150 Laurier Avenue West

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report (Rev #2)

Prepared for:

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PN: 2022-074

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1 Screening

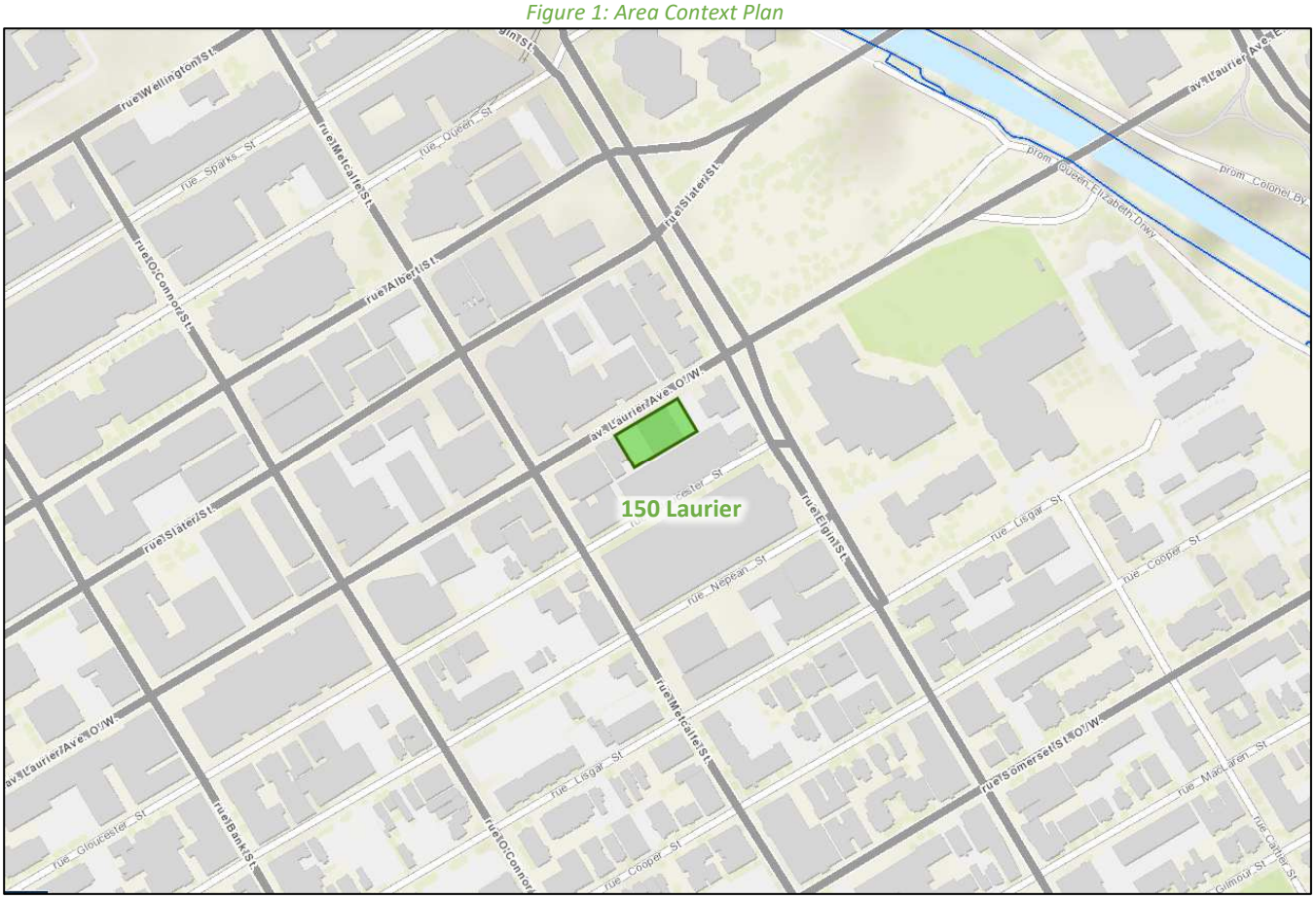
This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines, prior to the June 2023 updates. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown in the Screening Form, a TIA is required including the Design Review component and the Network Impact Component. This study has been prepared to support a site plan application.

2 Existing and Planned Conditions

2.1 Proposed Development

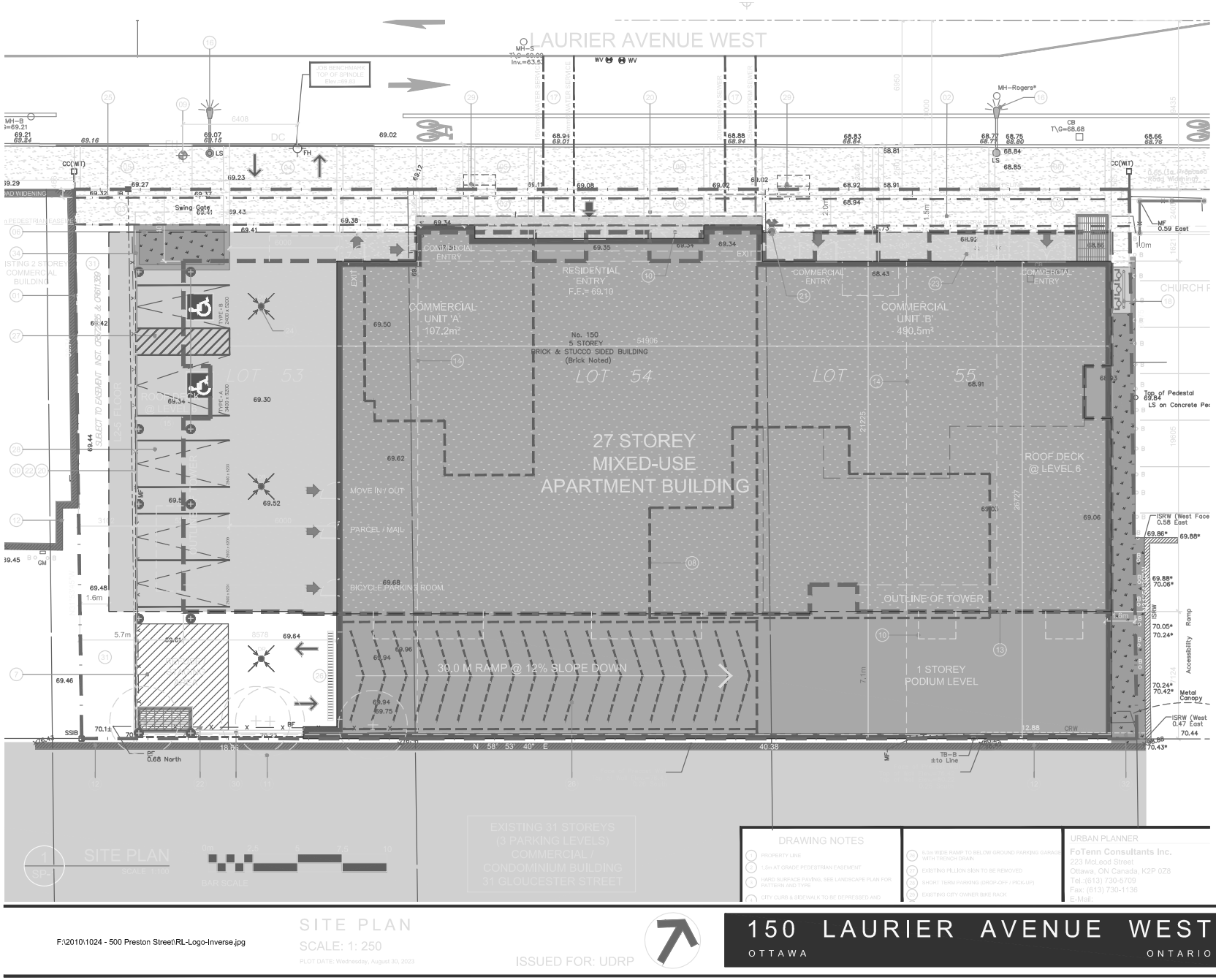
The existing site, located at 150 Laurier Avenue West, is zoned as Mixed Use/Commercial Zone (MD S50). The proposed redevelopment will convert an existing 9-storey commercial/retail building to a 27-storey mixed-use building with ground floor commercial/retail and residential. In total, 403 residential units and 6,215 sq. ft. of commercial/retail will be provided with 201 auto parking spaces and 267 bike parking spaces. The existing surface and underground accesses on the east side will be removed, and an access located on the western limit of the site will be slightly shifted to the east. The anticipated build-out and occupancy horizon is assumed to be 2027 with construction occurring in a single phase. The site is located within the Central Area Secondary Plan area and Design Priority Area. Figure 1 illustrates the study area context. Figure 2 illustrates the proposed concept plan.

Figure 1: Area Context Plan



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: July 6, 2022

Figure 2: Concept Plan



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SITE PLAN
SCALE: 1: 250
PLOT DATE: Wednesday, August 30, 2023

ISSUED FOR: UDRP

150 LAURIER AVENUE WEST
OTTAWA ONTARIO

JADCO GROUP
345 Boulevard Samson, Laval, QC H7X 2Z7

SHEET # 11

2.2 Existing Conditions

2.2.1 Area Road Network

Laurier Avenue West: Laurier Avenue West is a City of Ottawa arterial road with a three-lane cross-section, and a four-lane cross-section east of Elgin Street. Protected bikes lanes are provided west of Elgin Street, with a cycle track on the south side of the road to the west of Elgin Street and an on-street bike lane on the north side. Sidewalks are present on both sides of the road. An unposted speed limit is assumed to be 50km/h. The city-protected right-of-way is 20.0 metres west of Elgin Street and 26.0 metres east of Elgin Street.

O'Connor Street: O'Connor Street is a City of Ottawa one-way arterial road (southbound) with a three-lane cross-section. A two-way protected bike lane is present on the east side of the road south of Laurier Avenue West, and a southbound transition is located to the north. Sidewalks are present on both sides of the road. Within the study area, paid parking is provided on the west side north of Slater Street for a maximum of one hour on weekdays from 9:00AM to 3:30PM. Between Slater Street and Laurier Avenue West, on-street parking is restricted on the west side during 9:00AM to 3:00PM, and paid parking is provided on the east side of the road from 8:00AM to 5:30PM for a maximum of one hour on weekdays. Between Laurier Avenue West and Gloucester Street, paid parking is provided on both sides of the road for a maximum of one hour on weekdays from 8:00AM to 3:30PM. South of Gloucester Street, paid parking is provided on the west side for a maximum of one hour on weekdays from 8:00AM to 5:30PM. An unposted speed limit is assumed to be 50km/h. The city-protected right-of-way is 20.0 metres within the study area.

Metcalfe Street: Metcalfe Street is a City of Ottawa one-way arterial road (northbound) with a three-lane cross-section. Sidewalks are present on both sides of the road. Within the study area, paid parking was provided on the west side of the road between Slater Street and Laurier Avenue West for a maximum of one hour on weekdays from 9:00AM to 3:30PM and on-street parking is restricted on the east side during 9:00AM to 3:30PM. South of Laurier Avenue West, paid parking was provided on the east side of the road for a maximum of one hour on weekdays from 8:00AM to 5:00PM. No parking is allowed along Metcalfe Street within the study area due to the temporary restrictions in the area for construction. An unposted speed limit is assumed to be 50km/h. The city-protected right-of-way is 20.0 metres within the study area.

Elgin Street: Elgin Street is a City of Ottawa arterial road with a divided four-lane cross-section. Sidewalks are present on both sides of the road. Within the study area, paid parking is provided from 7:00AM to 7:00PM for a maximum of two hours on the east side of the road between Gloucester Street and Lisgar Street and on both sides of the road south of Lisgar Street. An unposted speed limit is assumed to be 50km/h. The city-protected right-of-way is 40.0 metres within the study area.

Gloucester Street: Gloucester Street is a City of Ottawa one-way local road (westbound) with a two-lane cross-section. Within the study area, paid parking is permitted on the north side and partially on the south side of the road for two hours during weekdays from 7:00AM to 7:00PM west of Metcalfe Street, and for one hour during weekdays from 7:00AM to 7:00PM between Metcalfe Street and O'Connor Street, and permitted for two hours during weekdays from 7:00AM to 7:00PM on both sides of the road east of O'Connor Street. An unposted speed limit is assumed to be 50km/h. The measured right-of-way is 18.0-20.5 metres within the study area.

Nepean Street: Nepean Street is a City of Ottawa one-way local road (eastbound) with a two-lane cross-section. Sidewalks are present on both sides of the road. Within the study area, paid parking is provided on the south side of the road east of Metcalfe Street and was provided on both sides of the road west of Metcalfe Street. Due to the temporary restrictions in the area for construction, parking is restricted along Nepean Street between

Metcalfe Street and O'Connor Street. An unposted speed limit is assumed to be 50km/h. The measured right-of-way is 18.0-20.5 metres within the study area.

2.2.2 Existing Intersections

The existing signalized area key intersections within 400 metres of the site have been summarized below:

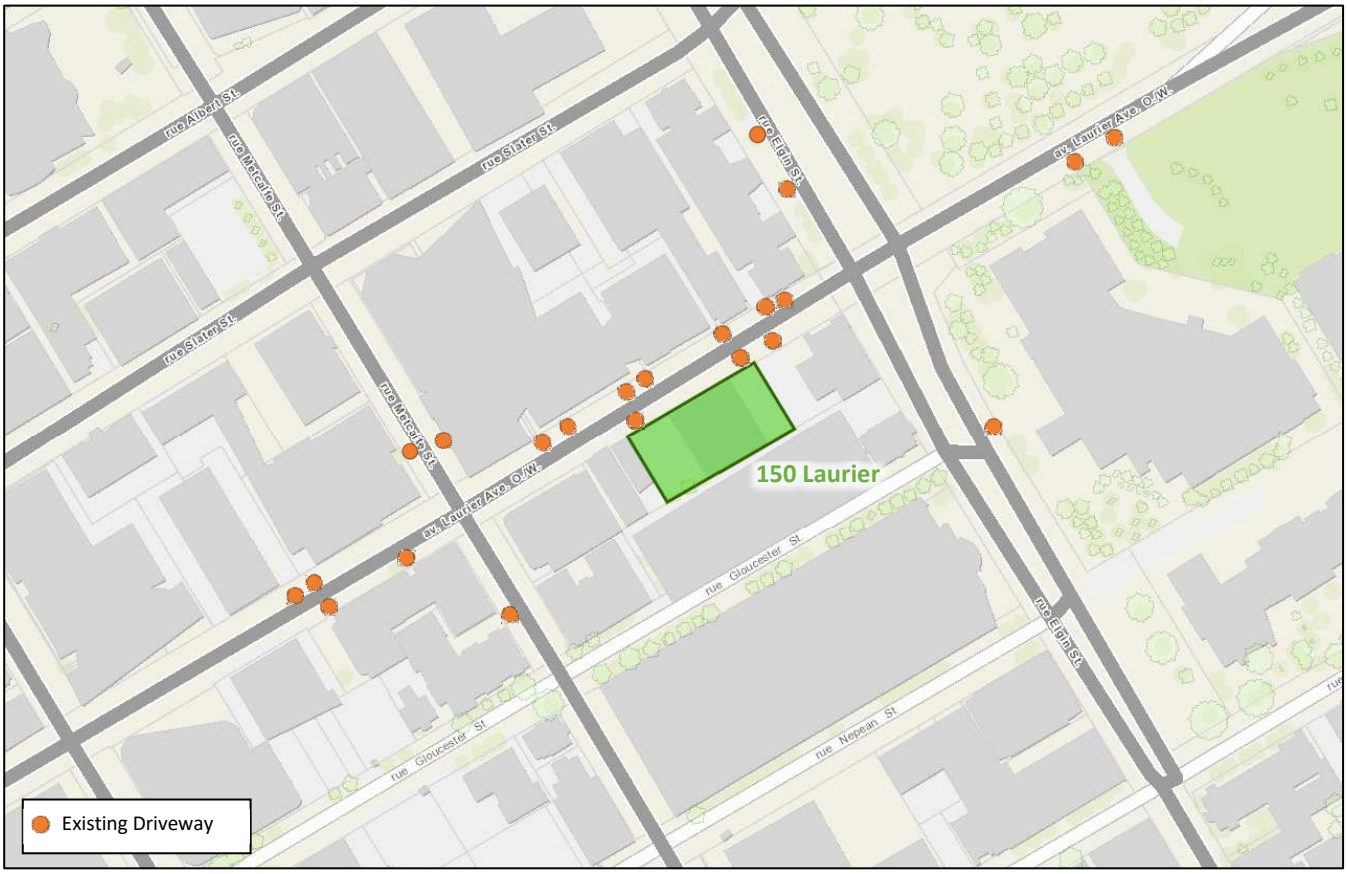
Laurier Avenue West at O'Connor Street	The intersection of Laurier Avenue West at O'Connor Street is a signalized intersection. The southbound approach consists of a protected bike lane, a shared left-turn/through lane, a through lane, and a shared through/right-turn lane, and the south leg of the intersection is inbound only with a bi-directional protected bike facility. The eastbound approach consists of a shared through/right-turn lane and a protected bike lane, and westbound approach consists of an auxiliary left-turn lane, a through lane and a protected bike lane. Right-turn on red is restricted on the southbound and eastbound movements. Bike boxes are provided on the north, south, and east legs.
Laurier Avenue West at Metcalfe Street	The intersection of Laurier Avenue West at Metcalfe Street is a signalized intersection. The northbound approach consists of a shared left-turn/through lane, a through lane, and a shared through/right-turn lane, and the north leg of the intersection is inbound only. The eastbound approach consists of a shared left-turn/ through lane and a protected bike lane, and westbound approach consists of an auxiliary through lane, a shared through/right-turn lane, and a protected bike lane. Right-turn on red is restricted on the northbound and westbound movements. Eastbound left-turn movement is restricted during 7:00 to 9:00AM and 3:30 to 5:30PM on weekdays. Bike box is provided on the south leg.
Laurier Avenue West at Elgin Street	The intersection of Laurier Avenue West at Elgin Street is a signalized intersection. The northbound approach consists of two through lanes and an auxiliary right-turn lane, and the southbound approach consists of two auxiliary left-turn lane, a through lane, and a shared through/right-turn lane. The eastbound approach consists of an auxiliary through lane, a shared through/right-turn lane, and a protected bike lane, and the westbound approach consists of a left-turn lane, a through lane, a protected bike lane, and an auxiliary right-turn lane. Northbound left-turn, eastbound left-turn, and eastbound right-turn on red are restricted. Bike box is provided on the west leg.
Gloucester Street at Metcalfe Street	The intersection of Gloucester Street at Metcalfe Street is a signalized intersection. The northbound approach consists of a shared left-turn/through lane and two through lanes, and the westbound approach consists of a through lane and a shared through/right-turn lane. The north and west legs of the intersection are inbound only.
Nepean Street at Elgin Street	The intersection of Nepean Street at Elgin Street is a signalized intersection. The northbound approach consists of a through lane and an a shared through/right-turn lane, and the southbound approach consists of an auxiliary left-turn lane and two through lanes. The

eastbound approach consists of a shared all-movement lane, and the westbound approach consists of a left-turn and a right-turn lane. The east leg provide access to the underground parking lot at City Hall.

2.2.3 Existing Driveways

Within 200 metres of the proposed site access, a couple of driveways to underground parking and surface parking are present along Laurier Avenue West. Along Laurier Avenue West there are driveways to the First Baptist Church, two to private loading zones, the Ottawa Courthouse, and City Hall. Along Elgin Street, two driveways to a hotel are present on the west side of Elgin Street, and a driveway to the Ottawa Courthouse is present on the east side of Elgin Street. Driveways to underground parking are also present along Metcalfe Street. Figure 3 illustrates the existing driveways.

Figure 3: Existing Driveways



2.2.4 Cycling and Pedestrian Facilities

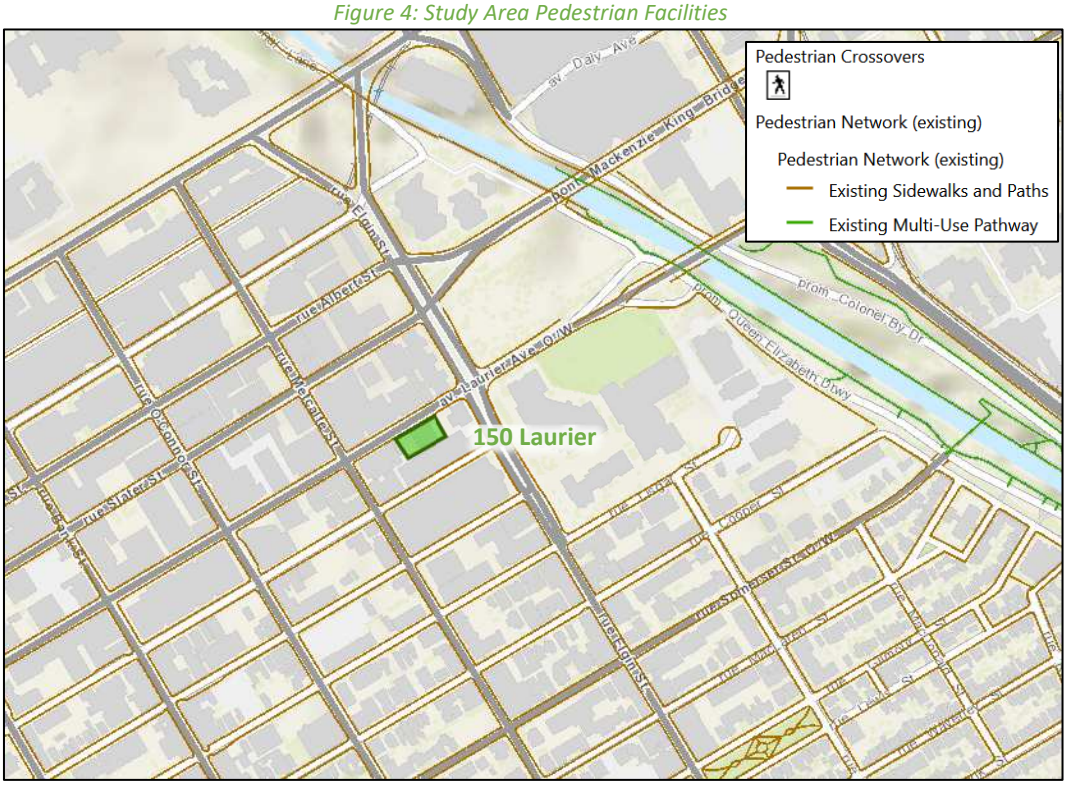
Figure 4 illustrates the pedestrian facilities in the study area and Figure 5 illustrates the cycling facilities.

Sidewalks are provided on both sides along all roads within the study area.

Cycling facilities include protected bikes lanes on both sides along Laurier Avenue West west of Elgin Street, a two-way protected bikes lane on the east side of O'Connor Street south of Laurier Avenue West, and a southbound transition is located to the north. Cycle track is provided on the south side and on-street bike lane is provided on the north side along Laurier Avenue West east of Elgin Street. Elgin Street is a suggested route.

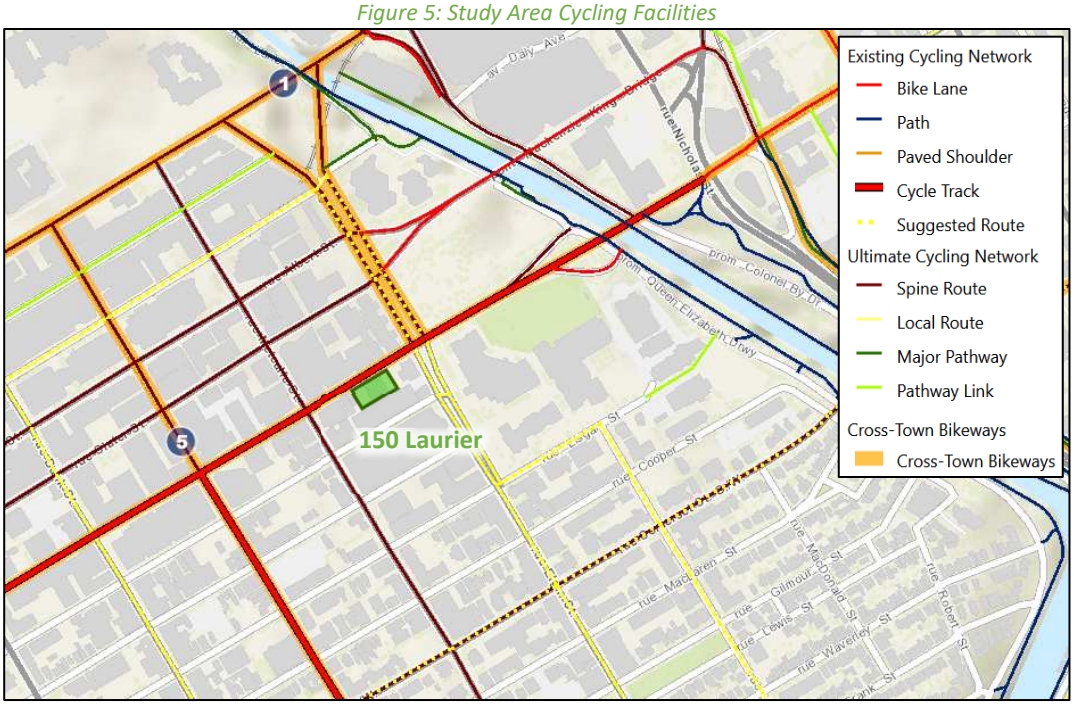
Laurier Avenue West, Metcalfe Street, O'Connor Street, and Elgin Street north of Laurier Avenue West are spine routes and Elgin Street south of Laurier Avenue West is a local route. Elgin Street north of Laurier Avenue West, Laurier Avenue West, and O'Connor Street are cross-town bikeways.

Figure 4: Study Area Pedestrian Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: July 6, 2022

Figure 5: Study Area Cycling Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: July 6, 2022

Pedestrian and cyclist volumes included in study area intersection counts, presented in Section 2.2.7, have been compiled and are illustrated in Figure 6 and Figure 7, respectively.

Figure 6: Existing Pedestrian Volumes

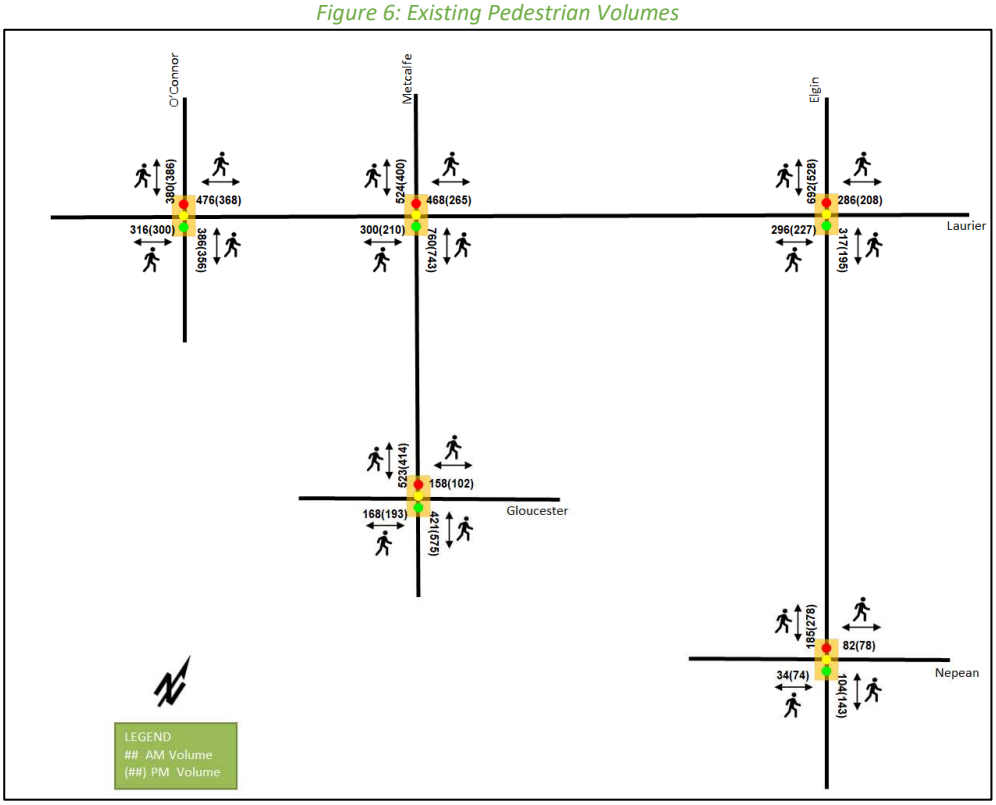
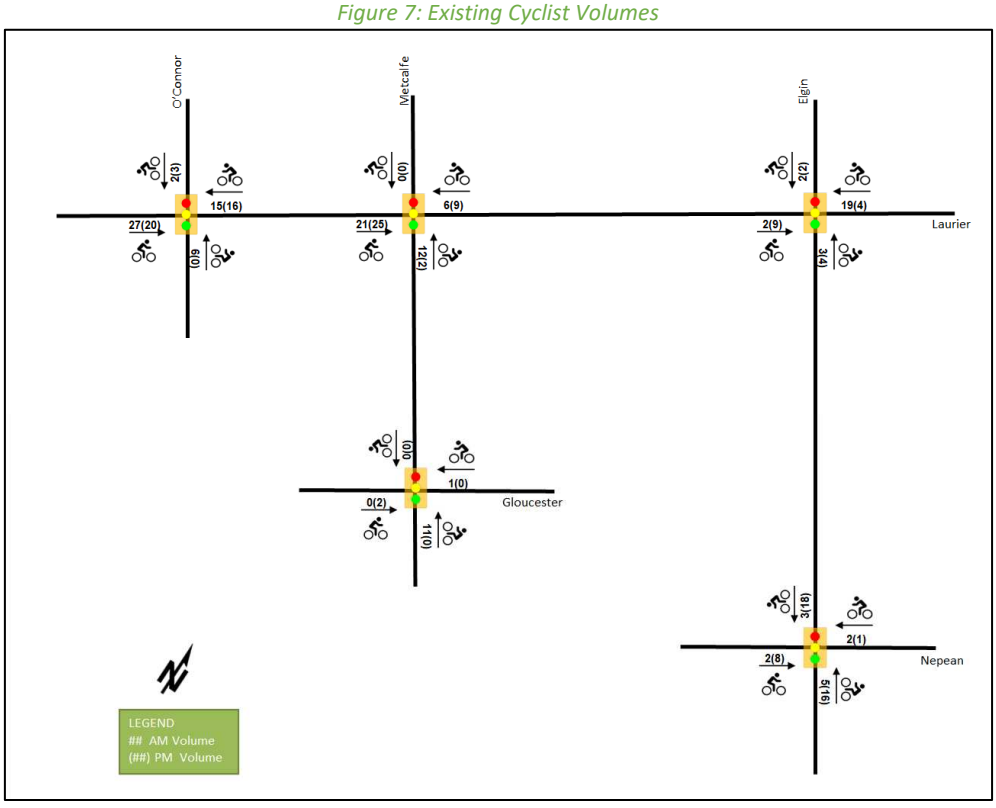


Figure 7: Existing Cyclist Volumes



2.2.5 Existing Transit

Figure 8 illustrates the transit system map in the study area and Figure 9 illustrates nearby transit stops relevant to the proposed site. All transit information is from November 1, 2022 and is included for general information purposes and context to the surrounding area.

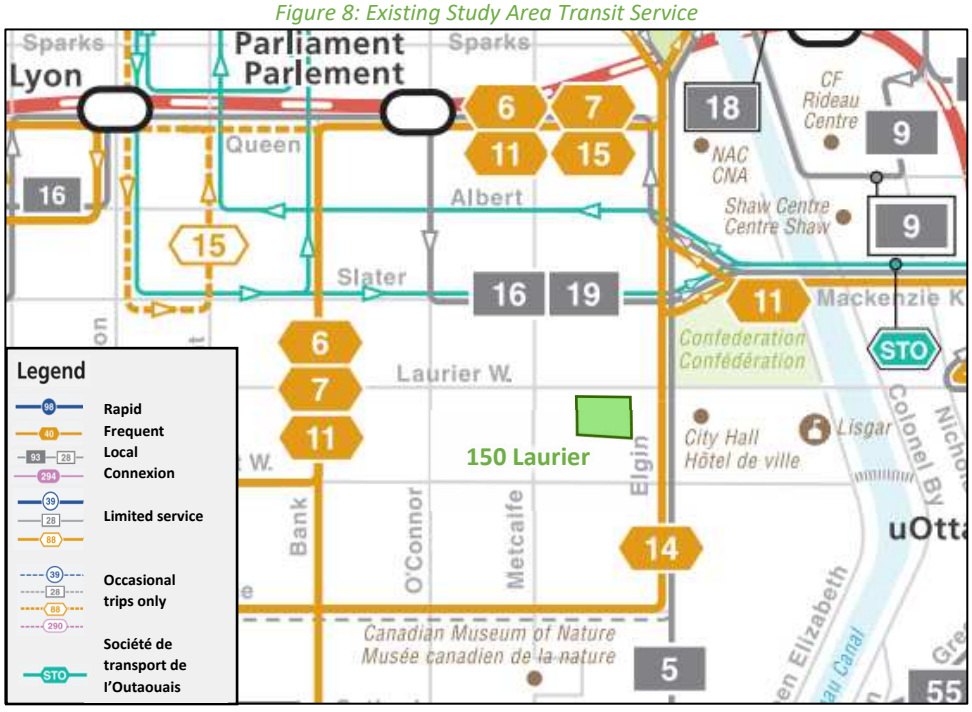
Within the study area, routes #5, #14, and #114 travel along Elgin Street, routes #6, #7 and #15 travel along Queen Street, route #11 travels along Elgin Street and Queen Street, and routes #16 and #19 loop along Elgin Street, Queen Street, Slater Avenue and O'Connor Street.

The frequency of these routes within proximity of the proposed site based on November 1, 2022 service levels are:

- Route # 5 – 30-minute service all-day
- Route # 6 – 15-minute service all day, 30-minute service after 8:00 PM
- Route # 7 – 15-minute service all day, 30-minute service after 8:00 PM
- Route # 11 – 10-15-minute service all day, 30-minute service after 8:00 PM
- Route # 14 – 10-15-minute service all day, 30-minute service after 8:00 PM
- Route # 15 – 15-minute service all-day
- Route # 16 – 15-minute service during peak hour/direction, 30-minute service all day
- Route # 19 – 30-minute service all-day
- Route # 114 – two buses during peak hour/direction

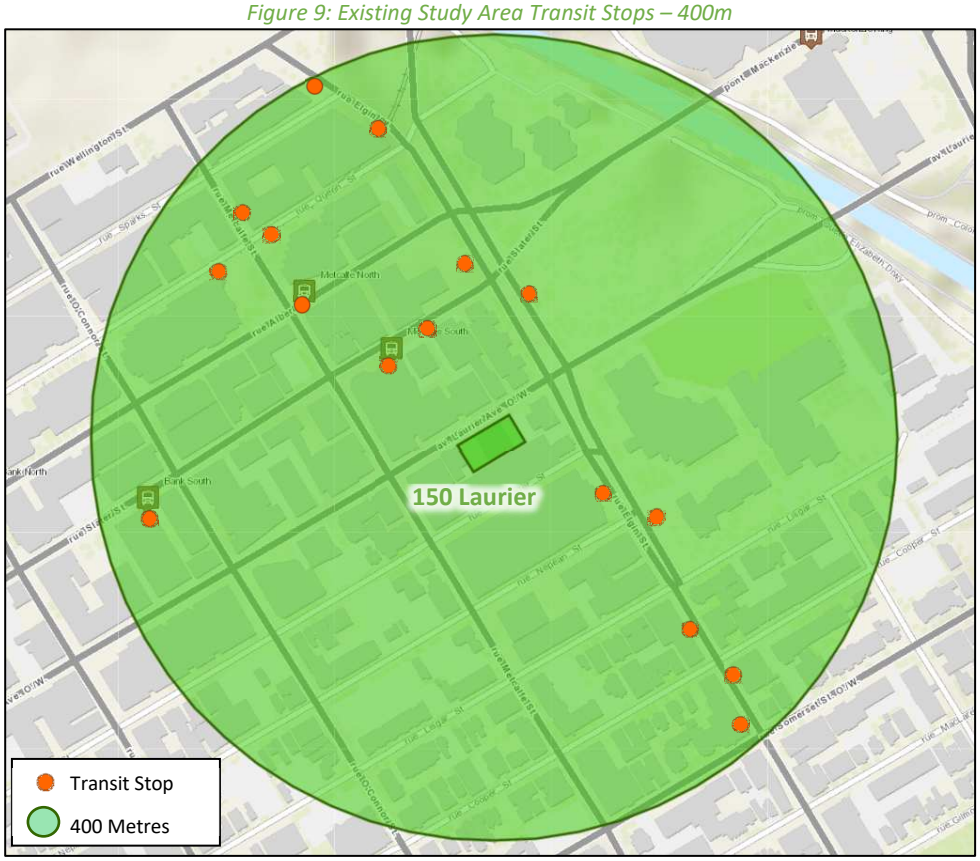
Parliament LRT station is located within 600-metre walking distance, and it provides 5-minute service all-day except in the early morning and late evening. It is noted that STO service are provided along Slater Street and Albert Street.

Figure 8: Existing Study Area Transit Service



Source: http://www.octranspo.com/ Accessed: November 1, 2022

Figure 9: Existing Study Area Transit Stops – 400m



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: July 6, 2022

2.2.6 Existing Area Traffic Management Measures

There are no existing area traffic management measures within the study area.

2.2.7 Existing Peak Hour Travel Demand

Existing turning movement counts were acquired from the City of Ottawa and the Traffic Specialist for the existing study area intersections, and the volumes were balanced along the roadway corridors. Table 1 summarizes the intersection count dates and sources.

Table 1: Intersection Count Date

Intersection	Count Date	Source
Laurier Avenue West at O'Connor Street	Tuesday, March 21, 2017	City of Ottawa
Laurier Avenue West at Metcalfe Street	Tuesday, April 04, 2017	City of Ottawa
Laurier Avenue West at Elgin Street	Wednesday, February 27, 2019	City of Ottawa
Gloucester Street at Metcalfe Street	Tuesday, April 04, 2017	City of Ottawa
Nepean Street at Elgin Street	Tuesday, July 12, 2022	The Traffic Specialist

Figure 10 illustrates the existing traffic counts and volumes were balanced along Laurier Avenue West and Elgin Street. Table 2 summarizes the existing intersection operations. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and average delay for unsignalized intersections. Detailed turning movement count data is included in Appendix B and the Synchro worksheets are provided in Appendix C.

Figure 10: Existing Traffic Counts

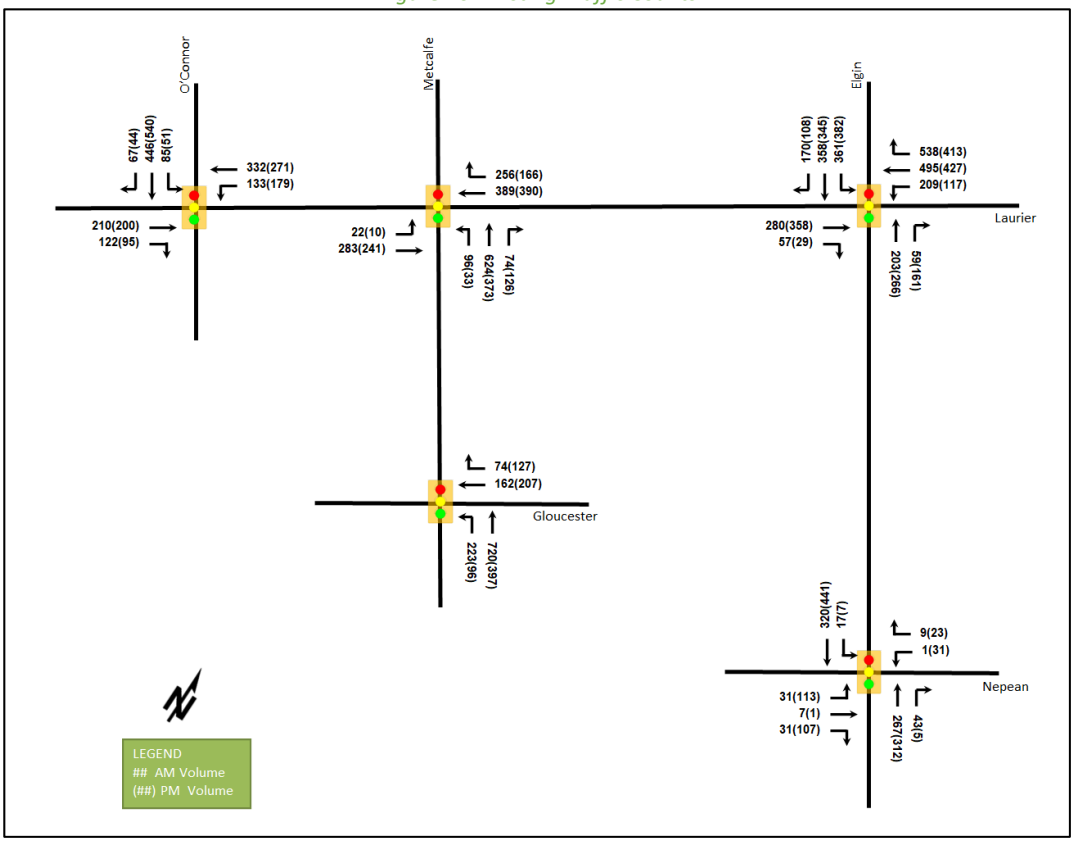


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Laurier Avenue West at O'Connor Street ***Signalized***	EBT/R	B	0.69	28.0	72.7	A	0.60	24.4	61.8
	WBL	A	0.38	7.6	m9.9	A	0.47	21.7	37.0
	WBT	A	0.41	6.9	21.6	A	0.33	16.2	46.4
	SB	A	0.55	23.0	38.8	A	0.52	22.4	40.1
	Overall	**B**	**0.68**	**18.9**	-	**B**	**0.61**	**21.5**	-
Laurier Avenue West at Metcalfe Street ***Signalized***	EBL/T	A	0.44	20.1	m61.4	A	0.32	6.7	13.6
	WBT/R	A	0.59	16.5	52.7	A	0.42	12.0	37.5
	NB	A	0.59	16.1	49.9	A	0.50	18.2	21.2
	Overall	**B**	**0.61**	**17.0**	-	**A**	**0.46**	**13.5**	-
Laurier Avenue West at Elgin Street ***Signalized***	EBT/R	A	0.42	30.6	44.1	A	0.46	31.1	50.3
	WBL	B	0.67	31.4	45.9	A	0.42	23.0	27.2
	WBT	B	0.64	23.3	112.0	A	0.57	21.9	93.4
	WBR	**F**	**1.01**	**57.3**	**#116.6**	C	0.76	21.2	**#58.1**
	NBT	A	0.31	34.0	30.0	A	0.41	25.1	23.0
	NBR	A	0.18	1.1	0.0	A	0.51	8.4	8.7
	SBL	E	0.97	**82.1**	**#69.4**	E	0.95	76.6	**#71.4**
	SBT/R	A	0.54	19.6	52.0	A	0.43	18.6	43.9
	Overall	**E**	**0.92**	**38.9**	-	**C**	**0.74**	**30.1**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Gloucester Street at Metcalfe Street *Signalized*	WBT/R	A	0.34	21.3	23.5	A	0.38	19.5	30.5
	NBL/T	A	0.40	7.7	30.8	A	0.23	7.9	16.8
	Overall	**A**	**0.37**	**10.5**	**-**	**A**	**0.27**	**12.6**	**-**
Nepean Street at Elgin Street *Signalized*	EB	A	0.17	16.1	15.5	A	0.38	16.5	42.7
	WBL	A	0.00	23.0	1.3	A	0.08	17.1	9.6
	WBR	A	0.02	0.1	0.0	A	0.04	2.0	2.2
	NBT/R	A	0.19	8.1	18.4	A	0.26	17.8	31.4
	SBL	A	0.04	8.3	4.1	A	0.02	14.1	m1.3
	SBT	A	0.19	9.0	20.4	A	0.33	18.3	46.2
	Overall	**A**	**0.17**	**9.2**	**-**	**A**	**0.35**	**17.3**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 0.90
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

During both peak hours, intersections within the study area operate well except for the Laurier Avenue West and Elgin Street intersection.

At the intersection of Laurier Avenue West and Elgin Street, during the AM peak, the westbound right-turn movement is over theoretical capacity and may be subject to extended queues, and the southbound left-turn movement may be subject to high delays and extended queues. During the PM peak, the westbound right-turn and southbound left-turn movements may exhibit extended queues.

2.2.8 Collision Analysis

Collision data have been acquired from the City of Ottawa open data website (data.ottawa.ca) for five years prior to the commencement of this TIA for the surrounding study are road network. Table 3 summarizes the collision types and conditions in the study area, Table 3 illustrates the intersections and segments analyzed, and Table 4 summarizes the total collisions for each of these locations. Collision data are included in Appendix D.

Table 3: Study Area Collision Summary, 2016-2020

		Number	%
Total Collisions		**114**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	23	20%
	Property Damage Only	91	80%
Initial Impact Type	**Angle**	9	8%
	Rear end	24	21%
	Sideswipe	34	30%
	Turning Movement	26	23%
	SMV Unattended	9	8%
	SMV Other	8	7%
	Other	4	4%
Road Surface Condition	**Dry**	83	73%
	Wet	16	14%
	Loose Snow	5	4%
	Slush	7	6%
	Packed Snow	1	1%
	Ice	2	2%
Pedestrian Involved		3	3%
Cyclists Involved		18	16%

Figure 11: Representation of Study Area Collision Records

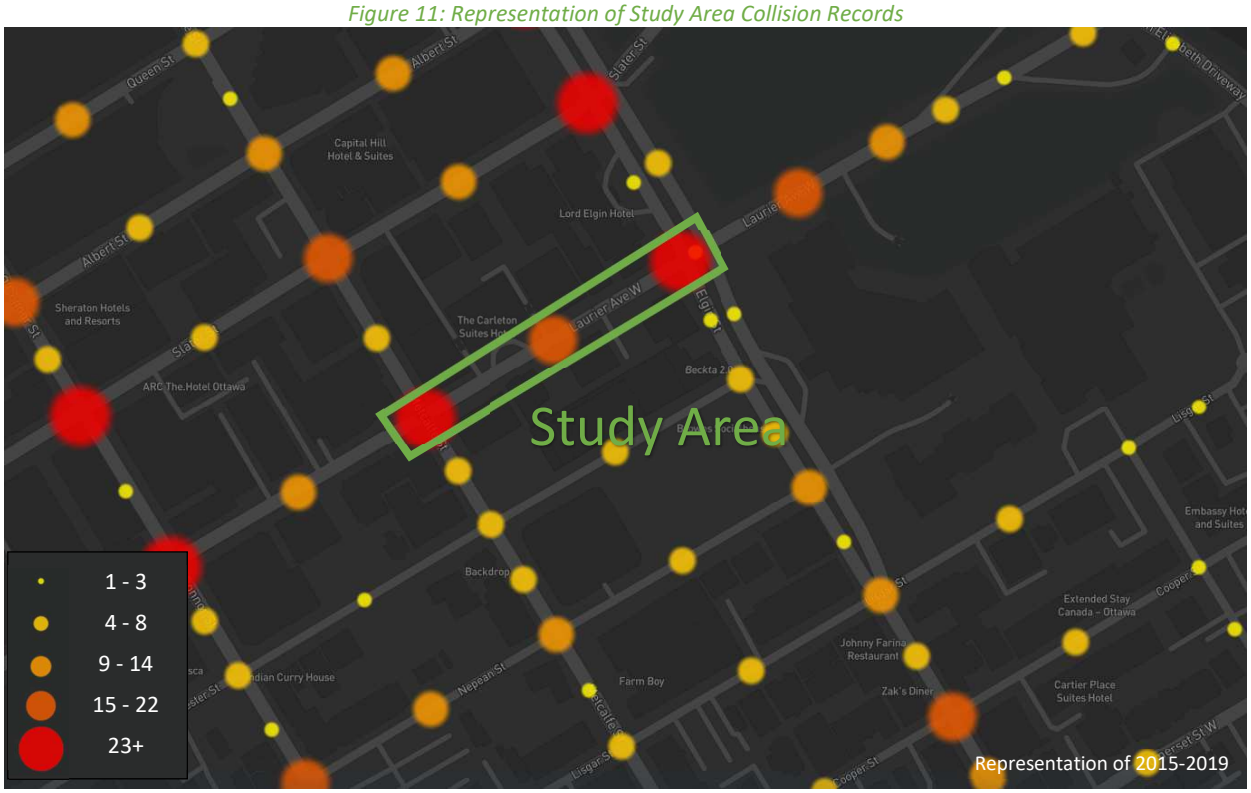


Table 4: Summary of Collision Locations, 2016-2020

	Number	%
Intersections / Segments	**114**	**100%**
Elgin St @ Laurier Ave	69	61%
Metcalfe St @ Laurier Ave	27	24%
Laurier Ave W btwn Metcalfe St & Elgin St	17	15%
Laurier Ave W btwn Elgin St & Elgin St	1	1%

Within the study area, the intersection of Elgin Street at Laurier Avenue, Metcalfe Street at Laurier Avenue and segments of Laurier Avenue West between Metcalfe Street and Elgin Street are noted to have experienced higher collisions than other locations. Table 5, Table 6, and Table 7 summarize the collision types and conditions for each location.

Table 5: Elgin Street at Laurier Avenue Collision Summary

		Number	%
Total Collisions		**69**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	15	22%
	Property Damage Only	54	78%
Initial Impact Type	**Angle**	2	3%
	Rear end	15	22%
	Sideswipe	24	35%
	Turning Movement	17	25%
	SMV Unattended	1	1%
	SMV Other	7	10%
	Other	3	4%
Road Surface Condition	**Dry**	48	70%
	Wet	10	14%
	Loose Snow	5	7%
	Slush	5	7%
	Unknown	1	1%
Pedestrian Involved		3	4%
Cyclists Involved		11	16%

The Elgin Street at Laurier Avenue intersection had a total of 69 collisions during the 2016-2020 time period, with 54 involving property damage only and the remaining 15 having non-fatal injuries. The collision types are most represented by sideswipe with 24 collisions, followed by 17 turning movement collisions and 15 rear end collisions. General congestion and the skew of the through movements crossing the intersection may be contributing factors to the sideswipe collisions. It is also noted that this period included the Elgin construction activities and various detours. The varying types of cycling facilities on each leg are considered a direct contributor to the cycling collision frequency noted at this intersection. Weather conditions do not affect collisions at this location. It is noted that the City of Ottawa is currently re-designing the intersection as part of the Laurier Avenue Cycling Modifications Project, and no further analysis is required as part of this study.

Table 6: Metcalfe Street at Laurier Avenue Collision Summary

		Number	%
Total Collisions		**27**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	3	11%
	Property Damage Only	24	89%
Initial Impact Type	**Angle**	5	19%
	Rear end	7	26%
	Sideswipe	8	30%
	Turning Movement	3	11%
	SMV Unattended	2	7%
	SMV Other	1	4%
	Other	1	4%
Road Surface Condition	**Dry**	19	70%
	Wet	4	15%
	Slush	2	7%
	Packed Snow	1	4%
	Ice	1	4%
Pedestrian Involved		0	0%
Cyclists Involved		2	7%

The Metcalfe Street at Laurier Avenue intersection had a total of 27 collisions during the 2016-2020 time period, with 24 involving property damage only and the remaining three having non-fatal injuries. The collision types are most represented by sideswipe with eight collisions, followed by seven rear end collisions and five angle collisions. The collisions are distributed across the various types and no overall pattern is noted. Weather conditions do not affect collisions at this location. No further analysis is required as part of this study.

Table 7: Laurier Avenue West between Metcalfe Street and Elgin Street Collision Summary

		Number	%
Total Collisions		**17**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	5	29%
	Property Damage Only	12	71%
Initial Impact Type	**Angle**	2	12%
	Rear end	2	12%
	Sideswipe	2	12%
	Turning Movement	5	29%
	SMV Unattended	6	35%
Road Surface Condition	**Dry**	16	94%
	Wet	1	6%
Pedestrian Involved		0	0%
Cyclists Involved		5	29%

The segment of Laurier Avenue West between Metcalfe Street and Elgin Street had a total of 17 collisions during the 2016-2020 time period, with twelve involving property damage only and the remaining five having non-fatal injuries. The collision types are most represented by SMV Unattended with six collisions, followed by five turning movement collisions, with the remaining collisions split between angle, rear end, and sideswipe collision types. The collisions are distributed across the various types and no overall pattern is noted. Weather conditions do not affect collisions at this location. The cyclists' collisions may be related to the access movements. No further analysis is required as part of this study.

