	-	-	20.4
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.7

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	382	533	47	26	19
Future Vol, veh/h	24	382	533	47	26	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	415	579	51	28	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	630	0	-	0	1072	605
Stage 1	-	-	-	-	605	-
Stage 2	-	-	-	-	467	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	952	-	-	-	244	498
Stage 1	-	-	-	-	545	-
Stage 2	-	-	-	-	631	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	952	-	-	-	237	498
Mov Cap-2 Maneuver	-	-	-	-	370	-
Stage 1	-	-	-	-	530	-
Stage 2	-	-	-	-	631	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	14.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	952	-	-	-	415
HCM Lane V/C Ratio	0.027	-	-	-	0.118
HCM Control Delay (s)	8.9	-	-	-	14.8
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:10	3:10	3:10	3:10	3:10	3:10
End Time	4:30	4:30	4:30	4:30	4:30	4:30
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2486	2503	2463	2497	2466	2484
Vehs Exited	2482	2510	2467	2490	2460	2482
Starting Vehs	93	96	90	84	83	89
Ending Vehs	97	89	86	91	89	90
Travel Distance (km)	3008	3061	3021	2998	2977	3013
Travel Time (hr)	87.8	87.9	86.5	88.4	88.4	87.8
Total Delay (hr)	21.3	20.3	19.9	22.1	22.7	21.3
Total Stops	2655	2568	2509	2719	2572	2605
Fuel Used (l)	245.9	250.3	246.7	245.2	244.9	246.6

Interval #0 Information Seeding

Start Time	3:10
End Time	3:30
Total Time (min)	20

Volumes adjusted by PHF, Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	3:30
End Time	4:30
Total Time (min)	60

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2486	2503	2463	2497	2466	2484
Vehs Exited	2482	2510	2467	2490	2460	2482
Starting Vehs	93	96	90	84	83	89
Ending Vehs	97	89	86	91	89	90
Travel Distance (km)	3008	3061	3021	2998	2977	3013
Travel Time (hr)	87.8	87.9	86.5	88.4	88.4	87.8
Total Delay (hr)	21.3	20.3	19.9	22.1	22.7	21.3
Total Stops	2655	2568	2509	2719	2572	2605
Fuel Used (l)	245.9	250.3	246.7	245.2	244.9	246.6

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	11.4	61.5	43.0	48.2	22.1	90.0	39.1
Average Queue (m)	1.4	31.7	21.2	23.3	8.3	41.2	14.0
95th Queue (m)	7.0	50.9	36.1	41.0	17.4	73.6	30.1
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				1	0		
Queuing Penalty (veh)				3	0		

Intersection: 2: Edmund Street & Townline Road

Movement	EB	WB	WB	NB	SB
Directions Served	L	L	R	LTR	LTR
Maximum Queue (m)	14.2	3.5	1.3	9.1	18.7
Average Queue (m)	4.4	0.2	0.0	1.6	6.3
95th Queue (m)	12.3	2.5	0.9	7.2	13.8
Link Distance (m)				297.5	217.5
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)	31.0	39.0	17.0		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Townline Road & Lanark Street

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (m)	12.7	5.6	1.4	18.7
Average Queue (m)	2.8	0.2	0.1	8.3
95th Queue (m)	10.1	2.4	1.4	16.2
Link Distance (m)	21.4	21.4	163.7	301.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: McNeely Street & Townline Road

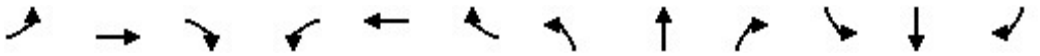
Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	42.5	46.6	92.6	77.5	126.2	84.9
Average Queue (m)	22.7	21.7	44.5	24.3	58.9	35.1
95th Queue (m)	38.7	38.1	81.7	66.9	102.6	73.1
Link Distance (m)	118.3	118.3		300.2	602.7	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			19	0	22	1
Queuing Penalty (veh)			51	1	88	6