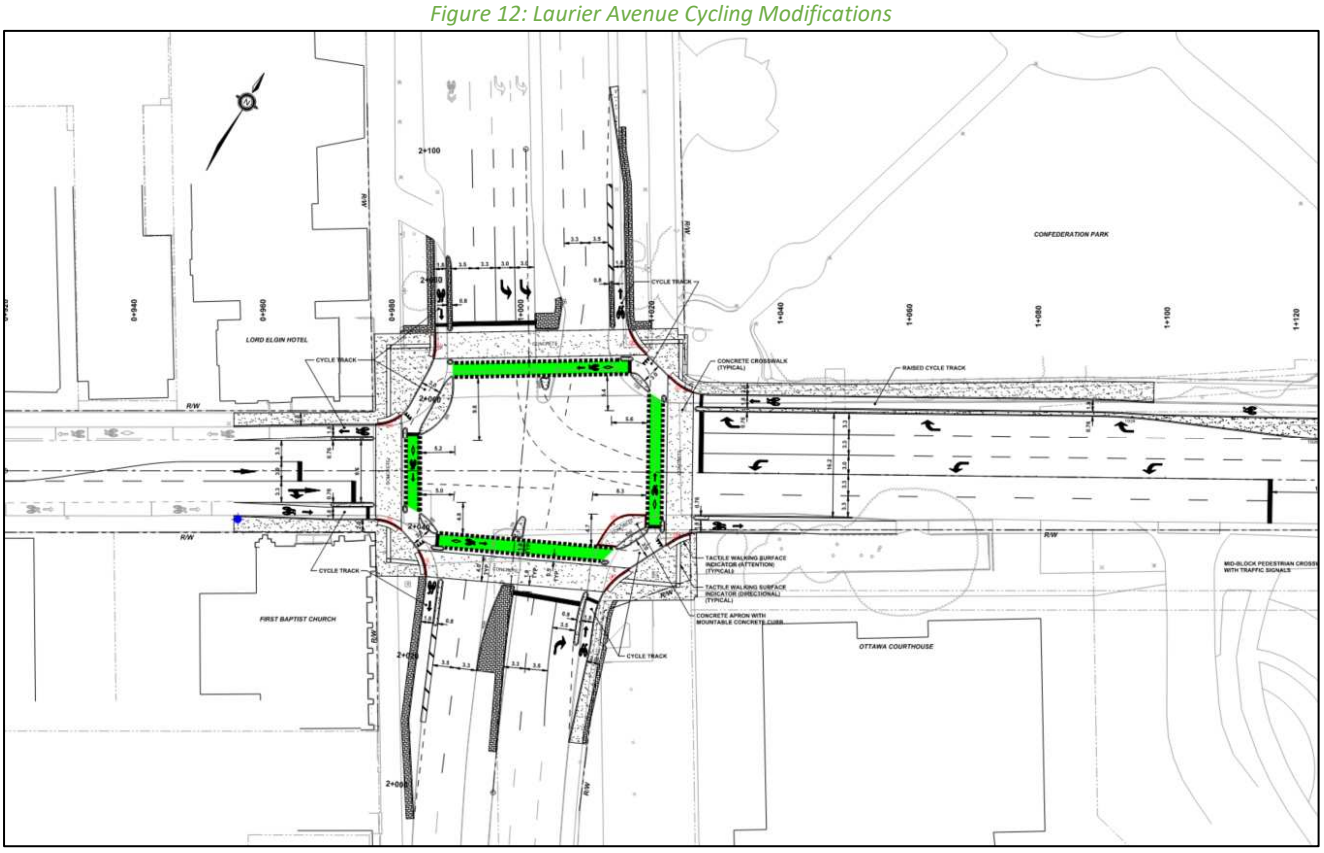
2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

Within the Transportation Master Plan (TMP), the Rapid Transit and Transit Priority (RTTP) Network's Network Concept diagram and 2031 Affordable Network diagram show an isolated measures transit priority corridor along Elgin Street between Gladstone Avenue and Wellington Street.

The Laurier Avenue Cycling Modifications, which is expected to be completed by the end of 2023, proposed to segregate the westbound cycling facilities from on-road to within a raised boulevard on the north side of Laurier Avenue from Queen Elizabeth Driveway to just west of Elgin Street. It also proposed the protected crossings at the Laurier Avenue and Elgin Street intersection. The preliminary design drawing of the Laurier Avenue Cycling Modifications is illustrated in Figure 12.

Figure 12: Laurier Avenue Cycling Modifications



Source: Laurier Avenue Cycling Modifications - Elgin Street to Queen Elizabeth Driveway Design - Preliminary Plan (City of Ottawa)

2.3.2 Other Study Area Developments

208-212 Slater Street

The proposed development application includes a site plan application for a mixed-use building containing either 180 apartment units and 1,000 ft^2 of retail GFA or 220 hotel units and approximately 1,000 ft^2 of retail GFA. To provide a conservative analysis, the hotel scenario has been carried forward for the intersection analysis in the report. The development built-out year is assumed to be 2022 and is predicted to generate 30 new AM and 27 new PM two-way peak hour auto trips. (Novatech, 2021)

180 Metcalfe Street

The proposed development application includes a site plan application for a 27-storey building with 311 apartment units. The development built-out year is assumed to be 2022/2023 and is predicted to generate 6 new AM and 26 new PM two-way peak hour auto trips. (Parsons, 2018)

3 Study Area and Time Periods

3.1 Study Area

The study area will include the intersections of:

- Laurier Avenue West at:
  - O'Connor Street
  - Metcalfe Street
  - Elgin Street
  - Site Access (Future)
- Gloucester Street at:
  - Metcalfe Street
- Nepean Street at:
  - Elgin Street

The boundary road will be Laurier Avenue West and no screenlines are present within proximity to the site.

3.2 Time Periods

As the proposed development is a mixed-use development with residential units and commercial, the AM and PM peak hours will be examined.

3.3 Horizon Years

The anticipated build-out year is 2027. As a result, the full build-out plus five years horizon year is 2032.

4 Exemption Review

Table 8 summarizes the exemptions for this TIA.

Table 8: Exemption Review

Module	Element	Explanation	Exempt/Required
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans	Required
	4.1.3 New Street Networks	Only required for plans of subdivision	Exempt
4.2 Parking	4.2.1 Parking Supply	Only required for site plans	Required
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Exempt
Network Impact Component			
4.5 Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Required
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and	Exempt

Module	Element	Explanation	Exempt/Required
		total volumes exceed ATM capacity thresholds	
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Exempt

5 Development-Generated Travel Demand

5.1 Mode Shares

Examining the mode shares recommended in the TRANS Trip Generation Manual (2020) for the subject district, derived from the most recent National Capital Region Origin-Destination survey (OD Survey), the existing average district mode shares by land use for Ottawa Inner Area have been summarized in Table 9.

Table 9: TRANS Trip Generation Manual Recommended Mode Shares – Ottawa Inner Area

Travel Mode	Multi-Unit (High-Rise)		Commercial Generator	
	AM	PM	AM	PM
Auto Driver	26%	25%	39%	22%
Auto Passenger	6%	8%	2%	4%
Transit	28%	21%	16%	12%
Cycling	5%	6%	3%	4%
Walking	34%	39%	40%	58%
Total	**100%**	**100%**	**100%**	**100%**

Being within 600 metres walking (or a 450 metres linear) distance of the Parliament LRT station, a higher transit mode is considered achievable at this location. A five percent shift to transit mode from the auto mode is proposed for each of the land use. The proposed modified mode share targets are summarized in Table 10.

Table 10: Proposed Development Mode Shares

Travel Mode	Multi-Unit (High-Rise)		Commercial Generator	
	AM	PM	AM	PM
Auto Driver	21%	20%	34%	17%
Auto Passenger	6%	8%	2%	4%
Transit	33%	26%	21%	17%
Cycling	5%	6%	3%	4%
Walking	34%	39%	40%	58%
Total	**100%**	**100%**	**100%**	**100%**

5.2 Trip Generation

This TIA has been prepared using the vehicle and person trip rates for the residential dwellings using the TRANS Trip Generation Manual (2020) and the vehicle trip rates and derived person trip rates for commercial component from the ITE Trip Generation Manual 10th Edition (2017) using the City-prescribed conversion factor of 1.28. Table 11 summarizes the person trip rates for the proposed residential land uses for each peak period and the person trip rates for the non-residential land uses by peak hour.

Table 11: Trip Generation Person Trip Rates

Land Use	Land Use Code	Peak Period	Vehicle Trip Rate	Person Trip Rates
Multi-Unit (High-Rise)		AM	-	0.80

	221 & 222 (TRANS)	PM	-	0.90
Land Use	**Land Use Code**	**Peak Hour**	**Vehicle Trip Rate**	**Person Trip Rates**
Strip Retail Plaza (<40k)	822 (ITE)	AM	2.36	3.02
		PM	6.59	8.44

Using the above person trip rates, the total person trip generation has been estimated. Table 12 summarizes the total person trip generation.

Table 12: Total Person Trip Generation

Land Use	**Units**	**AM Peak Period**			**PM Peak Period**		
		In	**Out**	**Total**	**In**	**Out**	**Total**
Multi-Unit (High-Rise)	403	100	222	322	211	152	363
Land Use	**GFA**	**AM Peak Hour**			**PM Peak Hour**		
		In	**Out**	**Total**	**In**	**Out**	**Total**
Strip Retail Plaza (<40k)	6,215 sq. ft	11	8	19	26	26	52

Internal capture rates from the ITE Trip Generation Handbook 3rd Edition have been assigned to the development's retail component for mixed-use developments. The rates summarized in Table 13 represent the percentage of trips to/from the retail use based on the residential component.

Table 13: Internal Capture Rates

Land Use	**AM**		**PM**	
	In	**Out**	**In**	**Out**
Residential to/from Strip Retail Plaza (<40k)	17%	14%	10%	26%

Pass-by reductions applied to the retail trip generation at a rate of 35% have been included, a value taken as a moderately conservative interpretation from the rates presented in the ITE Trip Generation Handbook 3rd Edition.

Using the above mode share targets for a LRT area, the internal capture and pass-by rates, and the person trip rates, the person trips by mode have been projected. Trip generation by peak hour has been forecasted using the prescribed peak period conversion factors presented in the TRANS Trip Generation Manual (2020) for the residential component. Table 14 summarizes the residential trip generation and the non-residential trip generation by mode and peak hour.

Table 14: Trip Generation by Mode

Travel Mode		**AM Peak Hour**				**PM Peak Hour**			
		Mode Share	**In**	**Out**	**Total**	**Mode Share**	**In**	**Out**	**Total**
Multi-Unit (High-Rise)	Auto Driver	**21%**	10	23	33	**20%**	18	13	31
	Auto Passenger	**6%**	3	6	9	**8%**	7	5	12
	Transit	**33%**	18	40	58	**26%**	26	19	45
	Cycling	**5%**	3	6	9	**6%**	6	4	10
	Walking	**34%**	20	44	63	**39%**	43	31	74
	Total	**100%**	**54**	**119**	**173**	**100%**	**100**	**72**	**172**
Strip Retail Plaza (<40k)	Auto Driver	**34%**	2	1	3	**17%**	3	2	5
	Auto Passenger	**2%**	0	0	0	**4%**	1	1	2
	Transit	**21%**	2	1	3	**17%**	4	3	7
	Cycling	**3%**	0	0	0	**4%**	1	1	2
	Walking	**40%**	3	3	6	**58%**	14	12	26
	Internal Capture	*varies*	*-2*	*-1*	*-3*	*varies*	*-3*	*-7*	*-10*

Travel Mode		AM Peak Hour				PM Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total
	Pass-by	*35%*	*-1*	*-1*	*-2*	*35%*	*-1*	*-1*	*-2*
	Total	**100%**	**8**	**5**	**13**	**100%**	**23**	**19**	**42**
Total	Auto Driver	-	12	24	36	-	21	15	36
	Auto Passenger	-	3	6	9	-	8	6	14
	Transit	-	20	41	61	-	30	22	52
	Cycling	-	3	6	9	-	7	5	12
	Walking	-	23	47	70	-	57	43	100
	Total	**100%**	**62**	**124**	**186**	**100%**	**123**	**91**	**214**

As shown above, a total of 36 AM and 36 PM new peak hour two-way vehicle trips are projected as a result of the proposed development.

5.3 Trip Distribution

To understand the travel patterns of the subject development, the OD Survey has been reviewed to determine the travel, and these patterns were applied based on the build-out of Ottawa Inner. Table 15 below summarizes the distributions.

Table 15: OD Survey Distribution – Ottawa Inner

To/From	% of Trips
North	10%
South	40%
East	10%
West	40%
Total	**100%**

5.4 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the study area road network. Table 16 summarizes the proportional assignment to the study area roadways, and Figure 13 and Figure 14 illustrate the new site generated volumes and pass-by volumes.

Table 16: Trip Assignment

To/From	Inbound Via	Outbound Via
North	10% Elgin (N)	10% Metcalfe (N)
South	15% Metcalfe (S) 25% Laurier (W)	20% O'Connor (S) 10% Laurier (E) 10% Elgin (S)
East	10% Laurier (E)	10% Laurier (E)
West	40% Laurier (W)	40% Laurier (W)
Total	**100%**	**100%**

Figure 13: New Site Generation Auto Volumes

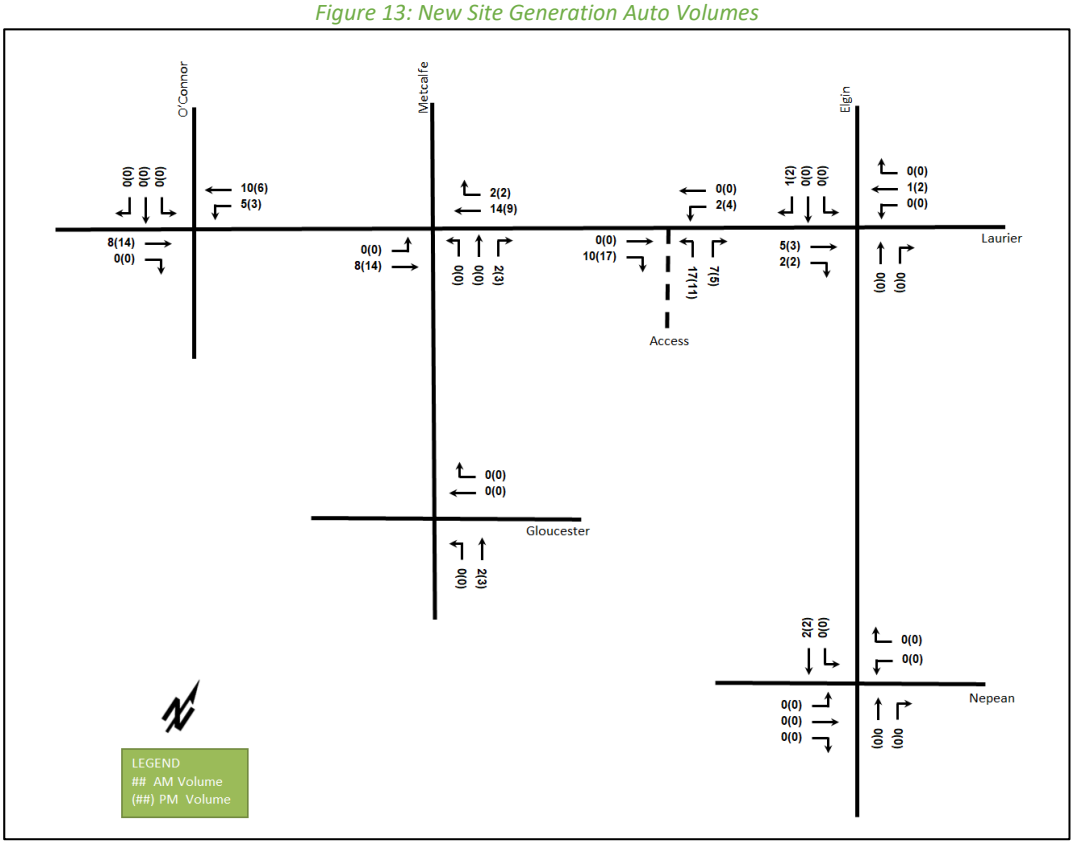
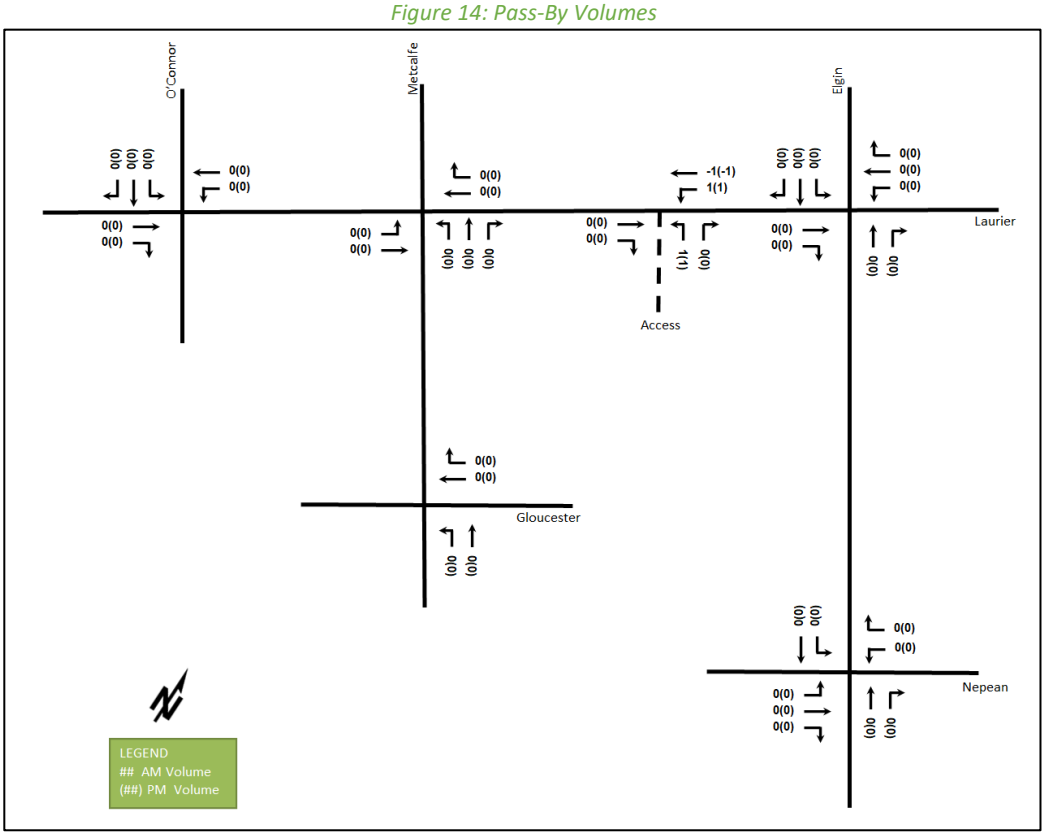


Figure 14: Pass-By Volumes



6 Background Network Travel Demands

6.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3 and have been incorporated into the road network analysis.

6.2 Background Growth

A review of the background projections from the City's TRANS Regional Model for the 2011 and 2031 horizons was completed to determine the background growth for each of the study area roadways. The background TRANS model growth rates are summarized in Table 17 and the TRANS model plots are provided in Appendix E.

Table 17: TRANS Regional Model Projections – Study Area Growth Rates

Street	TRANS Rate	
	Eastbound	Westbound
Laurier	-1.10%	-1.08%
	Northbound	**Southbound**
O'Connor	-	-0.44%
Metcalfe	0.82%	-
Elgin	0.58%	0.61%

Given the various construction activities in the area, such as Elgin Street, a comparison to the existing traffic count data was not conducted. Therefore, the TRANS rates were generally applied to the area road network. It is noted that any negative growth values are conservative considered as 0%. Table 18 summarizes the recommended growth rates to be considered within the study area.

Table 18: Recommended Area Growth Rates

Street	Peak Hour	
	Eastbound	Westbound
Laurier	0%	0%
	Northbound	**Southbound**
O'Connor	-	0%
Metcalfe	1.00%	-
Elgin	0.50%	0.50%

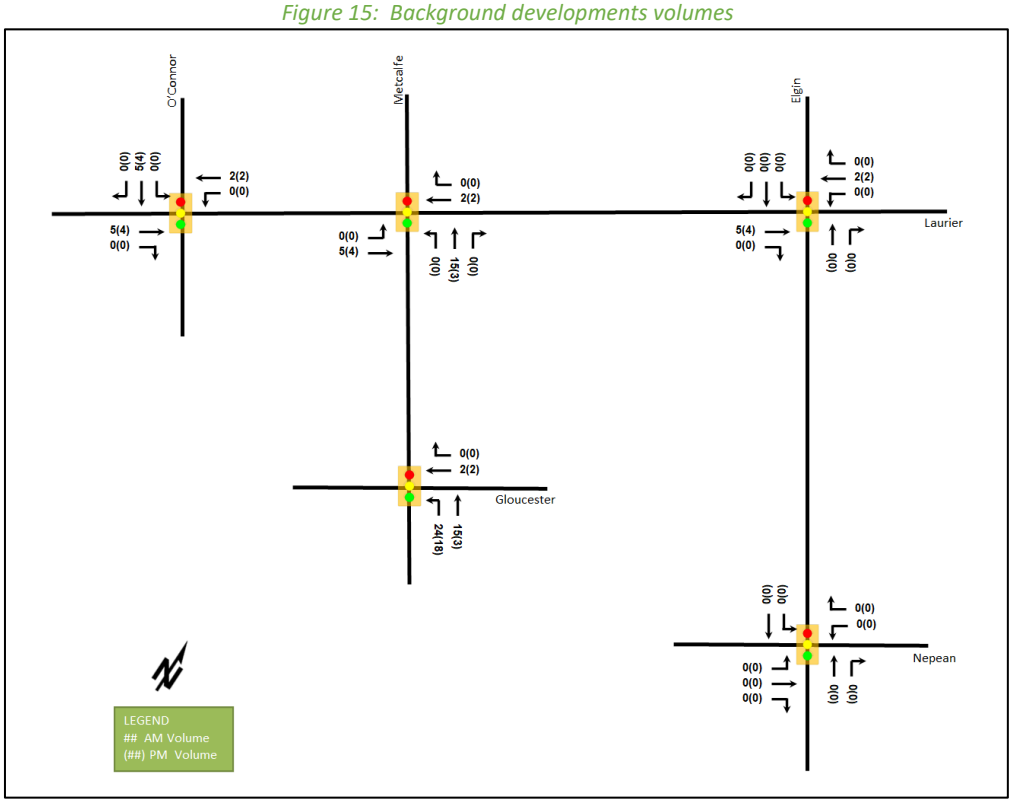
6.3 Other Developments

The background developments explicitly considered in the background conditions (Section 6.2) include:

- 208-212 Slater Street
- 180 Metcalfe Street

Figure 15 illustrates the background developments volumes. The background development volumes within the study area have been provided in Appendix F.

Figure 15: Background developments volumes



7 Demand Rationalization

7.1 2027 Future Background Operations

Figure 16 illustrates the 2027 background volumes and Table 19 summarizes the 2027 background intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection. The synchro worksheets for the 2027 future background horizon are provided in Appendix G.

Figure 16: 2027 Future Background Volumes

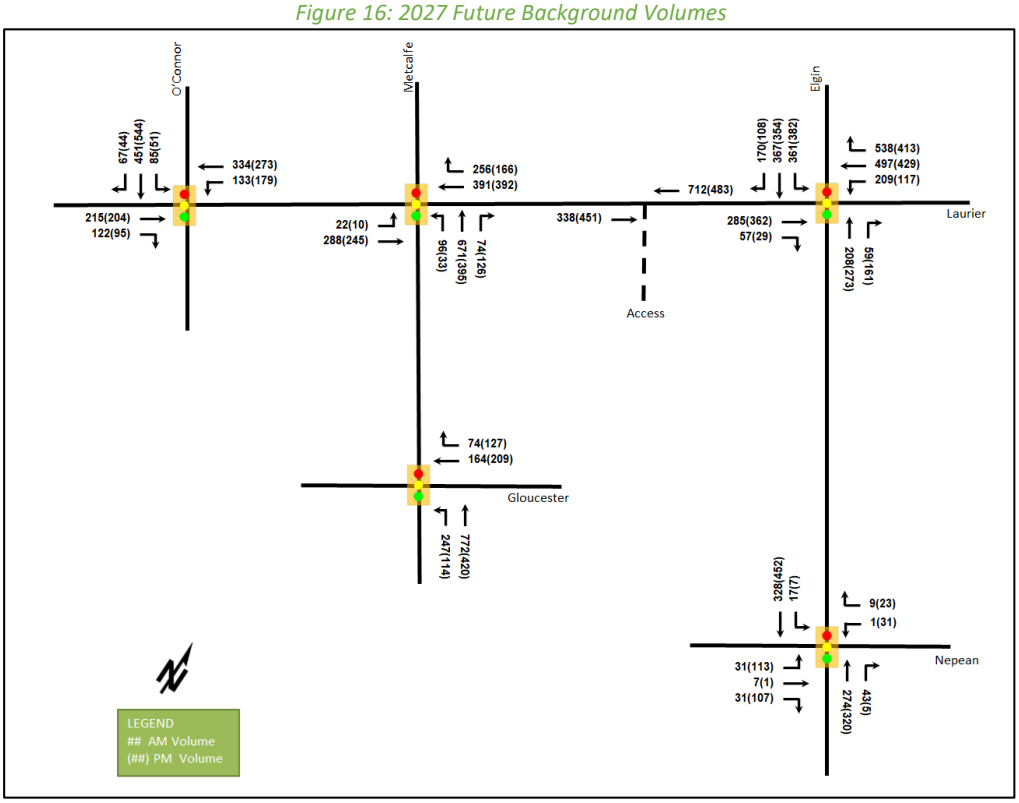


Table 19: 2027 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Laurier Avenue West at O'Connor Street ***Signalized***	EBT/R	B	0.63	25.6	64.6	A	0.60	24.6	62.9
	WBL	A	0.32	7.1	9.3	A	0.48	22.1	37.2
	WBT	A	0.37	6.7	19.7	A	0.33	16.2	46.7
	SB	A	0.50	22.3	34.9	A	0.52	22.4	40.4
	Overall	**B**	**0.61**	**17.9**	-	**B**	**0.61**	**21.6**	-
Laurier Avenue West at Metcalfe Street ***Signalized***	EBL/T	A	0.40	19.1	56.3	A	0.32	6.6	13.5
	WBT/R	A	0.53	15.5	46.1	A	0.42	12.0	37.8
	NB	A	0.55	15.6	47.1	A	0.51	18.1	21.5
	Overall	**B**	**0.56**	**16.2**	-	**A**	**0.47**	**13.5**	-
Laurier Avenue West at Elgin Street ***Signalized***	EBT/R	A	0.39	30.0	40.4	A	0.47	31.2	50.7
	WBL	A	0.59	27.2	41.4	A	0.42	23.1	27.2
	WBT	A	0.58	21.6	97.3	A	0.57	22.0	94.4
	WBR	E	0.91	35.5	**#89.7**	C	0.77	21.4	**#58.5**
	NBT	A	0.29	33.7	27.8	A	0.42	25.2	23.2
	NBR	A	0.16	0.9	0.0	A	0.51	8.4	8.5
	SBL	D	0.87	65.4	**#60.1**	E	0.95	76.6	**#71.4**
	SBT/R	A	0.49	18.6	46.3	A	0.43	18.8	45.1
	Overall	**D**	**0.82**	**31.4**	-	**C**	**0.74**	**30.2**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Gloucester Street at Metcalfe Street *Signalized*	WBT/R	A	0.31	20.5	21.3	A	0.38	19.6	30.8
	NBL/T	A	0.39	7.6	29.5	A	0.25	8.2	18.4
	Overall	**A**	**0.35**	**10.0**	-	**A**	**0.29**	**12.6**	-
Nepean Street at Elgin Street *Signalized*	EB	A	0.16	16.1	14.5	A	0.38	16.5	42.7
	WBL	A	0.00	23.0	1.3	A	0.08	17.1	9.6
	WBR	A	0.02	0.1	0.0	A	0.04	2.0	2.2
	NBT/R	A	0.17	8.0	16.9	A	0.25	17.7	31.8
	SBL	A	0.03	8.2	3.8	A	0.02	13.9	m1.3
	SBT	A	0.17	8.9	18.8	A	0.34	18.0	47.2
	Overall	**A**	**0.16**	**9.1**	-	**A**	**0.35**	**17.2**	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, intersections within the study area will operate similar to existing condition with improvement to the intersection operations due to the adjustment of the peak hour factor to 1.00 for forecasted conditions. No capacity issues are noted.

7.2 2032 Future Background Operations

Figure 17 illustrates the 2032 background volumes and Table 20 summarizes the 2032 background intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection. The synchro worksheets for the 2032 future background horizon are provided in Appendix H.

Figure 17: 2032 Future Background Volumes

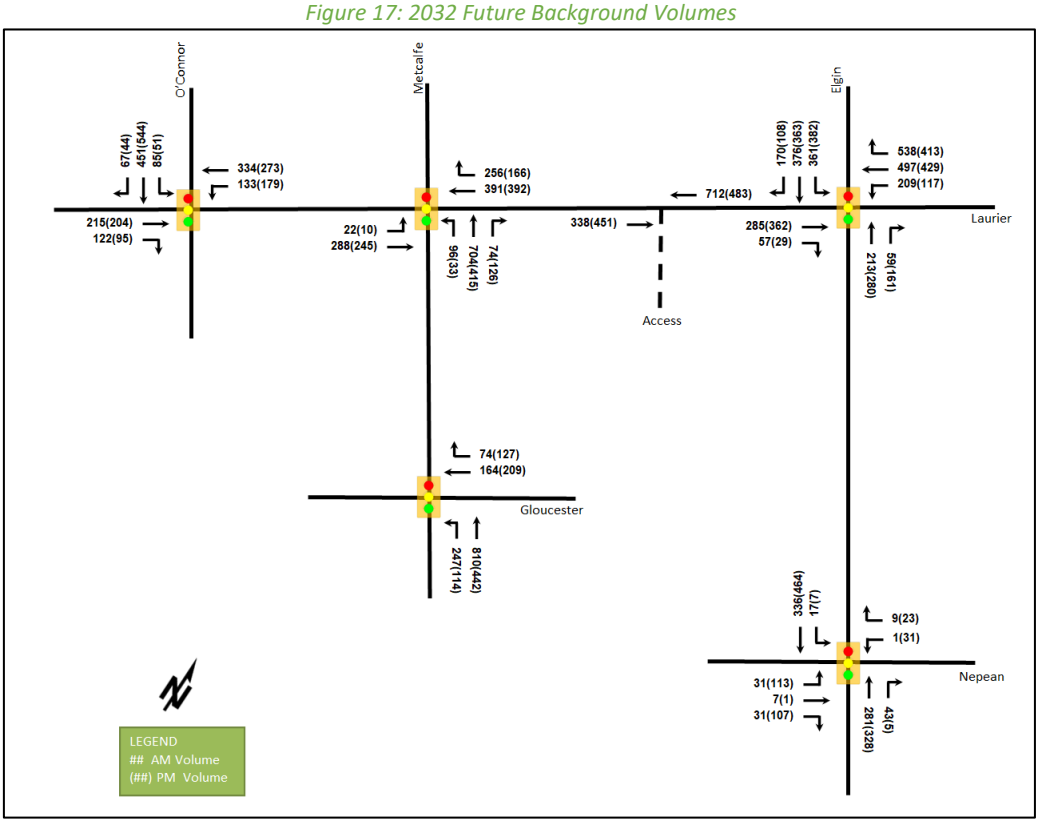


Table 20: 2032 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Laurier Avenue West at O'Connor Street ***Signalized***	EBT/R	B	0.63	25.6	64.6	A	0.60	24.6	62.9
	WBL	A	0.32	7.1	m9.3	A	0.48	22.1	37.2
	WBT	A	0.37	6.7	19.8	A	0.33	16.2	46.7
	SB	A	0.50	22.3	34.9	A	0.52	22.4	40.4
	Overall	**B**	**0.61**	**17.9**	-	**B**	**0.61**	**21.6**	-
Laurier Avenue West at Metcalfe Street ***Signalized***	EBL/T	A	0.40	19.1	56.3	A	0.32	6.6	13.5
	WBT/R	A	0.53	15.5	46.1	A	0.42	12.0	37.8
	NB	A	0.57	15.7	49.0	A	0.53	18.1	21.6
	Overall	**A**	**0.57**	**16.2**	-	**A**	**0.48**	**13.5**	-
Laurier Avenue West at Elgin Street ***Signalized***	EBT/R	A	0.39	30.0	40.4	A	0.47	31.2	50.7
	WBL	A	0.59	27.2	41.4	A	0.42	23.1	27.2
	WBT	A	0.58	21.6	97.3	A	0.57	22.0	94.4
	WBR	E	0.91	35.5	**#89.7**	C	0.77	21.4	**#58.8**
	NBT	A	0.29	33.8	28.4	A	0.43	25.1	23.6
	NBR	A	0.16	0.9	0.0	A	0.51	8.4	9.1
	SBL	D	0.87	65.4	**#60.1**	E	0.95	76.6	**#71.4**
	SBT/R	A	0.50	18.9	47.6	A	0.44	19.0	46.2
	Overall	**D**	**0.82**	**31.5**	-	**C**	**0.74**	**30.1**	-
Gloucester Street at Metcalfe Street ***Signalized***	WBT/R	A	0.31	20.8	21.5	A	0.38	19.7	30.9
	NBL/T	A	0.40	7.7	30.9	A	0.26	8.3	19.2
	Overall	**A**	**0.36**	**10.1**	-	**A**	**0.29**	**12.6**	-
Nepean Street at Elgin Street ***Signalized***	EB	A	0.16	16.1	14.5	A	0.38	16.5	42.7
	WBL	A	0.00	23.0	1.3	A	0.08	17.1	9.6
	WBR	A	0.02	0.1	0.0	A	0.04	2.0	2.2
	NBT/R	A	0.18	8.1	17.3	A	0.25	17.8	32.5
	SBL	A	0.03	8.2	3.8	A	0.02	13.9	m1.2
	SBT	A	0.18	9.0	19.3	A	0.35	17.9	48.1
	Overall	**A**	**0.16**	**9.1**	-	**A**	**0.36**	**17.2**	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

During both peak hours, intersections within the study area will operate similar to the 2027 future background horizon. No capacity issues are noted.

7.3 2027 Future Total Operations

Figure 18 illustrates the 2027 future total volumes and Table 21 summarizes the 2027 future total intersection operations. The level of service for signalized intersections is based on HCM 2010 calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and HCM average delay for unsignalized intersections. The synchro worksheets for the 2027 future total horizon are provided in Appendix I.

Figure 18: 2027 Future Total Volumes

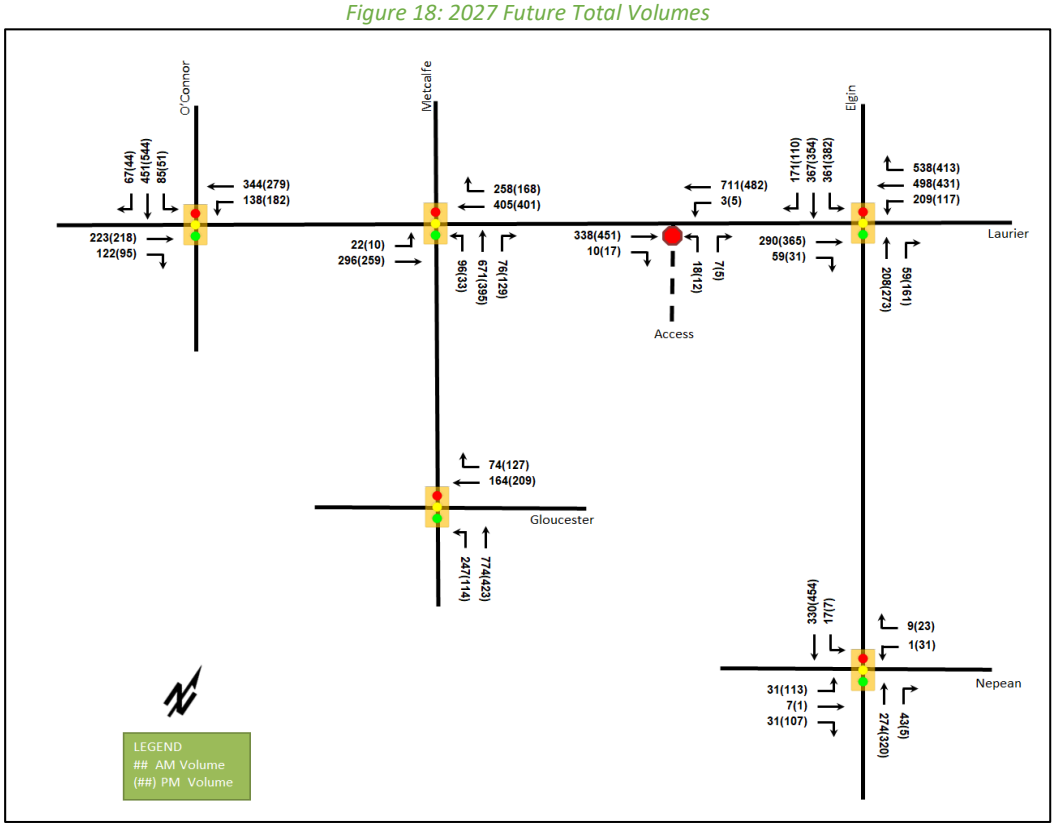


Table 21: 2027 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Laurier Avenue West at O'Connor Street ***Signalized***	EBT/R	B	0.64	25.9	66.5	B	0.63	25.3	66.2
	WBL	A	0.34	7.2	9.5	A	0.50	23.3	38.5
	WBT	A	0.39	6.7	19.9	A	0.34	16.6	48.1
	SB	A	0.50	22.3	34.9	A	0.52	22.4	40.4
	Overall	**B**	**0.62**	**18.0**	-	**B**	**0.62**	**22.0**	-
Laurier Avenue West at Metcalfe Street ***Signalized***	EBL/T	A	0.41	19.4	57.7	A	0.34	6.4	13.4
	WBT/R	A	0.54	15.6	47.4	A	0.43	12.1	38.6
	NB	A	0.56	15.6	47.3	A	0.52	18.1	21.5
	Overall	**A**	**0.57**	**16.3**	-	**A**	**0.48**	**13.4**	-
Laurier Avenue West at Elgin Street ***Signalized***	EBT/R	A	0.40	30.1	41.2	A	0.47	31.3	51.3
	WBL	A	0.59	27.4	41.4	A	0.42	23.2	27.2
	WBT	A	0.58	21.7	97.5	A	0.57	22.0	94.8
	WBR	E	0.91	35.5	**#89.7**	C	0.77	21.4	**#58.5**
	NBT	A	0.29	33.7	27.8	A	0.42	25.2	23.2
	NBR	A	0.16	0.9	0.0	A	0.51	8.5	9.0
	SBL	D	0.87	65.4	**#60.1**	E	0.95	76.6	**#71.4**
	SBT/R	A	0.49	18.6	46.3	A	0.44	18.8	45.3
	Overall	**D**	**0.82**	**31.4**	-	**C**	**0.74**	**30.2**	-
Gloucester Street at Metcalfe Street ***Signalized***	WBT/R	A	0.31	20.6	21.4	A	0.38	19.6	30.8
	NBL/T	A	0.39	7.6	29.7	A	0.25	8.2	18.5
	Overall	**A**	**0.35**	**10.0**	-	**A**	**0.29**	**12.6**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Nepean Street at Elgin Street *Signalized*	EB	A	0.16	16.1	14.5	A	0.38	16.5	42.7
	WBL	A	0.00	23.0	1.3	A	0.08	17.1	9.6
	WBR	A	0.02	0.1	0.0	A	0.04	2.0	2.2
	NBT/R	A	0.17	8.0	16.9	A	0.25	17.7	31.8
	SBL	A	0.03	8.2	3.8	A	0.02	14.0	m1.2
	SBT	A	0.17	8.9	19.0	A	0.34	18.1	47.5
	Overall	**A**	**0.16**	**9.1**	**-**	**A**	**0.35**	**17.3**	**-**
Laurier Avenue West at Access Un*signalized*	EBT/R	-	-	-	-	-	-	-	-
	WBL/T	A	0.00	8.0	0.0	A	0.01	8.5	0.0
	NBL/R	C	0.08	18.0	2.3	C	0.06	18.0	1.5
	Overall	**A**	**-**	**0.4**	**-**	**A**	**-**	**0.4**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

During both peak hours, the study area intersection will operate similar to the 2027 future background horizon. No capacity issues are noted. The intersection of Laurier Avenue West at Access will operate well.

7.4 2032 Future Total Operations

Figure 19 illustrates the 2032 future total volumes and Table 22 summarizes the 2032 future total intersection operations. The level of service for signalized intersections is based on HCM 2010 calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and HCM average delay for unsignalized intersections. The synchro worksheets for the 2032 future total horizon are provided in Appendix J.

Figure 19: 2032 Future Total Volumes

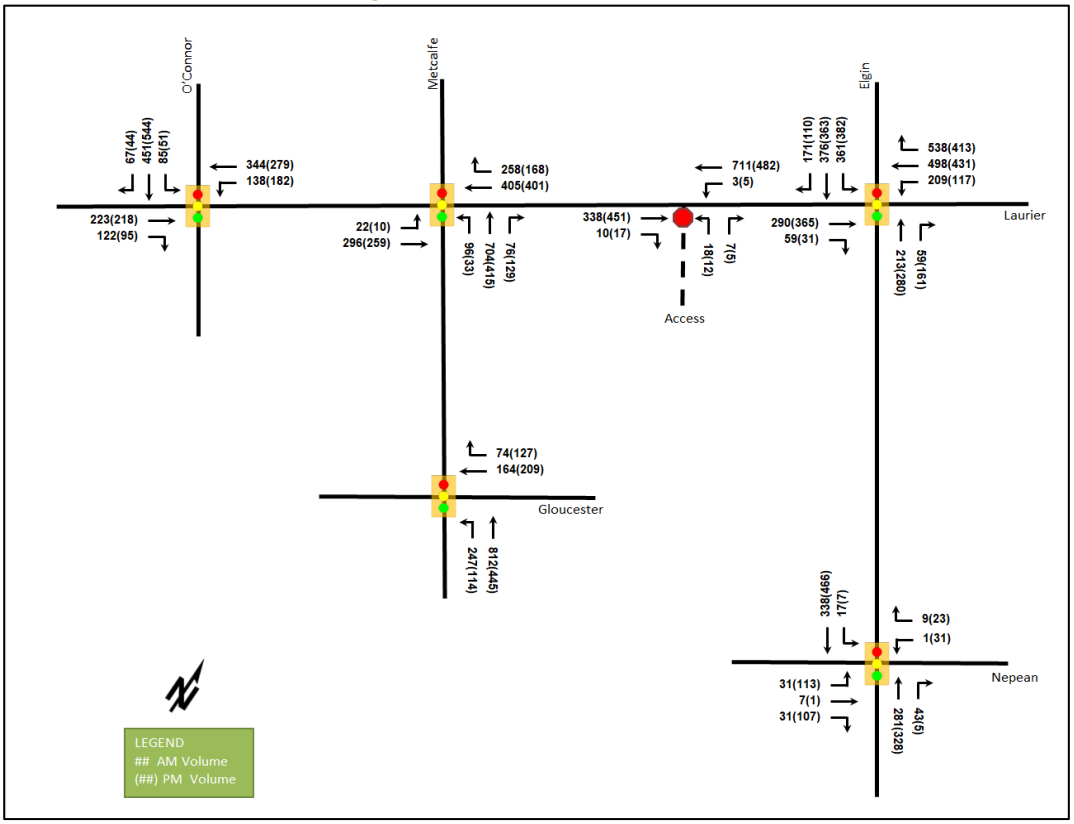


Table 22: 2032 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95th)	LOS	V/C	Delay (s)	Q (95th)
Laurier Avenue West at O'Connor Street ***Signalized***	EBT/R	B	0.64	25.9	66.5	B	0.63	25.3	66.2
	WBL	A	0.34	7.1	m9.4	A	0.50	23.3	38.3
	WBT	A	0.39	6.7	19.9	A	0.34	16.6	48.2
	SB	A	0.50	22.3	34.9	A	0.52	22.4	40.4
	Overall	**B**	**0.62**	**17.9**	-	**B**	**0.62**	**22.0**	-
Laurier Avenue West at Metcalfe Street ***Signalized***	EBL/T	A	0.41	19.4	57.7	A	0.34	6.4	13.4
	WBT/R	A	0.54	15.6	47.4	A	0.43	12.1	38.6
	NB	A	0.58	15.8	49.1	A	0.53	18.2	21.7
	Overall	**A**	**0.57**	**16.3**	-	**A**	**0.48**	**13.5**	-
Laurier Avenue West at Elgin Street ***Signalized***	EBT/R	A	0.40	30.1	41.2	A	0.47	31.3	51.3
	WBL	A	0.59	27.4	41.4	A	0.42	23.2	27.2
	WBT	A	0.58	21.7	97.5	A	0.57	22.0	94.8
	WBR	E	0.91	35.5	**#89.7**	C	0.77	21.4	**#58.8**
	NBT	A	0.29	33.8	28.4	A	0.43	25.1	23.6
	NBR	A	0.16	0.9	0.0	A	0.51	8.4	9.1
	SBL	D	0.87	65.4	**#60.1**	E	0.95	76.6	**#71.4**
	SBT/R	A	0.50	18.9	47.6	A	0.44	19.0	46.4
	Overall	**D**	**0.82**	**31.5**	-	**C**	**0.75**	**30.2**	-
Gloucester Street at Metcalfe Street ***Signalized***	WBT/R	A	0.31	20.8	21.5	A	0.38	19.7	30.9
	NBL/T	A	0.40	7.7	31.1	A	0.26	8.3	19.4
	Overall	**A**	**0.36**	**10.1**	-	**A**	**0.29**	**12.6**	-
Nepean Street at Elgin Street ***Signalized***	EB	A	0.16	16.1	14.5	A	0.38	16.5	42.7
	WBL	A	0.00	23.0	1.3	A	0.08	17.1	9.6
	WBR	A	0.02	0.1	0.0	A	0.04	2.0	2.2
	NBT/R	A	0.18	8.1	17.3	A	0.25	17.8	32.5
	SBL	A	0.03	8.2	3.8	A	0.02	13.7	m1.2
	SBT	A	0.18	9.0	19.4	A	0.35	18.0	48.7
	Overall	**A**	**0.16**	**9.1**	-	**A**	**0.36**	**17.2**	-
Laurier Avenue West at Access ***Unsignalized***	EBT/R	-	-	-	-	-	-	-	-
	WBL/T	A	0.00	8.0	0.0	A	0.01	8.5	0.0
	NBL/R	C	0.08	18.0	2.3	C	0.06	18.0	1.5
	Overall	**A**	**-**	**0.4**	-	**A**	**-**	**0.4**	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

During both peak hours, the study area intersection will operate similar to the 2032 future background horizon. No capacity issues are noted.

The intersection of Laurier Avenue West at Access will operate well.

7.5 Modal Share Sensitivity and Demand Rationalization Conclusions

No capacity constraints are noted within the study area. As such, no rationalization of the modal share and projected volumes is required.

8 Development Design

8.1 Design for Sustainable Modes

The proposed development is a mixed-use building with residential and ground floor commercial/retail, with the parking provided on five underground levels and surface. Bike racks are provided for external bicycle parking and bike rooms are provided for internal bike parking. Pedestrian and cycling facilities are provided along the boundary street. The existing surface and underground accesses on the east side will be removed, and the pin curb is recommended to be extended to the eastern property limit. The covered area to the underground parking ramp is recommended to have a vertical clearance of at least 6.1 metres for trucks to go through.

The infrastructure TDM checklist is provided in Appendix K.

8.2 Circulation and Access

Vehicle access is provided via a two-way access onto Laurier Avenue West. The two-way access is 6.0m wide and it connects to a maximum of 12% slope ramp to the underground parking. Garbage collection is proposed to collect from a staging area located in the southwest corner of the site, and emergency services are proposed to access the site via Laurier Avenue West. Appendix L illustrates the turning templates for the site.

9 Parking

9.1 Parking Supply

The site provides 171 residential parking spaces, 30 visitor parking spaces, and 267 bicycle spaces. A total of five vehicle parking, which includes one Type A and one Type B parking spaces, and eight bike racks will be provided on the ground level, and 196 vehicle parking spaces and 259 bicycle parking spaces will be provided below ground level.

The maximum parking provision is 605 vehicle parking spaces including residential and visitor parking and six vehicle parking spaces for commercial, and the minimum visitor parking is 30 parking spaces. The maximum visitor parking and minimum visitor parking requirements are satisfied.

The minimum bicycle parking provision is 202 bicycle parking spaces for the resident and three for the retail, and the minimum bicycle parking requirements are satisfied.

10 Boundary Street Design

Table 23 summarizes the MMLOS analysis for the boundary streets of Laurier Avenue West. The existing and future conditions for both streets will be the same and are considered in one row. The boundary street analysis is based on the policy area of Central Area. The MMLOS worksheets has been provided in Appendix M.

Table 23: Boundary Street MMLOS Analysis

Segment	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target
Laurier Avenue West	**D**	A	A	A	-	-	C	D

Laurier Avenue West does not meet the pedestrian MMLOS targets and would require traffic reductions to below 3000 vehicles a day to meet the target of ‘A’.

11 Access Intersections Design

11.1 Location and Design of Access

The existing surface and underground accesses on the east side will be removed, and the access located on the western limit of the site has been adjusted from the existing location to accommodate on-site parking. The pin curb is recommended to be extended to the eastern property limit. The site access is provided as an all-movements driveway onto Laurier Avenue West, and the throat length is approximately 4.0 metres. Given the downtown urban environment, narrow site and low auto volumes anticipated, the typical throat length of 40 metres cannot be accommodated, nor is considered practical for the context. The existing light standard and fire hydrant, which are located east of the existing access, are proposed to be re-located.

The site access will connect to the adjacent arterial road network, and a 12% slope ramp will be provided to access the underground parking at the rear of the site.

11.2 Intersection Control

Based upon the projected volumes, the site access will have stop-control on the minor approach. No further traffic control is necessary to address operational issues.

11.3 Access Intersection Design

11.3.1 Future Access Intersection Operations

The operations are noted in Section 7.4 and no capacity issues are noted.

11.3.2 Access Intersection MMLOS

The access intersection is unsignalized, and therefore no access intersection MMLOS analysis has been conducted.

11.3.3 Recommended Design Elements

The existing surface and underground accesses on the east side are proposed to be removed, and the pin curb is recommended to be extended to the eastern property limit. The existing light standard and fire hydrant, which are located east of the existing access, are proposed to be re-located.

12 Transportation Demand Management

12.1 Context for TDM

The mode shares used within the TIA represent a shift from auto modes to transit modes. Overall, the modal shares are likely to be achieved and supporting TDM measures should be provided.

The subject site is within the Central Area design priority area. The total bedroom count within the development is anticipated to be 312 including 147 one-bedroom units, 157 two-bedroom units, and eight loft units.

12.2 Need and Opportunity

The subject site has been assumed to rely predominantly on all travel modes with an increase in transit ridership with the proximity to the LRT corridors, and those assumptions have been carried through the analysis.

12.3 TDM Program

The “suite of post occupancy TDM measures” has been summarized in the TDM checklists for the residential land uses. The checklist is provided in Appendix K. The key TDM measures recommended include:

- Provide bike repair station for site and public use
- Posting of pedestrian, cycling, and transit information and maps at primary entrances/exits

- Inclusion of a 1-month Presto card for first time new townhome purchase and apartment rental, with a set time frame for this offer (e.g. 6-months) from the initial opening of the site
- Unbundle parking cost from purchase or rental costs

13 Transit

In Section 5.1 the trip generation by mode was estimated, including an estimate of the number of transit trips that will be generated by the proposed development. Table 24 summarizes the transit trip generation.

Table 24: Trip Generation by Transit Mode

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Transit	Varies	20	41	61	30	22	52

The proposed development is anticipated to generate an additional 61AM and 52 PM peak hour two-way transit trips. From the trip distribution found in section 5.3, these values can be further broken down. Table 25 summarizes forecasted site-generated transit ridership trips by direction and the equivalent bus loads.

Table 25: Forecasted Site-Generated Transit Ridership

Direction	AM Peak Hour		PM Peak Hour		Service Type	Approximate Equivalent Peak Hour/Direction Bus Loads
	In	Out	In	Out		
North	2	4	3	2	Bus	Negligible
South	8	17	12	9	LRT, Bus	One third of a standard bus
East	2	4	3	2	LRT, Bus	Negligible
West	8	17	12	9	LRT, Bus	One third of a standard bus

13.1 Transit Priority

Examining the study area intersection delays, negligible impacts are noted on transit movements at the study area intersections as a result of the development site traffic.

14 Network Intersection Design

14.1 Network Intersection Control

No change to the existing signalized control is recommended for the network intersections.

14.2 Network Intersection Design

14.2.1 2027 & 2032 Future Total Network Intersection Operations

The operations are noted in Section 7.4 and no capacity issues are noted.

14.2.2 Network Intersection MMLOS

The Laurier Avenue Cycling Modifications, which is expected to be completed by the end of 2023, will be included in the future conditions.

Table 26 summarizes the MMLOS analysis for the network intersections within the study area. The intersection analysis is based on the policy area of Central Area. The MMLOS worksheets has been provided in Appendix M.

Table 26: Study Area Intersection MMLOS Analysis

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
Laurier Avenue West at O'Connor Street	D	A	A	A	-	-	F	D	B	E

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
Laurier Avenue West at Metcalfe Street	D	A	F	A	-	-	F	D	A	E
Laurier Avenue West at Elgin Street (Existing)	F	A	F	A	E	D	E	D	D	E
Laurier Avenue West at Elgin Street (Future)	F	A	A	A	E	D	E	D	D	E
Gloucester Street at Metcalfe Street	C	A	F	B	-	-	-	-	A	E
Nepean Street at Elgin Street	F	A	F	B	C	D	-	-	A	E

The pedestrian LOS targets will not meet at the intersections within the study area. As typical for arterial roads, the crossing distance does not permit the targets to be met. To meet pedestrian LOS targets, the maximum crossing distance on all pedestrian crossings would need to be reduced to two lane-widths.

The bicycle LOS targets will not meet at the intersections within the study area except for the Laurier Avenue West at O'Connor Street and Laurier Avenue West at Elgin Street intersections. The Laurier Avenue West at Elgin Street does not meet the bicycle LOS targets in the existing condition, but it will meet once the cycling modifications have been made in the future conditions. To meet bicycle LOS targets at study area intersections that do not meet the targets, the left-turn configurations would need to be two-stage or include turn boxes at the intersections along Metcalfe Street and Elgin Street.

The truck LOS targets will meet at the intersection of Laurier Avenue West at Elgin Street and would need the delay to be below 30 seconds.

The truck LOS targets will not meet at the intersections along Laurier Avenue West and would need at least 15-meter effective corner radius or at least two receiving lands on departure from intersection.

14.2.3 Recommended Design Elements

No study area intersection design elements are proposed as part of this study.

15 Summary of Improvements Indicated and Modifications Options

The following summarizes the analysis and results presented in this TIA report:

Proposed Site and Screening

- The proposed site includes 403 residential units and 6,215 sq. ft. of commercial/retail
- A total of 201 auto parking spaces and 267 bike parking spaces will be provided
- The existing surface and underground accesses on the east side will be removed
- An access on the western limit of the site on Laurier Avenue West will be slightly shifted to the east
- The development is proposed to be completed as a single phase by 2027
- The trip generation, location, and safety triggers were met for the TIA Screening

Existing Conditions

- Laurier Avenue West, O'Connor Street, Metcalfe Street, and Elgin Street are arterial roads, and Gloucester Street and Nepean Street are local roads in the study area

- Protected bikes lanes are provided on both sides along Laurier Avenue West west of Elgin Street, a bike lane and cycletrack to the east of Elgin, a two-way protected bikes lane on the east side of O'Connor Street south of Laurier Avenue West, and a southbound transition is located to the north
- Cycle track is provided on the south side and on-street bike lane is provided on the north side along Laurier Avenue West east of Elgin Street
- Sidewalks are provided on both sides along all roads within the study area
- Laurier Avenue West, Metcalfe Street, O'Connor Street, and Elgin Street north of Laurier Avenue West are spine routes and Elgin Street south of Laurier Avenue West is a local route
- Elgin Street north of Laurier Avenue West, Laurier Avenue West, and O'Connor Street are cross-town bikeways
- The high volumes roadways have produced a high number of collisions at the study area intersections, primarily at the Elgin Street at Laurier Avenue intersection (61% or 69 collisions), predominantly represented by sideswipe collisions, which may be contributed by general congestion and the skew of the through movements crossing the intersection
- The westbound right-turn movement at Laurier Avenue West and Elgin Street intersection is over theoretical capacity and may be subject to extended queues during the AM peak in the existing condition.

Development Generated Travel Demand

- The proposed development is forecasted produce 186 two-way people trips during the AM peak hour and 214 two-way people trips during the PM peak hour
- Of the forecasted people trips, 36 two-way trips will be vehicle trips during the AM peak hour and 36 two-way trips will be vehicle trips during the PM peak hour
- Of the forecasted trips, 10% are anticipated to travel each to the north and the east and 40% each to the south and the west

Background Conditions

- The background developments were explicitly included in the background conditions, along with background growth on Metcalfe Street and Elgin Street along the mainline volumes
- The study area intersections at future background horizons will operate similar to the existing conditions

Development Design

- Parking will provide on five underground levels and surface
- Bike racks are provided for external bicycle parking and bike rooms are provided for internal bike parking
- The existing surface and underground accesses on the east side will be removed, and the pin curb is recommended to be extended to the eastern property limit
- The covered area to the underground parking ramp is **recommended** to have a vertical clearance of 6.1 metres
- Pedestrian and cycling facilities are provided along the boundary street
- The two-way access is 6.0m wide and it connects to a maximum of 12% slope ramp to the underground parking
- Garbage collection is proposed to collect from a staging area located in the southwest corner of the site
- Emergency services are proposed to access the site via Laurier Avenue West

Parking

- The site provides 171 residential parking spaces, 30 visitor parking spaces, and 267 bicycle parking spaces
- The minimum visitor parking, minimum bicycle parking, and the maximum residential parking requirements are satisfied

Boundary Street Design

- Laurier Avenue West does not meet the pedestrian MMLOS targets due to the vehicle volumes along the corridor

Access Intersections Design

- The site access is provided as an all-movements driveway onto Laurier Avenue West, and the throat length is approximately 4.0 metres
- Given the downtown urban environment, narrow site and low auto volumes anticipated, the typical throat length of 40 metres cannot be accommodated, nor is considered practical for the context
- The site access will connect to the adjacent arterial road network, and a 12% slope ramp will be provided to access the underground parking at the rear of the site
- The site access will have stop-control on the minor approach
- The existing surface and underground accesses on the east side will be removed, and the access located on the western limit of the site has been adjusted from the existing location to accommodate on-site parking
- The existing light standard and fire hydrant, which are located east of the existing access, are proposed to be re-located

TDM

- Supportive TDM measures to be included within the proposed development should include:
    - Provide bike repair station for site and public use
    - Posting of pedestrian, cycling, and transit information and maps at primary entrances/exits
    - Inclusion of a 1-month Presto card for first time new townhome purchase and apartment rental, with a set time frame for this offer (e.g. 6-months) from the initial opening of the site
    - Unbundle parking cost from purchase or rental costs

Transit

- The forecasted transit trips will include 61 two-way trips during the AM peak and 52 two-way trips during the PM peak
- Peak hour increases in transit ridership resulting from the site equate to one third of a standard bus load southerly and westerly of the site and negligible impact northerly and easterly of the site
- Negligible impacts are noted on transit movements at the study area intersections

Network Intersection Design

- No capacity issues are noted at the intersections within the study
- No change to the existing signalized control is recommended for the network intersections
- The pedestrian LOS targets will not be met at intersections within the study area, which require crossing distances need to be reduced to equal or less than two lane widths

- The bicycle LOS targets will not be met at the existing or future intersections within the study area except for the Laurier Avenue West at O'Connor Street intersection, and it is limited by the lack of dedicated facilities and improved left-turn configurations
- The Laurier Avenue West at Elgin Street does not meet the bicycle LOS targets in the existing condition, but it will meet once the cycling modifications have been made in the future conditions
- The transit LOS targets will not be met at the intersections of Laurier Avenue West at Elgin Street, which requires the delay to be below 30 seconds
- The truck LOS targets will not be met at the intersections along Laurier Avenue West and would need at least 15-meter effective corner radius or at least two receiving lands on departure from intersection

16 Conclusion

It is recommended that, from a transportation perspective, the proposed development applications proceed.

Prepared By:

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Transportation Engineering-Intern

Reviewed By:

Andrew Harte, P.Eng.
Senior Transportation Engineer

Appendix A

TIA Screening Form and PM Certification Form

CGH TRANSPORTATION

6 Plaza Court
Ottawa, ON K2H 7W1

City of Ottawa 2017 TIA Guidelines
Step 1 - Screening Form

Date: 29-Aug-22
Project Number: 2022-074
Project Reference: 150 Laurier

1.1 Description of Proposed Development	
Municipal Address	150 Laurier Avenue West
Description of Location	Ward 14. On Laurier Avenue West between Elgin Street and Metcalfe Street
Land Use Classification	Mixed Use/Commercial Zone (MD S50)
Development Size	312 residitial units and 4,117 sq.ft of commerical space
Accesses	An access on Laurier Avenue West
Phase of Development	Single
Buildout Year	2027
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger		
Land Use Type	Townhomes or apartments	
Development Size	312	Units
Trip Generation Trigger	Yes	

1.3 Location Triggers		
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?	Yes	Laurier Avenue West is a spine route
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?	Yes	Central Area DPA
Location Trigger	Yes	

1.4. Safety Triggers		
Are posted speed limits on a boundary street 80 km/hr or greater?	No	
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	No	
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	Yes	Within 150 of intersections
Is the proposed driveway within auxiliary lanes of an intersection?	No	
Does the proposed driveway make use of an existing median break that serves an existing site?	No	
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	Yes	Collisions at Laurier Avenue West and Elgin Street intersection
Does the development include a drive-thru facility?	No	
Safety Trigger	Yes	

TIA Plan Reports

On 14 June 2017, the Council of the City of Ottawa adopted new Transportation Impact Assessment (TIA) Guidelines. In adopting the guidelines, Council established a requirement for those preparing and delivering transportation impact assessments and reports to sign a letter of certification.

Individuals submitting TIA reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Ottawa's Official Plan, the Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines.

By submitting the attached TIA report (and any associated documents) and signing this document, the individual acknowledges that s/he meets the four criteria listed below.

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
4. I am either a licensed[1] or registered[2] professional in good standing, whose field of expertise [check √ appropriate field(s)] is either transportation engineering √ or transportation planning □.

[1,2] **License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.**

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Télécopieur: 613-560-6006

Dated at ___Ottawa_____ this __20__ day of _____September_____, 2018.
(City)

Name: _____Andrew Harte_____
(Please Print)

Professional Title: _____Professional Engineer_____

_____
Signature of Individual certifier that s/he meets the above four criteria

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Appendix B

Turning Movement Counts

Turning Movement Count
Summary Report Including Peak Hours, AADT and Expansion Factors
All Vehicles Except Bicycles

Elgin Street & Nepean Street — Ottawa, ON

Survey Date: Tuesday, July 12, 2022 | **Start Time:** 0700 | **AADT Factor:** 0.9
Weather AM: Overcast 20º C | **Survey Duration:** 8 Hrs. | **Survey Hours:** 0700-1000, 1130-1330 & 1500-1800
Weather PM: Mostly Cloudy 23º C | **Surveyor(s):** T. Carmody

	Nepean St. (Eastbound)					Ottawa City Hall (Westbound)						Elgin St. (Northbound)					Elgin St. (Southbound)						
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
0700-0800	41	5	30	0	**76**	2	0	2	0	**4**	**80**	0	190	21	1	**212**	6	208	0	6	**220**	**432**	**512**
0800-0900	30	6	31	0	**67**	1	0	8	0	**9**	**76**	0	263	37	0	**300**	17	309	0	13	**339**	**639**	**715**
0900-1000	36	4	36	0	**76**	4	0	9	0	**13**	**89**	0	280	30	2	**312**	11	276	0	6	**293**	**605**	**694**
1130-1230	41	2	41	0	**84**	12	0	18	0	**30**	**114**	0	278	15	2	**295**	7	386	0	11	**404**	**699**	**813**
1230-1330	30	1	59	0	**90**	15	0	11	0	**26**	**116**	0	283	21	2	**306**	7	382	0	6	**395**	**701**	**817**
1500-1600	82	5	64	0	**151**	30	0	24	0	**54**	**205**	1	284	7	0	**292**	5	379	0	5	**389**	**681**	**886**
1600-1700	108	2	105	0	**215**	27	0	21	0	**48**	**263**	0	300	3	1	**304**	7	431	0	11	**449**	**753**	**1016**
1700-1800	99	0	85	0	**184**	15	0	26	0	**41**	**225**	0	273	7	1	**281**	1	452	0	8	**461**	**742**	**967**
Totals	**467**	**25**	**451**	**0**	**943**	**106**	**0**	**119**	**0**	**225**	**1168**	**1**	**2151**	**141**	**9**	**2302**	**61**	**2823**	**0**	**66**	**2950**	**5252**	**6420**

Equivalent 12 & 24-hour Vehicle Volumes Including the Annual Average Daily Traffic (AADT) Factor Applicable to the Day and Month of the Turning Movement Count

Expansion factors are applied exclusively to standard weekday 8-hour turning movement counts conducted during the hours of 0700h - 1000h, 1130h - 1330h and 1500h - 1800h

Equivalent 12-hour vehicle volumes. These volumes are calculated by multiplying the 8-hour totals by the 8 ➡12 expansion factor of 1.39																							
Equ. 12 Hr	649	35	627	0	**1311**	147	0	165	0	**313**	**1624**	1	2990	196	13	**3200**	85	3924	0	92	**4101**	**7300**	**8924**
Average daily 12-hour vehicle volumes. These volumes are calculated by multiplying the equivalent 12-hour totals by the AADT factor of: 0.9																							
AADT 12-hr	584	31	564	0	**1180**	133	0	149	0	**281**	**1461**	1	2691	176	11	**2880**	76	3532	0	83	**3690**	**6570**	**8031**
24-Hour AADT. These volumes are calculated by multiplying the average daily 12-hour vehicle volumes by the 12 ➡24 expansion factor of 1.31																							
AADT 24 Hr	765	41	739	0	**1545**	174	0	195	0	**369**	**1914**	2	3525	231	15	**3773**	100	4626	0	108	**4834**	**8607**	**10521**

AADT and expansion factors provided by the City of Ottawa

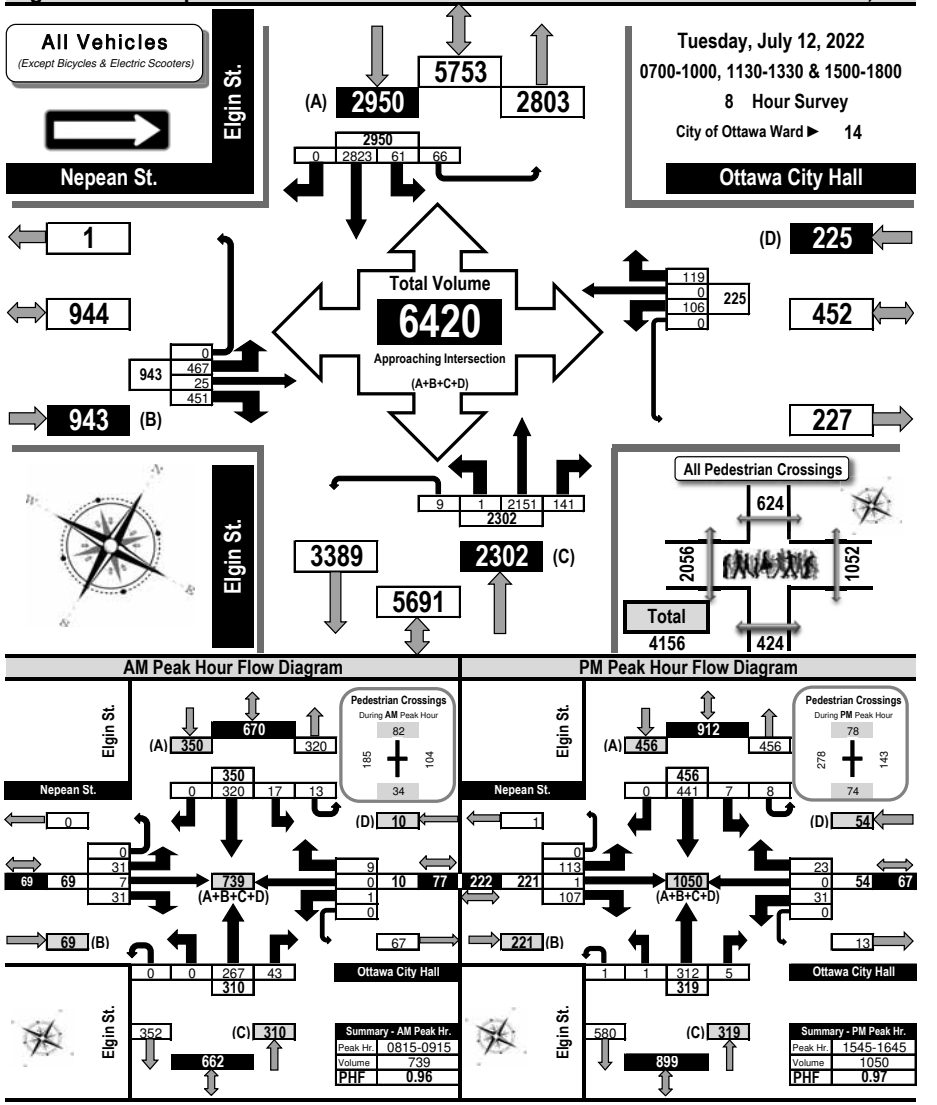
AM Peak Hour Factor ➡ 0.96												Highest Hourly Vehicle Volume Between 0700h & 1000h											
AM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
0815-0915	31	7	31	0	**69**	1	0	9	0	**10**	**79**	0	267	43	0	**310**	17	320	0	13	**350**	**660**	**739**
OFF Peak Hour Factor ➡ 0.99												Highest Hourly Vehicle Volume Between 1130h & 1330h											
OFF Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1200-1300	42	1	47	0	**90**	10	0	18	0	**28**	**118**	0	293	15	2	**310**	7	403	0	5	**415**	**725**	**843**
PM Peak Hour Factor ➡ 0.97												Highest Hourly Vehicle Volume Between 1500h & 1800h											
PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1545-1645	113	1	107	0	**221**	31	0	23	0	**54**	**275**	1	312	5	1	**319**	7	441	0	8	**456**	**775**	**1050**

Comments:
OC Transpo and Para Transpo buses, private buses and school buses comprise 49.08% of the heavy vehicle traffic. The bicycle totals include 26 E-scooters (both stand-up type and Vespa style). The pedestrian crossing totals include 11 pedestrians with accessibility issues using either a cane, walker or electric wheelchair. Many pedestrians and cyclists either cross or drive through the intersection on a red signal.

Notes:
1. Includes all vehicle types except bicycles, electric bicycles, and electric scooters.
2. When expansion and AADT factors are applied, the results will differ slightly due to rounding.

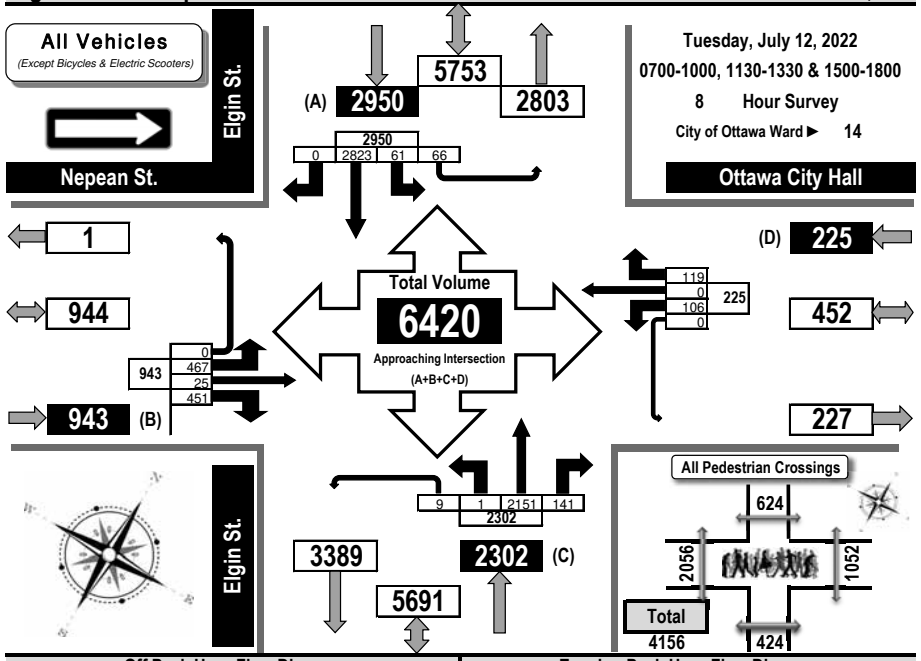
Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams
All Vehicles Except Bicycles

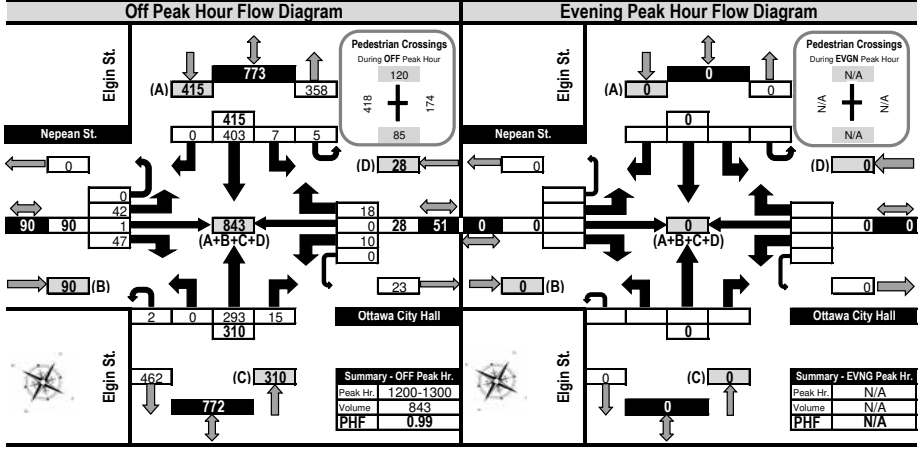
Elgin Street & Nepean Street — Ottawa, ON



Turning Movement Count
Summary, OFF and EVENING Peak Hour Flow Diagrams
All Vehicles Except Bicycles

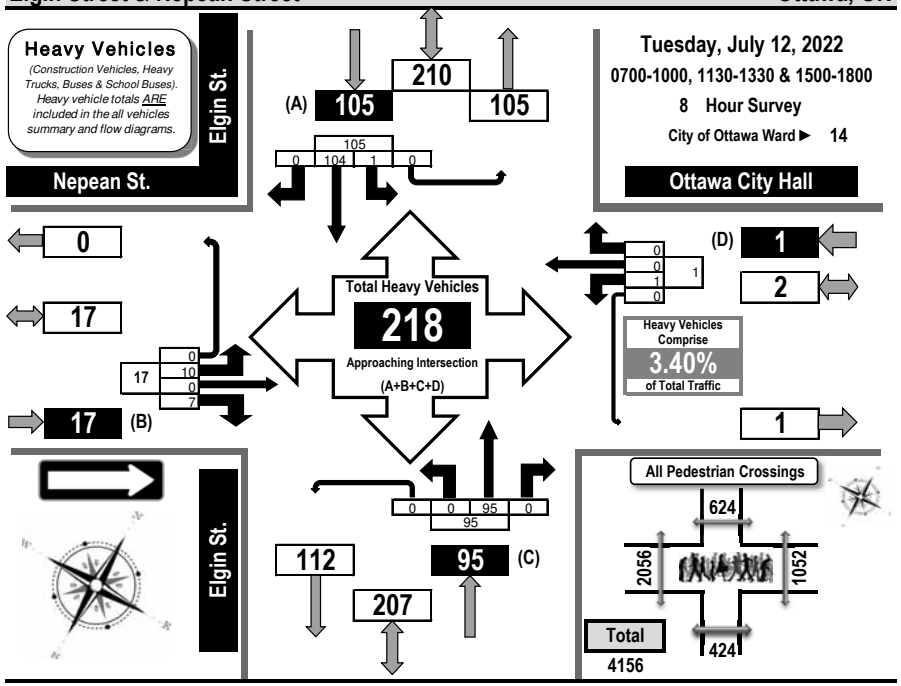
Elgin Street & Nepean Street — **Ottawa, ON**





Turning Movement Count
Heavy Vehicle Summary (FHWA Class 4-13)
Flow Diagram

Elgin Street & Nepean Street — **Ottawa, ON**



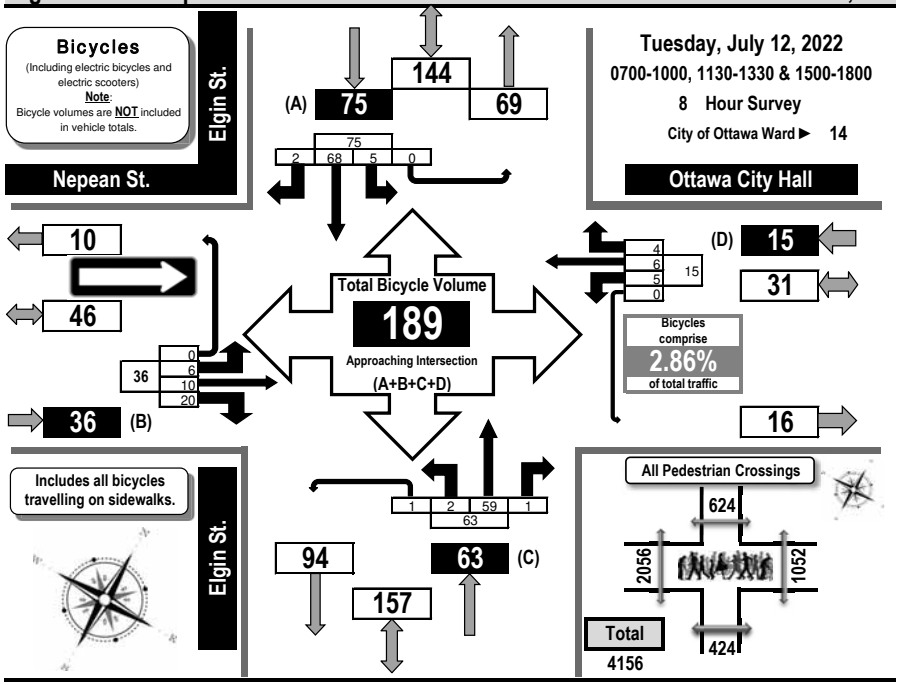
	Nepean St.					Ottawa City Hall					Elgin St.					Elgin St.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	1	0	1	0	2	0	0	0	0	0	0	11	0	0	11	0	11	0	0	11	24
0800-0900	2	0	2	0	4	0	0	0	0	0	0	14	0	0	14	0	14	0	0	14	32
0900-1000	5	0	1	0	6	0	0	0	0	0	0	14	0	0	14	0	15	0	0	15	35
1130-1230	0	0	2	0	2	0	0	0	0	0	0	15	0	0	15	0	18	0	0	18	35
1230-1330	1	0	0	0	1	0	0	0	0	0	0	14	0	0	14	0	14	0	0	14	29
1500-1600	1	0	1	0	2	1	0	0	0	1	0	10	0	0	10	1	13	0	0	14	27
1600-1700	0	0	0	0	0	0	0	0	0	0	0	9	0	0	9	0	10	0	0	10	19
1700-1800	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8	0	9	0	0	9	17
Totals	10	0	7	0	17	1	0	0	0	1	0	95	0	0	95	1	104	0	0	105	218

Comments:

OC Transpo and Para Transpo buses, private buses and school buses comprise 49.08% of the heavy vehicle traffic. The bicycle totals include 26 E-scooters (both stand-up type and Vespa style). The pedestrian crossing totals include 11 pedestrians with accessibility issues using either a cane, walker or electric wheelchair. Many pedestrians and cyclists either cross or drive through the intersection on a red signal.

Turning Movement Count
Bicycle Summary
Flow Diagram

Elgin Street & Nepean Street — **Ottawa, ON**



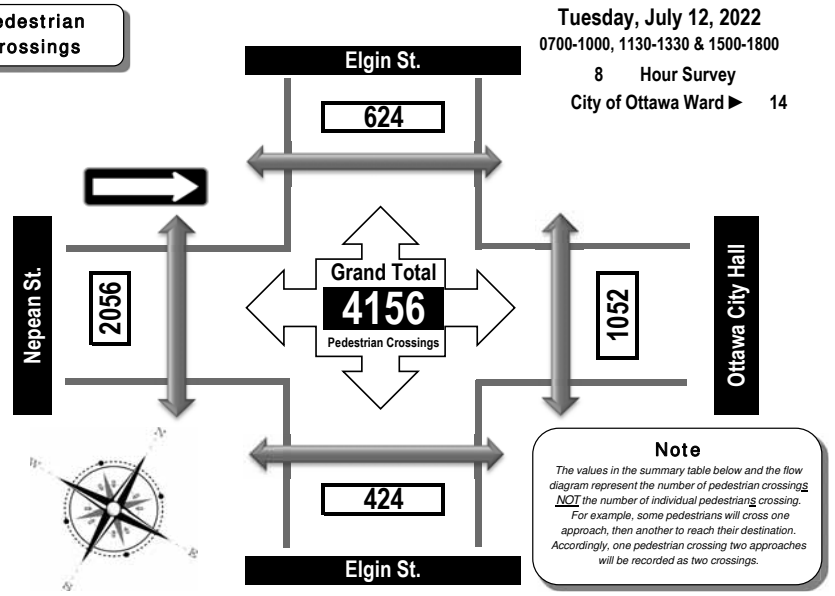
	Nepean St. Eastbound					Ottawa City Hall Westbound					Elgin St. Northbound					Elgin St. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	0	1	0	1	0	2	1	0	3	0	6	1	0	7	0	1	0	0	1	12
0800-0900	1	0	1	0	2	0	0	2	0	2	0	5	0	0	5	0	3	0	0	3	12
0900-1000	1	1	2	0	4	0	1	0	0	1	0	8	0	0	8	0	5	0	0	5	18
1130-1230	0	1	1	0	2	1	0	0	0	1	0	5	0	0	5	1	12	0	0	13	21
1230-1330	0	1	3	0	4	0	1	0	0	1	1	3	0	0	4	1	11	0	0	12	21
1500-1600	0	3	2	0	5	1	0	0	0	1	0	8	0	0	8	2	10	0	0	12	26
1600-1700	1	1	6	0	8	1	0	0	0	1	0	16	0	0	16	1	17	0	0	18	43
1700-1800	3	3	4	0	10	2	2	1	0	5	1	8	0	1	10	0	9	2	0	11	36
Totals	6	10	20	0	36	5	6	4	0	15	2	59	1	1	63	5	68	2	0	75	189

Comments:

OC Transpo and Para Transpo buses, private buses and school buses comprise 49.08% of the heavy vehicle traffic. The bicycle totals include 26 E-scooters (both stand-up type and Vespa style). The pedestrian crossing totals include 11 pedestrians with accessibility issues using either a cane, walker or electric wheelchair. Many pedestrians and cyclists either cross or drive through the intersection on a red signal.

Turning Movement Count
Pedestrian Crossings Summary
and Flow Diagram

Elgin Street & Nepean Street — **Ottawa, ON**



Time Period	West Side Crossing Nepean St.	East Side Crossing Ottawa City Hall	Street Total	South Side Crossing Elgin St.	North Side Crossing Elgin St.	Street Total	Grand Total
0700-0800	83	42	125	29	33	62	187
0800-0900	191	100	291	31	73	104	395
0900-1000	145	120	265	40	66	106	371
1130-1230	353	139	492	56	103	159	651
1230-1330	378	180	558	93	126	219	777
1500-1600	225	132	357	53	57	110	467
1600-1700	322	172	494	71	88	159	653
1700-1800	359	167	526	51	78	129	655
Totals	2056	1052	3108	424	624	1048	4156

Comments:

OC Transpo and Para Transpo buses, private buses and school buses comprise 49.08% of the heavy vehicle traffic. The bicycle totals include 26 E-scooters (both stand-up type and Vespa style). The pedestrian crossing totals include 11 pedestrians with accessibility issues using either a cane, walker or electric wheelchair. Many pedestrians and cyclists either cross or drive through the intersection on a red signal.

Transportation Services - Traffic Services

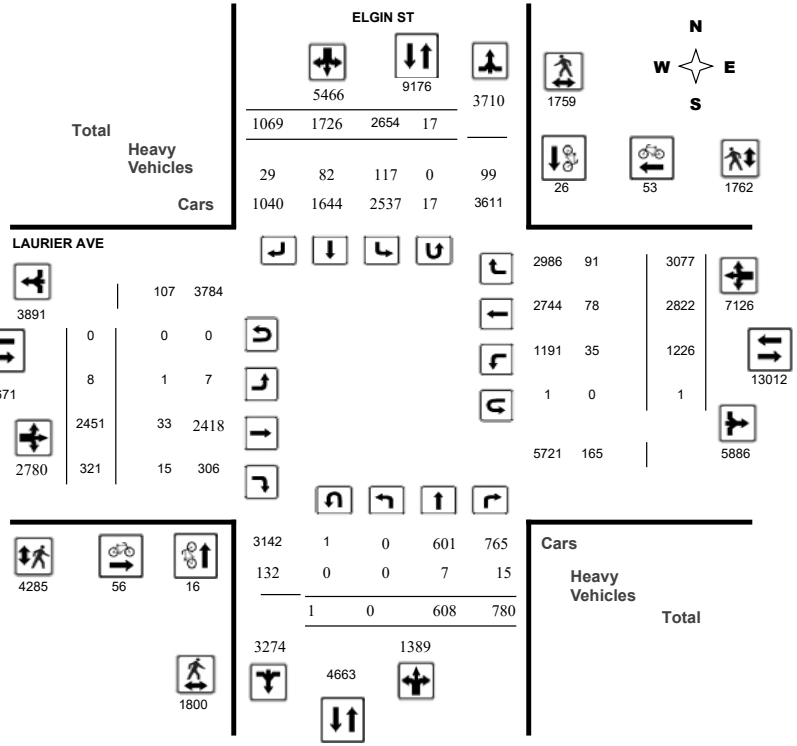
Turning Movement Count - Study Results

ELGIN ST @ LAURIER AVE

Survey Date: Wednesday, February 27, 2019 **WO No:** 38383

Start Time: 07:00 **Device:** Miovision

Full Study Diagram



Transportation Services - Traffic Services

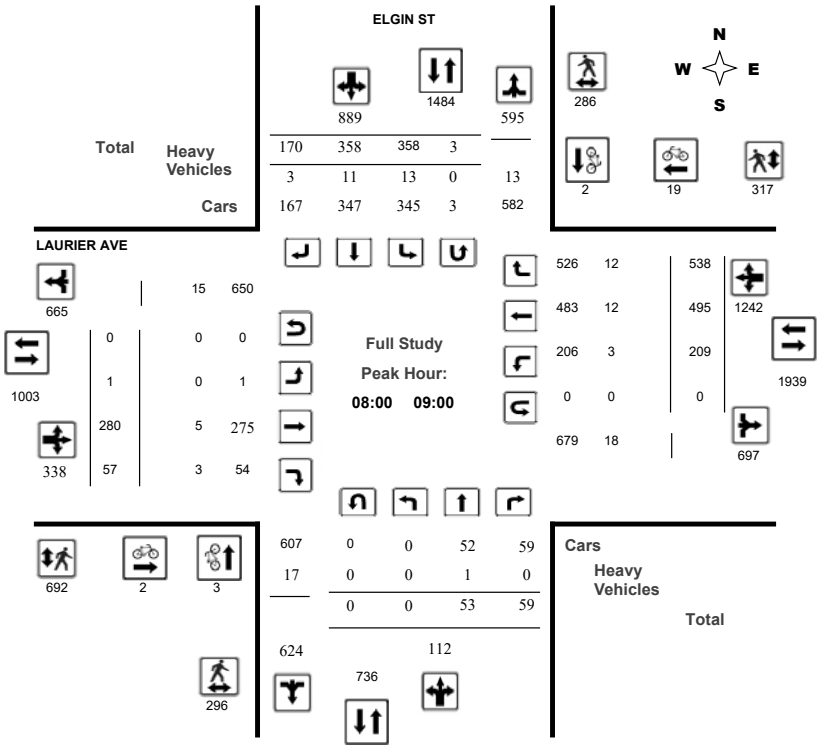
Turning Movement Count - Study Results

ELGIN ST @ LAURIER AVE

Survey Date: Wednesday, February 27, 2019 **WO No:** 38383

Start Time: 07:00 **Device:** Miovision

Full Study Peak Hour Diagram



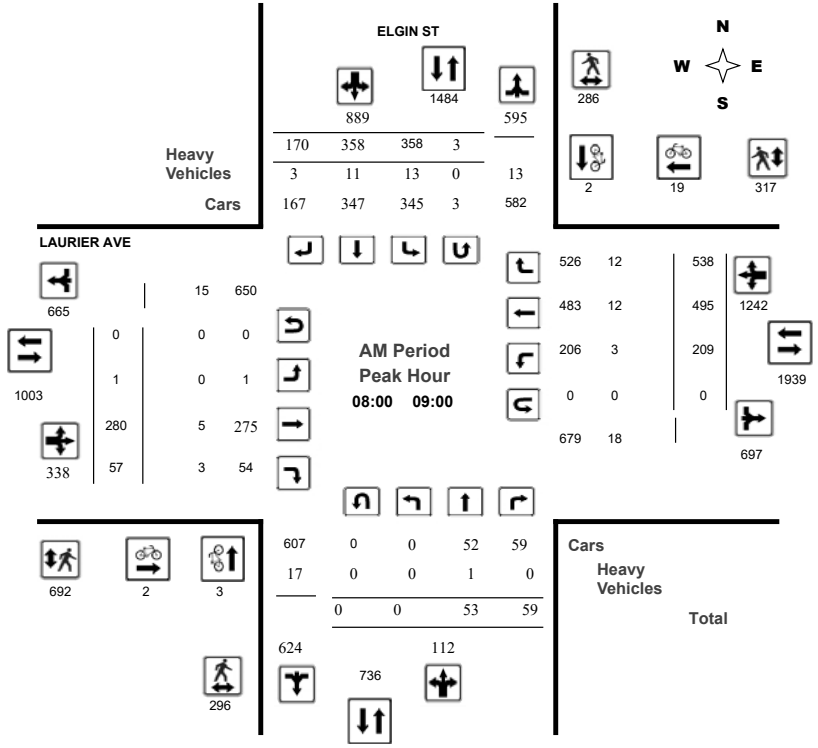
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ELGIN ST @ LAURIER AVE

Survey Date: Wednesday, February 27, 2019 **WO No:** 38383

Start Time: 07:00 **Device:** Miovision



Comments

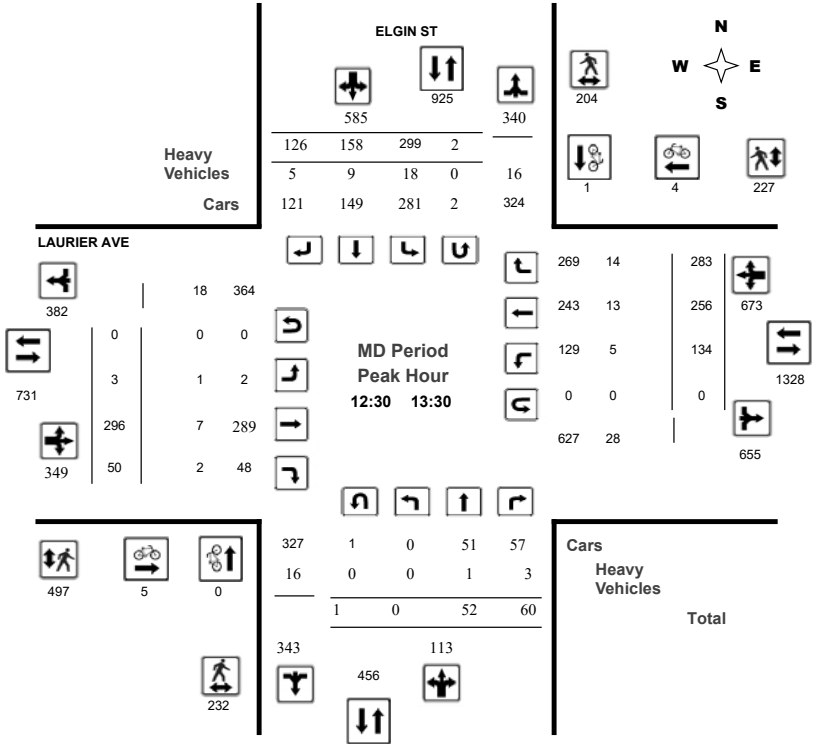
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ELGIN ST @ LAURIER AVE

Survey Date: Wednesday, February 27, 2019 **WO No:** 38383

Start Time: 07:00 **Device:** Miovision



Comments

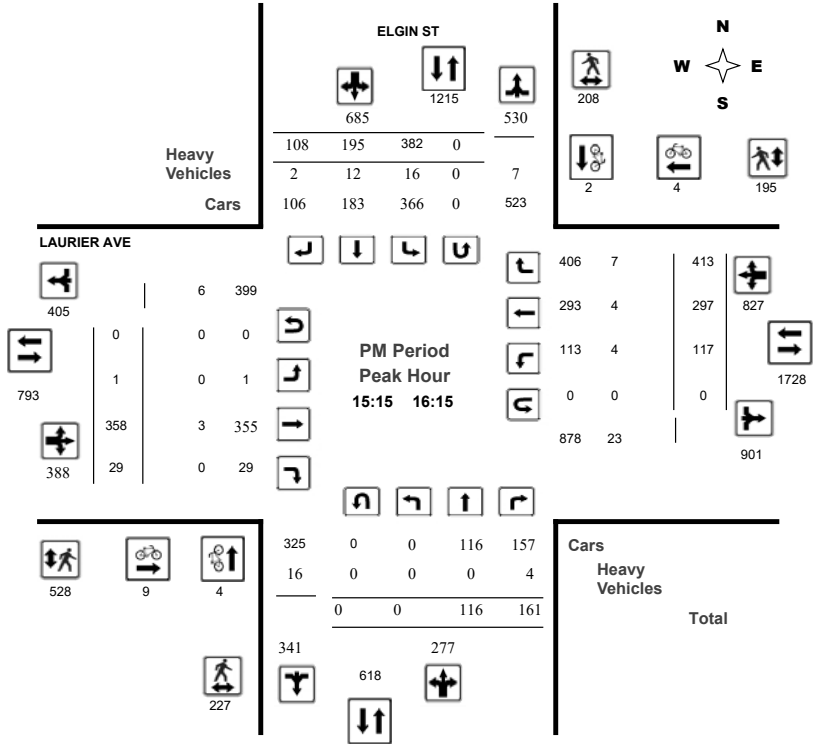
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ELGIN ST @ LAURIER AVE

Survey Date: Wednesday, February 27, 2019 **WO No:** 38383

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ELGIN ST @ LAURIER AVE

Survey Date: Wednesday, February 27, 2019 **WO No:** 38383

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, February 27, 2019

Total Observed U-Turns

Northbound: 1 Southbound: 17

Eastbound: 0 Westbound: 1

AADT Factor 1.00

	ELGIN ST								LAURIER AVE								
	Northbound				Southbound				Eastbound				Westbound				
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	0	45	56	**101**	274	227	138	**639**	**740**	0	260	40	**300**	188	484	470	**1142**	**1442**	**2182**
08:00 09:00	0	53	59	**112**	358	358	170	**886**	**998**	1	280	57	**338**	209	495	538	**1242**	**1580**	**2578**
09:00 10:00	0	45	70	**115**	285	277	170	**732**	**847**	1	273	61	**335**	200	418	445	**1063**	**1398**	**2245**
11:30 12:30	0	51	69	**120**	299	177	116	**592**	**712**	1	257	41	**299**	131	310	258	**699**	**998**	**1710**
12:30 13:30	0	52	60	**112**	299	158	126	**583**	**695**	3	296	50	**349**	134	256	283	**673**	**1022**	**1717**
15:00 16:00	0	102	148	**250**	402	184	99	**685**	**935**	1	377	29	**407**	130	294	367	**791**	**1198**	**2133**
16:00 17:00	0	158	172	**330**	343	184	123	**650**	**980**	1	366	19	**386**	109	288	390	**787**	**1173**	**2153**
17:00 18:00	0	102	146	**248**	394	161	127	**682**	**930**	0	342	24	**366**	125	277	326	**728**	**1094**	**2024**
Sub Total	0	608	780	**1388**	2654	1726	1069	**5449**	**6837**	8	2451	321	**2780**	1226	2822	3077	**7125**	**9905**	**16742**
U Turns	1			**1**	17			**17**	**18**	**0**			**0**	1			**1**	**1**	**19**
Total	1	608	780	**1389**	2671	1726	1069	**5466**	**6855**	8	2451	321	**2780**	1227	2822	3077	**7126**	**9906**	**16761**
EQ 12Hr	1	845	1084	**1930**	3713	2399	1486	**7598**	**9528**	11	3407	446	**3864**	1706	3923	4277	**9906**	**13770**	**23298**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	1	845	1084	**1930**	3713	2399	1486	**7598**	**9528**	11	3407	446	**3864**	1706	3923	4277	**9906**	**13770**	**23298**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**1.00**					
AVG 24Hr	1	1107	1420	**2528**	4864	3143	1947	**9954**	**12482**	14	4463	584	**5061**	2235	5139	5603	**12977**	**18038**	**30520**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ELGIN ST @ LAURIER AVE

Survey Date: Wednesday, February 27, 2019 **WO No:** 38383

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		ELGIN ST			LAURIER AVE			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	**0**	0	1	**1**	**1**
07:15	07:30	0	0	**0**	0	3	**3**	**3**
07:30	07:45	0	0	**0**	0	2	**2**	**2**
07:45	08:00	0	2	**2**	2	1	**3**	**5**
08:00	08:15	1	0	**1**	1	7	**8**	**9**
08:15	08:30	1	2	**3**	0	7	**7**	**10**
08:30	08:45	1	0	**1**	1	3	**4**	**5**
08:45	09:00	0	0	**0**	0	2	**2**	**2**
09:00	09:15	0	2	**2**	1	2	**3**	**5**
09:15	09:30	0	1	**1**	2	1	**3**	**4**
09:30	09:45	1	3	**4**	3	2	**5**	**9**
09:45	10:00	1	0	**1**	1	1	**2**	**3**
11:30	11:45	0	0	**0**	0	0	**0**	**0**
11:45	12:00	0	0	**0**	1	2	**3**	**3**
12:00	12:15	0	1	**1**	2	2	**4**	**5**
12:15	12:30	0	0	**0**	1	0	**1**	**1**
12:30	12:45	0	0	**0**	2	1	**3**	**3**
12:45	13:00	0	1	**1**	1	0	**1**	**2**
13:00	13:15	0	0	**0**	1	3	**4**	**4**
13:15	13:30	0	0	**0**	1	0	**1**	**1**
15:00	15:15	0	2	**2**	1	0	**1**	**3**
15:15	15:30	3	0	**3**	2	0	**2**	**5**
15:30	15:45	1	0	**1**	6	2	**8**	**9**
15:45	16:00	0	2	**2**	0	2	**2**	**4**
16:00	16:15	0	0	**0**	1	0	**1**	**1**
16:15	16:30	1	0	**1**	3	1	**4**	**5**
16:30	16:45	1	0	**1**	3	0	**3**	**4**
16:45	17:00	1	0	**1**	8	1	**9**	**10**
17:00	17:15	0	2	**2**	3	2	**5**	**7**
17:15	17:30	4	5	**9**	4	4	**8**	**17**
17:30	17:45	0	1	**1**	2	0	**2**	**3**
17:45	18:00	0	2	**2**	3	1	**4**	**6**
Total		16	26	**42**	56	53	**109**	**151**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ELGIN ST @ LAURIER AVE

Survey Date: Wednesday, February 27, 2019 **WO No:** 38383

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

Time Period		ELGIN ST			LAURIER AVE			
		NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00	07:15	17	25	**42**	64	17	**81**	**123**
07:15	07:30	23	19	**42**	90	10	**100**	**142**
07:30	07:45	41	45	**86**	129	32	**161**	**247**
07:45	08:00	67	46	**113**	137	49	**186**	**299**
08:00	08:15	63	51	**114**	148	54	**202**	**316**
08:15	08:30	67	68	**135**	174	90	**264**	**399**
08:30	08:45	74	81	**155**	184	93	**277**	**432**
08:45	09:00	92	86	**178**	186	80	**266**	**444**
09:00	09:15	65	61	**126**	140	62	**202**	**328**
09:15	09:30	49	42	**91**	101	60	**161**	**252**
09:30	09:45	51	25	**76**	80	42	**122**	**198**
09:45	10:00	37	29	**66**	74	39	**113**	**179**
11:30	11:45	52	35	**87**	91	34	**125**	**212**
11:45	12:00	54	51	**105**	130	43	**173**	**278**
12:00	12:15	56	68	**124**	136	59	**195**	**319**
12:15	12:30	61	68	**129**	165	58	**223**	**352**
12:30	12:45	59	45	**104**	139	57	**196**	**300**
12:45	13:00	61	72	**133**	134	59	**193**	**326**
13:00	13:15	58	52	**110**	118	53	**171**	**281**
13:15	13:30	54	35	**89**	106	58	**164**	**253**
15:00	15:15	45	29	**74**	62	40	**102**	**176**
15:15	15:30	57	55	**112**	120	39	**159**	**271**
15:30	15:45	49	40	**89**	105	42	**147**	**236**
15:45	16:00	51	56	**107**	126	59	**185**	**292**
16:00	16:15	70	57	**127**	177	55	**232**	**359**
16:15	16:30	61	67	**128**	164	61	**225**	**353**
16:30	16:45	63	95	**158**	179	64	**243**	**401**
16:45	17:00	52	88	**140**	168	72	**240**	**380**
17:00	17:15	68	101	**169**	202	80	**282**	**451**
17:15	17:30	59	68	**127**	169	80	**249**	**376**
17:30	17:45	67	49	**116**	178	64	**242**	**358**
17:45	18:00	57	50	**107**	109	57	**166**	**273**
Total	.....	1800	1759	**3559**	4285	1762	**6047**	**9606**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ELGIN ST @ LAURIER AVE