Network Summary

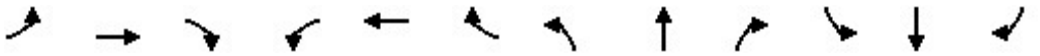
Network wide Queuing Penalty: 149

APPENDIX D: CAPACITY ANALYSIS RESULTS

2031 Future Total Condition (AM/PM)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	304	124	140	230	18	122	58	115	49	87	12
Future Volume (vph)	12	304	124	140	230	18	122	58	115	49	87	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. 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
Frt		0.956				0.850		0.947			0.989	
Flt Protected	0.950			0.950				0.980			0.984	
Satd. Flow (prot)	1770	1781	0	1770	1863	1583	0	1729	0	0	1813	0
Flt Permitted	0.604			0.276				0.817			0.828	
Satd. Flow (perm)	1125	1781	0	514	1863	1583	0	1441	0	0	1525	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37				44		56			8	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	330	135	152	250	20	133	63	125	53	95	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	465	0	152	250	20	0	321	0	0	161	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		

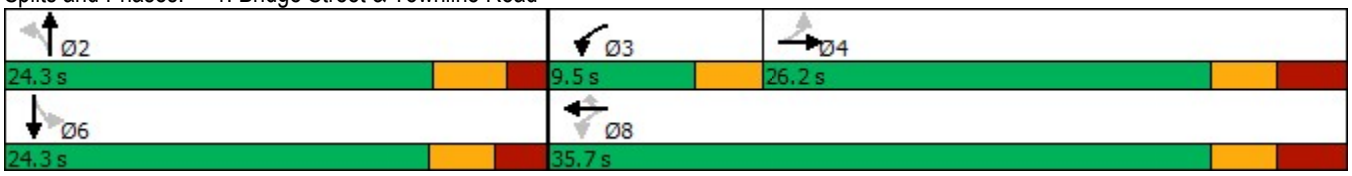


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.1	20.1		30.7	27.5	27.5		19.2			19.0	
Actuated g/C Ratio	0.35	0.35		0.53	0.47	0.47		0.33			0.33	
v/c Ratio	0.03	0.73		0.37	0.28	0.03		0.63			0.32	
Control Delay	13.9	24.5		9.6	10.2	1.3		20.7			17.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.9	24.5		9.6	10.2	1.3		20.7			17.1	
LOS	B	C		A	B	A		C			B	
Approach Delay		24.2			9.5			20.7			17.1	
Approach LOS		C			A			C			B	
Queue Length 50th (m)	1.0	43.2		7.9	15.8	0.0		25.5			13.3	
Queue Length 95th (m)	4.2	#86.0		15.6	28.3	1.4		50.6			27.2	
Internal Link Dist (m)		312.7			152.5			207.3			120.8	
Turn Bay Length (m)				119.0		40.0						
Base Capacity (vph)	389	640		412	950	829		513			503	
Starvation Cap Reductn	0	0		0	0	0		0			0	
Spillback Cap Reductn	0	0		0	0	0		0			0	
Storage Cap Reductn	0	0		0	0	0		0			0	
Reduced v/c Ratio	0.03	0.73		0.37	0.26	0.02		0.63			0.32	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 58.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 18.1		Intersection LOS: B	
Intersection Capacity Utilization 71.5%		ICU Level of Service C	
Analysis Period (min) 15			

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

Splits and Phases: 1: Bridge Street & Townline Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	186	373	270	174	247	250
Future Volume (vph)	186	373	270	174	247	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.532		0.950	
Satd. Flow (perm)	1863	1583	991	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		405				272
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	202	405	293	189	268	272
Shared Lane Traffic (%)						
Lane Group Flow (vph)	202	405	293	189	268	272
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.4	21.4	32.5	31.0	13.6	13.6
Actuated g/C Ratio	0.38	0.38	0.58	0.56	0.24	0.24
v/c Ratio	0.28	0.47	0.45	0.18	0.62	0.46
Control Delay	14.0	3.9	9.0	7.4	25.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	3.9	9.0	7.4	25.4	5.4
LOS	B	A	A	A	C	A
Approach Delay	7.3			8.4	15.4	
Approach LOS	A			A	B	
Queue Length 50th (m)	14.1	0.0	13.2	8.6	25.2	0.0
Queue Length 95th (m)	30.8	15.7	29.8	20.5	45.3	14.4
Internal Link Dist (m)	493.7			287.7	591.9	
Turn Bay Length (m)			38.0			45.0
Base Capacity (vph)	715	857	658	1038	578	700
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	0.28	0.47	0.45	0.18	0.46	0.39