Survey Date: Wednesday, February 27, 2019 **WO No:** 38383

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		ELGIN ST									LAURIER AVE									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	1	0		3	3	2		**9**	0	2	0		2	3	5		**12**	**21**
07:15	07:30	0	1	0		5	3	0		**9**	0	1	0		1	2	3		**7**	**16**
07:30	07:45	0	0	0		2	2	0		**4**	0	2	0		1	3	2		**8**	**12**
07:45	08:00	0	0	1		6	1	1		**9**	0	1	2		3	2	4		**12**	**21**
08:00	08:15	0	1	0		5	3	0		**9**	0	1	1		1	3	5		**11**	**20**
08:15	08:30	0	0	0		3	3	1		**7**	0	1	1		1	2	1		**6**	**13**
08:30	08:45	0	0	0		2	1	1		**4**	0	1	0		0	0	2		**3**	**7**
08:45	09:00	0	0	0		3	4	1		**8**	0	2	1		1	7	4		**15**	**23**
09:00	09:15	0	1	1		8	3	1		**14**	0	1	1		2	6	10		**20**	**34**
09:15	09:30	0	0	0		2	4	0		**6**	0	1	1		2	4	5		**13**	**19**
09:30	09:45	0	1	1		3	6	3		**14**	0	1	1		1	3	6		**12**	**26**
09:45	10:00	0	0	1		4	3	2		**10**	0	2	2		3	4	3		**14**	**24**
11:30	11:45	0	0	0		2	3	1		**6**	0	0	0		2	3	2		**7**	**13**
11:45	12:00	0	0	0		5	1	2		**8**	0	2	1		1	5	1		**10**	**18**
12:00	12:15	0	0	0		5	1	2		**8**	0	2	1		1	3	0		**7**	**15**
12:15	12:30	0	1	0		4	2	2		**9**	0	1	0		1	3	4		**9**	**18**
12:30	12:45	0	0	1		4	2	4		**11**	1	2	0		0	0	2		**5**	**16**
12:45	13:00	0	1	1		5	2	0		**9**	0	1	1		0	3	3		**8**	**17**
13:00	13:15	0	0	0		4	4	0		**8**	0	2	1		3	5	3		**14**	**22**
13:15	13:30	0	0	1		5	1	1		**8**	0	2	0		2	5	6		**15**	**23**
15:00	15:15	0	0	0		6	2	0		**8**	0	1	0		3	0	3		**7**	**15**
15:15	15:30	0	0	2		6	4	1		**13**	0	0	0		4	0	2		**6**	**19**
15:30	15:45	0	0	1		2	2	1		**6**	0	1	0		0	3	4		**8**	**14**
15:45	16:00	0	0	1		3	3	0		**7**	0	0	0		0	1	1		**2**	**9**
16:00	16:15	0	0	0		5	3	0		**8**	0	2	0		0	0	0		**2**	**10**
16:15	16:30	0	0	0		5	3	2		**10**	0	1	0		0	1	4		**6**	**16**
16:30	16:45	0	0	3		2	1	1		**7**	0	0	1		0	1	1		**3**	**10**
16:45	17:00	0	0	0		4	2	0		**6**	0	0	0		0	4	3		**7**	**13**
17:00	17:15	0	0	1		1	2	0		**4**	0	0	0		0	0	2		**2**	**6**
17:15	17:30	0	0	0		2	4	0		**6**	0	0	0		0	0	0		**0**	**6**
17:30	17:45	0	0	0		1	3	0		**4**	0	0	0		0	1	0		**1**	**5**
17:45	18:00	0	0	0		0	1	0		**1**	0	0	0		0	1	0		**1**	**2**
Total:	None	0	7	15	**0**	117	82	29	**0**	**250**	1	33	15	**0**	35	78	91	**0**	**253**	**503**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ELGIN ST @ LAURIER AVE

Survey Date: Wednesday, February 27, 2019 **WO No:** 38383

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

		ELGIN ST	LAURIER AVE			
Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	**0**
07:15	07:30	0	0	0	0	**0**
07:30	07:45	0	0	0	0	**0**
07:45	08:00	0	0	0	0	**0**
08:00	08:15	0	0	0	0	**0**
08:15	08:30	0	0	0	0	**0**
08:30	08:45	0	1	0	0	**1**
08:45	09:00	0	2	0	0	**2**
09:00	09:15	0	1	0	1	**2**
09:15	09:30	0	2	0	0	**2**
09:30	09:45	0	0	0	0	**0**
09:45	10:00	0	2	0	0	**2**
11:30	11:45	0	1	0	0	**1**
11:45	12:00	0	2	0	0	**2**
12:00	12:15	0	1	0	0	**1**
12:15	12:30	0	0	0	0	**0**
12:30	12:45	1	0	0	0	**1**
12:45	13:00	0	0	0	0	**0**
13:00	13:15	0	1	0	0	**1**
13:15	13:30	0	1	0	0	**1**
15:00	15:15	0	0	0	0	**0**
15:15	15:30	0	0	0	0	**0**
15:30	15:45	0	0	0	0	**0**
15:45	16:00	0	0	0	0	**0**
16:00	16:15	0	0	0	0	**0**
16:15	16:30	0	0	0	0	**0**
16:30	16:45	0	0	0	0	**0**
16:45	17:00	0	0	0	0	**0**
17:00	17:15	0	2	0	0	**2**
17:15	17:30	0	0	0	0	**0**
17:30	17:45	0	0	0	0	**0**
17:45	18:00	0	1	0	0	**1**
Total		1	17	0	1	**19**

Transportation Services - Traffic Services

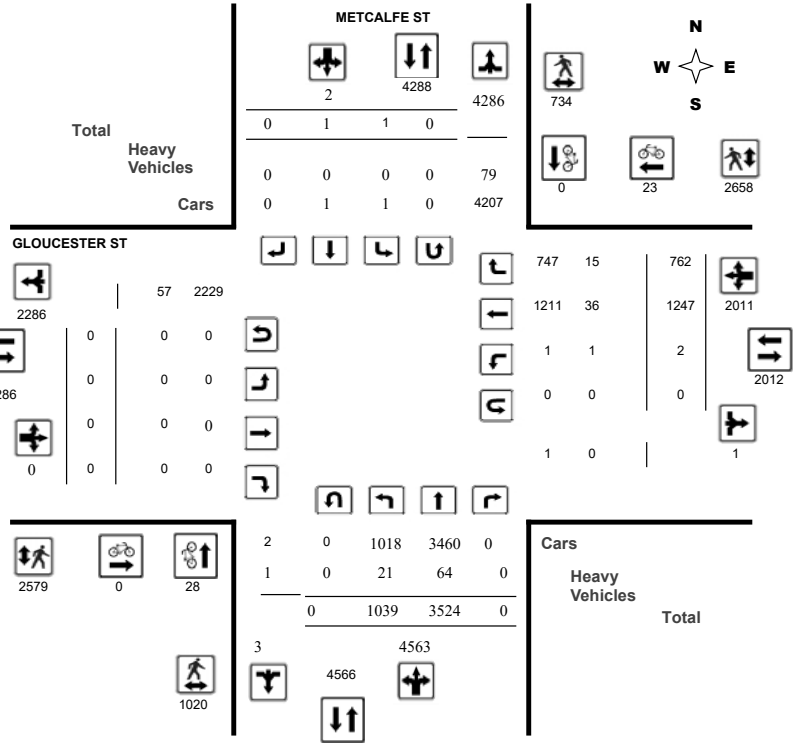
Turning Movement Count - Study Results

GLOUCESTER ST @ METCALFE ST

Survey Date: Tuesday, April 04, 2017 **WO No:** 36839

Start Time: 07:00 **Device:** Miovision

Full Study Diagram



Transportation Services - Traffic Services

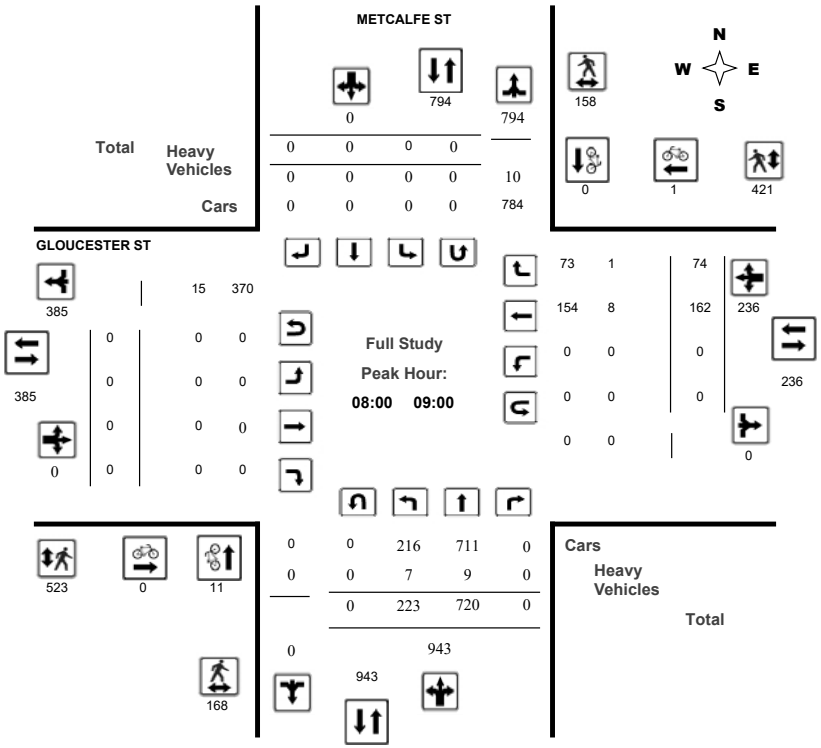
Turning Movement Count - Study Results

GLOUCESTER ST @ METCALFE ST

Survey Date: Tuesday, April 04, 2017 **WO No:** 36839

Start Time: 07:00 **Device:** Miovision

Full Study Peak Hour Diagram



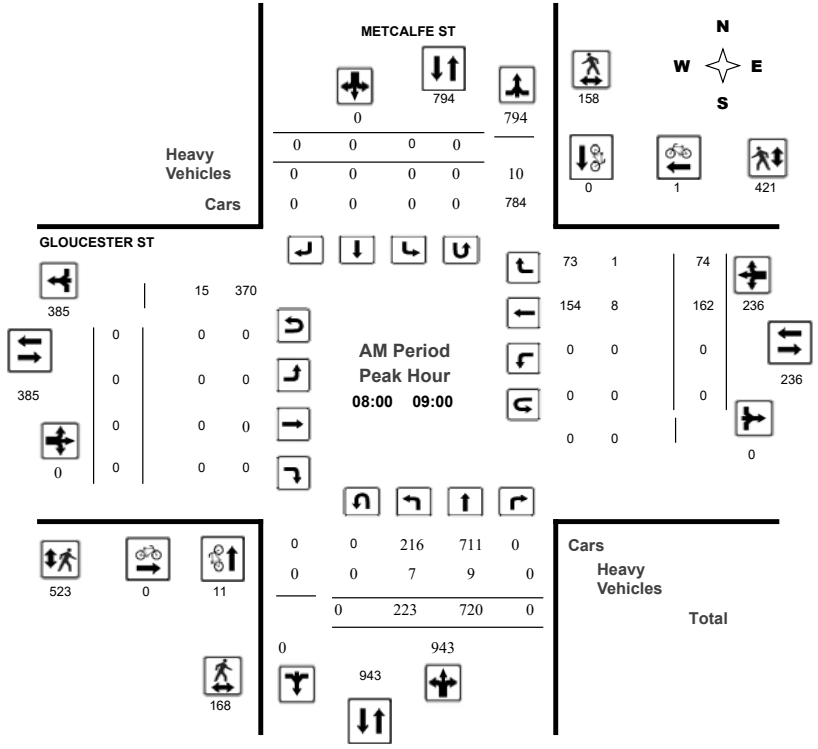
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

GLOUCESTER ST @ METCALFE ST

Survey Date: Tuesday, April 04, 2017 **WO No:** 36839

Start Time: 07:00 **Device:** Miovision



Comments

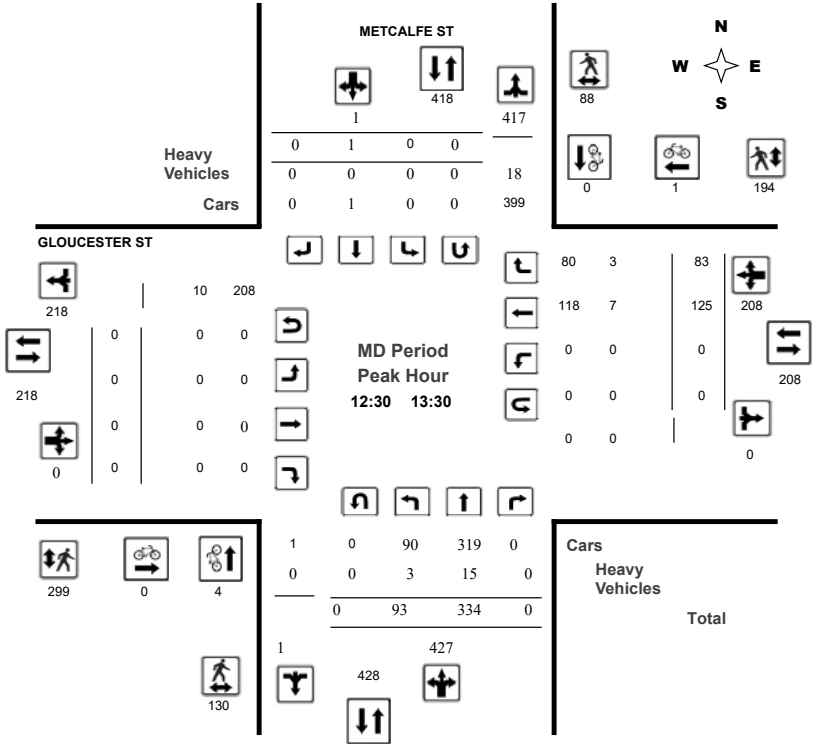
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

GLOUCESTER ST @ METCALFE ST

Survey Date: Tuesday, April 04, 2017 **WO No:** 36839

Start Time: 07:00 **Device:** Miovision



Comments

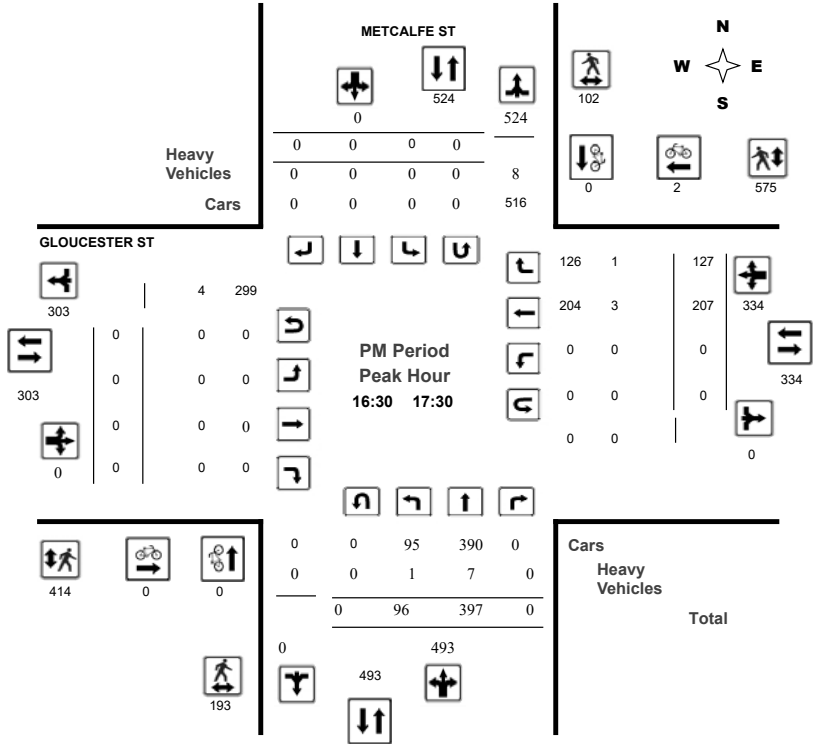
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

GLOUCESTER ST @ METCALFE ST

Survey Date: Tuesday, April 04, 2017 **WO No:** 36839

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GLOUCESTER ST @ METCALFE ST

Survey Date: Tuesday, April 04, 2017 **WO No:** 36839

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, April 04, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor .90

	METCALFE ST								GLOUCESTER ST								
	Northbound				Southbound				Eastbound				Westbound				
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	190	556	0	**746**	1	0	0	**1**	**747**	0	0	0	**0**	0	130	64	**194**	**194**	**941**
08:00 09:00	223	720	0	**943**	0	0	0	**0**	**943**	0	0	0	**0**	0	162	74	**236**	**236**	**1179**
09:00 10:00	161	518	0	**679**	0	0	0	**0**	**679**	0	0	0	**0**	1	166	88	**255**	**255**	**934**
11:30 12:30	109	326	0	**435**	0	0	0	**0**	**435**	0	0	0	**0**	0	107	79	**186**	**186**	**621**
12:30 13:30	93	334	0	**427**	0	1	0	**1**	**428**	0	0	0	**0**	0	125	83	**208**	**208**	**636**
15:00 16:00	84	303	0	**387**	0	0	0	**0**	**387**	0	0	0	**0**	1	165	114	**280**	**280**	**667**
16:00 17:00	91	376	0	**467**	0	0	0	**0**	**467**	0	0	0	**0**	0	190	146	**336**	**336**	**803**
17:00 18:00	88	391	0	**479**	0	0	0	**0**	**479**	0	0	0	**0**	0	202	114	**316**	**316**	**795**
Sub Total	1039	3524	0	**4563**	1	1	0	**2**	**4565**	0	0	0	**0**	2	1247	762	**2011**	**2011**	**6576**
U Turns	0			**0**	0			**0**	**0**	**0**			**0**	0			**0**	**0**	**0**
Total	1039	3524	0	**4563**	1	1	0	**2**	**4565**	0	0	0	**0**	2	1247	762	**2011**	**2011**	**6576**
EQ 12Hr	1444	4898	0	**6342**	1	1	0	**2**	**6344**	0	0	0	**0**	3	1733	1059	**2795**	**2795**	**9139**

Note: These values are calculated by multiplying the totals by the appropriate expansion factor. **1.39**

AVG 12Hr	1300	4408	0	**5708**	1	1	0	**2**	**5710**	0	0	0	**0**	3	1560	953	**2516**	**2516**	**8226**

Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **.90**

AVG 24Hr	1703	5774	0	**7477**	1	1	0	**2**	**7479**	0	0	0	**0**	4	2044	1248	**3296**	**3296**	**10775**

Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. **1.31**

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GLOUCESTER ST @ METCALFE ST

Survey Date: Tuesday, April 04, 2017 **WO No:** 36839

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		METCALFE ST Northbound	METCALFE ST Southbound	METCALFE ST Street Total	GLOUCESTER ST Eastbound	GLOUCESTER ST Westbound	GLOUCESTER ST Street Total	Grand Total
07:00	07:15	1	0	**1**	0	0	**0**	**1**
07:15	07:30	0	0	**0**	0	1	**1**	**1**
07:30	07:45	2	0	**2**	0	0	**0**	**2**
07:45	08:00	0	0	**0**	0	0	**0**	**0**
08:00	08:15	2	0	**2**	0	0	**0**	**2**
08:15	08:30	4	0	**4**	0	0	**0**	**4**
08:30	08:45	0	0	**0**	0	0	**0**	**0**
08:45	09:00	5	0	**5**	0	1	**1**	**6**
09:00	09:15	0	0	**0**	0	2	**2**	**2**
09:15	09:30	3	0	**3**	0	0	**0**	**3**
09:30	09:45	0	0	**0**	0	0	**0**	**0**
09:45	10:00	1	0	**1**	0	0	**0**	**1**
11:30	11:45	0	0	**0**	0	0	**0**	**0**
11:45	12:00	0	0	**0**	0	1	**1**	**1**
12:00	12:15	0	0	**0**	0	3	**3**	**3**
12:15	12:30	0	0	**0**	0	2	**2**	**2**
12:30	12:45	0	0	**0**	0	1	**1**	**1**
12:45	13:00	2	0	**2**	0	0	**0**	**2**
13:00	13:15	0	0	**0**	0	0	**0**	**0**
13:15	13:30	2	0	**2**	0	0	**0**	**2**
15:00	15:15	1	0	**1**	0	1	**1**	**2**
15:15	15:30	1	0	**1**	0	1	**1**	**2**
15:30	15:45	2	0	**2**	0	1	**1**	**3**
15:45	16:00	1	0	**1**	0	2	**2**	**3**
16:00	16:15	0	0	**0**	0	0	**0**	**0**
16:15	16:30	0	0	**0**	0	3	**3**	**3**
16:30	16:45	0	0	**0**	0	2	**2**	**2**
16:45	17:00	0	0	**0**	0	0	**0**	**0**
17:00	17:15	0	0	**0**	0	0	**0**	**0**
17:15	17:30	0	0	**0**	0	0	**0**	**0**
17:30	17:45	0	0	**0**	0	2	**2**	**2**
17:45	18:00	1	0	**1**	0	0	**0**	**1**
Total		28	0	**28**	0	23	**23**	**51**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GLOUCESTER ST @ METCALFE ST

Survey Date: Tuesday, April 04, 2017 **WO No:** 36839

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

Time Period		METCALFE ST NB Approach (E or W Crossing)	METCALFE ST SB Approach (E or W Crossing)	METCALFE ST Total	GLOUCESTER ST EB Approach (N or S Crossing)	GLOUCESTER ST WB Approach (N or S Crossing)	GLOUCESTER ST Total	Grand Total
07:00	07:15	11	14	**25**	45	55	**100**	**125**
07:15	07:30	18	19	**37**	59	57	**116**	**153**
07:30	07:45	27	12	**39**	86	73	**159**	**198**
07:45	08:00	32	22	**54**	105	93	**198**	**252**
08:00	08:15	34	29	**63**	96	110	**206**	**269**
08:15	08:30	43	33	**76**	128	95	**223**	**299**
08:30	08:45	42	53	**95**	142	101	**243**	**338**
08:45	09:00	49	43	**92**	157	115	**272**	**364**
09:00	09:15	39	27	**66**	91	65	**156**	**222**
09:15	09:30	25	27	**52**	85	75	**160**	**212**
09:30	09:45	15	19	**34**	70	59	**129**	**163**
09:45	10:00	16	16	**32**	46	48	**94**	**126**
11:30	11:45	24	10	**34**	38	58	**96**	**130**
11:45	12:00	29	28	**57**	47	50	**97**	**154**
12:00	12:15	30	25	**55**	59	65	**124**	**179**
12:15	12:30	28	19	**47**	66	61	**127**	**174**
12:30	12:45	35	21	**56**	88	44	**132**	**188**
12:45	13:00	27	20	**47**	77	42	**119**	**166**
13:00	13:15	40	31	**71**	80	54	**134**	**205**
13:15	13:30	28	16	**44**	54	54	**108**	**152**
15:00	15:15	30	15	**45**	71	50	**121**	**166**
15:15	15:30	38	16	**54**	47	66	**113**	**167**
15:30	15:45	32	12	**44**	57	69	**126**	**170**
15:45	16:00	25	11	**36**	61	81	**142**	**178**
16:00	16:15	31	20	**51**	70	162	**232**	**283**
16:15	16:30	28	30	**58**	76	104	**180**	**238**
16:30	16:45	48	26	**74**	114	139	**253**	**327**
16:45	17:00	38	25	**63**	93	121	**214**	**277**
17:00	17:15	56	29	**85**	101	168	**269**	**354**
17:15	17:30	51	22	**73**	106	147	**253**	**326**
17:30	17:45	33	26	**59**	77	91	**168**	**227**
17:45	18:00	18	18	**36**	87	86	**173**	**209**
Total	.....	1020	734	**1754**	2579	2658	**5237**	**6991**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GLOUCESTER ST @ METCALFE ST

Survey Date: Tuesday, April 04, 2017 **WO No:** 36839

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		METCALFE ST									GLOUCESTER ST									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	0	0		0	0	0		**0**	0	0	0		0	1	0		**1**	**1**
07:15	07:30	0	1	0		0	0	0		**1**	0	0	0		0	1	0		**1**	**2**
07:30	07:45	1	2	0		0	0	0		**3**	0	0	0		0	3	0		**3**	**6**
07:45	08:00	1	2	0		0	0	0		**3**	0	0	0		0	1	0		**1**	**4**
08:00	08:15	1	4	0		0	0	0		**5**	0	0	0		0	2	0		**2**	**7**
08:15	08:30	5	1	0		0	0	0		**6**	0	0	0		0	1	1		**2**	**8**
08:30	08:45	1	3	0		0	0	0		**4**	0	0	0		0	4	0		**4**	**8**
08:45	09:00	0	1	0		0	0	0		**1**	0	0	0		0	1	0		**1**	**2**
09:00	09:15	0	1	0		0	0	0		**1**	0	0	0		1	3	0		**4**	**5**
09:15	09:30	0	3	0		0	0	0		**3**	0	0	0		0	2	1		**3**	**6**
09:30	09:45	1	4	0		0	0	0		**5**	0	0	0		0	0	1		**1**	**6**
09:45	10:00	2	2	0		0	0	0		**4**	0	0	0		0	2	2		**4**	**8**
11:30	11:45	0	2	0		0	0	0		**2**	0	0	0		0	1	0		**1**	**3**
11:45	12:00	1	1	0		0	0	0		**2**	0	0	0		0	0	2		**2**	**4**
12:00	12:15	0	3	0		0	0	0		**3**	0	0	0		0	1	0		**1**	**4**
12:15	12:30	0	2	0		0	0	0		**2**	0	0	0		0	0	0		**0**	**2**
12:30	12:45	1	7	0		0	0	0		**8**	0	0	0		0	1	0		**1**	**9**
12:45	13:00	2	4	0		0	0	0		**6**	0	0	0		0	3	0		**3**	**9**
13:00	13:15	0	4	0		0	0	0		**4**	0	0	0		0	1	0		**1**	**5**
13:15	13:30	0	0	0		0	0	0		**0**	0	0	0		0	2	3		**5**	**5**
15:00	15:15	1	3	0		0	0	0		**4**	0	0	0		0	2	1		**3**	**7**
15:15	15:30	0	2	0		0	0	0		**2**	0	0	0		0	0	0		**0**	**2**
15:30	15:45	1	1	0		0	0	0		**2**	0	0	0		0	0	0		**0**	**2**
15:45	16:00	0	1	0		0	0	0		**1**	0	0	0		0	1	2		**3**	**4**
16:00	16:15	0	3	0		0	0	0		**3**	0	0	0		0	0	1		**1**	**4**
16:15	16:30	1	0	0		0	0	0		**1**	0	0	0		0	0	0		**0**	**1**
16:30	16:45	1	1	0		0	0	0		**2**	0	0	0		0	0	0		**0**	**2**
16:45	17:00	0	2	0		0	0	0		**2**	0	0	0		0	0	0		**0**	**2**
17:00	17:15	0	2	0		0	0	0		**2**	0	0	0		0	2	1		**3**	**5**
17:15	17:30	0	2	0		0	0	0		**2**	0	0	0		0	1	0		**1**	**3**
17:30	17:45	0	0	0		0	0	0		**0**	0	0	0		0	0	0		**0**	**0**
17:45	18:00	1	0	0		0	0	0		**1**	0	0	0		0	0	0		**0**	**1**
Total:	None	21	64	0	**0**	0	0	0	**0**	**85**	0	0	0	**0**	1	36	15	**0**	**52**	**137**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

GLOUCESTER ST @ METCALFE ST

Survey Date: Tuesday, April 04, 2017 **WO No:** 36839

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

		METCALFE ST	METCALFE ST	GLOUCESTER ST	GLOUCESTER ST	
Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	**0**
07:15	07:30	0	0	0	0	**0**
07:30	07:45	0	0	0	0	**0**
07:45	08:00	0	0	0	0	**0**
08:00	08:15	0	0	0	0	**0**
08:15	08:30	0	0	0	0	**0**
08:30	08:45	0	0	0	0	**0**
08:45	09:00	0	0	0	0	**0**
09:00	09:15	0	0	0	0	**0**
09:15	09:30	0	0	0	0	**0**
09:30	09:45	0	0	0	0	**0**
09:45	10:00	0	0	0	0	**0**
11:30	11:45	0	0	0	0	**0**
11:45	12:00	0	0	0	0	**0**
12:00	12:15	0	0	0	0	**0**
12:15	12:30	0	0	0	0	**0**
12:30	12:45	0	0	0	0	**0**
12:45	13:00	0	0	0	0	**0**
13:00	13:15	0	0	0	0	**0**
13:15	13:30	0	0	0	0	**0**
15:00	15:15	0	0	0	0	**0**
15:15	15:30	0	0	0	0	**0**
15:30	15:45	0	0	0	0	**0**
15:45	16:00	0	0	0	0	**0**
16:00	16:15	0	0	0	0	**0**
16:15	16:30	0	0	0	0	**0**
16:30	16:45	0	0	0	0	**0**
16:45	17:00	0	0	0	0	**0**
17:00	17:15	0	0	0	0	**0**
17:15	17:30	0	0	0	0	**0**
17:30	17:45	0	0	0	0	**0**
17:45	18:00	0	0	0	0	**0**
Total		0	0	0	0	**0**

Transportation Services - Traffic Services

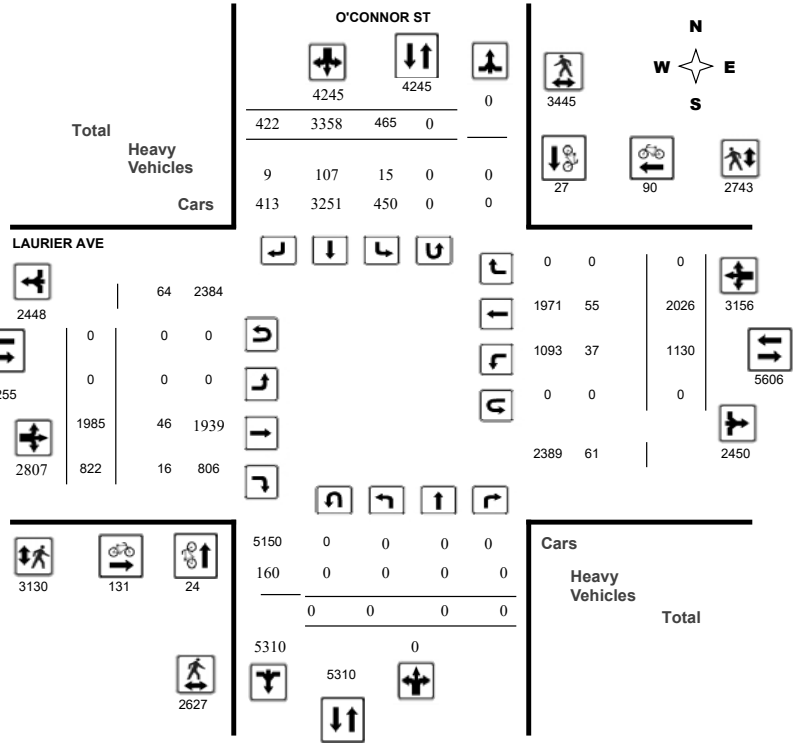
Turning Movement Count - Study Results

LAURIER AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36788

Start Time: 07:00 **Device:** Miovision

Full Study Diagram



Transportation Services - Traffic Services

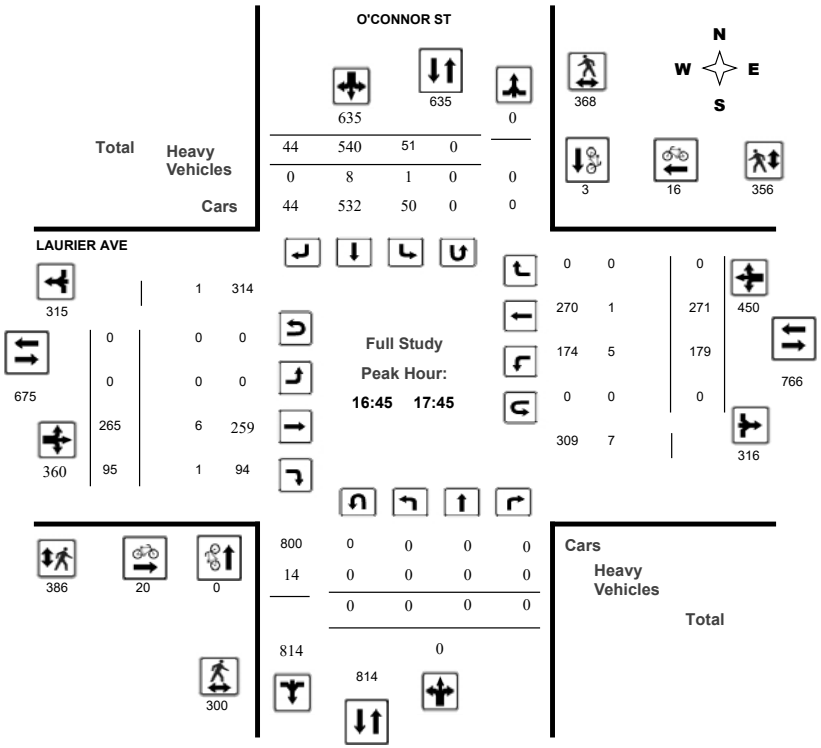
Turning Movement Count - Study Results

LAURIER AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36788

Start Time: 07:00 **Device:** Miovision

Full Study Peak Hour Diagram



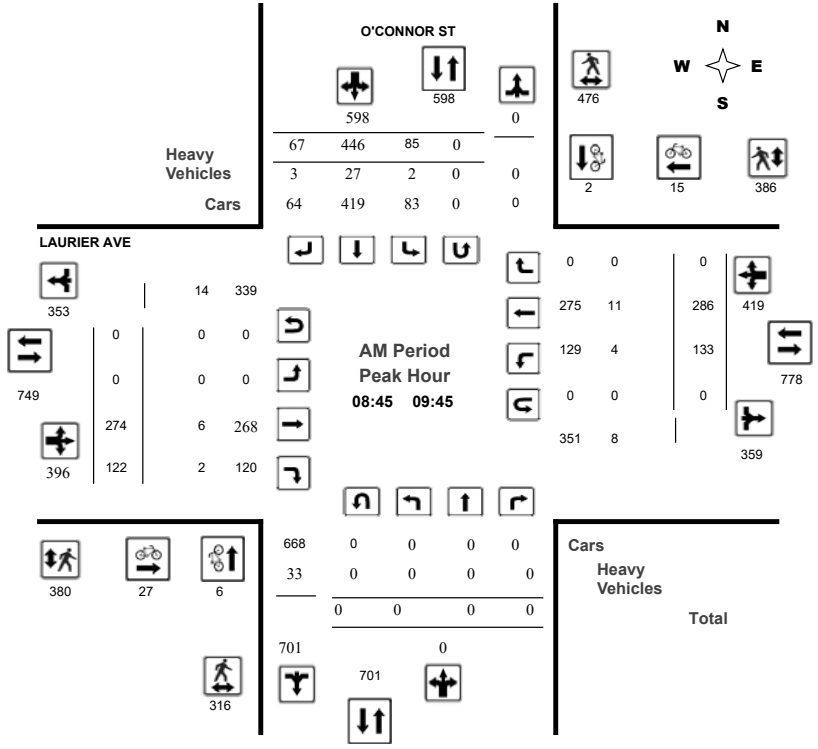
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

LAURIER AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36788

Start Time: 07:00 **Device:** Miovision



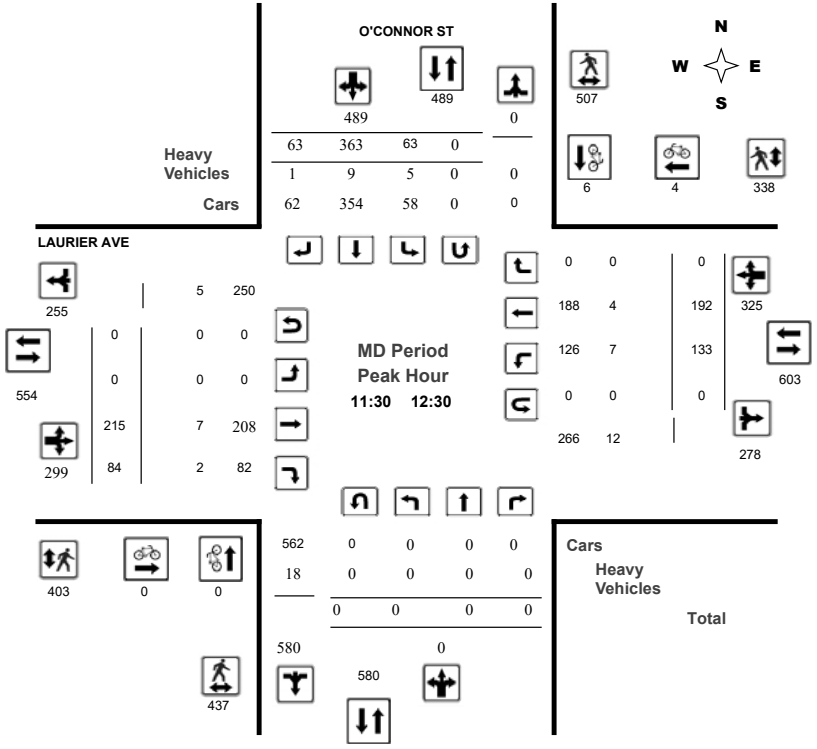
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

LAURIER AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36788

Start Time: 07:00 **Device:** Miovision



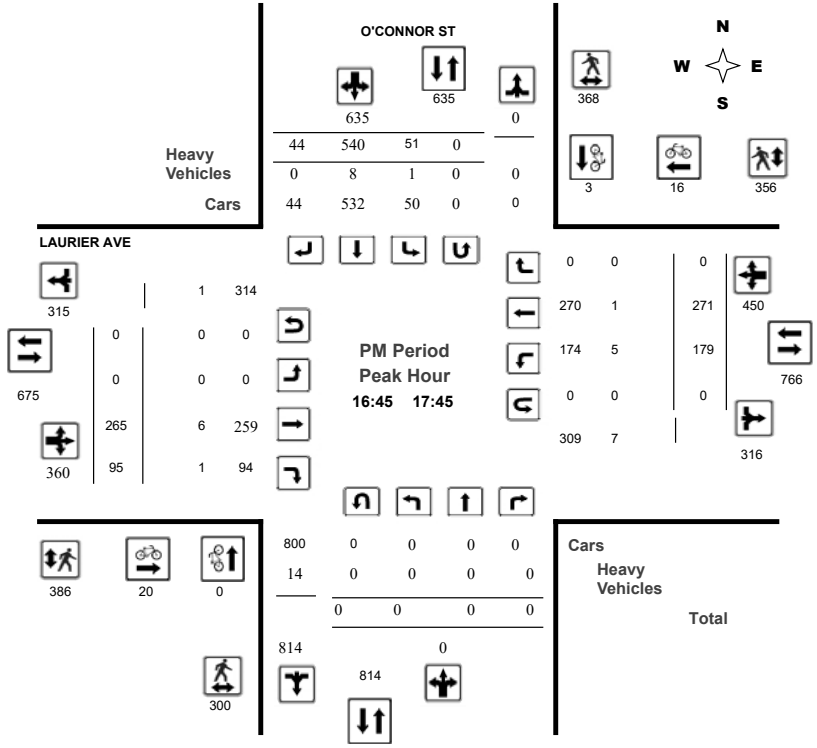
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

LAURIER AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36788

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

LAURIER AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36788

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, March 21, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor 1.00

	O'CONNOR ST								LAURIER AVE								
	Northbound				Southbound				Eastbound				Westbound				
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	0	0	0	**0**	48	338	45	**431**	**431**	0	239	117	**356**	103	302	0	**405**	**761**	**1192**
08:00 09:00	0	0	0	**0**	55	380	68	**503**	**503**	0	272	126	**398**	124	294	0	**418**	**816**	**1319**
09:00 10:00	0	0	0	**0**	86	456	76	**618**	**618**	0	257	121	**378**	137	274	0	**411**	**789**	**1407**
11:30 12:30	0	0	0	**0**	63	363	63	**489**	**489**	0	215	84	**299**	133	192	0	**325**	**624**	**1113**
12:30 13:30	0	0	0	**0**	50	320	48	**418**	**418**	0	228	87	**315**	119	180	0	**299**	**614**	**1032**
15:00 16:00	0	0	0	**0**	65	473	38	**576**	**576**	0	265	106	**371**	154	273	0	**427**	**798**	**1374**
16:00 17:00	0	0	0	**0**	43	506	43	**592**	**592**	0	252	97	**349**	183	238	0	**421**	**770**	**1362**
17:00 18:00	0	0	0	**0**	55	522	41	**618**	**618**	0	257	84	**341**	177	273	0	**450**	**791**	**1409**
Sub Total	0	0	0	**0**	465	3358	422	**4245**	**4245**	0	1985	822	**2807**	1130	2026	0	**3156**	**5963**	**10208**
U Turns	0			**0**	0			**0**	**0**	**0**			**0**	0			**0**	**0**	**0**
Total	0	0	0	**0**	465	3358	422	**4245**	**4245**	0	1985	822	**2807**	1130	2026	0	**3156**	**5963**	**10208**
EQ 12Hr	0	0	0	**0**	646	4668	587	**5901**	**5901**	0	2759	1143	**3902**	1571	2816	0	**4387**	**8289**	**14190**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	0	0	0	**0**	646	4668	587	**5901**	**5901**	0	2759	1143	**3902**	1571	2816	0	**4387**	**8289**	**14190**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**1.00**					
AVG 24Hr	0	0	0	**0**	846	6115	769	**7730**	**7730**	0	3614	1497	**5111**	2058	3689	0	**5747**	**10858**	**18588**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

LAURIER AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36788

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		O'CONNOR ST Northbound	O'CONNOR ST Southbound	O'CONNOR ST Street Total	LAURIER AVE Eastbound	LAURIER AVE Westbound	LAURIER AVE Street Total	Grand Total
07:00	07:15	0	0	**0**	1	1	**2**	**2**
07:15	07:30	1	0	**1**	2	6	**8**	**9**
07:30	07:45	1	0	**1**	3	1	**4**	**5**
07:45	08:00	1	1	**2**	4	1	**5**	**7**
08:00	08:15	1	0	**1**	4	8	**12**	**13**
08:15	08:30	2	0	**2**	9	10	**19**	**21**
08:30	08:45	7	2	**9**	10	6	**16**	**25**
08:45	09:00	0	1	**1**	16	9	**25**	**26**
09:00	09:15	3	1	**4**	3	1	**4**	**8**
09:15	09:30	2	0	**2**	4	4	**8**	**10**
09:30	09:45	1	0	**1**	4	1	**5**	**6**
09:45	10:00	0	1	**1**	2	5	**7**	**8**
11:30	11:45	0	2	**2**	0	0	**0**	**2**
11:45	12:00	0	2	**2**	0	0	**0**	**2**
12:00	12:15	0	2	**2**	0	1	**1**	**3**
12:15	12:30	0	0	**0**	0	3	**3**	**3**
12:30	12:45	1	0	**1**	4	2	**6**	**7**
12:45	13:00	0	0	**0**	2	0	**2**	**2**
13:00	13:15	0	1	**1**	2	1	**3**	**4**
13:15	13:30	0	0	**0**	2	0	**2**	**2**
15:00	15:15	0	1	**1**	5	0	**5**	**6**
15:15	15:30	0	2	**2**	7	1	**8**	**10**
15:30	15:45	0	1	**1**	4	4	**8**	**9**
15:45	16:00	0	1	**1**	0	4	**4**	**5**
16:00	16:15	4	2	**6**	6	0	**6**	**12**
16:15	16:30	0	1	**1**	5	1	**6**	**7**
16:30	16:45	0	2	**2**	7	0	**7**	**9**
16:45	17:00	0	1	**1**	4	0	**4**	**5**
17:00	17:15	0	0	**0**	7	4	**11**	**11**
17:15	17:30	0	0	**0**	5	3	**8**	**8**
17:30	17:45	0	2	**2**	4	9	**13**	**15**
17:45	18:00	0	1	**1**	5	4	**9**	**10**
Total		24	27	**51**	131	90	**221**	**272**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

LAURIER AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36788

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

Time Period		O'CONNOR ST NB Approach (E or W Crossing)	O'CONNOR ST SB Approach (E or W Crossing)	O'CONNOR ST Total	LAURIER AVE EB Approach (N or S Crossing)	LAURIER AVE WB Approach (N or S Crossing)	LAURIER AVE Total	Grand Total
07:00	07:15	30	41	**71**	45	28	**73**	**144**
07:15	07:30	58	59	**117**	59	51	**110**	**227**
07:30	07:45	45	64	**109**	66	62	**128**	**237**
07:45	08:00	66	88	**154**	91	105	**196**	**350**
08:00	08:15	84	124	**208**	119	105	**224**	**432**
08:15	08:30	67	131	**198**	120	132	**252**	**450**
08:30	08:45	133	148	**281**	144	138	**282**	**563**
08:45	09:00	120	170	**290**	113	144	**257**	**547**
09:00	09:15	88	110	**198**	102	108	**210**	**408**
09:15	09:30	75	100	**175**	90	89	**179**	**354**
09:30	09:45	33	96	**129**	75	45	**120**	**249**
09:45	10:00	65	63	**128**	77	58	**135**	**263**
11:30	11:45	71	83	**154**	80	57	**137**	**291**
11:45	12:00	116	121	**237**	101	78	**179**	**416**
12:00	12:15	134	156	**290**	126	116	**242**	**532**
12:15	12:30	116	147	**263**	96	87	**183**	**446**
12:30	12:45	121	169	**290**	124	106	**230**	**520**
12:45	13:00	128	148	**276**	115	122	**237**	**513**
13:00	13:15	124	124	**248**	103	89	**192**	**440**
13:15	13:30	93	101	**194**	88	94	**182**	**376**
15:00	15:15	64	97	**161**	96	69	**165**	**326**
15:15	15:30	53	88	**141**	73	45	**118**	**259**
15:30	15:45	64	89	**153**	77	63	**140**	**293**
15:45	16:00	59	121	**180**	110	77	**187**	**367**
16:00	16:15	93	132	**225**	140	90	**230**	**455**
16:15	16:30	75	112	**187**	112	82	**194**	**381**
16:30	16:45	91	131	**222**	118	94	**212**	**434**
16:45	17:00	87	105	**192**	104	80	**184**	**376**
17:00	17:15	84	97	**181**	113	108	**221**	**402**
17:15	17:30	67	86	**153**	85	95	**180**	**333**
17:30	17:45	62	80	**142**	84	73	**157**	**299**
17:45	18:00	61	64	**125**	84	53	**137**	**262**
Total	.....	2627	3445	**6072**	3130	2743	**5873**	**11945**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

LAURIER AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36788

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		O'CONNOR ST									LAURIER AVE									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	0	0		0	8	0		**8**	0	1	1		1	0	0		**3**	**11**
07:15	07:30	0	0	0		2	5	0		**7**	0	3	0		2	3	0		**8**	**15**
07:30	07:45	0	0	0		0	3	0		**3**	0	0	0		1	2	0		**3**	**6**
07:45	08:00	0	0	0		1	5	0		**6**	0	1	1		0	1	0		**3**	**9**
08:00	08:15	0	0	0		0	6	0		**6**	0	2	0		1	3	0		**6**	**12**
08:15	08:30	0	0	0		1	6	0		**7**	0	1	0		1	3	0		**5**	**12**
08:30	08:45	0	0	0		0	4	1		**5**	0	1	2		2	1	0		**6**	**11**
08:45	09:00	0	0	0		0	5	1		**6**	0	2	1		0	4	0		**7**	**13**
09:00	09:15	0	0	0		1	7	0		**8**	0	3	0		0	3	0		**6**	**14**
09:15	09:30	0	0	0		0	8	1		**9**	0	1	1		1	3	0		**6**	**15**
09:30	09:45	0	0	0		1	7	1		**9**	0	0	0		3	1	0		**4**	**13**
09:45	10:00	0	0	0		0	3	1		**4**	0	2	0		1	3	0		**6**	**10**
11:30	11:45	0	0	0		2	4	1		**7**	0	0	1		2	2	0		**5**	**12**
11:45	12:00	0	0	0		0	1	0		**1**	0	3	1		2	2	0		**8**	**9**
12:00	12:15	0	0	0		1	2	0		**3**	0	1	0		0	0	0		**1**	**4**
12:15	12:30	0	0	0		2	2	0		**4**	0	3	0		3	0	0		**6**	**10**
12:30	12:45	0	0	0		0	2	0		**2**	0	2	0		1	2	0		**5**	**7**
12:45	13:00	0	0	0		2	5	0		**7**	0	1	0		1	3	0		**5**	**12**
13:00	13:15	0	0	0		0	3	1		**4**	0	4	2		3	2	0		**11**	**15**
13:15	13:30	0	0	0		0	1	1		**2**	0	3	1		3	3	0		**10**	**12**
15:00	15:15	0	0	0		0	1	1		**2**	0	0	0		1	2	0		**3**	**5**
15:15	15:30	0	0	0		1	1	0		**2**	0	1	2		0	2	0		**5**	**7**
15:30	15:45	0	0	0		0	1	0		**1**	0	0	0		0	2	0		**2**	**3**
15:45	16:00	0	0	0		0	3	0		**3**	0	1	0		2	4	0		**7**	**10**
16:00	16:15	0	0	0		0	0	0		**0**	0	2	1		0	0	0		**3**	**3**
16:15	16:30	0	0	0		0	4	0		**4**	0	2	0		0	1	0		**3**	**7**
16:30	16:45	0	0	0		0	0	0		**0**	0	0	1		1	2	0		**4**	**4**
16:45	17:00	0	0	0		0	3	0		**3**	0	0	0		1	1	0		**2**	**5**
17:00	17:15	0	0	0		0	2	0		**2**	0	1	1		2	0	0		**4**	**6**
17:15	17:30	0	0	0		1	2	0		**3**	0	1	0		1	0	0		**2**	**5**
17:30	17:45	0	0	0		0	1	0		**1**	0	4	0		1	0	0		**5**	**6**
17:45	18:00	0	0	0		0	2	0		**2**	0	0	0		0	0	0		**0**	**2**
Total:	None	0	0	0	**0**	15	107	9	**0**	**131**	0	46	16	**0**	37	55	0	**0**	**154**	**285**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

LAURIER AVE @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36788

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

		O'CONNOR ST	LAURIER AVE			
Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	**0**
07:15	07:30	0	0	0	0	**0**
07:30	07:45	0	0	0	0	**0**
07:45	08:00	0	0	0	0	**0**
08:00	08:15	0	0	0	0	**0**
08:15	08:30	0	0	0	0	**0**
08:30	08:45	0	0	0	0	**0**
08:45	09:00	0	0	0	0	**0**
09:00	09:15	0	0	0	0	**0**
09:15	09:30	0	0	0	0	**0**
09:30	09:45	0	0	0	0	**0**
09:45	10:00	0	0	0	0	**0**
11:30	11:45	0	0	0	0	**0**
11:45	12:00	0	0	0	0	**0**
12:00	12:15	0	0	0	0	**0**
12:15	12:30	0	0	0	0	**0**
12:30	12:45	0	0	0	0	**0**
12:45	13:00	0	0	0	0	**0**
13:00	13:15	0	0	0	0	**0**
13:15	13:30	0	0	0	0	**0**
15:00	15:15	0	0	0	0	**0**
15:15	15:30	0	0	0	0	**0**
15:30	15:45	0	0	0	0	**0**
15:45	16:00	0	0	0	0	**0**
16:00	16:15	0	0	0	0	**0**
16:15	16:30	0	0	0	0	**0**
16:30	16:45	0	0	0	0	**0**
16:45	17:00	0	0	0	0	**0**
17:00	17:15	0	0	0	0	**0**
17:15	17:30	0	0	0	0	**0**
17:30	17:45	0	0	0	0	**0**
17:45	18:00	0	0	0	0	**0**
Total		0	0	0	0	**0**