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 55.6			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 10.3		Intersection LOS: B	
Intersection Capacity Utilization 50.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: McNeely Street & Townline Road

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	417	0	0	333	19	1	0	2	26	1	39
Future Vol, veh/h	28	417	0	0	333	19	1	0	2	26	1	39
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	453	0	0	362	21	1	0	2	28	1	42

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	383	0	0	453	0	0	907	896	453	876	875	362
Stage 1	-	-	-	-	-	-	513	513	-	362	362	-
Stage 2	-	-	-	-	-	-	394	383	-	514	513	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1175	-	-	1108	-	-	257	280	607	269	288	683
Stage 1	-	-	-	-	-	-	544	536	-	657	625	-
Stage 2	-	-	-	-	-	-	631	612	-	543	536	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1175	-	-	1108	-	-	236	273	607	263	281	683
Mov Cap-2 Maneuver	-	-	-	-	-	-	236	273	-	263	281	-
Stage 1	-	-	-	-	-	-	530	522	-	640	625	-
Stage 2	-	-	-	-	-	-	591	612	-	527	522	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0	14.1	15.5
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	398	1175	-	-	1108	-	-	414
HCM Lane V/C Ratio	0.008	0.026	-	-	-	-	-	0.173
HCM Control Delay (s)	14.1	8.1	-	-	0	-	-	15.5
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.6

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	451	327	13	43	24
Future Vol, veh/h	7	451	327	13	43	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	490	355	14	47	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	369	0	-	0	868	362
Stage 1	-	-	-	-	362	-
Stage 2	-	-	-	-	506	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1190	-	-	-	323	683
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	606	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	1190	-	-	-	321	683
Mov Cap-2 Maneuver	-	-	-	-	441	-
Stage 1	-	-	-	-	699	-
Stage 2	-	-	-	-	606	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1190	-	-	-	505
HCM Lane V/C Ratio	0.006	-	-	-	0.144
HCM Control Delay (s)	8	-	-	-	13.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.5

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	8:25	8:25	8:25	8:25	8:25	8:25
End Time	9:45	9:45	9:45	9:45	9:45	9:45
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2033	1975	2096	1980	2038	2022
Vehs Exited	2013	1988	2092	1982	2029	2021
Starting Vehs	66	76	71	70	61	66
Ending Vehs	86	63	75	68	70	69
Travel Distance (km)	2400	2391	2467	2432	2476	2433
Travel Time (hr)	67.9	66.1	68.0	67.5	68.2	67.6
Total Delay (hr)	14.3	12.6	13.5	13.3	13.0	13.3
Total Stops	2050	1904	2031	1956	1974	1983
Fuel Used (l)	197.6	195.0	200.8	198.5	200.8	198.5

Interval #0 Information Seeding

Start Time	8:25
End Time	8:45
Total Time (min)	20

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	8:45
End Time	9:45
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2033	1975	2096	1980	2038	2022
Vehs Exited	2013	1988	2092	1982	2029	2021
Starting Vehs	66	76	71	70	61	66
Ending Vehs	86	63	75	68	70	69
Travel Distance (km)	2400	2391	2467	2432	2476	2433
Travel Time (hr)	67.9	66.1	68.0	67.5	68.2	67.6
Total Delay (hr)	14.3	12.6	13.5	13.3	13.0	13.3
Total Stops	2050	1904	2031	1956	1974	1983
Fuel Used (l)	197.6	195.0	200.8	198.5	200.8	198.5

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	24.6	85.0	35.6	38.6	10.3	55.6	33.9
Average Queue (m)	3.0	45.1	17.9	18.3	2.1	29.0	13.7
95th Queue (m)	14.8	73.9	30.5	34.2	8.5	48.9	27.4
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				0			
Queuing Penalty (veh)				0			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (m)	14.6	9.1	14.4
Average Queue (m)	2.4	0.6	7.0
95th Queue (m)	9.8	4.3	12.5
Link Distance (m)		297.5	217.5
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	31.0		
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 3: Townline Road & Lanark Street