Transportation Services - Traffic Services

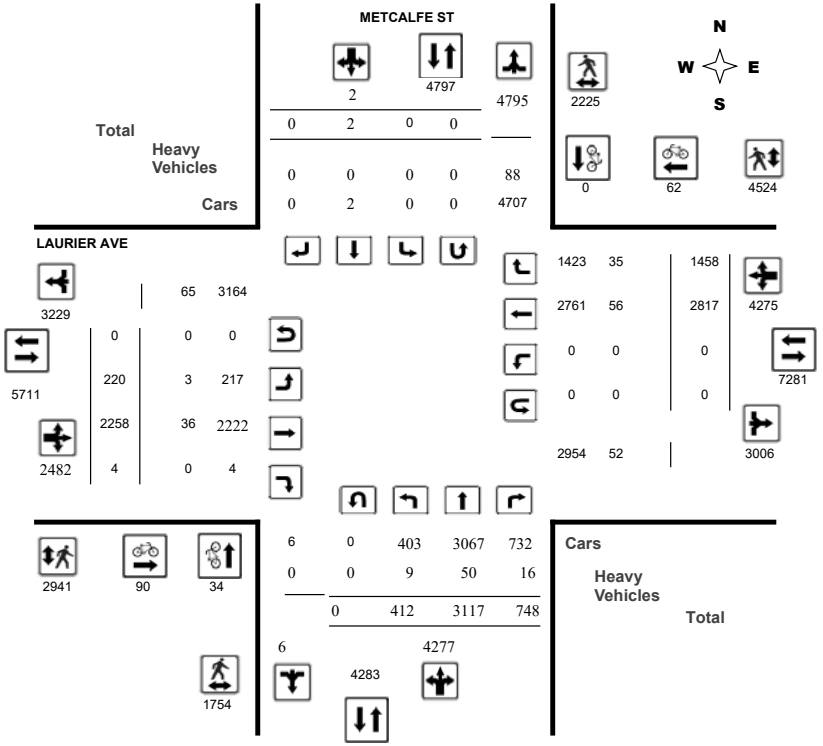
Turning Movement Count - Study Results

METCALFE ST @ LAURIER AVE

Survey Date: Tuesday, April 04, 2017 **WO No:** 36840

Start Time: 07:00 **Device:** Miovision

Full Study Diagram



Transportation Services - Traffic Services

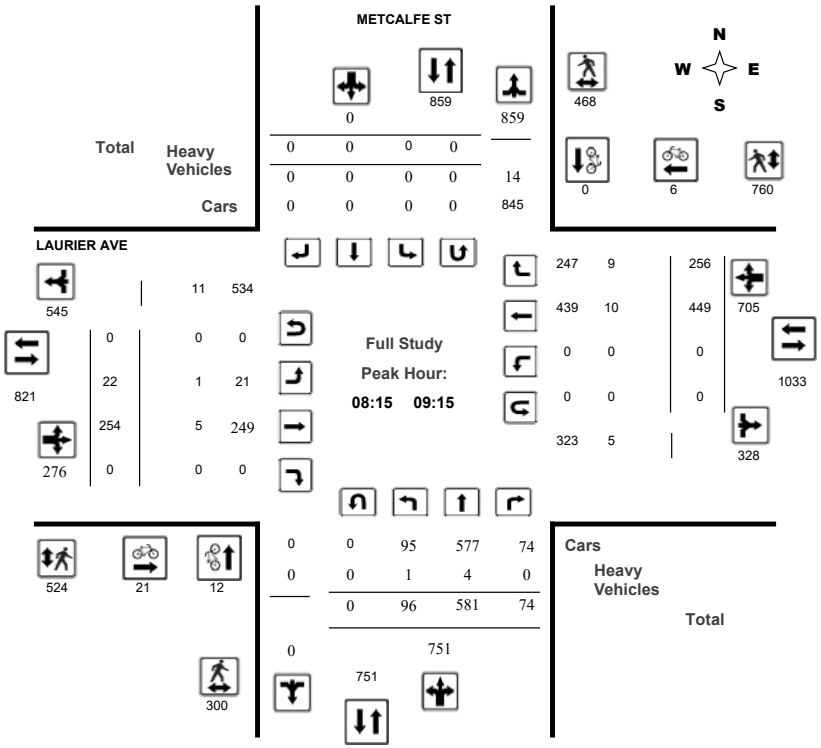
Turning Movement Count - Study Results

METCALFE ST @ LAURIER AVE

Survey Date: Tuesday, April 04, 2017 **WO No:** 36840

Start Time: 07:00 **Device:** Miovision

Full Study Peak Hour Diagram



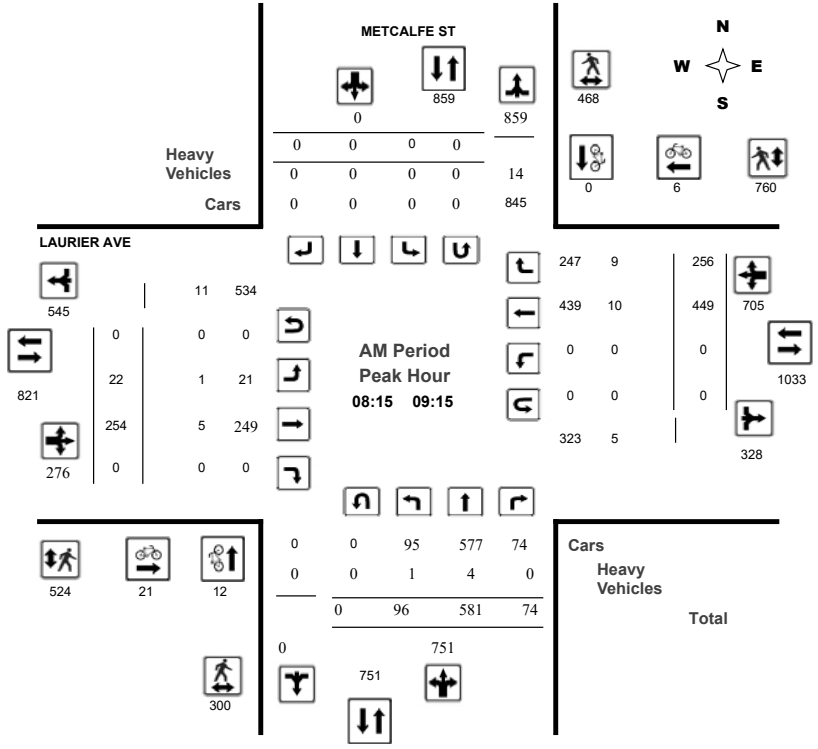
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

METCALFE ST @ LAURIER AVE

Survey Date: Tuesday, April 04, 2017 **WO No:** 36840

Start Time: 07:00 **Device:** Miovision



Comments

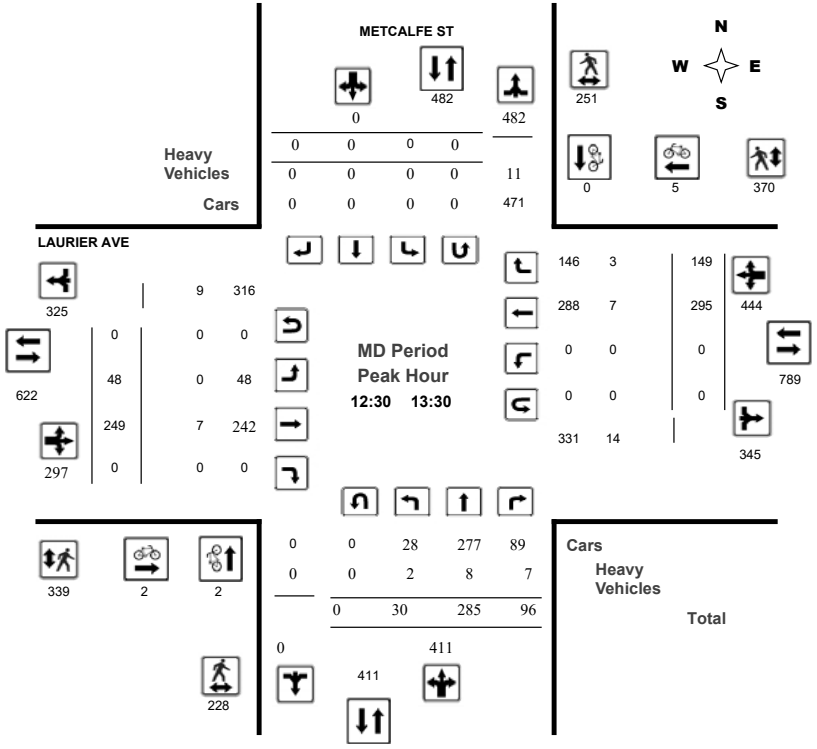
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

METCALFE ST @ LAURIER AVE

Survey Date: Tuesday, April 04, 2017 **WO No:** 36840

Start Time: 07:00 **Device:** Miovision



Comments

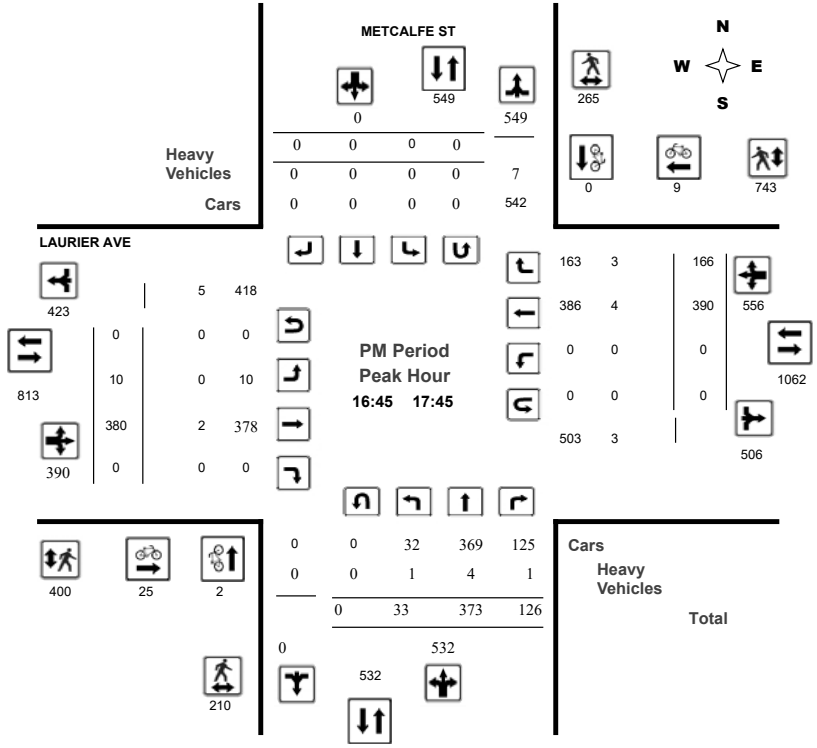
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

METCALFE ST @ LAURIER AVE

Survey Date: Tuesday, April 04, 2017 **WO No:** 36840

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

METCALFE ST @ LAURIER AVE

Survey Date: Tuesday, April 04, 2017 **WO No:** 36840

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, April 04, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor .90

	METCALFE ST								LAURIER AVE									
	Northbound				Southbound				Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	80	485	56	**621**	0	0	0	**0**	**621**	8	235	4	**247**	0	392	204	**596**	**843**	**1464**
08:00 09:00	99	597	72	**768**	0	0	0	**0**	**768**	9	271	0	**280**	0	443	239	**682**	**962**	**1730**
09:00 10:00	81	416	98	**595**	0	1	0	**1**	**596**	40	249	0	**289**	0	350	249	**599**	**888**	**1484**
11:30 12:30	26	294	95	**415**	0	1	0	**1**	**416**	67	221	0	**288**	0	262	164	**426**	**714**	**1130**
12:30 13:30	30	285	96	**411**	0	0	0	**0**	**411**	48	249	0	**297**	0	295	149	**444**	**741**	**1152**
15:00 16:00	29	313	91	**433**	0	0	0	**0**	**433**	23	318	0	**341**	0	328	134	**462**	**803**	**1236**
16:00 17:00	37	381	116	**534**	0	0	0	**0**	**534**	5	346	0	**351**	0	357	162	**519**	**870**	**1404**
17:00 18:00	30	346	124	**500**	0	0	0	**0**	**500**	20	369	0	**389**	0	390	157	**547**	**936**	**1436**
Sub Total	412	3117	748	**4277**	0	2	0	**2**	**4279**	220	2258	4	**2482**	0	2817	1458	**4275**	**6757**	**11036**
U Turns	0			**0**	0			**0**	**0**	**0**			**0**	0			**0**	**0**	**0**
Total	412	3117	748	**4277**	0	2	0	**2**	**4279**	220	2258	4	**2482**	0	2817	1458	**4275**	**6757**	**11036**
EQ 12Hr	573	4333	1040	**5946**	0	3	0	**3**	**5949**	306	3139	6	**3451**	0	3916	2027	**5943**	**9394**	**15343**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	516	3900	936	**5352**	0	3	0	**3**	**5355**	275	2825	5	**3105**	0	3524	1824	**5348**	**8453**	**13808**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**.90**						
AVG 24Hr	676	5109	1226	**7011**	0	4	0	**4**	**7015**	360	3701	7	**4068**	0	4616	2389	**7005**	**11073**	**18088**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													**1.31**						

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

METCALFE ST @ LAURIER AVE

Survey Date: Tuesday, April 04, 2017 **WO No:** 36840

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		METCALFE ST Northbound	METCALFE ST Southbound	METCALFE ST Street Total	LAURIER AVE Eastbound	LAURIER AVE Westbound	LAURIER AVE Street Total	Grand Total
07:00	07:15	0	0	**0**	3	2	**5**	**5**
07:15	07:30	0	0	**0**	1	7	**8**	**8**
07:30	07:45	1	0	**1**	0	2	**2**	**3**
07:45	08:00	3	0	**3**	1	6	**7**	**10**
08:00	08:15	2	0	**2**	6	0	**6**	**8**
08:15	08:30	4	0	**4**	0	2	**2**	**6**
08:30	08:45	3	0	**3**	7	1	**8**	**11**
08:45	09:00	4	0	**4**	12	1	**13**	**17**
09:00	09:15	1	0	**1**	2	2	**4**	**5**
09:15	09:30	3	0	**3**	0	6	**6**	**9**
09:30	09:45	1	0	**1**	1	3	**4**	**5**
09:45	10:00	1	0	**1**	2	1	**3**	**4**
11:30	11:45	0	0	**0**	1	0	**1**	**1**
11:45	12:00	0	0	**0**	1	2	**3**	**3**
12:00	12:15	1	0	**1**	1	2	**3**	**4**
12:15	12:30	0	0	**0**	1	0	**1**	**1**
12:30	12:45	1	0	**1**	0	1	**1**	**2**
12:45	13:00	1	0	**1**	1	1	**2**	**3**
13:00	13:15	0	0	**0**	0	3	**3**	**3**
13:15	13:30	0	0	**0**	1	0	**1**	**1**
15:00	15:15	1	0	**1**	2	0	**2**	**3**
15:15	15:30	1	0	**1**	1	0	**1**	**2**
15:30	15:45	1	0	**1**	2	0	**2**	**3**
15:45	16:00	1	0	**1**	1	2	**3**	**4**
16:00	16:15	0	0	**0**	4	3	**7**	**7**
16:15	16:30	0	0	**0**	5	2	**7**	**7**
16:30	16:45	1	0	**1**	6	4	**10**	**11**
16:45	17:00	0	0	**0**	6	7	**13**	**13**
17:00	17:15	0	0	**0**	7	0	**7**	**7**
17:15	17:30	0	0	**0**	6	2	**8**	**8**
17:30	17:45	2	0	**2**	6	0	**6**	**8**
17:45	18:00	1	0	**1**	3	0	**3**	**4**
Total		34	0	**34**	90	62	**152**	**186**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

METCALFE ST @ LAURIER AVE

Survey Date: Tuesday, April 04, 2017 **WO No:** 36840

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

Time Period		METCALFE ST NB Approach (E or W Crossing)	METCALFE ST SB Approach (E or W Crossing)	METCALFE ST Total	LAURIER AVE EB Approach (N or S Crossing)	LAURIER AVE WB Approach (N or S Crossing)	LAURIER AVE Total	Grand Total
07:00	07:15	20	44	**64**	54	114	**168**	**232**
07:15	07:30	30	55	**85**	76	116	**192**	**277**
07:30	07:45	30	59	**89**	98	163	**261**	**350**
07:45	08:00	59	94	**153**	101	206	**307**	**460**
08:00	08:15	64	90	**154**	104	192	**296**	**450**
08:15	08:30	74	108	**182**	132	181	**313**	**495**
08:30	08:45	69	143	**212**	151	222	**373**	**585**
08:45	09:00	97	124	**221**	157	205	**362**	**583**
09:00	09:15	60	93	**153**	84	152	**236**	**389**
09:15	09:30	54	57	**111**	92	110	**202**	**313**
09:30	09:45	44	67	**111**	63	103	**166**	**277**
09:45	10:00	48	60	**108**	64	83	**147**	**255**
11:30	11:45	49	38	**87**	63	76	**139**	**226**
11:45	12:00	49	67	**116**	89	82	**171**	**287**
12:00	12:15	67	78	**145**	83	97	**180**	**325**
12:15	12:30	68	78	**146**	94	105	**199**	**345**
12:30	12:45	65	60	**125**	84	85	**169**	**294**
12:45	13:00	73	90	**163**	94	111	**205**	**368**
13:00	13:15	58	49	**107**	91	100	**191**	**298**
13:15	13:30	32	52	**84**	70	74	**144**	**228**
15:00	15:15	52	59	**111**	87	123	**210**	**321**
15:15	15:30	44	54	**98**	66	102	**168**	**266**
15:30	15:45	49	44	**93**	72	123	**195**	**288**
15:45	16:00	44	46	**90**	62	118	**180**	**270**
16:00	16:15	65	68	**133**	99	261	**360**	**493**
16:15	16:30	64	54	**118**	94	153	**247**	**365**
16:30	16:45	80	76	**156**	125	209	**334**	**490**
16:45	17:00	59	74	**133**	118	190	**308**	**441**
17:00	17:15	61	84	**145**	98	219	**317**	**462**
17:15	17:30	49	55	**104**	96	195	**291**	**395**
17:30	17:45	41	52	**93**	88	139	**227**	**320**
17:45	18:00	36	53	**89**	92	115	**207**	**296**
Total	.....	1754	2225	**3979**	2941	4524	**7465**	**11444**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

METCALFE ST @ LAURIER AVE

Survey Date: Tuesday, April 04, 2017 **WO No:** 36840

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		METCALFE ST									LAURIER AVE									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	0	0		0	0	0		**0**	0	1	0		0	3	1		**5**	**5**
07:15	07:30	0	1	0		0	0	0		**1**	0	1	0		0	4	0		**5**	**6**
07:30	07:45	0	2	0		0	0	0		**2**	0	0	0		0	3	1		**4**	**6**
07:45	08:00	1	1	0		0	0	0		**2**	0	2	0		0	4	1		**7**	**9**
08:00	08:15	0	3	0		0	0	0		**3**	0	1	0		0	1	0		**2**	**5**
08:15	08:30	0	2	0		0	0	0		**2**	0	2	0		0	0	3		**5**	**7**
08:30	08:45	0	1	0		0	0	0		**1**	1	1	0		0	3	2		**7**	**8**
08:45	09:00	1	0	0		0	0	0		**1**	0	2	0		0	4	1		**7**	**8**
09:00	09:15	0	1	0		0	0	0		**1**	0	0	0		0	3	3		**6**	**7**
09:15	09:30	0	3	2		0	0	0		**5**	1	0	0		0	2	0		**3**	**8**
09:30	09:45	0	5	0		0	0	0		**5**	0	6	0		0	1	3		**10**	**15**
09:45	10:00	0	5	1		0	0	0		**6**	0	0	0		0	3	3		**6**	**12**
11:30	11:45	0	1	0		0	0	0		**1**	0	1	0		0	2	3		**6**	**7**
11:45	12:00	1	1	1		0	0	0		**3**	0	1	0		0	1	1		**3**	**6**
12:00	12:15	0	2	2		0	0	0		**4**	0	1	0		0	0	1		**2**	**6**
12:15	12:30	0	3	0		0	0	0		**3**	0	0	0		0	1	0		**1**	**4**
12:30	12:45	0	5	2		0	0	0		**7**	0	1	0		0	1	0		**2**	**9**
12:45	13:00	1	1	2		0	0	0		**4**	0	3	0		0	1	0		**4**	**8**
13:00	13:15	1	1	1		0	0	0		**3**	0	1	0		0	1	1		**3**	**6**
13:15	13:30	0	1	2		0	0	0		**3**	0	2	0		0	4	2		**8**	**11**
15:00	15:15	0	3	0		0	0	0		**3**	0	2	0		0	0	0		**2**	**5**
15:15	15:30	1	0	0		0	0	0		**1**	0	0	0		0	3	1		**4**	**5**
15:30	15:45	1	0	1		0	0	0		**2**	0	2	0		0	2	2		**6**	**8**
15:45	16:00	1	0	0		0	0	0		**1**	0	0	0		0	3	0		**3**	**4**
16:00	16:15	0	3	1		0	0	0		**4**	0	1	0		0	0	1		**2**	**6**
16:15	16:30	0	0	0		0	0	0		**0**	0	1	0		0	0	1		**2**	**2**
16:30	16:45	0	1	0		0	0	0		**1**	0	2	0		0	0	1		**3**	**4**
16:45	17:00	0	2	0		0	0	0		**2**	0	0	0		0	0	0		**0**	**2**
17:00	17:15	0	2	0		0	0	0		**2**	0	1	0		0	1	0		**2**	**4**
17:15	17:30	1	0	1		0	0	0		**2**	0	0	0		0	1	1		**2**	**4**
17:30	17:45	0	0	0		0	0	0		**0**	0	1	0		0	2	2		**5**	**5**
17:45	18:00	0	0	0		0	0	0		**0**	1	0	0		0	2	0		**3**	**3**
Total:	None	9	50	16	**0**	0	0	0	**0**	**75**	3	36	0	**0**	0	56	35	**0**	**130**	**205**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

METCALFE ST @ LAURIER AVE

Survey Date: Tuesday, April 04, 2017 **WO No:** 36840

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

		METCALFE ST		LAURIER AVE		
Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	**0**
07:15	07:30	0	0	0	0	**0**
07:30	07:45	0	0	0	0	**0**
07:45	08:00	0	0	0	0	**0**
08:00	08:15	0	0	0	0	**0**
08:15	08:30	0	0	0	0	**0**
08:30	08:45	0	0	0	0	**0**
08:45	09:00	0	0	0	0	**0**
09:00	09:15	0	0	0	0	**0**
09:15	09:30	0	0	0	0	**0**
09:30	09:45	0	0	0	0	**0**
09:45	10:00	0	0	0	0	**0**
11:30	11:45	0	0	0	0	**0**
11:45	12:00	0	0	0	0	**0**
12:00	12:15	0	0	0	0	**0**
12:15	12:30	0	0	0	0	**0**
12:30	12:45	0	0	0	0	**0**
12:45	13:00	0	0	0	0	**0**
13:00	13:15	0	0	0	0	**0**
13:15	13:30	0	0	0	0	**0**
15:00	15:15	0	0	0	0	**0**
15:15	15:30	0	0	0	0	**0**
15:30	15:45	0	0	0	0	**0**
15:45	16:00	0	0	0	0	**0**
16:00	16:15	0	0	0	0	**0**
16:15	16:30	0	0	0	0	**0**
16:30	16:45	0	0	0	0	**0**
16:45	17:00	0	0	0	0	**0**
17:00	17:15	0	0	0	0	**0**
17:15	17:30	0	0	0	0	**0**
17:30	17:45	0	0	0	0	**0**
17:45	18:00	0	0	0	0	**0**
Total		0	0	0	0	**0**

Appendix C

Synchro Intersection Worksheets – Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	210	122	133	332	0	0	0	0	85	446	67
Future Volume (vph)	0	210	122	133	332	0	0	0	0	85	446	67
Satd. Flow (prot)	0	1425	0	1642	1712	0	0	0	0	0	4173	0
Flt Permitted				0.350							0.993	
Satd. Flow (perm)	0	1425	0	605	1712	0	0	0	0	0	3782	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	369	0	148	369	0	0	0	0	0	664	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		2		9	6						4	
Permitted Phases				6						4		
Detector Phase		2		9	6					4	4	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		23.9		10.8	21.9					22.5	22.5	
Total Split (s)		29.0		11.0	45.0					25.0	25.0	
Total Split (%)		38.7%		14.7%	60.0%					33.3%	33.3%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.6		2.5	2.6					2.6	2.6	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.9		5.8	5.9						5.9	
Lead/Lag				Lead						Lag	Lag	
Lead-Lag Optimize?				Yes						Yes	Yes	
Recall Mode		C-Max		Max	C-Max					Max	Max	
Act Effct Green (s)		28.1		39.2	39.1						24.1	
Actuated g/C Ratio		0.37		0.52	0.52						0.32	
v/c Ratio		0.69		0.38	0.41						0.55	
Control Delay		28.0		7.6	6.9						23.0	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		28.0		7.6	6.9						23.0	
LOS		C		A	A						C	
Approach Delay		28.0			7.1						23.0	
Approach LOS		C			A						C	
Queue Length 50th (m)		43.0		5.8	14.8						27.9	
Queue Length 95th (m)		72.7		m9.9	21.6						38.8	
Internal Link Dist (m)		71.8			158.7			39.2			62.3	
Turn Bay Length (m)												
Base Capacity (vph)		533		388	892						1215	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.69		0.38	0.41						0.55	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 63 (84%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 18.9	Intersection LOS: B
Intersection Capacity Utilization 60.9%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 1: O'Connor & Laurier

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	283	0	0	389	256	96	624	74	0	0	0
Future Volume (vph)	22	283	0	0	389	256	96	624	74	0	0	0
Satd. Flow (prot)	0	1734	0	0	2510	0	0	4316	0	0	0	0
Flt Permitted		0.929						0.994				
Satd. Flow (perm)	0	1604	0	0	2510	0	0	4102	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	338	0	0	716	0	0	882	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2						4					
Detector Phase	2	2			6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	37.0	37.0			37.0		33.0	33.0				
Total Split (s)	37.0	37.0			37.0		33.0	33.0				
Total Split (%)	49.3%	49.3%			49.3%		44.0%	44.0%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.4	2.4			2.4		2.2	2.2				
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		5.7			5.7			5.5				
Lead/Lag	Lag	Lag			Lag							
Lead-Lag Optimize?	Yes	Yes			Yes							
Recall Mode	C-Max	C-Max			C-Max		Max	Max				
Act Effct Green (s)		36.3			36.3			27.5				
Actuated g/C Ratio		0.48			0.48			0.37				
v/c Ratio		0.44			0.59			0.59				
Control Delay		20.1			16.5			15.7				
Queue Delay		0.0			0.0			0.4				
Total Delay		20.1			16.5			16.1				
LOS		C			B			B				
Approach Delay		20.1			16.5			16.1				
Approach LOS		C			B			B				
Queue Length 50th (m)		36.1			36.4			37.6				
Queue Length 95th (m)		m61.4			52.7			49.9				
Internal Link Dist (m)		158.7			172.2			51.7			65.1	
Turn Bay Length (m)												
Base Capacity (vph)		776			1214			1504				
Starvation Cap Reductn		0			0			225				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.44			0.59			0.69				

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 48 (64%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø5
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	5
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 17.0	Intersection LOS: B
Intersection Capacity Utilization 64.0%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 2: Metcalfe & Laurier

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	280	57	209	495	538	0	203	59	361	358	170
Future Volume (vph)	0	280	57	209	495	538	0	203	59	361	358	170
Satd. Flow (prot)	0	3041	0	1658	1745	1483	0	3316	1483	3154	2408	0
Flt Permitted				0.503						0.950		
Satd. Flow (perm)	0	3041	0	739	1745	920	0	3316	680	1900	2408	0
Satd. Flow (RTOR)						238			149		99	
Lane Group Flow (vph)	0	374	0	232	550	598	0	226	66	401	587	0
Turn Type		NA		custom	NA	custom		NA	pm+ov	Prot	NA	
Protected Phases		2		9	5 6	3		4	9	3	8	
Permitted Phases				6		6			4			
Detector Phase		2		9	5 6	3		4	9	3	8	
Switch Phase												
Minimum Initial (s)		5.0		5.0		10.0		10.0	5.0	10.0	10.0	
Minimum Split (s)		30.0		12.0		20.7		28.2	12.0	20.7	28.2	
Total Split (s)		31.0		15.0		20.8		28.2	15.0	20.8	49.0	
Total Split (%)		31.0%		15.0%		20.8%		28.2%	15.0%	20.8%	49.0%	
Yellow Time (s)		3.3		3.3		3.3		3.3	3.3	3.3	3.3	
All-Red Time (s)		3.7		3.7		4.4		2.9	3.7	4.4	2.9	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0		7.0		7.7		6.2	7.0	7.7	6.2	
Lead/Lag				Lead		Lead		Lag	Lead	Lead		
Lead-Lag Optimize?				Yes		Yes		Yes	Yes	Yes		
Recall Mode		C-Max		Max		None		Max	Max	None	Max	
Act Effct Green (s)		29.0		37.0	49.0	41.4		22.0	29.2	13.1	42.8	
Actuated g/C Ratio		0.29		0.37	0.49	0.41		0.22	0.29	0.13	0.43	
v/c Ratio		0.42		0.67	0.64	1.01		0.31	0.18	0.97	0.54	
Control Delay		30.6		31.4	23.3	57.3		34.0	1.1	82.1	19.6	
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		30.6		31.4	23.3	57.3		34.0	1.1	82.1	19.6	
LOS		C		C	C	E		C	A	F	B	
Approach Delay		30.6			39.4			26.6			44.9	
Approach LOS		C			D			C			D	
Queue Length 50th (m)		30.8		28.5	76.4	~53.6		19.4	0.0	40.4	35.8	
Queue Length 95th (m)		44.1		45.9	112.0	#116.6		30.0	0.0	#69.4	52.0	
Internal Link Dist (m)		172.2			106.8			136.3			52.8	
Turn Bay Length (m)									90.0	85.0		
Base Capacity (vph)		881		346	855	594		729	368	413	1087	
Starvation Cap Reductn		0		0	0	0		0	0	0	0	
Spillback Cap Reductn		0		0	0	0		0	0	0	0	
Storage Cap Reductn		0		0	0	0		0	0	0	0	
Reduced v/c Ratio		0.42		0.67	0.64	1.01		0.31	0.18	0.97	0.54	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 64 (64%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø5	Ø6	Ø13
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	5	6	13
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	5.0	1.0
Minimum Split (s)	5.0	7.0	25.0	5.0
Total Split (s)	5.0	10.0	36.0	5.0
Total Split (%)	5%	10%	36%	5%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lag	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes
Recall Mode	None	None	C-Max	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

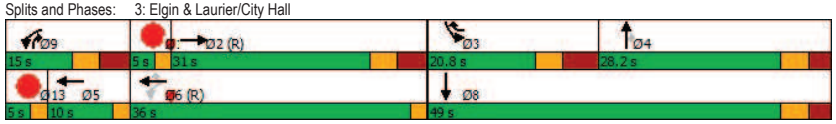
Intersection Summary

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 38.9	Intersection LOS: D
Intersection Capacity Utilization 83.8%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 3: Elgin & Laurier/City Hall



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	162	74	223	720	0	0	0	0
Future Volume (vph)	0	0	0	0	162	74	223	720	0	0	0	0
Satd. Flow (prot)	0	0	0	0	2844	0	0	4696	0	0	0	0
Flt Permitted								0.988				
Satd. Flow (perm)	0	0	0	0	2844	0	0	4325	0	0	0	0
Satd. Flow (RTOR)					27			82				
Lane Group Flow (vph)	0	0	0	0	262	0	0	1048	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					4			2				
Permitted Phases							2					
Detector Phase					4		2	2				
Switch Phase												
Minimum Initial (s)					10.0		10.0	10.0				
Minimum Split (s)					23.1		35.0	35.0				
Total Split (s)					25.0		50.0	50.0				
Total Split (%)					33.3%		66.7%	66.7%				
Yellow Time (s)					3.3		3.3	3.3				
All-Red Time (s)					1.8		1.7	1.7				
Lost Time Adjust (s)					0.0			0.0				
Total Lost Time (s)					5.1			5.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode					Max		C-Max	C-Max				
Act Effct Green (s)					19.9			45.0				
Actuated g/C Ratio					0.27			0.60				
v/c Ratio					0.34			0.40				
Control Delay					21.3			7.7				
Queue Delay					0.0			0.0				
Total Delay					21.3			7.7				
LOS					C			A				
Approach Delay					21.3			7.7				
Approach LOS					C			A				
Queue Length 50th (m)					14.0			23.1				
Queue Length 95th (m)					23.5			30.8				
Internal Link Dist (m)		34.9			48.3			35.0			51.7	
Turn Bay Length (m)												
Base Capacity (vph)					774			2627				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			163				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.34			0.43				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 73 (97%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 10.5	Intersection LOS: B
Intersection Capacity Utilization 41.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Metcalfe & Gloucester

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	7	31	1	0	9	0	267	43	17	320	0
Future Volume (vph)	31	7	31	1	0	9	0	267	43	17	320	0
Satd. Flow (prot)	0	1508	0	1658	0	1483	0	3072	0	1658	3252	0
Flt Permitted		0.978		0.708						0.545		
Satd. Flow (perm)	0	1429	0	1182	0	1294	0	3072	0	836	3252	0
Satd. Flow (RTOR)		34				53		34				
Lane Group Flow (vph)	0	76	0	1	0	10	0	345	0	19	356	0
Turn Type	Perm	NA		Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8				6		
Detector Phase	4	4		8		8		2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0		10.0		10.0	10.0	
Minimum Split (s)	25.1	25.1		25.1		25.1		31.4		31.4	31.4	
Total Split (s)	27.0	27.0		27.0		27.0		58.0		58.0	58.0	
Total Split (%)	30.0%	30.0%		30.0%		30.0%		64.4%		64.4%	64.4%	
Yellow Time (s)	3.3	3.3		3.3		3.3		3.3		3.3	3.3	
All-Red Time (s)	2.8	2.8		2.8		2.8		2.1		2.1	2.1	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0		0.0	0.0	
Total Lost Time (s)		6.1		6.1		6.1		5.4		5.4	5.4	
Lead/Lag	Lag	Lag		Lag		Lag						
Lead-Lag Optimize?	Yes	Yes		Yes		Yes						
Recall Mode	Max	Max		Max		Max		C-Max		C-Max	C-Max	
Act Effct Green (s)		25.9		25.9		25.9		52.6		52.6	52.6	
Actuated g/C Ratio		0.29		0.29		0.29		0.58		0.58	0.58	
v/c Ratio		0.17		0.00		0.02		0.19		0.04	0.19	
Control Delay		16.1		23.0		0.1		8.1		8.3	9.0	
Queue Delay		0.0		0.0		0.0		0.0		0.0	0.0	
Total Delay		16.1		23.0		0.1		8.1		8.3	9.0	
LOS		B		C		A		A		A	A	
Approach Delay		16.1			2.2			8.1			9.0	
Approach LOS		B			A			A			A	
Queue Length 50th (m)		5.3		0.1		0.0		12.0		1.3	13.9	
Queue Length 95th (m)		15.5		1.3		0.0		18.4		4.1	20.4	
Internal Link Dist (m)		54.5			21.0			120.5			136.3	
Turn Bay Length (m)										20.0		
Base Capacity (vph)		435		340		410		1809		488	1900	
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		0.17		0.00		0.02		0.19		0.04	0.19	

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

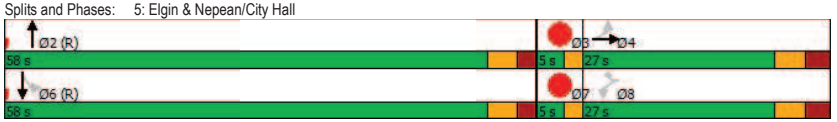
Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	6%	6%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.19

Intersection Signal Delay: 9.2	Intersection LOS: A
Intersection Capacity Utilization 66.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Elgin & Nepean/City Hall



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	200	95	179	271	0	0	0	0	51	540	44
Future Volume (vph)	0	200	95	179	271	0	0	0	0	51	540	44
Satd. Flow (prot)	0	1467	0	1642	1745	0	0	0	0	0	4479	0
Flt Permitted				0.391							0.996	
Satd. Flow (perm)	0	1467	0	676	1745	0	0	0	0	0	4246	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	328	0	199	301	0	0	0	0	0	706	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		2		9	6						4	
Permitted Phases				6						4		
Detector Phase		2		9	6					4	4	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		23.9		10.8	21.9					22.5	22.5	
Total Split (s)		29.0		11.0	45.0					25.0	25.0	
Total Split (%)		38.7%		14.7%	60.0%					33.3%	33.3%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.6		2.5	2.6					2.6	2.6	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.9		5.8	5.9						5.9	
Lead/Lag				Lead						Lag	Lag	
Lead-Lag Optimize?				Yes						Yes	Yes	
Recall Mode		C-Max		Max	C-Max					Max	Max	
Act Effct Green (s)		28.1		39.2	39.1						24.1	
Actuated g/C Ratio		0.37		0.52	0.52						0.32	
v/c Ratio		0.60		0.47	0.33						0.52	
Control Delay		24.4		21.7	16.2						22.4	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		24.4		21.7	16.2						22.4	
LOS		C		C	B						C	
Approach Delay		24.4			18.4						22.4	
Approach LOS		C			B						C	
Queue Length 50th (m)		36.5		18.4	25.4						29.4	
Queue Length 95th (m)		61.8		37.0	46.4						40.1	
Internal Link Dist (m)		71.8			158.7			39.2			62.3	
Turn Bay Length (m)												
Base Capacity (vph)		549		420	909						1364	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.60		0.47	0.33						0.52	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 22 (29%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

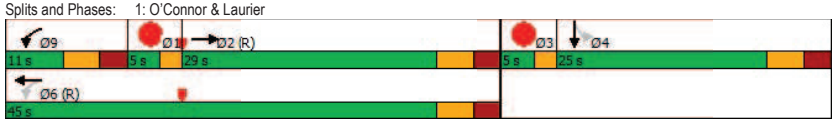
Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 21.5	Intersection LOS: C
Intersection Capacity Utilization 61.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: O'Connor & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	241	0	0	390	166	33	373	126	0	0	0
Future Volume (vph)	10	241	0	0	390	166	33	373	126	0	0	0
Satd. Flow (prot)	0	1742	0	0	2809	0	0	3706	0	0	0	0
Flt Permitted		0.973						0.997				
Satd. Flow (perm)	0	1689	0	0	2809	0	0	3621	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	279	0	0	617	0	0	591	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2						4					
Detector Phase	2	2			6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	37.0	37.0			37.0		19.5	19.5				
Total Split (s)	40.0	40.0			40.0		30.0	30.0				
Total Split (%)	53.3%	53.3%			53.3%		40.0%	40.0%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.4	2.4			2.4		2.2	2.2				
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		5.7			5.7			5.5				
Lead/Lag	Lag	Lag			Lag							
Lead-Lag Optimize?	Yes	Yes			Yes							
Recall Mode	C-Max	C-Max			C-Max		Max	Max				
Act Effct Green (s)		39.3			39.3			24.5				
Actuated g/C Ratio		0.52			0.52			0.33				
v/c Ratio		0.32			0.42			0.50				
Control Delay		6.7			12.0			17.9				
Queue Delay		0.0			0.0			0.3				
Total Delay		6.7			12.0			18.2				
LOS		A			B			B				
Approach Delay		6.7			12.0			18.2				
Approach LOS		A			B			B				
Queue Length 50th (m)		8.9			26.1			16.4				
Queue Length 95th (m)		13.6			37.5			21.2				
Internal Link Dist (m)		158.7			172.2			51.7			65.1	
Turn Bay Length (m)												
Base Capacity (vph)		885			1471			1182				
Starvation Cap Reductn		0			0			174				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.32			0.42			0.59				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 30 (40%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

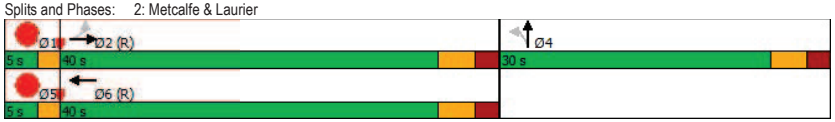
Lane Group	Ø1	Ø5
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	5
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 13.5	Intersection LOS: B
Intersection Capacity Utilization 47.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Metcalfe & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	358	29	117	427	413	0	266	161	382	345	108
Future Volume (vph)	0	358	29	117	427	413	0	266	161	382	345	108
Satd. Flow (prot)	0	3155	0	1642	1745	1483	0	3316	1483	3154	2624	0
Flt Permitted				0.468						0.950		
Satd. Flow (perm)	0	3155	0	627	1745	976	0	3316	680	2228	2624	0
Satd. Flow (RTOR)						215			149		53	
Lane Group Flow (vph)	0	430	0	130	474	459	0	296	179	424	503	0
Turn Type		NA		custom	NA	custom		NA	pm+ov	Prot	NA	
Protected Phases		2		9	5 6	3		4	9	3	8	
Permitted Phases				6		6			4			
Detector Phase		2		9	5 6	3		4	9	3	8	
Switch Phase												
Minimum Initial (s)		5.0		5.0		10.0		10.0	5.0	10.0	10.0	
Minimum Split (s)		30.0		12.0		20.7		28.2	12.0	20.7	28.2	
Total Split (s)		31.0		14.0		21.8		28.2	14.0	21.8	50.0	
Total Split (%)		31.0%		14.0%		21.8%		28.2%	14.0%	21.8%	50.0%	
Yellow Time (s)		3.3		3.3		3.3		3.3	3.3	3.3	3.3	
All-Red Time (s)		3.7		3.7		4.4		2.9	3.7	4.4	2.9	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0		7.0		7.7		6.2	7.0	7.7	6.2	
Lead/Lag				Lead		Lead		Lag	Lead	Lead		
Lead-Lag Optimize?				Yes		Yes		Yes	Yes	Yes		
Recall Mode		C-Max		None		None		Max	None	None	Max	
Act Effct Green (s)		29.0		35.0	48.0	41.4		22.0	28.2	14.1	43.8	
Actuated g/C Ratio		0.29		0.35	0.48	0.41		0.22	0.28	0.14	0.44	
v/c Ratio		0.47		0.45	0.57	0.76		0.41	0.51	0.95	0.43	
Control Delay		31.2		23.9	21.9	21.2		25.2	8.5	76.6	18.5	
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		31.2		23.9	21.9	21.2		25.2	8.5	76.6	18.5	
LOS		C		C	C	C		C	A	E	B	
Approach Delay		31.2			21.8			18.9			45.1	
Approach LOS		C			C			B			D	
Queue Length 50th (m)		36.0		15.2	63.2	29.6		15.8	1.4	42.6	30.6	
Queue Length 95th (m)		50.5		27.2	93.4	#58.1		22.9	8.7	#71.4	43.9	
Internal Link Dist (m)		172.2			106.8			136.3			52.8	
Turn Bay Length (m)									90.0	85.0		
Base Capacity (vph)		915		290	837	601		729	354	444	1179	
Starvation Cap Reductn		0		0	0	0		0	0	0	0	
Spillback Cap Reductn		0		0	0	0		0	0	0	0	
Storage Cap Reductn		0		0	0	0		0	0	0	0	
Reduced v/c Ratio		0.47		0.45	0.57	0.76		0.41	0.51	0.95	0.43	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 52 (52%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø5	Ø6	Ø13
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	5	6	13
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	5.0	1.0
Minimum Split (s)	5.0	7.0	25.0	5.0
Total Split (s)	5.0	10.0	35.0	5.0
Total Split (%)	5%	10%	35%	5%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lag	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes
Recall Mode	None	None	C-Max	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

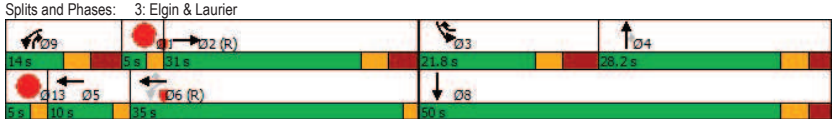
Intersection Summary

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 30.2	Intersection LOS: C
Intersection Capacity Utilization 79.1%	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: 3: Elgin & Laurier



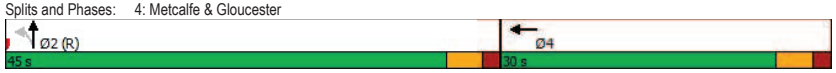
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	207	127	96	397	0	0	0	0
Future Volume (vph)	0	0	0	0	207	127	96	397	0	0	0	0
Satd. Flow (prot)	0	0	0	0	2922	0	0	4716	0	0	0	0
Flt Permitted								0.990				
Satd. Flow (perm)	0	0	0	0	2922	0	0	4427	0	0	0	0
Satd. Flow (RTOR)					19			93				
Lane Group Flow (vph)	0	0	0	0	371	0	0	548	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					4			2				
Permitted Phases							2					
Detector Phase					4		2	2				
Switch Phase												
Minimum Initial (s)					10.0		10.0	10.0				
Minimum Split (s)					23.1		35.0	35.0				
Total Split (s)					30.0		45.0	45.0				
Total Split (%)					40.0%		60.0%	60.0%				
Yellow Time (s)					3.3		3.3	3.3				
All-Red Time (s)					1.8		1.7	1.7				
Lost Time Adjust (s)					0.0			0.0				
Total Lost Time (s)					5.1			5.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode					Max		C-Max	C-Max				
Act Effct Green (s)					24.9			40.0				
Actuated g/C Ratio					0.33			0.53				
v/c Ratio					0.38			0.23				
Control Delay					19.5			7.9				
Queue Delay					0.0			0.0				
Total Delay					19.5			7.9				
LOS					B			A				
Approach Delay					19.5			7.9				
Approach LOS					B			A				
Queue Length 50th (m)					19.6			11.3				
Queue Length 95th (m)					30.5			16.8				
Internal Link Dist (m)		34.9			48.3			35.0			51.7	
Turn Bay Length (m)												
Base Capacity (vph)					982			2404				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.38			0.23				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 67 (89%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 41.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Metcalfe & Gloucester



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	1	107	31	0	23	1	312	5	7	441	0
Future Volume (vph)	113	1	107	31	0	23	1	312	5	7	441	0
Satd. Flow (prot)	0	1491	0	1658	0	1483	0	3256	0	1658	3316	0
Flt Permitted		0.975		0.605				0.954		0.528		
Satd. Flow (perm)	0	1397	0	983	0	1286	0	3105	0	757	3316	0
Satd. Flow (RTOR)		55				48		2				
Lane Group Flow (vph)	0	246	0	34	0	26	0	354	0	8	490	0
Turn Type	Perm	NA		Perm		Perm	Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8		8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	25.1	25.1		25.1		25.1	31.4	31.4		31.4	31.4	
Total Split (s)	45.0	45.0		45.0		45.0	50.0	50.0		50.0	50.0	
Total Split (%)	45.0%	45.0%		45.0%		45.0%	50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	3.3	3.3		3.3		3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.8	2.8		2.8		2.8	2.1	2.1		2.1	2.1	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0		0.0	0.0	
Total Lost Time (s)		6.1		6.1		6.1		5.4		5.4	5.4	
Lead/Lag	Lag	Lag		Lag		Lag						
Lead-Lag Optimize?	Yes	Yes		Yes		Yes						
Recall Mode	Max	Max		Max		Max	C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		43.9		43.9		43.9		44.6		44.6	44.6	
Actuated g/C Ratio		0.44		0.44		0.44		0.45		0.45	0.45	
v/c Ratio		0.38		0.08		0.04		0.26		0.02	0.33	
Control Delay		16.5		17.1		2.0		17.8		14.1	18.3	
Queue Delay		0.0		0.0		0.0		0.0		0.0	0.0	
Total Delay		16.5		17.1		2.0		17.8		14.1	18.3	
LOS		B		B		A		B		B	B	
Approach Delay		16.5			10.6			17.8			18.2	
Approach LOS		B			B			B			B	
Queue Length 50th (m)		23.7		3.7		0.0		21.7		0.6	37.5	
Queue Length 95th (m)		42.7		9.6		2.2		31.4		m1.3	46.2	
Internal Link Dist (m)		54.5			21.0			120.5			136.3	
Turn Bay Length (m)										20.0		
Base Capacity (vph)		644		431		591		1385		337	1478	
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		0.38		0.08		0.04		0.26		0.02	0.33	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	5%	5%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

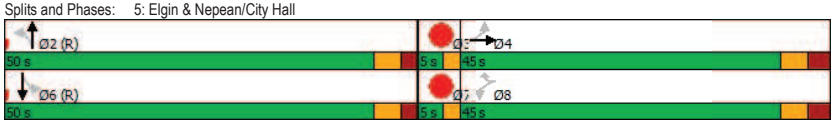
Intersection Summary	

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 17.3	Intersection LOS: B
Intersection Capacity Utilization 66.6%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 5: Elgin & Nepean/City Hall



Appendix D

Collision Data

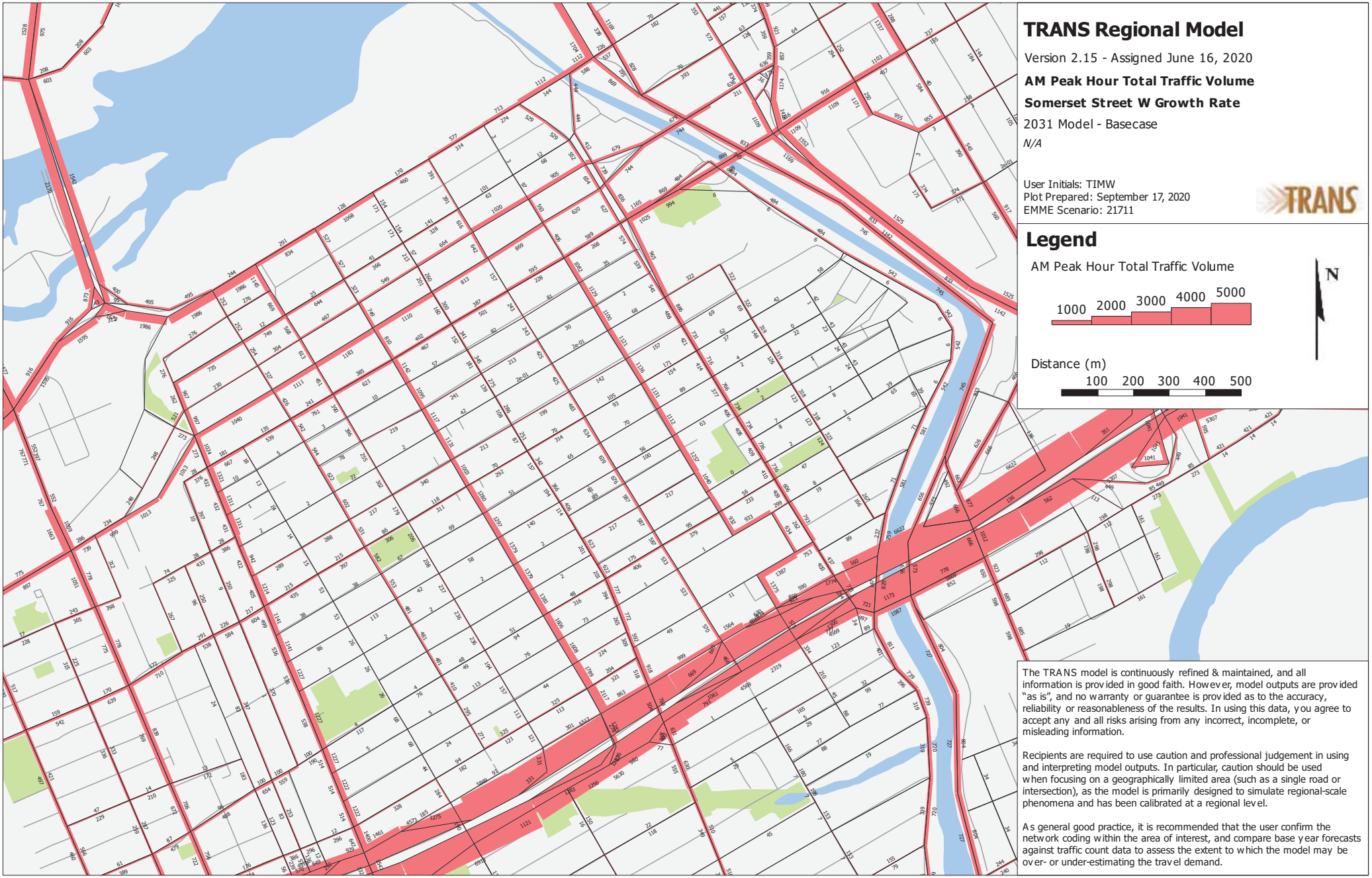
CGH TRANSPORTATION

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Traffic Control Condition	Classification Of Accident	Initial Impact Type	Road Surface Condition	# Vehicles	# Motorcycles	# Bicycles	# Pedestrians
11/5/2018	2018	12:51	LAURIER AVE W btwn ELGIN ST & ELGIN ST (__3ZA35X)	02 - Rain	01 - Daylight	10 - No control	0	03 - P.D. only	05 - Turning movement	02 - Wet	2	0	0	0
9/26/2016	2016	3:24	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	07 - SMV other	01 - Dry	1	0	0	0
11/1/2016	2016	16:51	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	05 - Dusk	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
12/1/2016	2016	17:28	ELGIN ST @ LAURIER AVE (0002232)	02 - Rain	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	02 - Wet	2	0	0	0
12/20/2016	2016	21:45	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	99 - Other	04 - Slush	2	0	0	0
2/12/2016	2016	15:24	ELGIN ST @ LAURIER AVE (0002232)	03 - Snow	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	03 - Loose snow	2	0	0	0
12/21/2016	2016	20:09	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	02 - Wet	2	0	0	0
5/5/2016	2016	15:30	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
5/20/2016	2016	2:47	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	02 - Angle	01 - Dry	2	0	1	0
6/25/2016	2016	18:32	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
7/4/2016	2016	18:11	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	0	1	0
6/22/2016	2016	14:30	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	04 - Sideswipe	01 - Dry	2	0	1	0
7/26/2016	2016	7:54	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
7/11/2016	2016	15:33	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	0	1	0
9/8/2016	2016	20:35	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	0	1	0
9/10/2016	2016	21:15	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	07 - SMV other	01 - Dry	1	0	0	1
1/27/2017	2017	14:30	ELGIN ST @ LAURIER AVE (0002232)	03 - Snow	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	02 - Wet	2	0	0	0
10/9/2017	2017	0:23	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	07 - SMV other	01 - Dry	1	0	0	0
10/26/2017	2017	13:20	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
12/17/2017	2017	22:29	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	05 - Turning movement	02 - Wet	2	0	0	0
12/7/2017	2017	8:43	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	0	1	0
2/21/2017	2017	21:24	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
3/6/2017	2017	20:04	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	05 - Turning movement	02 - Wet	2	0	0	0
3/14/2017	2017	16:30	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	05 - Turning movement	03 - Loose snow	2	0	0	0
3/24/2017	2017	9:52	ELGIN ST @ LAURIER AVE (0002232)	03 - Snow	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	03 - Loose snow	2	0	0	0
4/27/2017	2017	16:51	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
4/29/2017	2017	7:07	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
6/9/2017	2017	12:28	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	0	1	0
7/11/2017	2017	18:15	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
8/12/2017	2017	1:42	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	00 - Unknown	03 - P.D. only	06 - SMV unattended vehicle	01 - Dry	1	0	0	0
9/29/2017	2017	6:50	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	03 - Dawn	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
9/26/2017	2017	17:27	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	07 - SMV other	01 - Dry	1	0	0	1
1/18/2018	2018	20:25	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
10/7/2018	2018	16:21	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
11/28/2018	2018	7:46	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	05 - Turning movement	02 - Wet	2	0	1	0
12/12/2018	2018	10:20	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
12/29/2018	2018	12:25	ELGIN ST @ LAURIER AVE (0002232)	04 - Freezing Rain	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	07 - SMV other	06 - Ice	1	0	0	0
2/8/2018	2018	15:26	ELGIN ST @ LAURIER AVE (0002232)	03 - Snow	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	03 - Loose snow	2	0	0	0
2/1/2018	2018	18:17	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
2/13/2018	2018	12:05	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2/22/2018	2018	15:08	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	0	0	0
2/18/2018	2018	16:27	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
3/21/2018	2018	19:30	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
5/16/2018	2018	17:15	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
5/9/2018	2018	18:42	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	0	1	0
5/29/2018	2018	16:51	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	3	0	0	0
6/6/2018	2018	17:00	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	00 - Unknown	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
6/20/2018	2018	16:36	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	07 - SMV other	01 - Dry	1	0	0	1
7/2/2018	2018	2:10	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	07 - SMV other	01 - Dry	1	0	0	0
7/20/2018	2018	13:09	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
7/25/2018	2018	12:06	ELGIN ST @ LAURIER AVE (0002232)	02 - Rain	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	05 - Turning movement	02 - Wet	2	0	1	0
7/23/2018	2018	14:15	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	3	0	0	0
8/29/2018	2018	23:40	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	1	0
9/21/2019	2019	19:33	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
10/5/2019	2019	16:10	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
1/25/2019	2019	17:42	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	02 - Wet	2	0	0	0
12/9/2019	2019	17:48	ELGIN ST @ LAURIER AVE (0002232)	02 - Rain	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	02 - Wet	2	0	0	0
1/24/2019	2019	8:45	ELGIN ST @ LAURIER AVE (0002232)	03 - Snow	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	04 - Slush	2	0	0	0
1/30/2019	2019	18:00	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	05 - Turning movement	04 - Slush	2	0	0	0
1/30/2019	2019	18:15	ELGIN ST @ LAURIER AVE (0002232)	03 - Snow	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	03 - Loose snow	2	0	0	0
2/15/2019	2019	12:19	ELGIN ST @ LAURIER AVE (0002232)	03 - Snow	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	04 - Slush	2	0	0	0
4/1/2019	2019	17:30	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
7/3/2019	2019	15:00	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
1/22/2020	2020	14:15	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	02 - Wet	2	0	0	0
2/7/2020	2020	14:59	ELGIN ST @ LAURIER AVE (0002232)	03 - Snow	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	04 - Slush	2	0	0	0
2/20/2020	2020	12:55	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	99 - Other	01 - Dry	2	0	0	0
4/25/2020	2020	18:30	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
6/17/2020	2020	23:36	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	99 - Other	01 - Dry	2	0	0	0
8/5/2020	2020	17:00	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	3	0	0	0
9/17/2020	2020	12:10	ELGIN ST @ LAURIER AVE (0002232)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
11/23/2016	2016	11:39	LAURIER AVE W btwn METCALFE ST & ELGIN ST (3ZA35P)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
4/5/2016	2016	16:09	LAURIER AVE W btwn METCALFE ST & ELGIN ST (__3ZA35P)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
5/12/2016	2016	14:50	LAURIER AVE W btwn METCALFE ST & ELGIN ST (3ZA35P)	01 - Clear	01 - Daylight	10 - No control	0	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	0	1	0
7/15/2016	2016	8:41	LAURIER AVE W btwn METCALFE ST & ELGIN ST (__3ZA35P)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
9/13/2016	2016	16:15	LAURIER AVE W btwn METCALFE ST & ELGIN ST (3ZA35P)	01 - Clear	01 - Daylight	10 - No control	0	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	0	1	0
10/7/2017	2017	15:15	LAURIER AVE W btwn METCALFE ST & ELGIN ST (__3ZA35P)	01 - Clear	01 - Daylight	10 - No control	0	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	0	1	0
2/20/2017	2017	18:09	LAURIER AVE W btwn METCALFE ST & ELGIN ST (3ZA35P)	01 - Clear	07 - Dark	10 - No control	0	03 - P.D. only	06 - SMV unattended vehicle	01 - Dry	1	0	0	0
6/22/2017	2017	Unknown	LAURIER AVE W btwn METCALFE ST & ELGIN ST (__3ZA35P)	01 - Clear	00 - Unknown	10 - No control	0	03 - P.D. only	06 - SMV unattended vehicle	01 - Dry	1	0	0	0
8/9/2017	2017	Unknown	LAURIER AVE W btwn METCALFE ST & ELGIN ST (__3ZA35P)	01 - Clear	00 - Unknown	10 - No control	0	03 - P.D. only	06 - SMV unattended vehicle	01 - Dry	1	0	0	0
9/13/2017	2017	17:18	LAURIER AVE W btwn METCALFE ST & ELGIN ST (__3ZA35P)	01 - Clear	01 - Daylight	10 - No control	0	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	0	1	0
10/4/2018	2018	14:55	LAURIER AVE W btwn METCALFE ST & ELGIN ST (__3ZA35P)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
2/21/2018	2018	16:07	LAURIER AVE W btwn METCALFE ST & ELGIN ST (__3ZA35P)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	06 - SMV unattended vehicle	02 - Wet	1	0	0	0
4/11/2018	2018	12:00	LAURIER AVE W btwn METCALFE ST & ELGIN ST (__3ZA35P)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	06 - SMV unattended vehicle	01 - Dry	1	0	0	0
5/22/2018	2018	14:59	LAURIER AVE W btwn METCALFE ST & ELGIN ST (__3ZA35P)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	06 - SMV unattended vehicle	01 - Dry	1	0	0	0
6/5/2018	2018	14:39	LAURIER AVE W btwn METCALFE ST & ELGIN ST (__3ZA35P)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
7/8/2019	2019	8:21	LAURIER AVE W btwn METCALFE ST & ELGIN ST (__3ZA35P)	01 - Clear	01 - Daylight	10 - No control	0	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	0	1	0
7/10/2019	2019	8:42	LAURIER AVE W btwn METCALFE ST & ELGIN ST (__3ZA35P)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
12/26/2016	2016	17:06	METCALFE ST @ LAURIER AVE (0002231)	04 - Freezing Rain	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	06 - Ice	2	0	0	0
6/10/2016	2016	11:02	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	06 - SMV unattended vehicle	01 - Dry	1	0	0	0
9/9/2016	2016	21:12	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	0	1	0
11/8/2017	2017	15:25	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	1	0
2/16/2017	2017	12:00	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	01 - Daylight	01 - Traffic signal	00 - Unknown	03 - P.D. only	06 - SMV unattended vehicle	04 - Slush	1	0	0	0
5/7/2017	2017	13:20	METCALFE ST @ LAURIER AVE (0002231)	02 - Rain	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	02 - Wet	2	0	0	0
7/20/2017	2017	18:01	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
8/4/2017	2017	15:47	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
2/2/2018	2018	13:43	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
7/31/2018	2018	12:45	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	07 - SMV other	01 - Dry	1	0	0	0
9/20/2019	2019	15:00	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
10/23/2019	2019	18:50	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
11/19/2019	2019	23:20	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
11/27/2019	2019	17:17	METCALFE ST @ LAURIER AVE (0002231)	02 - Rain	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	05 - Turning movement	02 - Wet	2	0	0	0
12/19/2019	2019	10:20	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	03 - Rear end	01 - Dry	2	0	0	0
12/12/2019	2019	16:20	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	05 - Dusk	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
12/17/2019	2019	16:15	METCALFE ST @ LAURIER AVE (0002231)	03 - Snow	05 - Dusk	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	04 - Slush	2	0	0	0
3/15/2019	2019	8:55	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	02 - Wet	2	0	0	0
1/9/2019	2019	12:10	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	02 - Wet	2	0	0	0

6/16/2019	2019	10:45	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	3	0	0	0
7/24/2019	2019	9:34	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
7/31/2019	2019	10:20	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
8/12/2019	2019	12:27	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
1/25/2020	2020	7:53	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	03 - Dawn	01 - Traffic signal	01 - Functioning	03 - P.D. only	99 - Other	01 - Dry	2	0	0	0
7/3/2020	2020	9:03	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
9/28/2020	2020	14:27	METCALFE ST @ LAURIER AVE (0002231)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	02 - Angle	01 - Dry	2	0	0	0
1/19/2020	2020	4:59	METCALFE ST @ LAURIER AVE (0002231)	03 - Snow	07 - Dark	01 - Traffic signal	01 - Functioning	03 - P.D. only	03 - Rear end	05 - Packed snow	2	0	0	0

Appendix E

City TRANS Plots



TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Somerset Street W Growth Rate

2031 Model - Basecase

N/A

User Initials: TIMW
Plot Prepared: September 17, 2020
EMME Scenario: 21711

TRANS

Legend

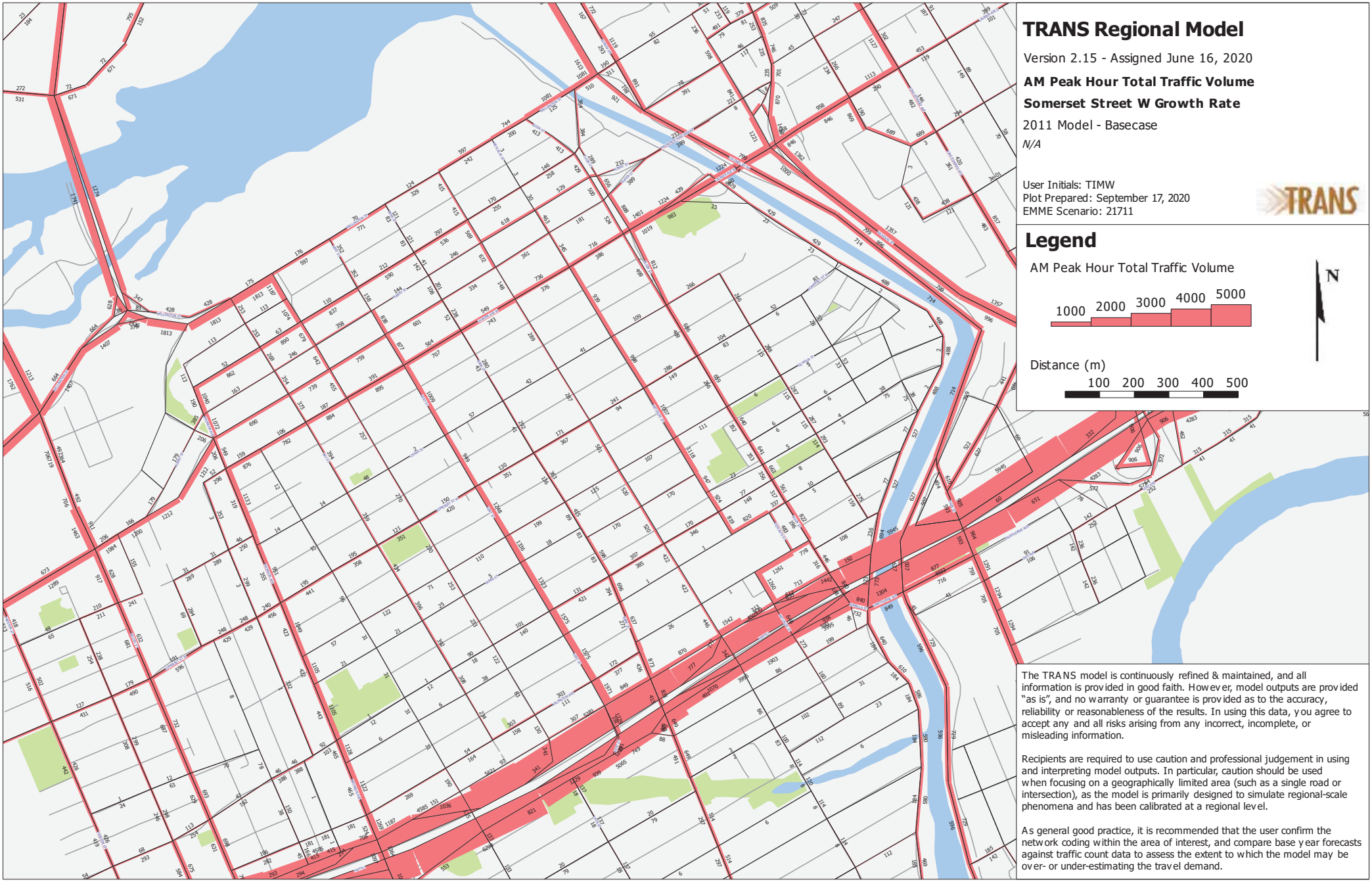
AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

Distance (m)

100 200 300 400 500

N



TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Somerset Street W Growth Rate

2011 Model - Basecase

N/A

User Initials: TIMW
Plot Prepared: September 17, 2020
EMME Scenario: 21711

TRANS

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

N

Distance (m)

100 200 300 400 500

The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

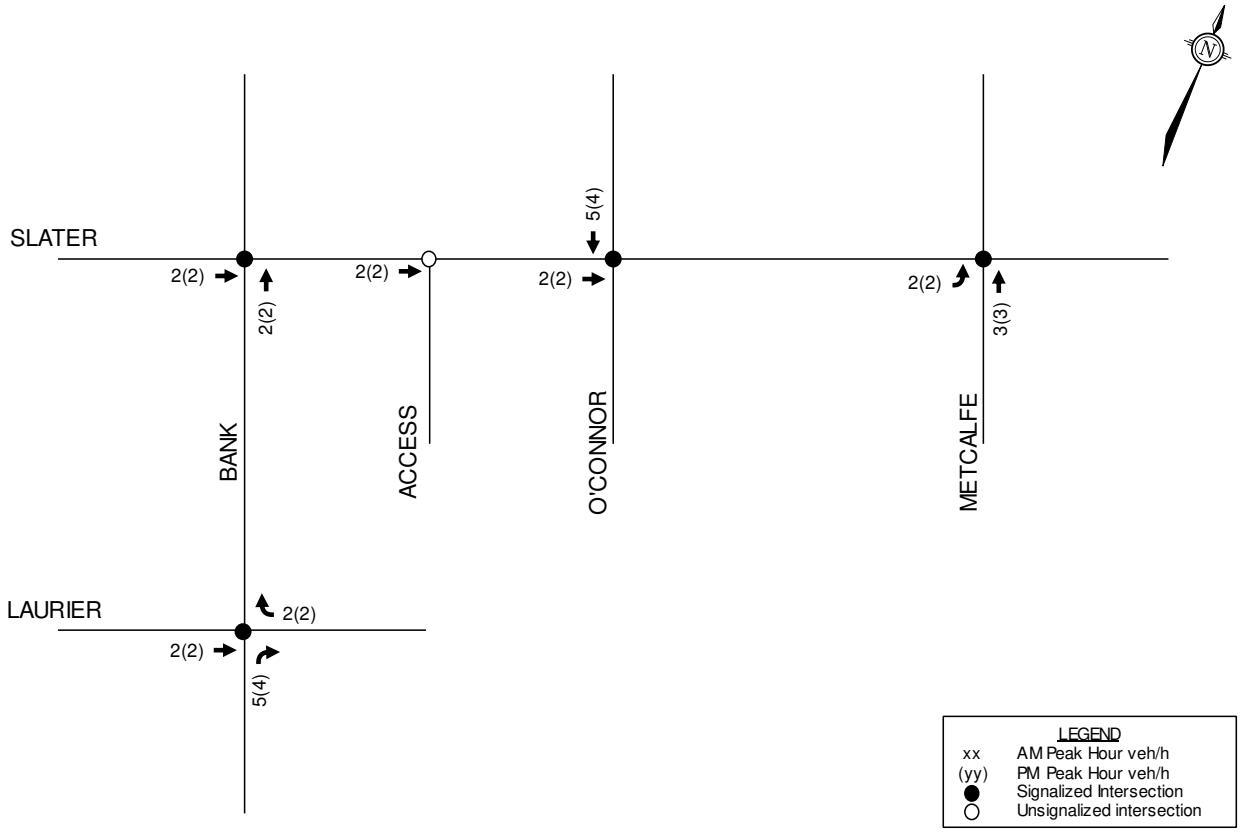
As general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.

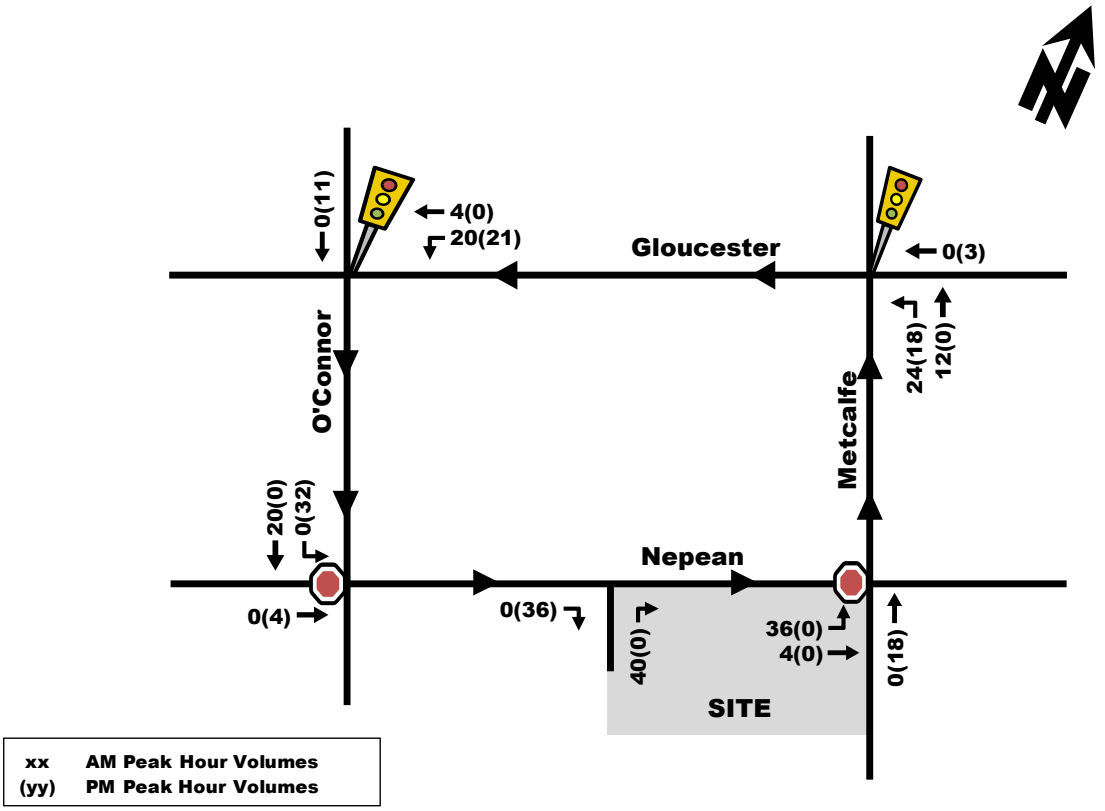
Appendix F

Background Development Volumes

CGH TRANSPORTATION

Figure 6: Site Generated Traffic




0(11)
4(0)
20(21)
Gloucester
0(3)
24(18)
12(0)
O'Connor
Metcalfe
20(0)
0(32)
Nepean
0(4)
0(36)
40(0)
36(0)
4(0)
0(18)
SITE
xx AM Peak Hour Volumes
(yy) PM Peak Hour Volumes

Appendix G

Synchro Intersection Worksheets – 2027 Future Background Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	215	122	133	334	0	0	0	0	85	451	67
Future Volume (vph)	0	215	122	133	334	0	0	0	0	85	451	67
Satd. Flow (prot)	0	1430	0	1642	1712	0	0	0	0	0	4174	0
Flt Permitted				0.382							0.993	
Satd. Flow (perm)	0	1430	0	660	1712	0	0	0	0	0	3784	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	337	0	133	334	0	0	0	0	0	603	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		2		9	6						4	
Permitted Phases				6						4		
Detector Phase		2		9	6					4	4	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		23.9		10.8	21.9					22.5	22.5	
Total Split (s)		29.0		11.0	45.0					25.0	25.0	
Total Split (%)		38.7%		14.7%	60.0%					33.3%	33.3%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.6		2.5	2.6					2.6	2.6	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.9		5.8	5.9						5.9	
Lead/Lag				Lead						Lag	Lag	
Lead-Lag Optimize?				Yes						Yes	Yes	
Recall Mode		C-Max		Max	C-Max					Max	Max	
Act Effct Green (s)		28.1		39.2	39.1						24.1	
Actuated g/C Ratio		0.37		0.52	0.52						0.32	
v/c Ratio		0.63		0.32	0.37						0.50	
Control Delay		25.6		7.1	6.7						22.3	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		25.6		7.1	6.7						22.3	
LOS		C		A	A						C	
Approach Delay		25.6			6.8						22.3	
Approach LOS		C			A						C	
Queue Length 50th (m)		38.1		5.2	13.3						24.9	
Queue Length 95th (m)		64.6		9.3	19.7						34.9	
Internal Link Dist (m)		71.8			158.7			39.2			62.3	
Turn Bay Length (m)												
Base Capacity (vph)		535		413	892						1215	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.63		0.32	0.37						0.50	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 63 (84%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

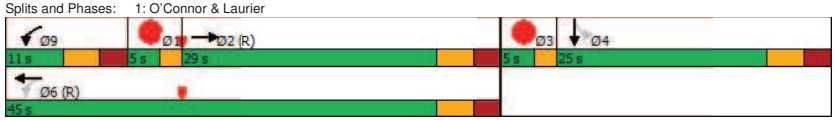
Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 17.9	Intersection LOS: B
Intersection Capacity Utilization 61.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: O'Connor & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	288	0	0	391	256	96	671	74	0	0	0
Future Volume (vph)	22	288	0	0	391	256	96	671	74	0	0	0
Satd. Flow (prot)	0	1734	0	0	2511	0	0	4339	0	0	0	0
Flt Permitted		0.938						0.994				
Satd. Flow (perm)	0	1617	0	0	2511	0	0	4137	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	310	0	0	647	0	0	841	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2						4					
Detector Phase	2	2			6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	37.0	37.0			37.0		33.0	33.0				
Total Split (s)	37.0	37.0			37.0		33.0	33.0				
Total Split (%)	49.3%	49.3%			49.3%		44.0%	44.0%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.4	2.4			2.4		2.2	2.2				
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		5.7			5.7			5.5				
Lead/Lag	Lag	Lag			Lag							
Lead-Lag Optimize?	Yes	Yes			Yes							
Recall Mode	C-Max	C-Max			C-Max		Max	Max				
Act Effct Green (s)		36.3			36.3			27.5				
Actuated g/C Ratio		0.48			0.48			0.37				
v/c Ratio		0.40			0.53			0.55				
Control Delay		19.1			15.5			15.2				
Queue Delay		0.0			0.0			0.4				
Total Delay		19.1			15.5			15.6				
LOS		B			B			B				
Approach Delay		19.1			15.5			15.6				
Approach LOS		B			B			B				
Queue Length 50th (m)		31.3			31.6			35.2				
Queue Length 95th (m)		56.3			46.1			47.1				
Internal Link Dist (m)		158.7			172.2			51.7			65.1	
Turn Bay Length (m)												
Base Capacity (vph)		782			1215			1516				
Starvation Cap Reductn		0			0			249				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.40			0.53			0.66				

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 48 (64%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

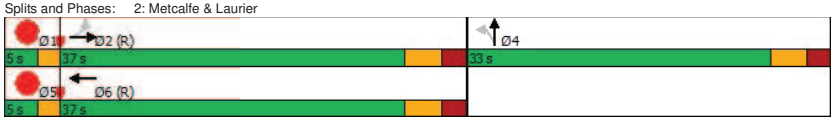
Lane Group	Ø1	Ø5
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	5
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 16.2	Intersection LOS: B
Intersection Capacity Utilization 65.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Metcalfe & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	285	57	209	497	538	0	208	59	361	367	170
Future Volume (vph)	0	285	57	209	497	538	0	208	59	361	367	170
Satd. Flow (prot)	0	3043	0	1658	1745	1483	0	3316	1483	3154	2423	0
Flt Permitted				0.532						0.950		
Satd. Flow (perm)	0	3043	0	771	1745	920	0	3316	680	1869	2423	0
Satd. Flow (RTOR)						238			149		95	
Lane Group Flow (vph)	0	342	0	209	497	538	0	208	59	361	537	0
Turn Type		NA		custom	NA	custom		NA	pm+ov	Prot	NA	
Protected Phases		2		9	5 6	3		4	9	3	8	
Permitted Phases				6		6			4			
Detector Phase		2		9	5 6	3		4	9	3	8	
Switch Phase												
Minimum Initial (s)		5.0		5.0		10.0		10.0	5.0	10.0	10.0	
Minimum Split (s)		30.0		12.0		20.7		28.2	12.0	20.7	28.2	
Total Split (s)		31.0		15.0		20.8		28.2	15.0	20.8	49.0	
Total Split (%)		31.0%		15.0%		20.8%		28.2%	15.0%	20.8%	49.0%	
Yellow Time (s)		3.3		3.3		3.3		3.3	3.3	3.3	3.3	
All-Red Time (s)		3.7		3.7		4.4		2.9	3.7	4.4	2.9	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0		7.0		7.7		6.2	7.0	7.7	6.2	
Lead/Lag				Lead		Lead		Lag	Lead	Lead		
Lead-Lag Optimize?				Yes		Yes		Yes	Yes	Yes		
Recall Mode		C-Max		Max		None		Max	Max	None	Max	
Act Effct Green (s)		29.0		37.0	49.0	41.4		22.0	29.2	13.1	42.8	
Actuated g/C Ratio		0.29		0.37	0.49	0.41		0.22	0.29	0.13	0.43	
v/c Ratio		0.39		0.59	0.58	0.91		0.29	0.16	0.87	0.49	
Control Delay		30.0		27.2	21.6	35.5		33.7	0.9	65.4	18.6	
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		30.0		27.2	21.6	35.5		33.7	0.9	65.4	18.6	
LOS		C		C	C	D		C	A	E	B	
Approach Delay		30.0			28.6			26.5			37.4	
Approach LOS		C			C			C			D	
Queue Length 50th (m)		27.8		25.3	66.1	39.9		17.7	0.0	35.8	31.5	
Queue Length 95th (m)		40.4		41.4	97.3	#89.7		27.8	0.0	#60.1	46.3	
Internal Link Dist (m)		172.2			106.8			136.3			52.8	
Turn Bay Length (m)									90.0	85.0		
Base Capacity (vph)		882		356	855	594		729	368	413	1091	
Starvation Cap Reductn		0		0	0	0		0	0	0	0	
Spillback Cap Reductn		0		0	0	0		0	0	0	0	
Storage Cap Reductn		0		0	0	0		0	0	0	0	
Reduced v/c Ratio		0.39		0.59	0.58	0.91		0.29	0.16	0.87	0.49	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 64 (64%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø5	Ø6	Ø13
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	5	6	13
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	5.0	1.0
Minimum Split (s)	5.0	7.0	25.0	5.0
Total Split (s)	5.0	10.0	36.0	5.0
Total Split (%)	5%	10%	36%	5%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lag	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes
Recall Mode	None	None	C-Max	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

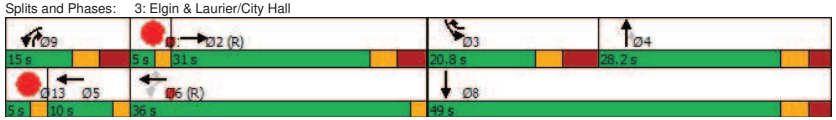
Intersection Summary

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 31.4	Intersection LOS: C
Intersection Capacity Utilization 83.8%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 3: Elgin & Laurier/City Hall



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	164	74	247	772	0	0	0	0
Future Volume (vph)	0	0	0	0	164	74	247	772	0	0	0	0
Satd. Flow (prot)	0	0	0	0	2845	0	0	4696	0	0	0	0
Flt Permitted								0.988				
Satd. Flow (perm)	0	0	0	0	2845	0	0	4315	0	0	0	0
Satd. Flow (RTOR)					29			89				
Lane Group Flow (vph)	0	0	0	0	238	0	0	1019	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					4			2				
Permitted Phases							2					
Detector Phase					4		2	2				
Switch Phase												
Minimum Initial (s)					10.0		10.0	10.0				
Minimum Split (s)					23.1		35.0	35.0				
Total Split (s)					25.0		50.0	50.0				
Total Split (%)					33.3%		66.7%	66.7%				
Yellow Time (s)					3.3		3.3	3.3				
All-Red Time (s)					1.8		1.7	1.7				
Lost Time Adjust (s)					0.0			0.0				
Total Lost Time (s)					5.1			5.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode					Max		C-Max	C-Max				
Act Effct Green (s)					19.9			45.0				
Actuated g/C Ratio					0.27			0.60				
v/c Ratio					0.31			0.39				
Control Delay					20.5			7.6				
Queue Delay					0.0			0.0				
Total Delay					20.5			7.6				
LOS					C			A				
Approach Delay					20.5			7.6				
Approach LOS					C			A				
Queue Length 50th (m)					12.3			22.0				
Queue Length 95th (m)					21.3			29.5				
Internal Link Dist (m)		34.9			48.3			35.0			51.7	
Turn Bay Length (m)												
Base Capacity (vph)					776			2624				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			105				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.31			0.40				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 73 (97%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.39

Intersection Signal Delay: 10.0	Intersection LOS: B
Intersection Capacity Utilization 43.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Metcalfe & Gloucester

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	7	31	1	0	9	0	274	43	17	328	0
Future Volume (vph)	31	7	31	1	0	9	0	274	43	17	328	0
Satd. Flow (prot)	0	1506	0	1658	0	1483	0	3077	0	1658	3252	0
Flt Permitted		0.978		0.712						0.560		
Satd. Flow (perm)	0	1427	0	1188	0	1294	0	3077	0	855	3252	0
Satd. Flow (RTOR)		31				53		33				
Lane Group Flow (vph)	0	69	0	1	0	9	0	317	0	17	328	0
Turn Type	Perm	NA		Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8				6		
Detector Phase	4	4		8		8		2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0		10.0		10.0	10.0	
Minimum Split (s)	25.1	25.1		25.1		25.1		31.4		31.4	31.4	
Total Split (s)	27.0	27.0		27.0		27.0		58.0		58.0	58.0	
Total Split (%)	30.0%	30.0%		30.0%		30.0%		64.4%		64.4%	64.4%	
Yellow Time (s)	3.3	3.3		3.3		3.3		3.3		3.3	3.3	
All-Red Time (s)	2.8	2.8		2.8		2.8		2.1		2.1	2.1	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0		0.0	0.0	
Total Lost Time (s)		6.1		6.1		6.1		5.4		5.4	5.4	
Lead/Lag	Lag	Lag		Lag		Lag						
Lead-Lag Optimize?	Yes	Yes		Yes		Yes						
Recall Mode	Max	Max		Max		Max		C-Max		C-Max	C-Max	
Act Effct Green (s)		25.9		25.9		25.9		52.6		52.6	52.6	
Actuated g/C Ratio		0.29		0.29		0.29		0.58		0.58	0.58	
v/c Ratio		0.16		0.00		0.02		0.17		0.03	0.17	
Control Delay		16.1		23.0		0.1		8.0		8.2	8.9	
Queue Delay		0.0		0.0		0.0		0.0		0.0	0.0	
Total Delay		16.1		23.0		0.1		8.0		8.2	8.9	
LOS		B		C		A		A		A	A	
Approach Delay		16.1			2.4			8.0			8.9	
Approach LOS		B			A			A			A	
Queue Length 50th (m)		4.8		0.1		0.0		10.9		1.2	12.7	
Queue Length 95th (m)		14.5		1.3		0.0		16.9		3.8	18.8	
Internal Link Dist (m)		54.5			21.0			120.5			136.3	
Turn Bay Length (m)										20.0		
Base Capacity (vph)		432		341		410		1812		499	1900	
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		0.16		0.00		0.02		0.17		0.03	0.17	

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

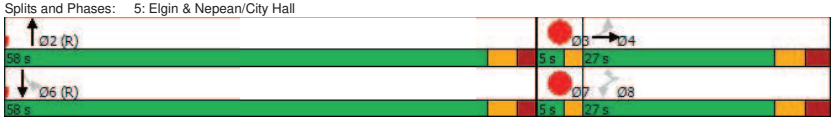
Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	6%	6%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary	

Maximum v/c Ratio: 0.17

Intersection Signal Delay: 9.1	Intersection LOS: A
Intersection Capacity Utilization 66.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Elgin & Nepean/City Hall



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	204	95	179	273	0	0	0	0	51	544	44
Future Volume (vph)	0	204	95	179	273	0	0	0	0	51	544	44
Satd. Flow (prot)	0	1472	0	1642	1745	0	0	0	0	0	4480	0
Flt Permitted				0.386							0.996	
Satd. Flow (perm)	0	1472	0	667	1745	0	0	0	0	0	4249	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	333	0	199	303	0	0	0	0	0	710	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		2		9	6						4	
Permitted Phases				6						4		
Detector Phase		2		9	6					4	4	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		23.9		10.8	21.9					22.5	22.5	
Total Split (s)		29.0		11.0	45.0					25.0	25.0	
Total Split (%)		38.7%		14.7%	60.0%					33.3%	33.3%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.6		2.5	2.6					2.6	2.6	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.9		5.8	5.9						5.9	
Lead/Lag				Lead						Lag	Lag	
Lead-Lag Optimize?				Yes						Yes	Yes	
Recall Mode		C-Max		Max	C-Max					Max	Max	
Act Effct Green (s)		28.1		39.2	39.1						24.1	
Actuated g/C Ratio		0.37		0.52	0.52						0.32	
v/c Ratio		0.60		0.48	0.33						0.52	
Control Delay		24.6		22.1	16.2						22.4	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		24.6		22.1	16.2						22.4	
LOS		C		C	B						C	
Approach Delay		24.6			18.6						22.4	
Approach LOS		C			B						C	
Queue Length 50th (m)		37.2		18.6	25.8						29.6	
Queue Length 95th (m)		62.9		37.2	46.7						40.4	
Internal Link Dist (m)		71.8			158.7			39.2			62.3	
Turn Bay Length (m)												
Base Capacity (vph)		551		416	909						1365	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.60		0.48	0.33						0.52	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 22 (29%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

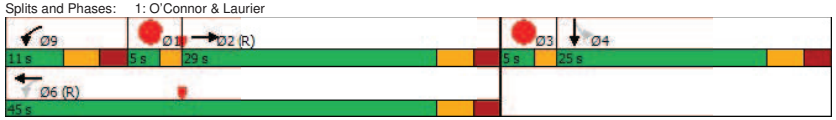
Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 21.6	Intersection LOS: C
Intersection Capacity Utilization 61.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: O'Connor & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	245	0	0	392	166	33	395	126	0	0	0
Future Volume (vph)	10	245	0	0	392	166	33	395	126	0	0	0
Satd. Flow (prot)	0	1742	0	0	2811	0	0	3749	0	0	0	0
Flt Permitted		0.974						0.997				
Satd. Flow (perm)	0	1691	0	0	2811	0	0	3666	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	283	0	0	620	0	0	616	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2						4					
Detector Phase	2	2			6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	37.0	37.0			37.0		19.5	19.5				
Total Split (s)	40.0	40.0			40.0		30.0	30.0				
Total Split (%)	53.3%	53.3%			53.3%		40.0%	40.0%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.4	2.4			2.4		2.2	2.2				
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		5.7			5.7			5.5				
Lead/Lag	Lag	Lag			Lag							
Lead-Lag Optimize?	Yes	Yes			Yes							
Recall Mode	C-Max	C-Max			C-Max		Max	Max				
Act Effct Green (s)		39.3			39.3			24.5				
Actuated g/C Ratio		0.52			0.52			0.33				
v/c Ratio		0.32			0.42			0.51				
Control Delay		6.6			12.0			17.8				
Queue Delay		0.0			0.0			0.3				
Total Delay		6.6			12.0			18.1				
LOS		A			B			B				
Approach Delay		6.6			12.0			18.1				
Approach LOS		A			B			B				
Queue Length 50th (m)		8.9			26.2			16.7				
Queue Length 95th (m)		13.5			37.8			21.5				
Internal Link Dist (m)		158.7			172.2			51.7			65.1	
Turn Bay Length (m)												
Base Capacity (vph)		886			1472			1197				
Starvation Cap Reductn		0			0			175				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.32			0.42			0.60				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 30 (40%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

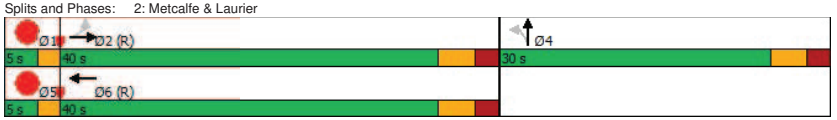
Lane Group	Ø1	Ø5
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	5
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary	

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 13.5	Intersection LOS: B
Intersection Capacity Utilization 48.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Metcalfe & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	362	29	117	429	413	0	273	161	382	354	108
Future Volume (vph)	0	362	29	117	429	413	0	273	161	382	354	108
Satd. Flow (prot)	0	3205	0	1642	1745	1483	0	3316	1483	3154	2636	0
Flt Permitted				0.465						0.950		
Satd. Flow (perm)	0	3205	0	696	1745	976	0	3316	680	2237	2636	0
Satd. Flow (RTOR)						214			149		51	
Lane Group Flow (vph)	0	434	0	130	477	459	0	303	179	424	513	0
Turn Type		NA		custom	NA	custom		NA	pm+ov	Prot	NA	
Protected Phases		2		9	5 6	3		4	9	3	8	
Permitted Phases				6		6			4			
Detector Phase		2		9	5 6	3		4	9	3	8	
Switch Phase												
Minimum Initial (s)		5.0		5.0		10.0		10.0	5.0	10.0	10.0	
Minimum Split (s)		30.0		12.0		20.7		28.2	12.0	20.7	28.2	
Total Split (s)		31.0		14.0		21.8		28.2	14.0	21.8	50.0	
Total Split (%)		31.0%		14.0%		21.8%		28.2%	14.0%	21.8%	50.0%	
Yellow Time (s)		3.3		3.3		3.3		3.3	3.3	3.3	3.3	
All-Red Time (s)		3.7		3.7		4.4		2.9	3.7	4.4	2.9	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0		7.0		7.7		6.2	7.0	7.7	6.2	
Lead/Lag				Lead		Lead		Lag	Lead	Lead		
Lead-Lag Optimize?				Yes		Yes		Yes	Yes	Yes		
Recall Mode		C-Max		None		None		Max	None	None	Max	
Act Effct Green (s)		29.0		35.0	48.0	41.4		22.0	28.2	14.1	43.8	
Actuated g/C Ratio		0.29		0.35	0.48	0.41		0.22	0.28	0.14	0.44	
v/c Ratio		0.47		0.42	0.57	0.77		0.42	0.51	0.95	0.43	
Control Delay		31.2		23.1	22.0	21.4		25.2	8.5	76.6	18.8	
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		31.2		23.1	22.0	21.4		25.2	8.5	76.6	18.8	
LOS		C		C	C	C		C	A	E	B	
Approach Delay		31.2			21.8			19.0			44.9	
Approach LOS		C			C			B			D	
Queue Length 50th (m)		36.3		15.2	63.8	29.7		16.1	1.3	42.6	31.6	
Queue Length 95th (m)		50.7		27.2	94.4	#58.5		23.2	9.0	#71.4	45.1	
Internal Link Dist (m)		172.2			106.8			136.3			52.8	
Turn Bay Length (m)									90.0	85.0		
Base Capacity (vph)		930		309	837	600		729	354	444	1183	
Starvation Cap Reductn		0		0	0	0		0	0	0	0	
Spillback Cap Reductn		0		0	0	0		0	0	0	0	
Storage Cap Reductn		0		0	0	0		0	0	0	0	
Reduced v/c Ratio		0.47		0.42	0.57	0.77		0.42	0.51	0.95	0.43	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 52 (52%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø5	Ø6	Ø13
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	5	6	13
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	5.0	1.0
Minimum Split (s)	5.0	7.0	25.0	5.0
Total Split (s)	5.0	10.0	35.0	5.0
Total Split (%)	5%	10%	35%	5%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lag	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes
Recall Mode	None	None	C-Max	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

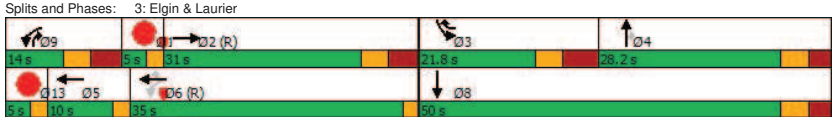
Intersection Summary

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 30.2	Intersection LOS: C
Intersection Capacity Utilization 79.1%	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: 3: Elgin & Laurier



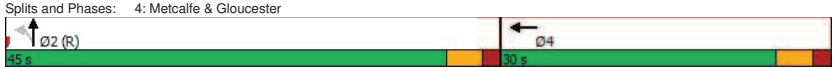
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	209	127	114	420	0	0	0	0
Future Volume (vph)	0	0	0	0	209	127	114	420	0	0	0	0
Satd. Flow (prot)	0	0	0	0	2923	0	0	4712	0	0	0	0
Flt Permitted								0.989				
Satd. Flow (perm)	0	0	0	0	2923	0	0	4395	0	0	0	0
Satd. Flow (RTOR)					17			92				
Lane Group Flow (vph)	0	0	0	0	373	0	0	594	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					4			2				
Permitted Phases							2					
Detector Phase					4		2	2				
Switch Phase												
Minimum Initial (s)					10.0		10.0	10.0				
Minimum Split (s)					23.1		35.0	35.0				
Total Split (s)					30.0		45.0	45.0				
Total Split (%)					40.0%		60.0%	60.0%				
Yellow Time (s)					3.3		3.3	3.3				
All-Red Time (s)					1.8		1.7	1.7				
Lost Time Adjust (s)					0.0			0.0				
Total Lost Time (s)					5.1			5.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode					Max		C-Max	C-Max				
Act Effct Green (s)					24.9			40.0				
Actuated g/C Ratio					0.33			0.53				
v/c Ratio					0.38			0.25				
Control Delay					19.6			8.2				
Queue Delay					0.0			0.0				
Total Delay					19.6			8.2				
LOS					B			A				
Approach Delay					19.6			8.2				
Approach LOS					B			A				
Queue Length 50th (m)					19.8			12.7				
Queue Length 95th (m)					30.8			18.4				
Internal Link Dist (m)		34.9			48.3			35.0			51.7	
Turn Bay Length (m)												
Base Capacity (vph)					981			2386				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.38			0.25				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 67 (89%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 41.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Metcalfe & Gloucester



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	1	107	31	0	23	0	320	5	7	452	0
Future Volume (vph)	113	1	107	31	0	23	0	320	5	7	452	0
Satd. Flow (prot)	0	1491	0	1658	0	1483	0	3260	0	1658	3316	0
Flt Permitted		0.975		0.605						0.522		
Satd. Flow (perm)	0	1397	0	983	0	1286	0	3260	0	751	3316	0
Satd. Flow (RTOR)		55				48		2				
Lane Group Flow (vph)	0	246	0	34	0	26	0	362	0	8	502	0
Turn Type	Perm	NA		Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8				6		
Detector Phase	4	4		8		8		2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0		10.0		10.0	10.0	
Minimum Split (s)	25.1	25.1		25.1		25.1		31.4		31.4	31.4	
Total Split (s)	45.0	45.0		45.0		45.0		50.0		50.0	50.0	
Total Split (%)	45.0%	45.0%		45.0%		45.0%		50.0%		50.0%	50.0%	
Yellow Time (s)	3.3	3.3		3.3		3.3		3.3		3.3	3.3	
All-Red Time (s)	2.8	2.8		2.8		2.8		2.1		2.1	2.1	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0		0.0	0.0	
Total Lost Time (s)		6.1		6.1		6.1		5.4		5.4	5.4	
Lead/Lag	Lag	Lag		Lag		Lag						
Lead-Lag Optimize?	Yes	Yes		Yes		Yes						
Recall Mode	Max	Max		Max		Max		C-Max		C-Max	C-Max	
Act Effct Green (s)		43.9		43.9		43.9		44.6		44.6	44.6	
Actuated g/C Ratio		0.44		0.44		0.44		0.45		0.45	0.45	
v/c Ratio		0.38		0.08		0.04		0.25		0.02	0.34	
Control Delay		16.5		17.1		2.0		17.7		13.9	18.0	
Queue Delay		0.0		0.0		0.0		0.0		0.0	0.0	
Total Delay		16.5		17.1		2.0		17.7		13.9	18.0	
LOS		B		B		A		B		B	B	
Approach Delay		16.5			10.6			17.7			18.0	
Approach LOS		B			B			B			B	
Queue Length 50th (m)		23.7		3.7		0.0		22.2		0.6	38.1	
Queue Length 95th (m)		42.7		9.6		2.2		31.8		m1.3	47.2	
Internal Link Dist (m)		54.5			21.0			120.5			136.3	
Turn Bay Length (m)										20.0		
Base Capacity (vph)		644		431		591		1455		334	1478	
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		0.38		0.08		0.04		0.25		0.02	0.34	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	5%	5%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

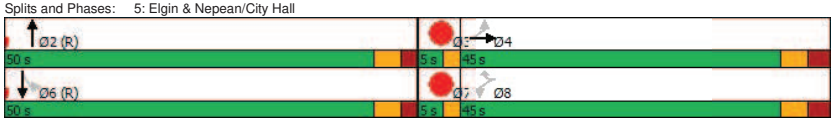
Intersection Summary	

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 17.2	Intersection LOS: B
Intersection Capacity Utilization 66.6%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 5: Elgin & Nepean/City Hall



Appendix H

Synchro Intersection Worksheets – 2032 Future Background Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	215	122	133	334	0	0	0	0	85	451	67
Future Volume (vph)	0	215	122	133	334	0	0	0	0	85	451	67
Satd. Flow (prot)	0	1430	0	1642	1712	0	0	0	0	0	4174	0
Flt Permitted				0.382							0.993	
Satd. Flow (perm)	0	1430	0	660	1712	0	0	0	0	0	3784	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	337	0	133	334	0	0	0	0	0	603	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		2		9	6						4	
Permitted Phases				6						4		
Detector Phase		2		9	6					4	4	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		23.9		10.8	21.9					22.5	22.5	
Total Split (s)		29.0		11.0	45.0					25.0	25.0	
Total Split (%)		38.7%		14.7%	60.0%					33.3%	33.3%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.6		2.5	2.6					2.6	2.6	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.9		5.8	5.9						5.9	
Lead/Lag				Lead						Lag	Lag	
Lead-Lag Optimize?				Yes						Yes	Yes	
Recall Mode		C-Max		Max	C-Max					Max	Max	
Act Effct Green (s)		28.1		39.2	39.1						24.1	
Actuated g/C Ratio		0.37		0.52	0.52						0.32	
v/c Ratio		0.63		0.32	0.37						0.50	
Control Delay		25.6		7.1	6.7						22.3	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		25.6		7.1	6.7						22.3	
LOS		C		A	A						C	
Approach Delay		25.6			6.8						22.3	
Approach LOS		C			A						C	
Queue Length 50th (m)		38.1		5.2	13.3						24.9	
Queue Length 95th (m)		64.6		m9.3	19.8						34.9	
Internal Link Dist (m)		71.8			158.7			39.2			62.3	
Turn Bay Length (m)												
Base Capacity (vph)		535		413	892						1215	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.63		0.32	0.37						0.50	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 63 (84%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

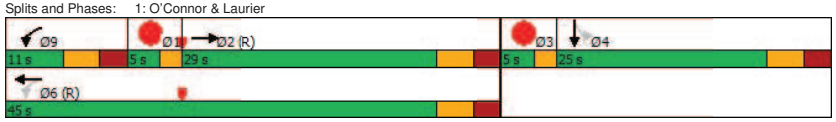
Intersection Summary

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 17.9	Intersection LOS: B
Intersection Capacity Utilization 61.2%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 1: O'Connor & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	288	0	0	391	256	96	704	74	0	0	0
Future Volume (vph)	22	288	0	0	391	256	96	704	74	0	0	0
Satd. Flow (prot)	0	1734	0	0	2511	0	0	4356	0	0	0	0
Flt Permitted		0.938						0.995				
Satd. Flow (perm)	0	1617	0	0	2511	0	0	4161	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	310	0	0	647	0	0	874	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2						4					
Detector Phase	2	2			6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	37.0	37.0			37.0		33.0	33.0				
Total Split (s)	37.0	37.0			37.0		33.0	33.0				
Total Split (%)	49.3%	49.3%			49.3%		44.0%	44.0%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.4	2.4			2.4		2.2	2.2				
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		5.7			5.7			5.5				
Lead/Lag	Lag	Lag			Lag							
Lead-Lag Optimize?	Yes	Yes			Yes							
Recall Mode	C-Max	C-Max			C-Max		Max	Max				
Act Effct Green (s)		36.3			36.3			27.5				
Actuated g/C Ratio		0.48			0.48			0.37				
v/c Ratio		0.40			0.53			0.57				
Control Delay		19.1			15.5			15.3				
Queue Delay		0.0			0.0			0.4				
Total Delay		19.1			15.5			15.7				
LOS		B			B			B				
Approach Delay		19.1			15.5			15.7				
Approach LOS		B			B			B				
Queue Length 50th (m)		31.3			31.6			36.9				
Queue Length 95th (m)		56.3			46.1			49.0				
Internal Link Dist (m)		158.7			172.2			51.7			65.1	
Turn Bay Length (m)												
Base Capacity (vph)		782			1215			1525				
Starvation Cap Reductn		0			0			239				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.40			0.53			0.68				

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 48 (64%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