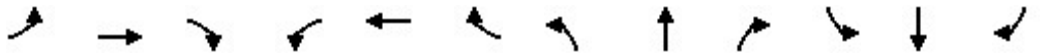
Movement	EB	EB	SB
Directions Served	L	T	LR
Maximum Queue (m)	8.8	3.8	21.4
Average Queue (m)	0.4	0.3	9.6
95th Queue (m)	3.4	2.9	17.1
Link Distance (m)	21.4	21.4	301.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: McNeely Street & Townline Road

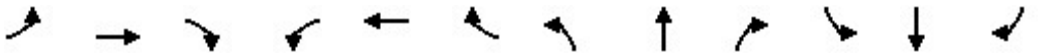
Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	38.8	57.2	53.4	29.3	61.6	49.2
Average Queue (m)	17.8	24.2	26.6	12.6	30.8	17.7
95th Queue (m)	32.9	42.0	46.4	24.5	49.9	33.9
Link Distance (m)	118.3	118.3		300.2	602.7	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			3	0	1	0
Queuing Penalty (veh)			4	0	4	0

Network Summary

Network wide Queuing Penalty: 9



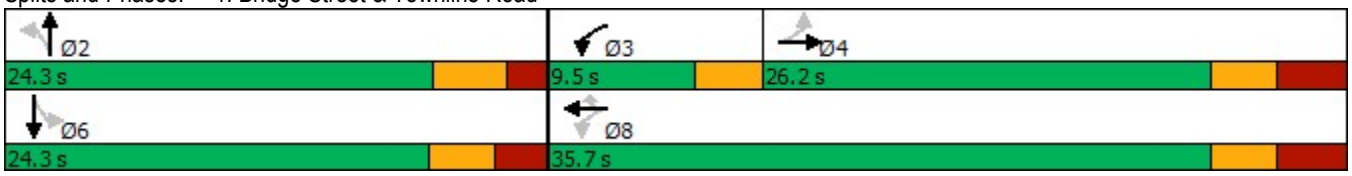
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	210	116	199	283	85	130	117	164	38	91	7
Future Volume (vph)	7	210	116	199	283	85	130	117	164	38	91	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	119.0		40.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (m)	7.5			10.0			7.5			7.5		
Lane Util. 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
Frt		0.947				0.850		0.946			0.993	
Flt Protected	0.950			0.950				0.984			0.986	
Satd. Flow (prot)	1770	1764	0	1770	1863	1583	0	1734	0	0	1824	0
Flt Permitted	0.573			0.392				0.857			0.812	
Satd. Flow (perm)	1067	1764	0	730	1863	1583	0	1510	0	0	1502	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50				92		58			5	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		336.7			176.5			231.3			144.8	
Travel Time (s)		30.3			15.9			16.7			10.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	228	126	216	308	92	141	127	178	41	99	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	354	0	216	308	92	0	446	0	0	148	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2			6		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	26.2	26.2		9.5	26.2	26.2	23.2	23.2		23.4	23.4	
Total Split (s)	26.2	26.2		9.5	35.7	35.7	24.3	24.3		24.3	24.3	
Total Split (%)	43.7%	43.7%		15.8%	59.5%	59.5%	40.5%	40.5%		40.5%	40.5%	
Maximum Green (s)	20.0	20.0		6.5	29.5	29.5	19.1	19.1		18.9	18.9	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.3	3.3		3.0	3.0	
All-Red Time (s)	3.2	3.2		0.0	3.2	3.2	1.9	1.9		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2		3.0	6.2	6.2		5.2			5.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0		0	0	
Act Effct Green (s)	20.0	20.0		32.7	29.5	29.5		19.1			18.9	
Actuated g/C Ratio	0.33	0.33		0.54	0.49	0.49		0.32			0.32	
v/c Ratio	0.02	0.57		0.42	0.34	0.11		0.86			0.31	
Control Delay	13.7	18.3		9.9	10.6	2.6		36.0			17.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	13.7	18.3		9.9	10.6	2.6		36.0			17.3	
LOS	B	B		A	B	A		D			B	
Approach Delay		18.2			9.2			36.0			17.3	
Approach LOS		B			A			D			B	
Queue Length 50th (m)	0.6	27.9		11.7	20.1	0.0		41.7			12.4	
Queue Length 95th (m)	3.2	51.6		21.7	35.1	5.9		#91.5			25.5	
Internal Link Dist (m)		312.7			152.5			207.3			120.8	
Turn Bay Length (m)				119.0		40.0						
Base Capacity (vph)	355	621		510	915	825		520			476	
Starvation Cap Reductn	0	0		0	0	0		0			0	
Spillback Cap Reductn	0	0		0	0	0		0			0	
Storage Cap Reductn	0	0		0	0	0		0			0	
Reduced v/c Ratio	0.02	0.57		0.42	0.34	0.11		0.86			0.31	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 19.6		Intersection LOS: B	