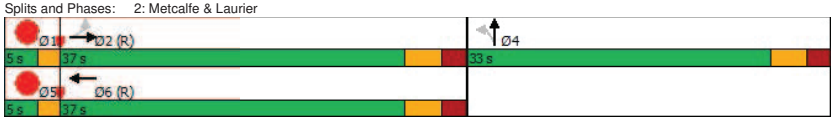
Lane Group	Ø1	Ø5
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	5
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 16.2	Intersection LOS: B
Intersection Capacity Utilization 65.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Metcalfe & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	285	57	209	497	538	0	213	59	361	376	170
Future Volume (vph)	0	285	57	209	497	538	0	213	59	361	376	170
Satd. Flow (prot)	0	3043	0	1658	1745	1483	0	3316	1483	3154	2434	0
Flt Permitted				0.532						0.950		
Satd. Flow (perm)	0	3043	0	771	1745	920	0	3316	680	1878	2434	0
Satd. Flow (RTOR)						238			149		91	
Lane Group Flow (vph)	0	342	0	209	497	538	0	213	59	361	546	0
Turn Type		NA		custom	NA	custom		NA	pm+ov	Prot	NA	
Protected Phases		2		9	5 6	3		4	9	3	8	
Permitted Phases				6		6			4			
Detector Phase		2		9	5 6	3		4	9	3	8	
Switch Phase												
Minimum Initial (s)		5.0		5.0		10.0		10.0	5.0	10.0	10.0	
Minimum Split (s)		30.0		12.0		20.7		28.2	12.0	20.7	28.2	
Total Split (s)		31.0		15.0		20.8		28.2	15.0	20.8	49.0	
Total Split (%)		31.0%		15.0%		20.8%		28.2%	15.0%	20.8%	49.0%	
Yellow Time (s)		3.3		3.3		3.3		3.3	3.3	3.3	3.3	
All-Red Time (s)		3.7		3.7		4.4		2.9	3.7	4.4	2.9	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0		7.0		7.7		6.2	7.0	7.7	6.2	
Lead/Lag				Lead		Lead		Lag	Lead	Lead		
Lead-Lag Optimize?				Yes		Yes		Yes	Yes	Yes		
Recall Mode		C-Max		Max		None		Max	Max	None	Max	
Act Effct Green (s)		29.0		37.0	49.0	41.4		22.0	29.2	13.1	42.8	
Actuated g/C Ratio		0.29		0.37	0.49	0.41		0.22	0.29	0.13	0.43	
v/c Ratio		0.39		0.59	0.58	0.91		0.29	0.16	0.87	0.50	
Control Delay		30.0		27.2	21.6	35.5		33.8	0.9	65.4	18.9	
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		30.0		27.2	21.6	35.5		33.8	0.9	65.4	18.9	
LOS		C		C	C	D		C	A	E	B	
Approach Delay		30.0			28.6			26.7			37.4	
Approach LOS		C			C			C			D	
Queue Length 50th (m)		27.8		25.3	66.1	39.9		18.2	0.0	35.8	32.5	
Queue Length 95th (m)		40.4		41.4	97.3	#89.7		28.4	0.0	#60.1	47.6	
Internal Link Dist (m)		172.2			106.8			136.3			52.8	
Turn Bay Length (m)									90.0	85.0		
Base Capacity (vph)		882		356	855	594		729	368	413	1093	
Starvation Cap Reductn		0		0	0	0		0	0	0	0	
Spillback Cap Reductn		0		0	0	0		0	0	0	0	
Storage Cap Reductn		0		0	0	0		0	0	0	0	
Reduced v/c Ratio		0.39		0.59	0.58	0.91		0.29	0.16	0.87	0.50	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 64 (64%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø5	Ø6	Ø13
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	5	6	13
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	5.0	1.0
Minimum Split (s)	5.0	7.0	25.0	5.0
Total Split (s)	5.0	10.0	36.0	5.0
Total Split (%)	5%	10%	36%	5%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lag	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes
Recall Mode	None	None	C-Max	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

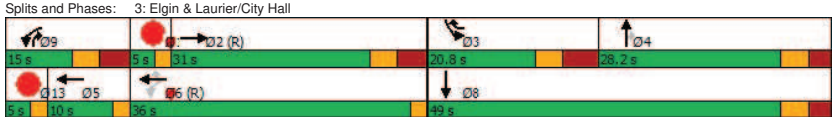
Intersection Summary

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 31.5	Intersection LOS: C
Intersection Capacity Utilization 83.8%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 3: Elgin & Laurier/City Hall



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	164	74	247	810	0	0	0	0
Future Volume (vph)	0	0	0	0	164	74	247	810	0	0	0	0
Satd. Flow (prot)	0	0	0	0	2845	0	0	4696	0	0	0	0
Flt Permitted								0.988				
Satd. Flow (perm)	0	0	0	0	2845	0	0	4330	0	0	0	0
Satd. Flow (RTOR)					26			89				
Lane Group Flow (vph)	0	0	0	0	238	0	0	1057	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					4			2				
Permitted Phases							2					
Detector Phase					4		2	2				
Switch Phase												
Minimum Initial (s)					10.0		10.0	10.0				
Minimum Split (s)					23.1		35.0	35.0				
Total Split (s)					25.0		50.0	50.0				
Total Split (%)					33.3%		66.7%	66.7%				
Yellow Time (s)					3.3		3.3	3.3				
All-Red Time (s)					1.8		1.7	1.7				
Lost Time Adjust (s)					0.0			0.0				
Total Lost Time (s)					5.1			5.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode					Max		C-Max	C-Max				
Act Effct Green (s)					19.9			45.0				
Actuated g/C Ratio					0.27			0.60				
v/c Ratio					0.31			0.40				
Control Delay					20.8			7.7				
Queue Delay					0.0			0.0				
Total Delay					20.8			7.7				
LOS					C			A				
Approach Delay					20.8			7.7				
Approach LOS					C			A				
Queue Length 50th (m)					12.4			23.2				
Queue Length 95th (m)					21.5			30.9				
Internal Link Dist (m)		34.9			48.3			35.0			51.7	
Turn Bay Length (m)												
Base Capacity (vph)					773			2633				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			144				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.31			0.42				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 73 (97%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 10.1	Intersection LOS: B
Intersection Capacity Utilization 44.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Metcalfe & Gloucester

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	7	31	1	0	9	0	281	43	17	336	0
Future Volume (vph)	31	7	31	1	0	9	0	281	43	17	336	0
Satd. Flow (prot)	0	1506	0	1658	0	1483	0	3079	0	1658	3252	0
Flt Permitted		0.978		0.712						0.556		
Satd. Flow (perm)	0	1427	0	1188	0	1294	0	3079	0	850	3252	0
Satd. Flow (RTOR)		31				53		32				
Lane Group Flow (vph)	0	69	0	1	0	9	0	324	0	17	336	0
Turn Type	Perm	NA		Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8				6		
Detector Phase	4	4		8		8		2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0		10.0		10.0	10.0	
Minimum Split (s)	25.1	25.1		25.1		25.1		31.4		31.4	31.4	
Total Split (s)	27.0	27.0		27.0		27.0		58.0		58.0	58.0	
Total Split (%)	30.0%	30.0%		30.0%		30.0%		64.4%		64.4%	64.4%	
Yellow Time (s)	3.3	3.3		3.3		3.3		3.3		3.3	3.3	
All-Red Time (s)	2.8	2.8		2.8		2.8		2.1		2.1	2.1	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0		0.0	0.0	
Total Lost Time (s)		6.1		6.1		6.1		5.4		5.4	5.4	
Lead/Lag	Lag	Lag		Lag		Lag						
Lead-Lag Optimize?	Yes	Yes		Yes		Yes						
Recall Mode	Max	Max		Max		Max		C-Max		C-Max	C-Max	
Act Effct Green (s)		25.9		25.9		25.9		52.6		52.6	52.6	
Actuated g/C Ratio		0.29		0.29		0.29		0.58		0.58	0.58	
v/c Ratio		0.16		0.00		0.02		0.18		0.03	0.18	
Control Delay		16.1		23.0		0.1		8.1		8.2	9.0	
Queue Delay		0.0		0.0		0.0		0.0		0.0	0.0	
Total Delay		16.1		23.0		0.1		8.1		8.2	9.0	
LOS		B		C		A		A		A	A	
Approach Delay		16.1			2.4			8.1			8.9	
Approach LOS		B			A			A			A	
Queue Length 50th (m)		4.8		0.1		0.0		11.2		1.2	13.1	
Queue Length 95th (m)		14.5		1.3		0.0		17.3		3.8	19.3	
Internal Link Dist (m)		54.5			21.0			120.5			136.3	
Turn Bay Length (m)										20.0		
Base Capacity (vph)		432		341		410		1812		496	1900	
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		0.16		0.00		0.02		0.18		0.03	0.18	

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

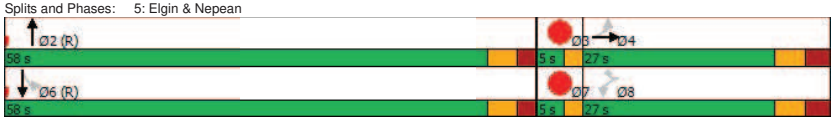
Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	6%	6%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary	

Maximum v/c Ratio: 0.18

Intersection Signal Delay: 9.1	Intersection LOS: A
Intersection Capacity Utilization 66.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Elgin & Nepean



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	204	95	179	273	0	0	0	0	51	544	44
Future Volume (vph)	0	204	95	179	273	0	0	0	0	51	544	44
Satd. Flow (prot)	0	1472	0	1642	1745	0	0	0	0	0	4480	0
Flt Permitted				0.386							0.996	
Satd. Flow (perm)	0	1472	0	667	1745	0	0	0	0	0	4249	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	333	0	199	303	0	0	0	0	0	710	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		2		9	6						4	
Permitted Phases				6						4		
Detector Phase		2		9	6					4	4	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		23.9		10.8	21.9					22.5	22.5	
Total Split (s)		29.0		11.0	45.0					25.0	25.0	
Total Split (%)		38.7%		14.7%	60.0%					33.3%	33.3%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.6		2.5	2.6					2.6	2.6	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.9		5.8	5.9						5.9	
Lead/Lag				Lead						Lag	Lag	
Lead-Lag Optimize?				Yes						Yes	Yes	
Recall Mode		C-Max		Max	C-Max					Max	Max	
Act Effct Green (s)		28.1		39.2	39.1						24.1	
Actuated g/C Ratio		0.37		0.52	0.52						0.32	
v/c Ratio		0.60		0.48	0.33						0.52	
Control Delay		24.6		22.1	16.2						22.4	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		24.6		22.1	16.2						22.4	
LOS		C		C	B						C	
Approach Delay		24.6			18.6						22.4	
Approach LOS		C			B						C	
Queue Length 50th (m)		37.2		18.6	25.8						29.6	
Queue Length 95th (m)		62.9		37.2	46.7						40.4	
Internal Link Dist (m)		71.8			158.7			39.2			62.3	
Turn Bay Length (m)												
Base Capacity (vph)		551		416	909						1365	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.60		0.48	0.33						0.52	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 22 (29%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

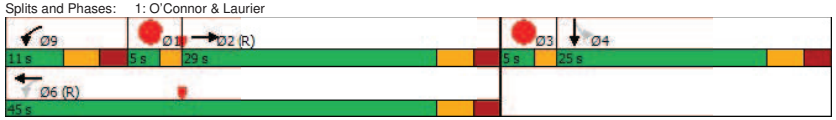
Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 21.6	Intersection LOS: C
Intersection Capacity Utilization 61.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: O'Connor & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	245	0	0	392	166	33	415	126	0	0	0
Future Volume (vph)	10	245	0	0	392	166	33	415	126	0	0	0
Satd. Flow (prot)	0	1742	0	0	2811	0	0	3782	0	0	0	0
Flt Permitted		0.974						0.997				
Satd. Flow (perm)	0	1691	0	0	2811	0	0	3701	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	283	0	0	620	0	0	638	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2						4					
Detector Phase	2	2			6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	37.0	37.0			37.0		19.5	19.5				
Total Split (s)	40.0	40.0			40.0		30.0	30.0				
Total Split (%)	53.3%	53.3%			53.3%		40.0%	40.0%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.4	2.4			2.4		2.2	2.2				
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		5.7			5.7			5.5				
Lead/Lag	Lag	Lag			Lag							
Lead-Lag Optimize?	Yes	Yes			Yes							
Recall Mode	C-Max	C-Max			C-Max		Max	Max				
Act Effct Green (s)		39.3			39.3			24.5				
Actuated g/C Ratio		0.52			0.52			0.33				
v/c Ratio		0.32			0.42			0.53				
Control Delay		6.6			12.0			17.7				
Queue Delay		0.0			0.0			0.3				
Total Delay		6.6			12.0			18.1				
LOS		A			B			B				
Approach Delay		6.6			12.0			18.1				
Approach LOS		A			B			B				
Queue Length 50th (m)		8.9			26.2			16.9				
Queue Length 95th (m)		13.5			37.8			21.6				
Internal Link Dist (m)		158.7			172.2			51.7			65.1	
Turn Bay Length (m)												
Base Capacity (vph)		886			1472			1208				
Starvation Cap Reductn		0			0			176				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.32			0.42			0.62				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 30 (40%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

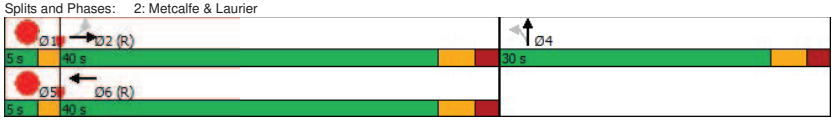
Lane Group	Ø1	Ø5
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	5
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary	

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 13.5	Intersection LOS: B
Intersection Capacity Utilization 48.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Metcalfe & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	362	29	117	429	413	0	280	161	382	363	108
Future Volume (vph)	0	362	29	117	429	413	0	280	161	382	363	108
Satd. Flow (prot)	0	3205	0	1642	1745	1483	0	3316	1483	3154	2647	0
Flt Permitted				0.465						0.950		
Satd. Flow (perm)	0	3205	0	696	1745	976	0	3316	680	2247	2647	0
Satd. Flow (RTOR)						213			149		50	
Lane Group Flow (vph)	0	434	0	130	477	459	0	311	179	424	523	0
Turn Type		NA		custom	NA	custom		NA	pm+ov	Prot	NA	
Protected Phases		2		9	5 6	3		4	9	3	8	
Permitted Phases				6		6			4			
Detector Phase		2		9	5 6	3		4	9	3	8	
Switch Phase												
Minimum Initial (s)		5.0		5.0		10.0		10.0	5.0	10.0	10.0	
Minimum Split (s)		30.0		12.0		20.7		28.2	12.0	20.7	28.2	
Total Split (s)		31.0		14.0		21.8		28.2	14.0	21.8	50.0	
Total Split (%)		31.0%		14.0%		21.8%		28.2%	14.0%	21.8%	50.0%	
Yellow Time (s)		3.3		3.3		3.3		3.3	3.3	3.3	3.3	
All-Red Time (s)		3.7		3.7		4.4		2.9	3.7	4.4	2.9	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0		7.0		7.7		6.2	7.0	7.7	6.2	
Lead/Lag				Lead		Lead		Lag	Lead	Lead		
Lead-Lag Optimize?				Yes		Yes		Yes	Yes	Yes		
Recall Mode		C-Max		None		None		Max	None	None	Max	
Act Effct Green (s)		29.0		35.0	48.0	41.4		22.0	28.2	14.1	43.8	
Actuated g/C Ratio		0.29		0.35	0.48	0.41		0.22	0.28	0.14	0.44	
v/c Ratio		0.47		0.42	0.57	0.77		0.43	0.51	0.95	0.44	
Control Delay		31.2		23.1	22.0	21.4		25.1	8.4	76.6	19.0	
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		31.2		23.1	22.0	21.4		25.1	8.4	76.6	19.0	
LOS		C		C	C	C		C	A	E	B	
Approach Delay		31.2			21.9			19.0			44.8	
Approach LOS		C			C			B			D	
Queue Length 50th (m)		36.3		15.2	63.8	29.9		16.4	1.4	42.6	32.4	
Queue Length 95th (m)		50.7		27.2	94.4	#58.8		23.6	9.1	#71.4	46.2	
Internal Link Dist (m)		172.2			106.8			136.3			52.8	
Turn Bay Length (m)									90.0	85.0		
Base Capacity (vph)		930		309	837	600		729	354	444	1187	
Starvation Cap Reductn		0		0	0	0		0	0	0	0	
Spillback Cap Reductn		0		0	0	0		0	0	0	0	
Storage Cap Reductn		0		0	0	0		0	0	0	0	
Reduced v/c Ratio		0.47		0.42	0.57	0.77		0.43	0.51	0.95	0.44	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 52 (52%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø5	Ø6	Ø13
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	5	6	13
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	5.0	1.0
Minimum Split (s)	5.0	7.0	25.0	5.0
Total Split (s)	5.0	10.0	35.0	5.0
Total Split (%)	5%	10%	35%	5%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lag	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes
Recall Mode	None	None	C-Max	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

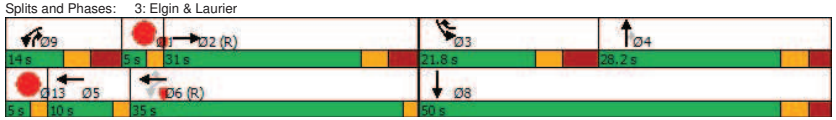
Intersection Summary

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 30.1	Intersection LOS: C
Intersection Capacity Utilization 79.1%	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: 3: Elgin & Laurier



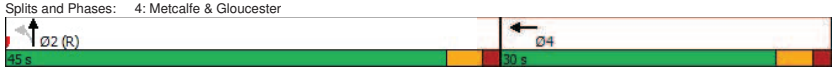
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	209	127	114	442	0	0	0	0
Future Volume (vph)	0	0	0	0	209	127	114	442	0	0	0	0
Satd. Flow (prot)	0	0	0	0	2923	0	0	4716	0	0	0	0
Flt Permitted								0.990				
Satd. Flow (perm)	0	0	0	0	2923	0	0	4412	0	0	0	0
Satd. Flow (RTOR)					16			92				
Lane Group Flow (vph)	0	0	0	0	373	0	0	618	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					4			2				
Permitted Phases							2					
Detector Phase					4		2	2				
Switch Phase												
Minimum Initial (s)					10.0		10.0	10.0				
Minimum Split (s)					23.1		35.0	35.0				
Total Split (s)					30.0		45.0	45.0				
Total Split (%)					40.0%		60.0%	60.0%				
Yellow Time (s)					3.3		3.3	3.3				
All-Red Time (s)					1.8		1.7	1.7				
Lost Time Adjust (s)					0.0			0.0				
Total Lost Time (s)					5.1			5.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode					Max		C-Max	C-Max				
Act Effct Green (s)					24.9			40.0				
Actuated g/C Ratio					0.33			0.53				
v/c Ratio					0.38			0.26				
Control Delay					19.7			8.3				
Queue Delay					0.0			0.0				
Total Delay					19.7			8.3				
LOS					B			A				
Approach Delay					19.7			8.3				
Approach LOS					B			A				
Queue Length 50th (m)					19.9			13.4				
Queue Length 95th (m)					30.9			19.2				
Internal Link Dist (m)		34.9			48.3			35.0			51.7	
Turn Bay Length (m)												
Base Capacity (vph)					981			2396				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.38			0.26				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 67 (89%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 41.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Metcalfe & Gloucester



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	1	107	31	0	23	0	328	5	7	464	0
Future Volume (vph)	113	1	107	31	0	23	0	328	5	7	464	0
Satd. Flow (prot)	0	1491	0	1658	0	1483	0	3260	0	1658	3316	0
Flt Permitted		0.975		0.605						0.516		
Satd. Flow (perm)	0	1397	0	983	0	1286	0	3260	0	744	3316	0
Satd. Flow (RTOR)		55				48		2				
Lane Group Flow (vph)	0	246	0	34	0	26	0	370	0	8	516	0
Turn Type	Perm	NA		Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8				6		
Detector Phase	4	4		8		8		2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0		10.0		10.0	10.0	
Minimum Split (s)	25.1	25.1		25.1		25.1		31.4		31.4	31.4	
Total Split (s)	45.0	45.0		45.0		45.0		50.0		50.0	50.0	
Total Split (%)	45.0%	45.0%		45.0%		45.0%		50.0%		50.0%	50.0%	
Yellow Time (s)	3.3	3.3		3.3		3.3		3.3		3.3	3.3	
All-Red Time (s)	2.8	2.8		2.8		2.8		2.1		2.1	2.1	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0		0.0	0.0	
Total Lost Time (s)		6.1		6.1		6.1		5.4		5.4	5.4	
Lead/Lag	Lag	Lag		Lag		Lag						
Lead-Lag Optimize?	Yes	Yes		Yes		Yes						
Recall Mode	Max	Max		Max		Max		C-Max		C-Max	C-Max	
Act Effct Green (s)		43.9		43.9		43.9		44.6		44.6	44.6	
Actuated g/C Ratio		0.44		0.44		0.44		0.45		0.45	0.45	
v/c Ratio		0.38		0.08		0.04		0.25		0.02	0.35	
Control Delay		16.5		17.1		2.0		17.8		13.9	17.9	
Queue Delay		0.0		0.0		0.0		0.0		0.0	0.0	
Total Delay		16.5		17.1		2.0		17.8		13.9	17.9	
LOS		B		B		A		B		B	B	
Approach Delay		16.5			10.6			17.8			17.8	
Approach LOS		B			B			B			B	
Queue Length 50th (m)		23.7		3.7		0.0		22.7		0.6	39.5	
Queue Length 95th (m)		42.7		9.6		2.2		32.5		m1.2	48.1	
Internal Link Dist (m)		54.5			21.0			120.5			136.3	
Turn Bay Length (m)										20.0		
Base Capacity (vph)		644		431		591		1455		331	1478	
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		0.38		0.08		0.04		0.25		0.02	0.35	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	5%	5%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

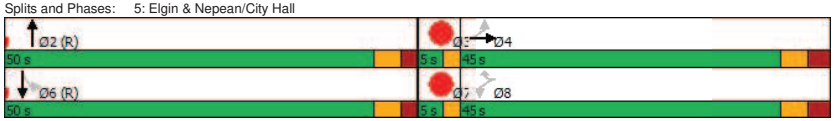
Intersection Summary	

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 17.2	Intersection LOS: B
Intersection Capacity Utilization 66.6%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 5: Elgin & Nepean/City Hall



Appendix I

Synchro Intersection Worksheets –2027 Future Total Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	223	122	138	344	0	0	0	0	85	451	67
Future Volume (vph)	0	223	122	138	344	0	0	0	0	85	451	67
Satd. Flow (prot)	0	1437	0	1642	1712	0	0	0	0	0	4174	0
Flt Permitted				0.374							0.993	
Satd. Flow (perm)	0	1437	0	646	1712	0	0	0	0	0	3784	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	345	0	138	344	0	0	0	0	0	603	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		2		9	6						4	
Permitted Phases				6						4		
Detector Phase		2		9	6					4	4	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		23.9		10.8	21.9					22.5	22.5	
Total Split (s)		29.0		11.0	45.0					25.0	25.0	
Total Split (%)		38.7%		14.7%	60.0%					33.3%	33.3%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.6		2.5	2.6					2.6	2.6	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.9		5.8	5.9						5.9	
Lead/Lag				Lead						Lag	Lag	
Lead-Lag Optimize?				Yes						Yes	Yes	
Recall Mode		C-Max		Max	C-Max					Max	Max	
Act Effct Green (s)		28.1		39.2	39.1						24.1	
Actuated g/C Ratio		0.37		0.52	0.52						0.32	
v/c Ratio		0.64		0.34	0.39						0.50	
Control Delay		25.9		7.2	6.7						22.3	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		25.9		7.2	6.7						22.3	
LOS		C		A	A						C	
Approach Delay		25.9			6.8						22.3	
Approach LOS		C			A						C	
Queue Length 50th (m)		39.2		5.3	13.4						24.9	
Queue Length 95th (m)		66.5		9.5	19.9						34.9	
Internal Link Dist (m)		71.8			158.7			39.2			62.3	
Turn Bay Length (m)												
Base Capacity (vph)		538		406	892						1215	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.64		0.34	0.39						0.50	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 63 (84%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

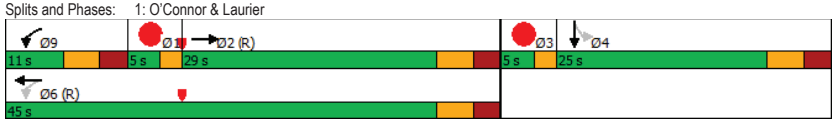
Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 18.0	Intersection LOS: B
Intersection Capacity Utilization 61.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: O'Connor & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	296	0	0	405	258	96	671	76	0	0	0
Future Volume (vph)	22	296	0	0	405	258	96	671	76	0	0	0
Satd. Flow (prot)	0	1736	0	0	2524	0	0	4327	0	0	0	0
Flt Permitted		0.938						0.994				
Satd. Flow (perm)	0	1618	0	0	2524	0	0	4126	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	318	0	0	663	0	0	843	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2						4					
Detector Phase	2	2			6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	37.0	37.0			37.0		33.0	33.0				
Total Split (s)	37.0	37.0			37.0		33.0	33.0				
Total Split (%)	49.3%	49.3%			49.3%		44.0%	44.0%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.4	2.4			2.4		2.2	2.2				
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		5.7			5.7			5.5				
Lead/Lag	Lag	Lag			Lag							
Lead-Lag Optimize?	Yes	Yes			Yes							
Recall Mode	C-Max	C-Max			C-Max		Max	Max				
Act Effct Green (s)		36.3			36.3			27.5				
Actuated g/C Ratio		0.48			0.48			0.37				
v/c Ratio		0.41			0.54			0.56				
Control Delay		19.4			15.6			15.2				
Queue Delay		0.0			0.0			0.4				
Total Delay		19.4			15.6			15.6				
LOS		B			B			B				
Approach Delay		19.4			15.6			15.6				
Approach LOS		B			B			B				
Queue Length 50th (m)		32.4			32.6			35.3				
Queue Length 95th (m)		57.7			47.4			47.3				
Internal Link Dist (m)		158.7			93.1			51.7			65.1	
Turn Bay Length (m)												
Base Capacity (vph)		783			1221			1512				
Starvation Cap Reductn		0			0			248				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.41			0.54			0.67				

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 48 (64%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

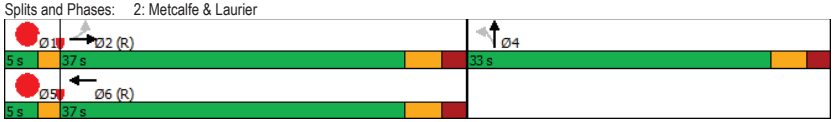
Lane Group	Ø1	Ø5
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	5
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 16.3	Intersection LOS: B
Intersection Capacity Utilization 65.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Metcalfe & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	290	59	209	498	538	0	208	59	361	367	171
Future Volume (vph)	0	290	59	209	498	538	0	208	59	361	367	171
Satd. Flow (prot)	0	3041	0	1658	1745	1483	0	3316	1483	3154	2417	0
Flt Permitted				0.525						0.950		
Satd. Flow (perm)	0	3041	0	763	1745	920	0	3316	680	1869	2417	0
Satd. Flow (RTOR)						238			149		96	
Lane Group Flow (vph)	0	349	0	209	498	538	0	208	59	361	538	0
Turn Type		NA		custom	NA	custom		NA	pm+ov	Prot	NA	
Protected Phases		2		9	5 6	3		4	9	3	8	
Permitted Phases				6		6			4			
Detector Phase		2		9	5 6	3		4	9	3	8	
Switch Phase												
Minimum Initial (s)		5.0		5.0		10.0		10.0	5.0	10.0	10.0	
Minimum Split (s)		30.0		12.0		20.7		28.2	12.0	20.7	28.2	
Total Split (s)		31.0		15.0		20.8		28.2	15.0	20.8	49.0	
Total Split (%)		31.0%		15.0%		20.8%		28.2%	15.0%	20.8%	49.0%	
Yellow Time (s)		3.3		3.3		3.3		3.3	3.3	3.3	3.3	
All-Red Time (s)		3.7		3.7		4.4		2.9	3.7	4.4	2.9	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0		7.0		7.7		6.2	7.0	7.7	6.2	
Lead/Lag				Lead		Lead		Lag	Lead	Lead		
Lead-Lag Optimize?				Yes		Yes		Yes	Yes	Yes		
Recall Mode		C-Max		Max		None		Max	Max	None	Max	
Act Effct Green (s)		29.0		37.0	49.0	41.4		22.0	29.2	13.1	42.8	
Actuated g/C Ratio		0.29		0.37	0.49	0.41		0.22	0.29	0.13	0.43	
v/c Ratio		0.40		0.59	0.58	0.91		0.29	0.16	0.87	0.49	
Control Delay		30.1		27.4	21.7	35.5		33.7	0.9	65.4	18.6	
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		30.1		27.4	21.7	35.5		33.7	0.9	65.4	18.6	
LOS		C		C	C	D		C	A	E	B	
Approach Delay		30.1			28.6			26.5			37.4	
Approach LOS		C			C			C			D	
Queue Length 50th (m)		28.4		25.3	66.2	39.9		17.7	0.0	35.8	31.5	
Queue Length 95th (m)		41.2		41.4	97.5	#89.7		27.8	0.0	#60.1	46.3	
Internal Link Dist (m)		55.2			106.8			136.3			52.8	
Turn Bay Length (m)									90.0	85.0		
Base Capacity (vph)		881		353	855	594		729	368	413	1089	
Starvation Cap Reductn		0		0	0	0		0	0	0	0	
Spillback Cap Reductn		0		0	0	0		0	0	0	0	
Storage Cap Reductn		0		0	0	0		0	0	0	0	
Reduced v/c Ratio		0.40		0.59	0.58	0.91		0.29	0.16	0.87	0.49	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 64 (64%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø5	Ø6	Ø13
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	5	6	13
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	5.0	1.0
Minimum Split (s)	5.0	7.0	25.0	5.0
Total Split (s)	5.0	10.0	36.0	5.0
Total Split (%)	5%	10%	36%	5%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lag	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes
Recall Mode	None	None	C-Max	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

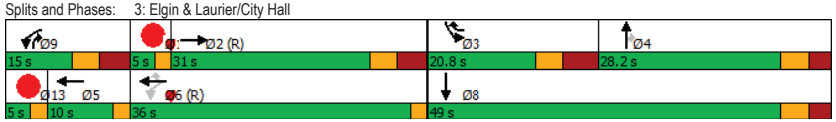
Intersection Summary

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 31.4	Intersection LOS: C
Intersection Capacity Utilization 83.8%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 3: Elgin & Laurier/City Hall



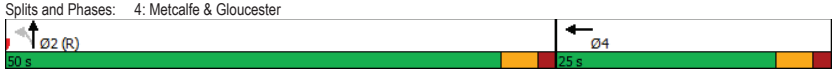
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	164	74	247	774	0	0	0	0
Future Volume (vph)	0	0	0	0	164	74	247	774	0	0	0	0
Satd. Flow (prot)	0	0	0	0	2845	0	0	4696	0	0	0	0
Flt Permitted								0.988				
Satd. Flow (perm)	0	0	0	0	2845	0	0	4316	0	0	0	0
Satd. Flow (RTOR)					28			89				
Lane Group Flow (vph)	0	0	0	0	238	0	0	1021	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					4			2				
Permitted Phases							2					
Detector Phase					4		2	2				
Switch Phase												
Minimum Initial (s)					10.0		10.0	10.0				
Minimum Split (s)					23.1		35.0	35.0				
Total Split (s)					25.0		50.0	50.0				
Total Split (%)					33.3%		66.7%	66.7%				
Yellow Time (s)					3.3		3.3	3.3				
All-Red Time (s)					1.8		1.7	1.7				
Lost Time Adjust (s)					0.0			0.0				
Total Lost Time (s)					5.1			5.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode					Max		C-Max	C-Max				
Act Effct Green (s)					19.9			45.0				
Actuated g/C Ratio					0.27			0.60				
v/c Ratio					0.31			0.39				
Control Delay					20.6			7.6				
Queue Delay					0.0			0.0				
Total Delay					20.6			7.6				
LOS					C			A				
Approach Delay					20.6			7.6				
Approach LOS					C			A				
Queue Length 50th (m)					12.3			22.1				
Queue Length 95th (m)					21.4			29.7				
Internal Link Dist (m)		34.9			48.3			35.0			51.7	
Turn Bay Length (m)												
Base Capacity (vph)					775			2625				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			109				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.31			0.41				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 73 (97%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.39

Intersection Signal Delay: 10.0	Intersection LOS: B
Intersection Capacity Utilization 43.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Metcalfe & Gloucester



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	7	31	1	0	9	0	274	43	17	330	0
Future Volume (vph)	31	7	31	1	0	9	0	274	43	17	330	0
Satd. Flow (prot)	0	1506	0	1658	0	1483	0	3077	0	1658	3252	0
Flt Permitted		0.978		0.712						0.560		
Satd. Flow (perm)	0	1427	0	1188	0	1294	0	3077	0	855	3252	0
Satd. Flow (RTOR)		31				53		33				
Lane Group Flow (vph)	0	69	0	1	0	9	0	317	0	17	330	0
Turn Type	Perm	NA		Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8				6		
Detector Phase	4	4		8		8		2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0		10.0		10.0	10.0	
Minimum Split (s)	25.1	25.1		25.1		25.1		31.4		31.4	31.4	
Total Split (s)	27.0	27.0		27.0		27.0		58.0		58.0	58.0	
Total Split (%)	30.0%	30.0%		30.0%		30.0%		64.4%		64.4%	64.4%	
Yellow Time (s)	3.3	3.3		3.3		3.3		3.3		3.3	3.3	
All-Red Time (s)	2.8	2.8		2.8		2.8		2.1		2.1	2.1	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0		0.0	0.0	
Total Lost Time (s)		6.1		6.1		6.1		5.4		5.4	5.4	
Lead/Lag	Lag	Lag		Lag		Lag						
Lead-Lag Optimize?	Yes	Yes		Yes		Yes						
Recall Mode	Max	Max		Max		Max		C-Max		C-Max	C-Max	
Act Effct Green (s)		25.9		25.9		25.9		52.6		52.6	52.6	
Actuated g/C Ratio		0.29		0.29		0.29		0.58		0.58	0.58	
v/c Ratio		0.16		0.00		0.02		0.17		0.03	0.17	
Control Delay		16.1		23.0		0.1		8.0		8.2	8.9	
Queue Delay		0.0		0.0		0.0		0.0		0.0	0.0	
Total Delay		16.1		23.0		0.1		8.0		8.2	8.9	
LOS		B		C		A		A		A	A	
Approach Delay		16.1			2.4			8.0			8.9	
Approach LOS		B			A			A			A	
Queue Length 50th (m)		4.8		0.1		0.0		10.9		1.2	12.8	
Queue Length 95th (m)		14.5		1.3		0.0		16.9		3.8	19.0	
Internal Link Dist (m)		54.5			21.0			120.5			136.3	
Turn Bay Length (m)										20.0		
Base Capacity (vph)		432		341		410		1812		499	1900	
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		0.16		0.00		0.02		0.17		0.03	0.17	

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

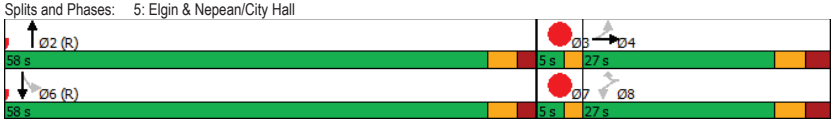
Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	6%	6%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.17

Intersection Signal Delay: 9.1	Intersection LOS: A
Intersection Capacity Utilization 66.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Elgin & Nepean/City Hall



Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	338	10	3	711	18	7
Future Vol, veh/h	338	10	3	711	18	7
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	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	338	10	3	711	18	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	348	0	1060	343
Stage 1	-	-	-	-	343	-
Stage 2	-	-	-	-	717	-
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	-	-	1211	-	248	700
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	484	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1211	-	247	700
Mov Cap-2 Maneuver	-	-	-	-	247	-
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	482	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	18
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	302	-	-	1211	-
HCM Lane V/C Ratio	0.083	-	-	0.002	-
HCM Control Delay (s)	18	-	-	8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	218	95	182	279	0	0	0	0	51	544	44
Future Volume (vph)	0	218	95	182	279	0	0	0	0	51	544	44
Satd. Flow (prot)	0	1483	0	1642	1745	0	0	0	0	0	4480	0
Flt Permitted				0.371							0.996	
Satd. Flow (perm)	0	1483	0	641	1745	0	0	0	0	0	4249	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	348	0	202	310	0	0	0	0	0	710	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		2		9	6						4	
Permitted Phases				6						4		
Detector Phase		2		9	6					4	4	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		23.9		10.8	21.9					22.5	22.5	
Total Split (s)		29.0		11.0	45.0					25.0	25.0	
Total Split (%)		38.7%		14.7%	60.0%					33.3%	33.3%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.6		2.5	2.6					2.6	2.6	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.9		5.8	5.9						5.9	
Lead/Lag				Lead						Lag	Lag	
Lead-Lag Optimize?				Yes						Yes	Yes	
Recall Mode		C-Max		Max	C-Max					Max	Max	
Act Effct Green (s)		28.1		39.2	39.1						24.1	
Actuated g/C Ratio		0.37		0.52	0.52						0.32	
v/c Ratio		0.63		0.50	0.34						0.52	
Control Delay		25.3		23.3	16.6						22.4	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		25.3		23.3	16.6						22.4	
LOS		C		C	B						C	
Approach Delay		25.3			19.2						22.4	
Approach LOS		C			B						C	
Queue Length 50th (m)		39.3		19.4	26.7						29.6	
Queue Length 95th (m)		66.2		38.5	48.1						40.4	
Internal Link Dist (m)		71.8			158.7			39.2			62.3	
Turn Bay Length (m)												
Base Capacity (vph)		555		404	909						1365	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.63		0.50	0.34						0.52	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 22 (29%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

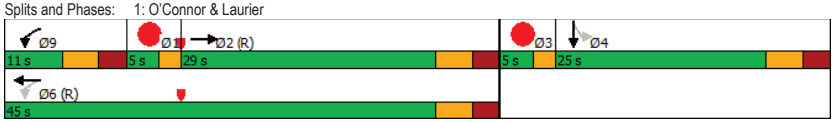
Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 22.0	Intersection LOS: C
Intersection Capacity Utilization 62.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: O'Connor & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	259	0	0	401	168	33	395	129	0	0	0
Future Volume (vph)	10	259	0	0	401	168	33	395	129	0	0	0
Satd. Flow (prot)	0	1742	0	0	2815	0	0	3732	0	0	0	0
Flt Permitted		0.974						0.997				
Satd. Flow (perm)	0	1692	0	0	2815	0	0	3649	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	299	0	0	633	0	0	619	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2						4					
Detector Phase	2	2			6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	37.0	37.0			37.0		19.5	19.5				
Total Split (s)	40.0	40.0			40.0		30.0	30.0				
Total Split (%)	53.3%	53.3%			53.3%		40.0%	40.0%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.4	2.4			2.4		2.2	2.2				
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		5.7			5.7			5.5				
Lead/Lag	Lag	Lag			Lag							
Lead-Lag Optimize?	Yes	Yes			Yes							
Recall Mode	C-Max	C-Max			C-Max		Max	Max				
Act Effct Green (s)		39.3			39.3			24.5				
Actuated g/C Ratio		0.52			0.52			0.33				
v/c Ratio		0.34			0.43			0.52				
Control Delay		6.4			12.1			17.8				
Queue Delay		0.0			0.0			0.3				
Total Delay		6.4			12.1			18.1				
LOS		A			B			B				
Approach Delay		6.4			12.1			18.1				
Approach LOS		A			B			B				
Queue Length 50th (m)		9.0			27.0			16.7				
Queue Length 95th (m)		13.4			38.6			21.5				
Internal Link Dist (m)		158.7			97.3			51.7			65.1	
Turn Bay Length (m)												
Base Capacity (vph)		886			1475			1192				
Starvation Cap Reductn		0			0			170				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.34			0.43			0.61				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 30 (40%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

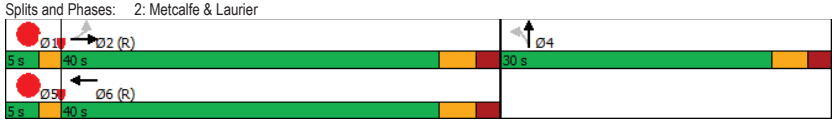
Lane Group	Ø1	Ø5
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	5
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 48.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Metcalfe & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	365	31	117	431	413	0	273	161	382	354	110
Future Volume (vph)	0	365	31	117	431	413	0	273	161	382	354	110
Satd. Flow (prot)	0	3198	0	1642	1745	1483	0	3316	1483	3154	2627	0
Flt Permitted				0.459						0.950		
Satd. Flow (perm)	0	3198	0	689	1745	976	0	3316	680	2237	2627	0
Satd. Flow (RTOR)						214			149		52	
Lane Group Flow (vph)	0	440	0	130	479	459	0	303	179	424	515	0
Turn Type		NA		custom	NA	custom		NA	pm+ov	Prot	NA	
Protected Phases		2		9	5 6	3		4	9	3	8	
Permitted Phases				6		6			4			
Detector Phase		2		9	5 6	3		4	9	3	8	
Switch Phase												
Minimum Initial (s)		5.0		5.0		10.0		10.0	5.0	10.0	10.0	
Minimum Split (s)		30.0		12.0		20.7		28.2	12.0	20.7	28.2	
Total Split (s)		31.0		14.0		21.8		28.2	14.0	21.8	50.0	
Total Split (%)		31.0%		14.0%		21.8%		28.2%	14.0%	21.8%	50.0%	
Yellow Time (s)		3.3		3.3		3.3		3.3	3.3	3.3	3.3	
All-Red Time (s)		3.7		3.7		4.4		2.9	3.7	4.4	2.9	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0		7.0		7.7		6.2	7.0	7.7	6.2	
Lead/Lag				Lead		Lead		Lag	Lead	Lead		
Lead-Lag Optimize?				Yes		Yes		Yes	Yes	Yes		
Recall Mode		C-Max		None		None		Max	None	None	Max	
Act Effct Green (s)		29.0		35.0	48.0	41.4		22.0	28.2	14.1	43.8	
Actuated g/C Ratio		0.29		0.35	0.48	0.41		0.22	0.28	0.14	0.44	
v/c Ratio		0.47		0.42	0.57	0.77		0.42	0.51	0.95	0.44	
Control Delay		31.3		23.2	22.0	21.4		25.2	8.5	76.6	18.8	
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		31.3		23.2	22.0	21.4		25.2	8.5	76.6	18.8	
LOS		C		C	C	C		C	A	E	B	
Approach Delay		31.3			21.9			19.0			44.9	
Approach LOS		C			C			B			D	
Queue Length 50th (m)		36.8		15.2	64.1	29.7		16.1	1.3	42.6	31.7	
Queue Length 95th (m)		51.3		27.2	94.8	#58.5		23.2	9.0	#71.4	45.3	
Internal Link Dist (m)		50.9			106.8			136.3			52.8	
Turn Bay Length (m)									90.0	85.0		
Base Capacity (vph)		928		307	837	600		729	354	444	1179	
Starvation Cap Reductn		0		0	0	0		0	0	0	0	
Spillback Cap Reductn		0		0	0	0		0	0	0	0	
Storage Cap Reductn		0		0	0	0		0	0	0	0	
Reduced v/c Ratio		0.47		0.42	0.57	0.77		0.42	0.51	0.95	0.44	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 52 (52%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø5	Ø6	Ø13
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	5	6	13
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	5.0	1.0
Minimum Split (s)	5.0	7.0	25.0	5.0
Total Split (s)	5.0	10.0	35.0	5.0
Total Split (%)	5%	10%	35%	5%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lag	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes
Recall Mode	None	None	C-Max	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

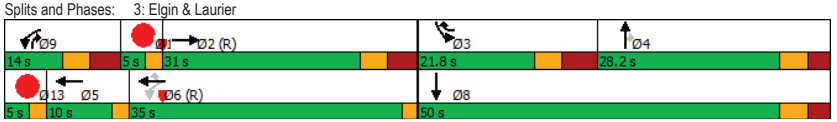
Intersection Summary

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 30.2	Intersection LOS: C
Intersection Capacity Utilization 79.1%	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: 3: Elgin & Laurier



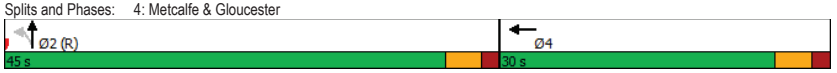
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	209	127	114	423	0	0	0	0
Future Volume (vph)	0	0	0	0	209	127	114	423	0	0	0	0
Satd. Flow (prot)	0	0	0	0	2923	0	0	4712	0	0	0	0
Flt Permitted								0.989				
Satd. Flow (perm)	0	0	0	0	2923	0	0	4396	0	0	0	0
Satd. Flow (RTOR)					17			92				
Lane Group Flow (vph)	0	0	0	0	373	0	0	597	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					4			2				
Permitted Phases							2					
Detector Phase					4		2	2				
Switch Phase												
Minimum Initial (s)					10.0		10.0	10.0				
Minimum Split (s)					23.1		35.0	35.0				
Total Split (s)					30.0		45.0	45.0				
Total Split (%)					40.0%		60.0%	60.0%				
Yellow Time (s)					3.3		3.3	3.3				
All-Red Time (s)					1.8		1.7	1.7				
Lost Time Adjust (s)					0.0			0.0				
Total Lost Time (s)					5.1			5.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode					Max		C-Max	C-Max				
Act Effct Green (s)					24.9			40.0				
Actuated g/C Ratio					0.33			0.53				
v/c Ratio					0.38			0.25				
Control Delay					19.6			8.2				
Queue Delay					0.0			0.0				
Total Delay					19.6			8.2				
LOS					B			A				
Approach Delay					19.6			8.2				
Approach LOS					B			A				
Queue Length 50th (m)					19.8			12.7				
Queue Length 95th (m)					30.8			18.5				
Internal Link Dist (m)		34.9			48.3			35.0			51.7	
Turn Bay Length (m)												
Base Capacity (vph)					981			2387				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.38			0.25				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 67 (89%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 41.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Metcalfe & Gloucester



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	1	107	31	0	23	0	320	5	7	454	0
Future Volume (vph)	113	1	107	31	0	23	0	320	5	7	454	0
Satd. Flow (prot)	0	1491	0	1658	0	1483	0	3260	0	1658	3316	0
Flt Permitted		0.975		0.605						0.522		
Satd. Flow (perm)	0	1397	0	983	0	1286	0	3260	0	751	3316	0
Satd. Flow (RTOR)		55				48		2				
Lane Group Flow (vph)	0	246	0	34	0	26	0	362	0	8	504	0
Turn Type	Perm	NA		Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8				6		
Detector Phase	4	4		8		8		2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0		10.0		10.0	10.0	
Minimum Split (s)	25.1	25.1		25.1		25.1		31.4		31.4	31.4	
Total Split (s)	45.0	45.0		45.0		45.0		50.0		50.0	50.0	
Total Split (%)	45.0%	45.0%		45.0%		45.0%		50.0%		50.0%	50.0%	
Yellow Time (s)	3.3	3.3		3.3		3.3		3.3		3.3	3.3	
All-Red Time (s)	2.8	2.8		2.8		2.8		2.1		2.1	2.1	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0		0.0	0.0	
Total Lost Time (s)		6.1		6.1		6.1		5.4		5.4	5.4	
Lead/Lag	Lag	Lag		Lag		Lag						
Lead-Lag Optimize?	Yes	Yes		Yes		Yes						
Recall Mode	Max	Max		Max		Max		C-Max		C-Max	C-Max	
Act Effct Green (s)		43.9		43.9		43.9		44.6		44.6	44.6	
Actuated g/C Ratio		0.44		0.44		0.44		0.45		0.45	0.45	
v/c Ratio		0.38		0.08		0.04		0.25		0.02	0.34	
Control Delay		16.5		17.1		2.0		17.7		14.0	18.1	
Queue Delay		0.0		0.0		0.0		0.0		0.0	0.0	
Total Delay		16.5		17.1		2.0		17.7		14.0	18.1	
LOS		B		B		A		B		B	B	
Approach Delay		16.5			10.6			17.7			18.1	
Approach LOS		B			B			B			B	
Queue Length 50th (m)		23.7		3.7		0.0		22.2		0.6	38.4	
Queue Length 95th (m)		42.7		9.6		2.2		31.8		m1.2	47.5	
Internal Link Dist (m)		54.5			21.0			120.5			136.3	
Turn Bay Length (m)										20.0		
Base Capacity (vph)		644		431		591		1455		334	1478	
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		0.38		0.08		0.04		0.25		0.02	0.34	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	5%	5%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

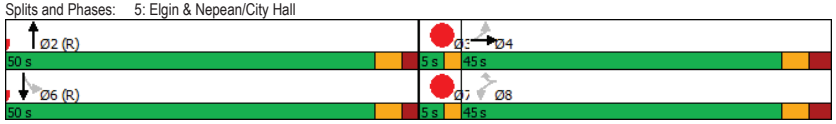
Intersection Summary

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 17.3	Intersection LOS: B
Intersection Capacity Utilization 66.6%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 5: Elgin & Nepean/City Hall



Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	451	17	5	482	12	5
Future Vol, veh/h	451	17	5	482	12	5
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	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	501	19	6	536	13	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	520	0	1059	511
Stage 1	-	-	-	-	511	-
Stage 2	-	-	-	-	548	-
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	-	-	1046	-	249	563
Stage 1	-	-	-	-	602	-
Stage 2	-	-	-	-	579	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1046	-	247	563
Mov Cap-2 Maneuver	-	-	-	-	247	-
Stage 1	-	-	-	-	602	-
Stage 2	-	-	-	-	574	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	18
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	296	-	-	1046	-
HCM Lane V/C Ratio	0.064	-	-	0.005	-
HCM Control Delay (s)	18	-	-	8.5	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Appendix J

Synchro Intersection Worksheets – 2032 Future Total Conditions

CGH TRANSPORTATION

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	223	122	138	344	0	0	0	0	85	451	67
Future Volume (vph)	0	223	122	138	344	0	0	0	0	85	451	67
Satd. Flow (prot)	0	1437	0	1642	1712	0	0	0	0	0	4174	0
Flt Permitted				0.374							0.993	
Satd. Flow (perm)	0	1437	0	646	1712	0	0	0	0	0	3784	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	345	0	138	344	0	0	0	0	0	603	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		2		9	6						4	
Permitted Phases				6						4		
Detector Phase		2		9	6					4	4	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		23.9		10.8	21.9					22.5	22.5	
Total Split (s)		29.0		11.0	45.0					25.0	25.0	
Total Split (%)		38.7%		14.7%	60.0%					33.3%	33.3%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.6		2.5	2.6					2.6	2.6	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.9		5.8	5.9						5.9	
Lead/Lag				Lead						Lag	Lag	
Lead-Lag Optimize?				Yes						Yes	Yes	
Recall Mode		C-Max		Max	C-Max					Max	Max	
Act Effct Green (s)		28.1		39.2	39.1						24.1	
Actuated g/C Ratio		0.37		0.52	0.52						0.32	
v/c Ratio		0.64		0.34	0.39						0.50	
Control Delay		25.9		7.1	6.7						22.3	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		25.9		7.1	6.7						22.3	
LOS		C		A	A						C	
Approach Delay		25.9			6.8						22.3	
Approach LOS		C			A						C	
Queue Length 50th (m)		39.2		5.3	13.5						24.9	
Queue Length 95th (m)		66.5		m9.4	19.9						34.9	
Internal Link Dist (m)		71.8			158.7			39.2			62.3	
Turn Bay Length (m)												
Base Capacity (vph)		538		406	892						1215	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.64		0.34	0.39						0.50	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 63 (84%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

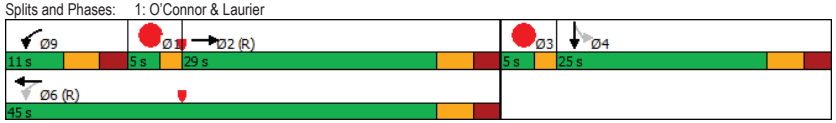
Intersection Summary

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 17.9	Intersection LOS: B
Intersection Capacity Utilization 61.9%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 1: O'Connor & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	296	0	0	405	258	96	704	76	0	0	0
Future Volume (vph)	22	296	0	0	405	258	96	704	76	0	0	0
Satd. Flow (prot)	0	1736	0	0	2524	0	0	4349	0	0	0	0
Flt Permitted		0.938						0.995				
Satd. Flow (perm)	0	1618	0	0	2524	0	0	4154	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	318	0	0	663	0	0	876	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2						4					
Detector Phase	2	2			6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	37.0	37.0			37.0		33.0	33.0				
Total Split (s)	37.0	37.0			37.0		33.0	33.0				
Total Split (%)	49.3%	49.3%			49.3%		44.0%	44.0%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.4	2.4			2.4		2.2	2.2				
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		5.7			5.7			5.5				
Lead/Lag	Lag	Lag			Lag							
Lead-Lag Optimize?	Yes	Yes			Yes							
Recall Mode	C-Max	C-Max			C-Max		Max	Max				
Act Effct Green (s)		36.3			36.3			27.5				
Actuated g/C Ratio		0.48			0.48			0.37				
v/c Ratio		0.41			0.54			0.58				
Control Delay		19.4			15.6			15.3				
Queue Delay		0.0			0.0			0.4				
Total Delay		19.4			15.6			15.8				
LOS		B			B			B				
Approach Delay		19.4			15.6			15.8				
Approach LOS		B			B			B				
Queue Length 50th (m)		32.4			32.6			37.0				
Queue Length 95th (m)		57.7			47.4			49.1				
Internal Link Dist (m)		158.7			93.1			51.7			65.1	
Turn Bay Length (m)												
Base Capacity (vph)		783			1221			1523				
Starvation Cap Reductn		0			0			237				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.41			0.54			0.68				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 48 (64%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