Intersection Capacity Utilization 78.0%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Bridge Street & Townline Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	196	303	364	269	442	433
Future Volume (vph)	196	303	364	269	442	433
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	38.0		0.0	45.0
Storage Lanes		1	1		1	1
Taper Length (m)			74.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.526		0.950	
Satd. Flow (perm)	1863	1583	980	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		329				471
Link Speed (k/h)	50			50	60	
Link Distance (m)	517.7			311.7	615.9	
Travel Time (s)	37.3			22.4	37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	213	329	396	292	480	471
Shared Lane Traffic (%)						
Lane Group Flow (vph)	213	329	396	292	480	471
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases		2	6		8	8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.0	24.0	9.5	24.0	23.5	23.5
Total Split (s)	26.8	26.8	9.6	36.4	23.6	23.6
Total Split (%)	44.7%	44.7%	16.0%	60.7%	39.3%	39.3%
Maximum Green (s)	21.3	21.3	5.6	30.9	18.1	18.1
Yellow Time (s)	3.3	3.3	3.0	3.3	3.7	3.7
All-Red Time (s)	2.2	2.2	1.0	2.2	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	21.3	21.3	32.4	30.9	17.7	17.7
Actuated g/C Ratio	0.36	0.36	0.54	0.52	0.30	0.30
v/c Ratio	0.32	0.42	0.65	0.30	0.91	0.59
Control Delay	15.7	3.9	14.8	9.4	46.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	3.9	14.8	9.4	46.4	5.4
LOS	B	A	B	A	D	A
Approach Delay	8.5			12.5	26.1	
Approach LOS	A			B	C	
Queue Length 50th (m)	17.5	0.0	24.5	17.8	52.5	0.0
Queue Length 95th (m)	32.4	14.3	42.1	31.4	#103.6	18.5
Internal Link Dist (m)	493.7			287.7	591.9	
Turn Bay Length (m)			38.0			45.0
Base Capacity (vph)	666	777	606	966	537	808
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.42	0.65	0.30	0.89	0.58

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 59.6
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 17.4 Intersection LOS: B
Intersection Capacity Utilization 67.5% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: McNeely Street & Townline Road

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	37	403	2	6	580	24	1	0	5	26	1	28
Future Vol, veh/h	37	403	2	6	580	24	1	0	5	26	1	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	31	-	-	39	-	17	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	40	438	2	7	630	26	1	0	5	28	1	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	656	0	0	440	0	0	1192	1189	439	1166	1164	630
Stage 1	-	-	-	-	-	-	519	519	-	644	644	-
Stage 2	-	-	-	-	-	-	673	670	-	522	520	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	931	-	-	1120	-	-	164	188	618	171	194	482
Stage 1	-	-	-	-	-	-	540	533	-	461	468	-
Stage 2	-	-	-	-	-	-	445	455	-	538	532	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	931	-	-	1120	-	-	147	179	618	163	184	482
Mov Cap-2 Maneuver	-	-	-	-	-	-	147	179	-	163	184	-
Stage 1	-	-	-	-	-	-	517	510	-	441	465	-
Stage 2	-	-	-	-	-	-	413	452	-	510	509	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.1	14.1	24.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	403	931	-	-	1120	-	-	247
HCM Lane V/C Ratio	0.016	0.043	-	-	0.006	-	-	0.242
HCM Control Delay (s)	14.1	9	-	-	8.2	-	-	24.2
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.9

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	427	598	48	26	19
Future Vol, veh/h	24	427	598	48	26	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	464	650	52	28	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	702	0	-	0	1192	676
Stage 1	-	-	-	-	676	-
Stage 2	-	-	-	-	516	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	895	-	-	-	207	453
Stage 1	-	-	-	-	505	-
Stage 2	-	-	-	-	599	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	895	-	-	-	201	453
Mov Cap-2 Maneuver	-	-	-	-	336	-
Stage 1	-	-	-	-	490	-
Stage 2	-	-	-	-	599	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	16
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	895	-	-	-	377
HCM Lane V/C Ratio	0.029	-	-	-	0.13
HCM Control Delay (s)	9.1	-	-	-	16
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:10	3:10	3:10	3:10	3:10	3:10
End Time	4:30	4:30	4:30	4:30	4:30	4:30
Total Time (min)	80	80	80	80	80	80
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2599	2568	2591	2568	2558	2579
Vehs Exited	2594	2571	2630	2563	2554	2583
Starting Vehs	87	97	126	90	107	98
Ending Vehs	92	94	87	95	111	93
Travel Distance (km)	3170	3066	3189	3178	3110	3143
Travel Time (hr)	93.7	91.0	98.9	94.2	90.9	93.7
Total Delay (hr)	23.7	23.0	28.4	23.9	22.2	24.3
Total Stops	2764	2796	3164	2825	2704	2848
Fuel Used (l)	260.4	253.1	268.3	260.9	253.0	259.1

Interval #0 Information Seeding

Start Time	3:10
End Time	3:30
Total Time (min)	20

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	3:30
End Time	4:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2599	2568	2591	2568	2558	2579
Vehs Exited	2594	2571	2630	2563	2554	2583
Starting Vehs	87	97	126	90	107	98
Ending Vehs	92	94	87	95	111	93
Travel Distance (km)	3170	3066	3189	3178	3110	3143
Travel Time (hr)	93.7	91.0	98.9	94.2	90.9	93.7
Total Delay (hr)	23.7	23.0	28.4	23.9	22.2	24.3
Total Stops	2764	2796	3164	2825	2704	2848
Fuel Used (l)	260.4	253.1	268.3	260.9	253.0	259.1

Intersection: 1: Bridge Street & Townline Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	R	LTR	LTR
Maximum Queue (m)	10.1	67.7	42.6	50.7	21.8	110.5	38.5
Average Queue (m)	1.6	32.7	21.6	24.8	8.3	46.2	14.0
95th Queue (m)	7.1	55.2	35.9	44.7	18.6	87.2	28.3
Link Distance (m)	327.7	327.7		158.8		220.6	129.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			119.0		40.0		
Storage Blk Time (%)				1			
Queuing Penalty (veh)				4			

Intersection: 2: Edmund Street & Townline Road

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (m)	12.9	3.6	10.6	15.5
Average Queue (m)	4.1	0.2	1.7	6.4
95th Queue (m)	12.2	2.2	7.6	12.6
Link Distance (m)			297.5	217.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	31.0	39.0		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Townline Road & Lanark Street

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (m)	13.8	7.3	1.2	21.2
Average Queue (m)	3.1	0.3	0.0	8.6
95th Queue (m)	10.5	3.4	0.8	17.5
Link Distance (m)	21.4	21.4	163.7	301.8
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: McNeely Street & Townline Road

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (m)	46.7	40.7	81.7	68.3	212.2	85.0
Average Queue (m)	22.6	22.7	41.8	21.4	78.2	45.3
95th Queue (m)	39.5	36.4	73.2	47.0	168.4	90.3
Link Distance (m)	118.3	118.3		300.2	602.7	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			38.0			45.0
Storage Blk Time (%)			15	0	31	3
Queuing Penalty (veh)			41	1	133	14

Network Summary

Network wide Queuing Penalty: 193