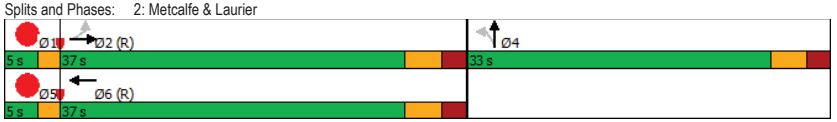
Lane Group	Ø1	Ø5
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	5
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 16.3	Intersection LOS: B
Intersection Capacity Utilization 66.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Metcalfe & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	290	59	209	498	538	0	213	59	361	376	171
Future Volume (vph)	0	290	59	209	498	538	0	213	59	361	376	171
Satd. Flow (prot)	0	3041	0	1658	1745	1483	0	3316	1483	3154	2431	0
Flt Permitted				0.525						0.950		
Satd. Flow (perm)	0	3041	0	763	1745	920	0	3316	680	1878	2431	0
Satd. Flow (RTOR)						238			149		92	
Lane Group Flow (vph)	0	349	0	209	498	538	0	213	59	361	547	0
Turn Type		NA		custom	NA	custom		NA	pm+ov	Prot	NA	
Protected Phases		2		9	5 6	3		4	9	3	8	
Permitted Phases				6		6			4			
Detector Phase		2		9	5 6	3		4	9	3	8	
Switch Phase												
Minimum Initial (s)		5.0		5.0		10.0		10.0	5.0	10.0	10.0	
Minimum Split (s)		30.0		12.0		20.7		28.2	12.0	20.7	28.2	
Total Split (s)		31.0		15.0		20.8		28.2	15.0	20.8	49.0	
Total Split (%)		31.0%		15.0%		20.8%		28.2%	15.0%	20.8%	49.0%	
Yellow Time (s)		3.3		3.3		3.3		3.3	3.3	3.3	3.3	
All-Red Time (s)		3.7		3.7		4.4		2.9	3.7	4.4	2.9	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0		7.0		7.7		6.2	7.0	7.7	6.2	
Lead/Lag				Lead		Lead		Lag	Lead	Lead		
Lead-Lag Optimize?				Yes		Yes		Yes	Yes	Yes		
Recall Mode		C-Max		Max		None		Max	Max	None	Max	
Act Effct Green (s)		29.0		37.0	49.0	41.4		22.0	29.2	13.1	42.8	
Actuated g/C Ratio		0.29		0.37	0.49	0.41		0.22	0.29	0.13	0.43	
v/c Ratio		0.40		0.59	0.58	0.91		0.29	0.16	0.87	0.50	
Control Delay		30.1		27.4	21.7	35.5		33.8	0.9	65.4	18.9	
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		30.1		27.4	21.7	35.5		33.8	0.9	65.4	18.9	
LOS		C		C	C	D		C	A	E	B	
Approach Delay		30.1			28.6			26.7			37.4	
Approach LOS		C			C			C			D	
Queue Length 50th (m)		28.4		25.3	66.2	39.9		18.2	0.0	35.8	32.6	
Queue Length 95th (m)		41.2		41.4	97.5	#89.7		28.4	0.0	#60.1	47.6	
Internal Link Dist (m)		55.2			106.8			136.3			52.8	
Turn Bay Length (m)									90.0	85.0		
Base Capacity (vph)		881		353	855	594		729	368	413	1093	
Starvation Cap Reductn		0		0	0	0		0	0	0	0	
Spillback Cap Reductn		0		0	0	0		0	0	0	0	
Storage Cap Reductn		0		0	0	0		0	0	0	0	
Reduced v/c Ratio		0.40		0.59	0.58	0.91		0.29	0.16	0.87	0.50	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 64 (64%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø5	Ø6	Ø13
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	5	6	13
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	5.0	1.0
Minimum Split (s)	5.0	7.0	25.0	5.0
Total Split (s)	5.0	10.0	36.0	5.0
Total Split (%)	5%	10%	36%	5%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lag	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes
Recall Mode	None	None	C-Max	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

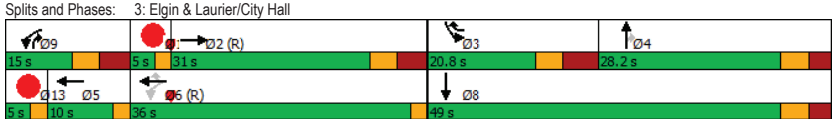
Intersection Summary

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 31.5	Intersection LOS: C
Intersection Capacity Utilization 83.8%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 3: Elgin & Laurier/City Hall



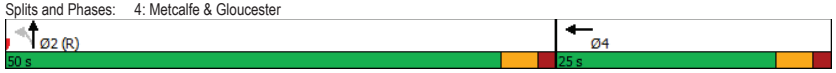
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	164	74	247	812	0	0	0	0
Future Volume (vph)	0	0	0	0	164	74	247	812	0	0	0	0
Satd. Flow (prot)	0	0	0	0	2845	0	0	4696	0	0	0	0
Flt Permitted								0.988				
Satd. Flow (perm)	0	0	0	0	2845	0	0	4330	0	0	0	0
Satd. Flow (RTOR)					26			89				
Lane Group Flow (vph)	0	0	0	0	238	0	0	1059	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					4			2				
Permitted Phases							2					
Detector Phase					4		2	2				
Switch Phase												
Minimum Initial (s)					10.0		10.0	10.0				
Minimum Split (s)					23.1		35.0	35.0				
Total Split (s)					25.0		50.0	50.0				
Total Split (%)					33.3%		66.7%	66.7%				
Yellow Time (s)					3.3		3.3	3.3				
All-Red Time (s)					1.8		1.7	1.7				
Lost Time Adjust (s)					0.0			0.0				
Total Lost Time (s)					5.1			5.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode					Max		C-Max	C-Max				
Act Effct Green (s)					19.9			45.0				
Actuated g/C Ratio					0.27			0.60				
v/c Ratio					0.31			0.40				
Control Delay					20.8			7.7				
Queue Delay					0.0			0.0				
Total Delay					20.8			7.7				
LOS					C			A				
Approach Delay					20.8			7.7				
Approach LOS					C			A				
Queue Length 50th (m)					12.4			23.2				
Queue Length 95th (m)					21.5			31.1				
Internal Link Dist (m)		34.9			48.3			35.0			51.7	
Turn Bay Length (m)												
Base Capacity (vph)					773			2633				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			148				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.31			0.43				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 73 (97%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 10.1	Intersection LOS: B
Intersection Capacity Utilization 44.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Metcalfe & Gloucester



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	7	31	1	0	9	0	281	43	17	338	0
Future Volume (vph)	31	7	31	1	0	9	0	281	43	17	338	0
Satd. Flow (prot)	0	1506	0	1658	0	1483	0	3079	0	1658	3252	0
Flt Permitted		0.978		0.712						0.556		
Satd. Flow (perm)	0	1427	0	1188	0	1294	0	3079	0	850	3252	0
Satd. Flow (RTOR)		31				53		32				
Lane Group Flow (vph)	0	69	0	1	0	9	0	324	0	17	338	0
Turn Type	Perm	NA		Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8				6		
Detector Phase	4	4		8		8		2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0		10.0		10.0	10.0	
Minimum Split (s)	25.1	25.1		25.1		25.1		31.4		31.4	31.4	
Total Split (s)	27.0	27.0		27.0		27.0		58.0		58.0	58.0	
Total Split (%)	30.0%	30.0%		30.0%		30.0%		64.4%		64.4%	64.4%	
Yellow Time (s)	3.3	3.3		3.3		3.3		3.3		3.3	3.3	
All-Red Time (s)	2.8	2.8		2.8		2.8		2.1		2.1	2.1	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0		0.0	0.0	
Total Lost Time (s)		6.1		6.1		6.1		5.4		5.4	5.4	
Lead/Lag	Lag	Lag		Lag		Lag						
Lead-Lag Optimize?	Yes	Yes		Yes		Yes						
Recall Mode	Max	Max		Max		Max		C-Max		C-Max	C-Max	
Act Effct Green (s)		25.9		25.9		25.9		52.6		52.6	52.6	
Actuated g/C Ratio		0.29		0.29		0.29		0.58		0.58	0.58	
v/c Ratio		0.16		0.00		0.02		0.18		0.03	0.18	
Control Delay		16.1		23.0		0.1		8.1		8.2	9.0	
Queue Delay		0.0		0.0		0.0		0.0		0.0	0.0	
Total Delay		16.1		23.0		0.1		8.1		8.2	9.0	
LOS		B		C		A		A		A	A	
Approach Delay		16.1			2.4			8.1			8.9	
Approach LOS		B			A			A			A	
Queue Length 50th (m)		4.8		0.1		0.0		11.2		1.2	13.1	
Queue Length 95th (m)		14.5		1.3		0.0		17.3		3.8	19.4	
Internal Link Dist (m)		54.5			21.0			120.5			136.3	
Turn Bay Length (m)										20.0		
Base Capacity (vph)		432		341		410		1812		496	1900	
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		0.16		0.00		0.02		0.18		0.03	0.18	

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

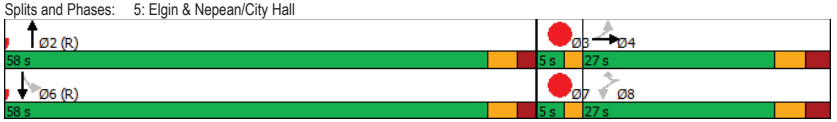
Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	6%	6%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.18

Intersection Signal Delay: 9.1	Intersection LOS: A
Intersection Capacity Utilization 66.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Elgin & Nepean/City Hall



Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	338	10	3	711	18	7
Future Vol, veh/h	338	10	3	711	18	7
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	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	338	10	3	711	18	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	348	0	1060	343
Stage 1	-	-	-	-	343	-
Stage 2	-	-	-	-	717	-
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	-	-	1211	-	248	700
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	484	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1211	-	247	700
Mov Cap-2 Maneuver	-	-	-	-	247	-
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	482	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	18
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	302	-	-	1211	-
HCM Lane V/C Ratio	0.083	-	-	0.002	-
HCM Control Delay (s)	18	-	-	8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	218	95	182	279	0	0	0	0	51	544	44
Future Volume (vph)	0	218	95	182	279	0	0	0	0	51	544	44
Satd. Flow (prot)	0	1483	0	1642	1745	0	0	0	0	0	4480	0
Flt Permitted				0.371							0.996	
Satd. Flow (perm)	0	1483	0	641	1745	0	0	0	0	0	4249	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	348	0	202	310	0	0	0	0	0	710	0
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		2		9	6						4	
Permitted Phases				6						4		
Detector Phase		2		9	6					4	4	
Switch Phase												
Minimum Initial (s)		10.0		5.0	10.0					10.0	10.0	
Minimum Split (s)		23.9		10.8	21.9					22.5	22.5	
Total Split (s)		29.0		11.0	45.0					25.0	25.0	
Total Split (%)		38.7%		14.7%	60.0%					33.3%	33.3%	
Yellow Time (s)		3.3		3.3	3.3					3.3	3.3	
All-Red Time (s)		2.6		2.5	2.6					2.6	2.6	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.9		5.8	5.9						5.9	
Lead/Lag				Lead						Lag	Lag	
Lead-Lag Optimize?				Yes						Yes	Yes	
Recall Mode		C-Max		Max	C-Max					Max	Max	
Act Effct Green (s)		28.1		39.2	39.1						24.1	
Actuated g/C Ratio		0.37		0.52	0.52						0.32	
v/c Ratio		0.63		0.50	0.34						0.52	
Control Delay		25.3		23.3	16.6						22.4	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		25.3		23.3	16.6						22.4	
LOS		C		C	B						C	
Approach Delay		25.3			19.2						22.4	
Approach LOS		C			B						C	
Queue Length 50th (m)		39.3		19.4	26.7						29.6	
Queue Length 95th (m)		66.2		38.5	48.0						40.4	
Internal Link Dist (m)		71.8			158.7			39.2			62.3	
Turn Bay Length (m)												
Base Capacity (vph)		555		404	909						1365	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.63		0.50	0.34						0.52	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 22 (29%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

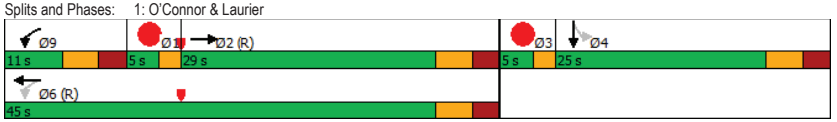
Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 22.0	Intersection LOS: C
Intersection Capacity Utilization 62.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: O'Connor & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	259	0	0	401	168	33	415	129	0	0	0
Future Volume (vph)	10	259	0	0	401	168	33	415	129	0	0	0
Satd. Flow (prot)	0	1742	0	0	2815	0	0	3769	0	0	0	0
Flt Permitted		0.974						0.997				
Satd. Flow (perm)	0	1692	0	0	2815	0	0	3688	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	299	0	0	633	0	0	641	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2						4					
Detector Phase	2	2			6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		10.0	10.0				
Minimum Split (s)	37.0	37.0			37.0		19.5	19.5				
Total Split (s)	40.0	40.0			40.0		30.0	30.0				
Total Split (%)	53.3%	53.3%			53.3%		40.0%	40.0%				
Yellow Time (s)	3.3	3.3			3.3		3.3	3.3				
All-Red Time (s)	2.4	2.4			2.4		2.2	2.2				
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		5.7			5.7			5.5				
Lead/Lag	Lag	Lag			Lag							
Lead-Lag Optimize?	Yes	Yes			Yes							
Recall Mode	C-Max	C-Max			C-Max		Max	Max				
Act Effct Green (s)		39.3			39.3			24.5				
Actuated g/C Ratio		0.52			0.52			0.33				
v/c Ratio		0.34			0.43			0.53				
Control Delay		6.4			12.1			17.8				
Queue Delay		0.0			0.0			0.3				
Total Delay		6.4			12.1			18.2				
LOS		A			B			B				
Approach Delay		6.4			12.1			18.2				
Approach LOS		A			B			B				
Queue Length 50th (m)		9.0			27.0			17.1				
Queue Length 95th (m)		13.4			38.6			21.7				
Internal Link Dist (m)		158.7			97.3			51.7			65.1	
Turn Bay Length (m)												
Base Capacity (vph)		886			1475			1204				
Starvation Cap Reductn		0			0			171				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.34			0.43			0.62				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 30 (40%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

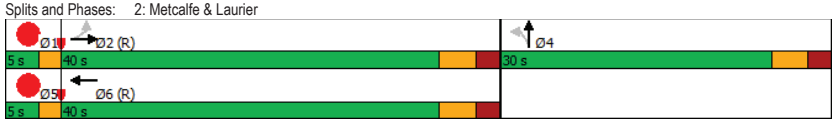
Lane Group	Ø1	Ø5
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	5
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	7%	7%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 13.5	Intersection LOS: B
Intersection Capacity Utilization 49.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Metcalfe & Laurier



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	365	31	117	431	413	0	280	161	382	363	110
Future Volume (vph)	0	365	31	117	431	413	0	280	161	382	363	110
Satd. Flow (prot)	0	3198	0	1642	1745	1483	0	3316	1483	3154	2639	0
Flt Permitted				0.459						0.950		
Satd. Flow (perm)	0	3198	0	689	1745	976	0	3316	680	2247	2639	0
Satd. Flow (RTOR)						213			149		51	
Lane Group Flow (vph)	0	440	0	130	479	459	0	311	179	424	525	0
Turn Type		NA		custom	NA	custom		NA	pm+ov	Prot	NA	
Protected Phases		2		9	5 6	3		4	9	3	8	
Permitted Phases				6		6			4			
Detector Phase		2		9	5 6	3		4	9	3	8	
Switch Phase												
Minimum Initial (s)		5.0		5.0		10.0		10.0	5.0	10.0	10.0	
Minimum Split (s)		30.0		12.0		20.7		28.2	12.0	20.7	28.2	
Total Split (s)		31.0		14.0		21.8		28.2	14.0	21.8	50.0	
Total Split (%)		31.0%		14.0%		21.8%		28.2%	14.0%	21.8%	50.0%	
Yellow Time (s)		3.3		3.3		3.3		3.3	3.3	3.3	3.3	
All-Red Time (s)		3.7		3.7		4.4		2.9	3.7	4.4	2.9	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)		7.0		7.0		7.7		6.2	7.0	7.7	6.2	
Lead/Lag				Lead		Lead		Lag	Lead	Lead		
Lead-Lag Optimize?				Yes		Yes		Yes	Yes	Yes		
Recall Mode		C-Max		None		None		Max	None	None	Max	
Act Effct Green (s)		29.0		35.0	48.0	41.4		22.0	28.2	14.1	43.8	
Actuated g/C Ratio		0.29		0.35	0.48	0.41		0.22	0.28	0.14	0.44	
v/c Ratio		0.47		0.42	0.57	0.77		0.43	0.51	0.95	0.44	
Control Delay		31.3		23.2	22.0	21.4		25.1	8.4	76.6	19.0	
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay		31.3		23.2	22.0	21.4		25.1	8.4	76.6	19.0	
LOS		C		C	C	C		C	A	E	B	
Approach Delay		31.3			21.9			19.0			44.7	
Approach LOS		C			C			B			D	
Queue Length 50th (m)		36.8		15.2	64.1	29.9		16.4	1.4	42.6	32.5	
Queue Length 95th (m)		51.3		27.2	94.8	#58.8		23.6	9.1	#71.4	46.4	
Internal Link Dist (m)		50.9			106.8			136.3			52.8	
Turn Bay Length (m)									90.0	85.0		
Base Capacity (vph)		928		307	837	600		729	354	444	1184	
Starvation Cap Reductn		0		0	0	0		0	0	0	0	
Spillback Cap Reductn		0		0	0	0		0	0	0	0	
Storage Cap Reductn		0		0	0	0		0	0	0	0	
Reduced v/c Ratio		0.47		0.42	0.57	0.77		0.43	0.51	0.95	0.44	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 52 (52%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø5	Ø6	Ø13
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	5	6	13
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	5.0	1.0
Minimum Split (s)	5.0	7.0	25.0	5.0
Total Split (s)	5.0	10.0	35.0	5.0
Total Split (%)	5%	10%	35%	5%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lag	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes
Recall Mode	None	None	C-Max	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

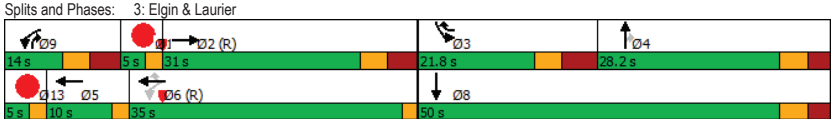
Intersection Summary

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 30.2	Intersection LOS: C
Intersection Capacity Utilization 79.1%	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: 3: Elgin & Laurier



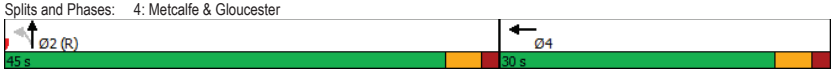
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	209	127	114	445	0	0	0	0
Future Volume (vph)	0	0	0	0	209	127	114	445	0	0	0	0
Satd. Flow (prot)	0	0	0	0	2923	0	0	4716	0	0	0	0
Flt Permitted								0.990				
Satd. Flow (perm)	0	0	0	0	2923	0	0	4413	0	0	0	0
Satd. Flow (RTOR)					16			92				
Lane Group Flow (vph)	0	0	0	0	373	0	0	621	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					4			2				
Permitted Phases							2					
Detector Phase					4		2	2				
Switch Phase												
Minimum Initial (s)					10.0		10.0	10.0				
Minimum Split (s)					23.1		35.0	35.0				
Total Split (s)					30.0		45.0	45.0				
Total Split (%)					40.0%		60.0%	60.0%				
Yellow Time (s)					3.3		3.3	3.3				
All-Red Time (s)					1.8		1.7	1.7				
Lost Time Adjust (s)					0.0			0.0				
Total Lost Time (s)					5.1			5.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode					Max		C-Max	C-Max				
Act Effct Green (s)					24.9			40.0				
Actuated g/C Ratio					0.33			0.53				
v/c Ratio					0.38			0.26				
Control Delay					19.7			8.3				
Queue Delay					0.0			0.0				
Total Delay					19.7			8.3				
LOS					B			A				
Approach Delay					19.7			8.3				
Approach LOS					B			A				
Queue Length 50th (m)					19.9			13.4				
Queue Length 95th (m)					30.9			19.4				
Internal Link Dist (m)		34.9			48.3			35.0			51.7	
Turn Bay Length (m)												
Base Capacity (vph)					981			2396				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.38			0.26				

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 67 (89%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 41.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Metcalfe & Gloucester



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	1	107	31	0	23	0	328	5	7	466	0
Future Volume (vph)	113	1	107	31	0	23	0	328	5	7	466	0
Satd. Flow (prot)	0	1491	0	1658	0	1483	0	3260	0	1658	3316	0
Flt Permitted		0.975		0.605						0.516		
Satd. Flow (perm)	0	1397	0	983	0	1286	0	3260	0	744	3316	0
Satd. Flow (RTOR)		55				48		2				
Lane Group Flow (vph)	0	246	0	34	0	26	0	370	0	8	518	0
Turn Type	Perm	NA		Perm		Perm		NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8				6		
Detector Phase	4	4		8		8		2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0		10.0		10.0		10.0	10.0	
Minimum Split (s)	25.1	25.1		25.1		25.1		31.4		31.4	31.4	
Total Split (s)	45.0	45.0		45.0		45.0		50.0		50.0	50.0	
Total Split (%)	45.0%	45.0%		45.0%		45.0%		50.0%		50.0%	50.0%	
Yellow Time (s)	3.3	3.3		3.3		3.3		3.3		3.3	3.3	
All-Red Time (s)	2.8	2.8		2.8		2.8		2.1		2.1	2.1	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0		0.0	0.0	
Total Lost Time (s)		6.1		6.1		6.1		5.4		5.4	5.4	
Lead/Lag	Lag	Lag		Lag		Lag						
Lead-Lag Optimize?	Yes	Yes		Yes		Yes						
Recall Mode	Max	Max		Max		Max		C-Max		C-Max	C-Max	
Act Effct Green (s)		43.9		43.9		43.9		44.6		44.6	44.6	
Actuated g/C Ratio		0.44		0.44		0.44		0.45		0.45	0.45	
v/c Ratio		0.38		0.08		0.04		0.25		0.02	0.35	
Control Delay		16.5		17.1		2.0		17.8		13.7	18.0	
Queue Delay		0.0		0.0		0.0		0.0		0.0	0.0	
Total Delay		16.5		17.1		2.0		17.8		13.7	18.0	
LOS		B		B		A		B		B	B	
Approach Delay		16.5			10.6			17.8			17.9	
Approach LOS		B			B			B			B	
Queue Length 50th (m)		23.7		3.7		0.0		22.7		0.6	39.8	
Queue Length 95th (m)		42.7		9.6		2.2		32.5		m1.2	48.7	
Internal Link Dist (m)		54.5			21.0			120.5			136.3	
Turn Bay Length (m)										20.0		
Base Capacity (vph)		644		431		591		1455		331	1478	
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		0.38		0.08		0.04		0.25		0.02	0.35	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Lane Group	Ø3	Ø7
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	7
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	5.0	5.0
Total Split (s)	5.0	5.0
Total Split (%)	5%	5%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

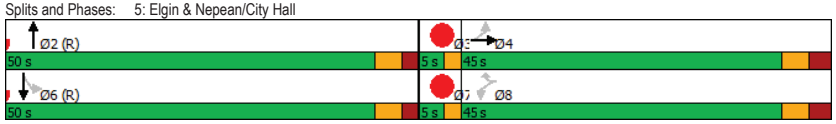
Intersection Summary

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 17.2	Intersection LOS: B
Intersection Capacity Utilization 66.6%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 5: Elgin & Nepean/City Hall



Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	451	17	5	482	12	5
Future Vol, veh/h	451	17	5	482	12	5
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	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	501	19	6	536	13	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	520	0	1059	511
Stage 1	-	-	-	-	511	-
Stage 2	-	-	-	-	548	-
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	-	-	1046	-	249	563
Stage 1	-	-	-	-	602	-
Stage 2	-	-	-	-	579	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1046	-	247	563
Mov Cap-2 Maneuver	-	-	-	-	247	-
Stage 1	-	-	-	-	602	-
Stage 2	-	-	-	-	574	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	18
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	296	-	-	1046	-
HCM Lane V/C Ratio	0.064	-	-	0.005	-
HCM Control Delay (s)	18	-	-	8.5	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Appendix K

TDM Checklist

TDM-Supportive Development Design and Infrastructure Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☑
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☑
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☑
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☐
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☐
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☐
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

	TDM-supportive design & infrastructure measures: *Non-residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☐
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☐
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☐
	2.3	**Shower & change facilities**	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	☐
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☐
	2.4	**Bicycle repair station**	
BETTER	2.4.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐

	TDM-supportive design & infrastructure measures: *Non-residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
	4.2	**Carpool parking**	
BASIC	4.2.1	Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	☐
BETTER	4.2.2	At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☑

	TDM-supportive design & infrastructure measures: *Non-residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	6. PARKING		
	6.1 Number of parking spaces		
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2 Separate long-term & short-term parking areas		
BETTER	6.2.1	Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	☐
	7. OTHER		
	7.1 On-site amenities to minimize off-site trips		
BETTER	7.1.1	Provide on-site amenities to minimize mid-day or mid-commute errands	☐

TDM-Supportive Development Design and Infrastructure Checklist:
Residential Developments (multi-family or condominium)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

	TDM-supportive design & infrastructure measures: *Residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	1. WALKING & CYCLING: ROUTES		
	1.1 Building location & access points		
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☑
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑
	1.2 Facilities for walking & cycling		
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☑
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☑
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☐
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☐
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☐
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☐
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☐
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☑
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☐

TDM Measures Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

BASIC — The measure is generally feasible and effective, and in most cases would benefit the development and its users

BETTER — The measure could maximize support for users of sustainable modes, and optimize development performance

★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		1.	**TDM PROGRAM MANAGEMENT**	
		1.1	**Program coordinator**	
BASIC	★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☐
		1.2	**Travel surveys**	
BETTER		1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
		2.	**WALKING AND CYCLING**	
		2.1	**Information on walking/cycling routes & destinations**	
BASIC		2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances	☑
		2.2	**Bicycle skills training**	
			Commuter travel	
BETTER	★	2.2.1	Offer on-site cycling courses for commuters, or subsidize off-site courses	☐
		2.3	**Valet bike parking**	
			Visitor travel	
BETTER		2.3.1	Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	☐

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		3. TRANSIT	
		3.1 Transit information	
BASIC	3.1.1	Display relevant transit schedules and route maps at entrances	☑
BASIC	3.1.2	Provide online links to OC Transpo and STO information	☐
BETTER	3.1.3	Provide real-time arrival information display at entrances	☐
		3.2 Transit fare incentives	
		Commuter travel	
BETTER	3.2.1	Offer preloaded PRESTO cards to encourage commuters to use transit	☐
BETTER ★	3.2.2	Subsidize or reimburse monthly transit pass purchases by employees	☐
		Visitor travel	
BETTER	3.2.3	Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	☐
		3.3 Enhanced public transit service	
		Commuter travel	
BETTER	3.3.1	Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	☐
		Visitor travel	
BETTER	3.3.2	Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	☐
		3.4 Private transit service	
		Commuter travel	
BETTER	3.4.1	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	☐
		Visitor travel	
BETTER	3.4.2	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	☐

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		4. RIDESHARING	
		4.1 Ridematching service	
		Commuter travel	
BASIC ★	4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	☐
		4.2 Carpool parking price incentives	
		Commuter travel	
BETTER	4.2.1	Provide discounts on parking costs for registered carpools	☐
		4.3 Vanpool service	
		Commuter travel	
BETTER	4.3.1	Provide a vanpooling service for long-distance commuters	☐
		5. CARSHARING & BIKESHARING	
		5.1 Bikeshare stations & memberships	
BETTER	5.1.1	Contract with provider to install on-site bikeshare station for use by commuters and visitors	☐
		Commuter travel	
BETTER	5.1.2	Provide employees with bikeshare memberships for local business travel	☐
		5.2 Carshare vehicles & memberships	
		Commuter travel	
BETTER	5.2.1	Contract with provider to install on-site carshare vehicles and promote their use by tenants	☐
BETTER	5.2.2	Provide employees with carshare memberships for local business travel	☐
		6. PARKING	
		6.1 Priced parking	
		Commuter travel	
BASIC ★	6.1.1	Charge for long-term parking (daily, weekly, monthly)	☑
BASIC	6.1.2	Unbundle parking cost from lease rates at multi-tenant sites	☑
		Visitor travel	
BETTER	6.1.3	Charge for short-term parking (hourly)	☐

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		7.	**TDM MARKETING & COMMUNICATIONS**	
		7.1	**Multimodal travel information**	
			Commuter travel	
BASIC	★	7.1.1	Provide a multimodal travel option information package to new/relocating employees and students	☑
			Visitor travel	
BETTER	★	7.1.2	Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	☐
		7.2	**Personalized trip planning**	
			Commuter travel	
BETTER	★	7.2.1	Offer personalized trip planning to new/relocating employees	☐
		7.3	**Promotions**	
			Commuter travel	
BETTER		7.3.1	Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	☐
		8.	**OTHER INCENTIVES & AMENITIES**	
		8.1	**Emergency ride home**	
			Commuter travel	
BETTER	★	8.1.1	Provide emergency ride home service to non-driving commuters	☐
		8.2	**Alternative work arrangements**	
			Commuter travel	
BASIC	★	8.2.1	Encourage flexible work hours	☐
BETTER		8.2.2	Encourage compressed workweeks	☐
BETTER	★	8.2.3	Encourage telework	☐
		8.3	**Local business travel options**	
			Commuter travel	
BASIC	★	8.3.1	Provide local business travel options that minimize the need for employees to bring a personal car to work	☐
		8.4	**Commuter incentives**	
			Commuter travel	
BETTER		8.4.1	Offer employees a taxable, mode-neutral commuting allowance	☐
		8.5	**On-site amenities**	
			Commuter travel	
BETTER		8.5.1	Provide on-site amenities/services to minimize mid-day or mid-commute errands	☐

TDM Measures Checklist:
Residential Developments (multi-family, condominium or subdivision)

Legend

BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance
★	The measure is one of the most dependably effective tools to encourage the use of sustainable modes

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		1.	**TDM PROGRAM MANAGEMENT**	
		1.1	**Program coordinator**	
BASIC	★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☐
		1.2	**Travel surveys**	
BETTER		1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
		2.	**WALKING AND CYCLING**	
		2.1	**Information on walking/cycling routes & destinations**	
BASIC		2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances *(multi-family, condominium)*	☑
		2.2	**Bicycle skills training**	
BETTER		2.2.1	Offer on-site cycling courses for residents, or subsidize off-site courses	☐

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		3.	**TRANSIT**	
		3.1	**Transit information**	
BASIC		3.1.1	Display relevant transit schedules and route maps at entrances *(multi-family, condominium)*	☑
BETTER		3.1.2	Provide real-time arrival information display at entrances *(multi-family, condominium)*	☐
		3.2	**Transit fare incentives**	
BASIC	★	3.2.1	Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit	☑
BETTER		3.2.2	Offer at least one year of free monthly transit passes on residence purchase/move-in	☐
		3.3	**Enhanced public transit service**	
BETTER	★	3.3.1	Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels *(subdivision)*	☐
		3.4	**Private transit service**	
BETTER		3.4.1	Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	☐
		4.	**CARSHARING & BIKESHARING**	
		4.1	**Bikeshare stations & memberships**	
BETTER		4.1.1	Contract with provider to install on-site bikeshare station (*multi-family)*	☐
BETTER		4.1.2	Provide residents with bikeshare memberships, either free or subsidized *(multi-family)*	☐
		4.2	**Carshare vehicles & memberships**	
BETTER		4.2.1	Contract with provider to install on-site carshare vehicles and promote their use by residents	☐
BETTER		4.2.2	Provide residents with carshare memberships, either free or subsidized	☐
		5.	**PARKING**	
		5.1	**Priced parking**	
BASIC	★	5.1.1	Unbundle parking cost from purchase price *(condominium)*	☑
BASIC	★	5.1.2	Unbundle parking cost from monthly rent *(multi-family)*	☑

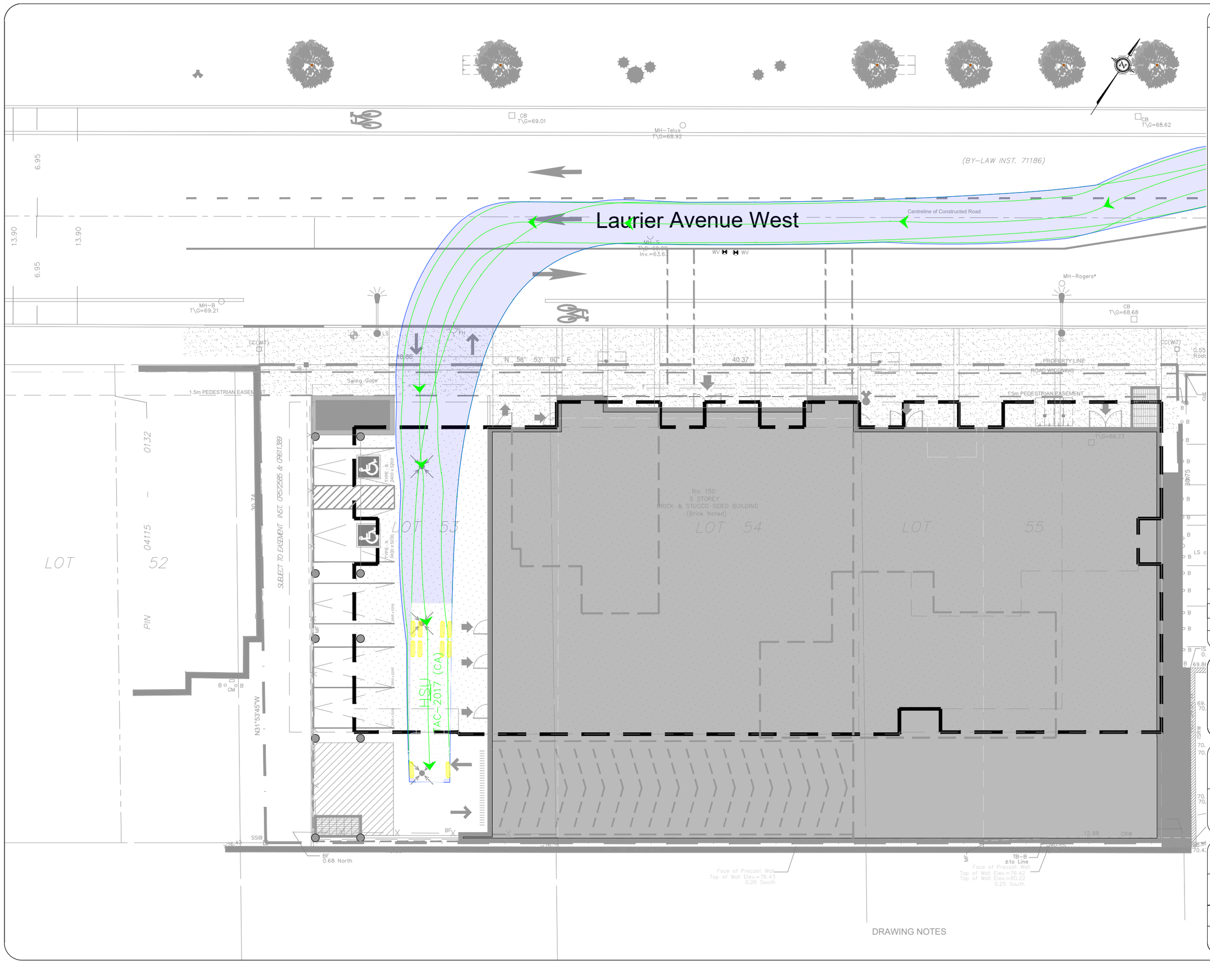
TDM Measures Checklist **City of Ottawa**
Version 1.0 (30 June 2017)

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		6.	**TDM MARKETING & COMMUNICATIONS**	
		6.1	**Multimodal travel information**	
BASIC	★	6.1.1	Provide a multimodal travel option information package to new residents	☑
		6.2	**Personalized trip planning**	
BETTER	★	6.2.1	Offer personalized trip planning to new residents	☐

Appendix L

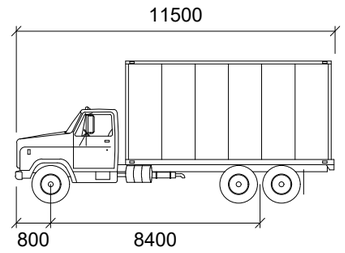
Turning Templates

CGH TRANSPORTATION



DRAWING NOTES

Notes:



HSU

	mm
Width	: 2600
Track	: 2600
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

REV:	DESCRIPTION:	BY:	DATE:
02	Issued for Review	AN	2023-08-31
01	Issued for Review	AN	2022-08-29

STATUS:

CGH Transportation
6 Plaza Court
Ottawa, ON
K2H 7W1
(343) 999-9117

CLIENT: Jadco Group

ARCHITECT:

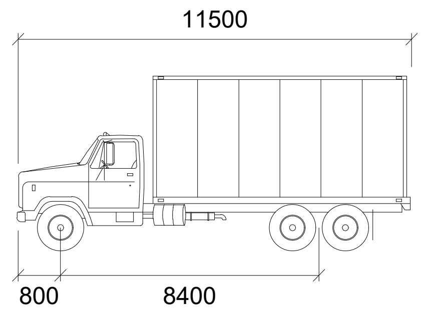
SITE: 150 Laurier Avenue W

TITLE: Turning Movement Analysis
HSU Movement (1)

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2023-08-31	AN	AH

PROJECT NO:	DRAWING NO:	REVISION:
2022-074	001	02

Notes:



HSU

mm

Width	: 2600
Track	: 2600
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

REV:	DESCRIPTION:	BY:	DATE:
02	Issued for Review	AN	2023-08-31
01	Issued for Review	AN	2022-08-29

STATUS:

CGH Transportation
6 Plaza Court
Ottawa, ON
K2H 7W1
(343) 999-9117

CLIENT: Jadco Group

ARCHITECT:

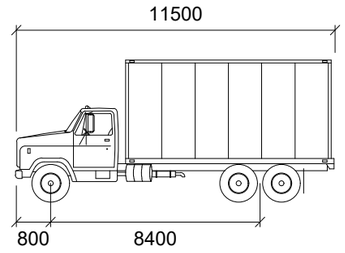
SITE: 150 Laurier Avenue W

TITLE: Turning Movement Analysis
HSU Movement (2)

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2023-08-31	AN	AH

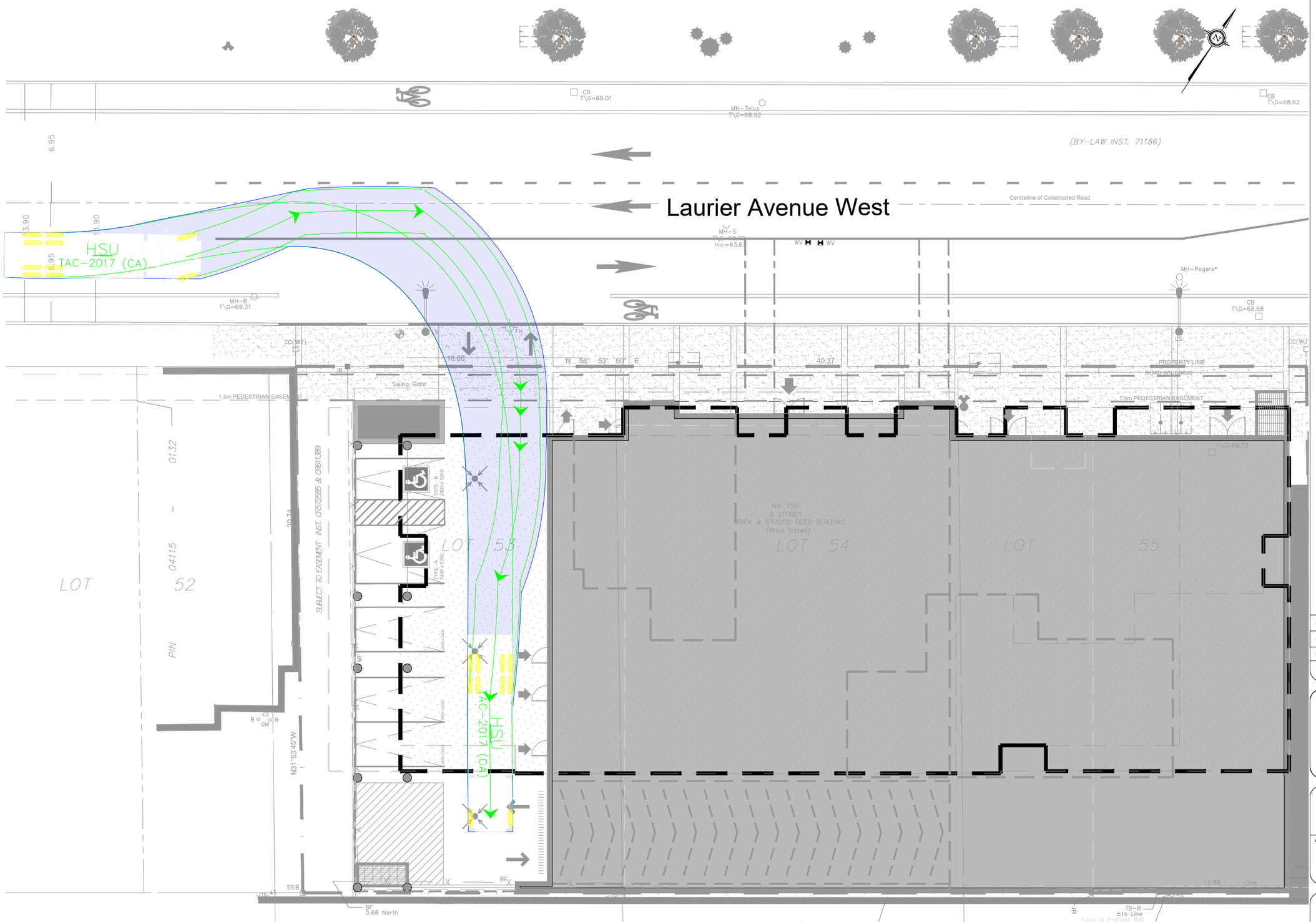
PROJECT NO:	DRAWING NO:	REVISION:
2022-074	002	02

Notes:



HSU

		mm
Width	:	2600
Track	:	2600
Lock to Lock Time	:	6.0
Steering Angle	:	40.0



DRAWING NOTES

REV:	DESCRIPTION:	BY:	DATE:
02	Issued for Review	AN	2023-08-31
01	Issued for Review	AN	2022-08-29

STATUS:

CGH Transportation
6 Plaza Court
Ottawa, ON
K2H 7W1
(343) 999-9117

CLIENT: Jadco Group

ARCHITECT:

SITE: 150 Laurier Avenue W

TITLE: Turning Movement Analysis
HSU Movement (3)

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2023-08-31	AN	AH

PROJECT NO:	DRAWING NO:	REVISION:
2022-074	003	02

Appendix M

MMLOS Analysis

CGH TRANSPORTATION

Multi-Modal Level of Service - Intersections Form

Consultant	CGH Transportation Inc.	**Project**	2022-074
Scenario	Existing/Future	**Date**	8/30/2023
Comments			

	INTERSECTIONS	Laurier Avenue West at O'Connor Street				Laurier Avenue West at Metcalfe Street				Laurier Avenue West at Elgin Street (Existing)				Gloucester Street at Metcalfe Street				Nepean Street at Elgin Street				Laurier Avenue West at Elgin Street (Future)			
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	4	4	4	4	4	3	4	4	8	8	5	4	3	3	3	3	6	5	3	0 - 2	8	8	5	4
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	Median > 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	No left turn / Prohib.	Protected/ Permissive	Permissive	No left turn / Prohib.	Permissive	No left turn / Prohib.	No left turn / Prohib.	Permissive	No left turn / Prohib.	Protected/ Permissive	Protected	No left turn / Prohib.	Permissive	No left turn / Prohib.	No left turn / Prohib.	Permissive	Permissive	Permissive	No left turn / Prohib.	Permissive	No left turn / Prohib.	Protected/ Permissive	Protected	No left turn / Prohib.
	Conflicting Right Turns	No right turn	Permissive or yield control	No right turn	Permissive or yield control	Permissive or yield control	No right turn	Permissive or yield control	No right turn	Protected/ Permissive	Permissive or yield control	Protected/ Permissive	Permissive or yield control	Permissive or yield control	No right turn	Permissive or yield control	No right turn	Permissive or yield control	Permissive or yield control	Permissive or yield control	No right turn	Protected/ Permissive	Permissive or yield control	Protected/ Permissive	Permissive or yield control
	Right Turns on Red (RToR) ?	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR allowed	RTOR prohibited	RTOR allowed	RTOR allowed	RTOR allowed	RTOR prohibited	RTOR allowed	RTOR prohibited	RTOR allowed	RTOR allowed	RTOR allowed	RTOR prohibited	RTOR allowed	RTOR prohibited	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No	No	No	No	No	Yes	Yes	No	No	Yes	Yes
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel
	Corner Radius	3-5m	5-10m	5-10m	3-5m	3-5m	3-5m	3-5m	3-5m	5-10m	10-15m	10-15m	5-10m	3-5m	3-5m	3-5m	3-5m	3-5m	3-5m	5-10m	3-5m	5-10m	10-15m	10-15m	5-10m
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Textured/coloured pavement	Textured/coloured pavement	Textured/coloured pavement	Textured/coloured pavement	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Textured/coloured pavement	Textured/coloured pavement	Textured/coloured pavement	Textured/coloured pavement	Textured/coloured pavement	Textured/coloured pavement	Textured/coloured pavement	Textured/coloured pavement
	PETSI Score	**73**	**59**	**64**	**68**	**58**	**88**	**68**	**65**	**0**	**-6**	**50**	**67**	**72**	**88**	**80**	**80**	**25**	**42**	**84**	**100**	**0**	**1**	**50**	**67**
	Ped. Exposure to Traffic LoS	**C**	**D**	**C**	**C**	**D**	**B**	**C**	**C**	**F**	**F**	**D**	**C**	**C**	**B**	**B**	**B**	**F**	**E**	**B**	**A**	**F**	**F**	**D**	**C**
	Cycle Length	75		75	75		75	75	75	100	100	100	100		75	75		90	90	90	90	100	100	100	100
	Effective Walk Time	15		30	19		14	29	29	36	15	21	35		34	13		36	36	7	7	36	15	21	35
	Average Pedestrian Delay	**24**		**14**	**21**		**25**	**14**	**14**	**20**	**36**	**31**	**21**		**11**	**26**		**16**	**16**	**38**	**38**	**20**	**36**	**31**	**21**
	Pedestrian Delay LoS	**C**	**-**	**B**	**C**	**-**	**C**	**B**	**B**	**C**	**D**	**D**	**C**	**-**	**B**	**C**	**-**	**B**	**B**	**D**	**D**	**C**	**D**	**D**	**C**
	Level of Service	**C**	**D**	**C**	**C**	**D**	**C**	**C**	**C**	**F**	**F**	**D**	**C**	**C**	**B**	**C**	**B**	**F**	**E**	**D**	**D**	**F**	**F**	**D**	**C**
		D				**D**				**F**				**C**				**F**				**F**			
	Approach From	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**
Bicycle	Bicycle Lane Arrangement on Approach	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP		Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP		Mixed Traffic	Mixed Traffic			Mixed Traffic	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP
	Right Turn Lane Configuration	Not Applicable	Not Applicable	Not Applicable	Not Applicable			Not Applicable	Not Applicable		> 50 m	Not Applicable	Not Applicable											Not Applicable	Not Applicable
	Right Turning Speed	Not Applicable	Not Applicable	Not Applicable	Not Applicable			Not Applicable	Not Applicable		≤ 25 km/h	Not Applicable	Not Applicable											Not Applicable	Not Applicable
	Cyclist relative to RT motorists	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**-**	**#N/A**	**Not Applicable**	**Not Applicable**	**#N/A**	**F**	**Not Applicable**	**Not Applicable**	**-**	**#N/A**	**#N/A**	**-**	**-**	**#N/A**	**#N/A**	**#N/A**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**
	Separated or Mixed Traffic	**Separated**	**Separated**	**Separated**	**Separated**	**-**	**Mixed Traffic**	**Separated**	**Separated**	**Mixed Traffic**	**Mixed Traffic**	**Separated**	**Separated**	**-**	**Mixed Traffic**	**Mixed Traffic**	**-**	**-**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Separated**	**Separated**	**Separated**	**Separated**
	Left Turn Approach	2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box		≥ 2 lanes crossed		2-stage, LT box	≥ 2 lanes crossed			2-stage, LT box		≥ 2 lanes crossed			≥ 2 lanes crossed		One lane crossed	No lane crossed	2-stage, LT box			2-stage, LT box
	Operating Speed	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h		> 50 to < 60 km/h		> 50 to < 60 km/h	> 50 to < 60 km/h			> 40 to ≤ 50 km/h		> 50 to < 60 km/h			> 50 to < 60 km/h		> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h			> 40 to ≤ 50 km/h
	Left Turning Cyclist	**A**	**A**	**A**	**A**	**-**	**F**	**-**	**A**	**F**	**-**	**-**	**A**	**-**	**F**	**-**	**-**	**F**	**-**	**E**	**C**	**A**	**-**	**-**	**A**
	Level of Service	**A**	**A**	**A**	**A**	**-**	**#N/A**	**-**	**A**	**#N/A**	**-**	**-**	**A**	**-**	**#N/A**	**#N/A**	**-**	**-**	**#N/A**	**#N/A**	**#N/A**	**A**	**-**	**-**	**A**
		A				**F**				**F**				**F**				**F**				**A**			
Transit	Average Signal Delay									≤ 20 sec	≤ 40 sec							≤ 20 sec				≤ 20 sec	≤ 40 sec		
	Level of Service	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**C**	**E**	**-**	**-**	**-**	**-**	**-**	**-**	**C**	**-**	**-**	**-**	**C**	**E**	**-**	**-**
		-				**-**				**E**				**-**				**C**				**E**			
Truck	Effective Corner Radius	< 10 m			< 10 m		< 10 m	< 10 m		10 - 15 m	10 - 15 m	10 - 15 m	10 - 15 m									10 - 15 m	10 - 15 m	10 - 15 m	10 - 15 m
	Number of Receiving Lanes on Departure from Intersection	≥ 2			≥ 2		1	≥ 2		1	≥ 2	≥ 2	≥ 2									1	≥ 2	≥ 2	≥ 2
	Level of Service	**D**	**-**	**-**	**D**	**-**	**F**	**D**	**-**	**E**	**B**	**B**	**B**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**E**	**B**	**B**	**B**
		D				**F**				**E**				**-**				**-**				**E**			
Auto	Volume to Capacity Ratio	0.61 - 0.70				0.0 - 0.60				0.81 - 0.90				0.0 - 0.60				0.0 - 0.60				0.81 - 0.90			
	Level of Service	**B**				**A**				**D**				**A**				**A**				**D**			

Multi-Modal Level of Service - Segments Form

Consultant	**CGH Transportation Inc.**	**Project**	**2022-074**
Scenario	**Existing/Future**	**Date**	**8/30/2023**
Comments			

SEGMENTS			Laurier	Section	Section	Section
			1	2	3	4
Pedestrian	Sidewalk Width Boulevard Width		≥ 2 m 0.5 - 2 m			
	Avg Daily Curb Lane Traffic Volume		> 3000			
	Operating Speed On-Street Parking		> 50 to 60 km/h no			
	Exposure to Traffic PLoS	**-**	**D**	-	-	-
	Effective Sidewalk Width					
	Pedestrian Volume					
	Crowding PLoS		-	-	-	-
	Level of Service		**-**	**-**	**-**	**-**
Bicycle	Type of Cycling Facility		Physically Separated			
	Number of Travel Lanes					
	Operating Speed					
	# of Lanes & Operating Speed LoS		-	-	-	-
	Bike Lane (+ Parking Lane) Width					
	Bike Lane Width LoS	**A**	-	-	-	-
	Bike Lane Blockages					
	Blockage LoS		-	-	-	-
	Median Refuge Width (no median = < 1.8 m)					
	No. of Lanes at Unsignalized Crossing					
	Sidestreet Operating Speed					
	Unsignalized Crossing - Lowest LoS		**A**	-	-	-
	Level of Service		**A**	**-**	**-**	**-**
Transit	Facility Type					
	Friction or Ratio Transit:Posted Speed	**-**				
	Level of Service		**-**	**-**	**-**	**-**
Truck	Truck Lane Width		≤ 3.5 m			
	Travel Lanes per Direction	**C**	1			
	Level of Service		**C**	**-**	**-**	**-**