267 O'Connor

TIA Strategy Report

prepared for:

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August 18, 2020

477191–01000

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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Dated at Ottawa this 18 day of August, 2020.
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Signature of Individual certifier that s/he meets the above four criteria

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PARSONS

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DOCUMENT CONTROL PAGE

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TIA Strategy Report

1. Screening Form

The Trip Generation Trigger was met based on the development size, and the Safety Trigger was met based on the proposed site driveway's proximity to the signalized O'Connor/Gilmour intersection and O'Connor Bikeway. The Location Trigger was not met. The Screening Form and City comments are provided in Appendix A.

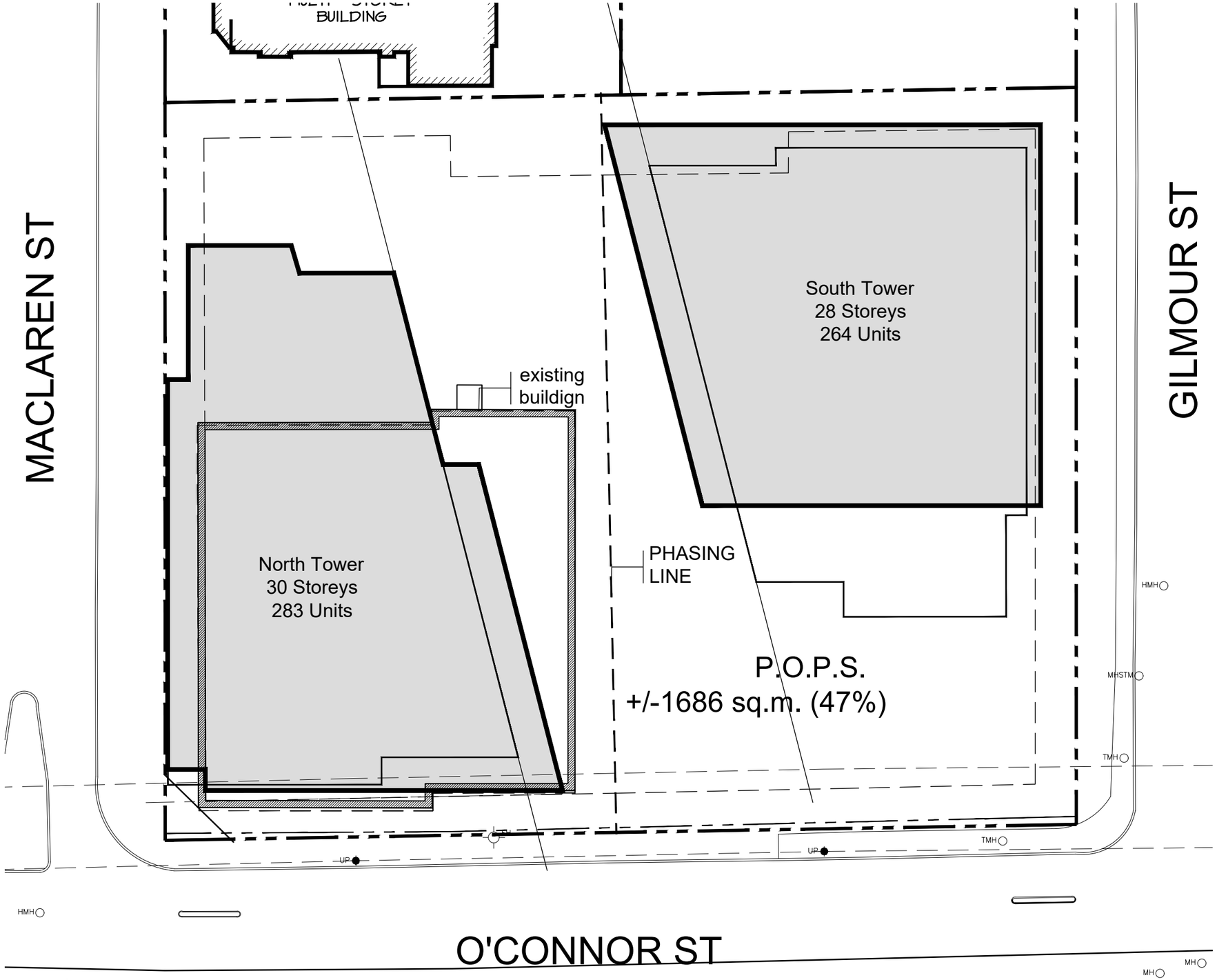
2. Scoping Report

2.1. Existing and Planned Conditions

2.1.1. Proposed Development

This report has been prepared to support a Zoning Bylaw Amendment (ZBLA) for the property located on O'Connor Street between MacLaren Street and Gilmour Street. The site is currently zoned as R4.T[479]. From the information provided, it is our understanding that the proponent is proposing to a construct a two-phase residential development located at 267 O'Connor Street. Phase I consists of a 30-storey tower comprised of 264 residential units and will be constructed on the southern portion of the site with vehicle access proposed to Gilmour Street. Phase II consists of a 30-storey tower comprised of 283 units on the northern portion of the site with vehicle access via the same connection to Gilmour Street. The site is currently occupied by a parking lot on the southern portion and a 6-storey commercial building on the northern portion. The expected build-out date for Phase I and II is 2023 and 2025, respectively. Depending on the growth rate of the study area, the horizon year 2030 will be assessed for 5-years beyond site build out. Currently, approximately 304 total parking spaces are proposed in an underground parking structure. As this development is at the ZBLA stage, these numbers are subject to change and may be revised during Site Plan Approval (SPA). The local context of the site is provided as Figure 1 and the initial Concept Plan is provided as Figure 2.

Figure 1: Local Context



DEVELOPMENT STATS

PHASE 1 TOWER - 28 STOREYS

-TOTAL GROSS FLOOR AREA	226,086 SQ.FT.
-TOTAL NET LEASEABLE AREA	184,345 SQ.FT.
-UNIT COUNT	264 UNITS

PHASE 2 TOWER - 30 STOREYS

-TOTAL GROSS FLOOR AREA	246,453 SQ.FT.
-TOTAL NET LEASEABLE AREA	198,869 SQ.FT.
-UNIT COUNT	283 UNITS

PROPERTY AREA

- TOTAL GROSS AREA	38,724 SQ.FT.
- 40% GROSS AREA	15,490 SQ.FT
- P.O.P.S.	18,141 SQ.FT

** 700 SQ.FT. AVERAGE UNIT SIZE
** ASSUME NO UNITS ON GROUND FLOOR

PARKING STATS (4 LEVELS)

PHASE 1 TOWER - 28 STOREYS, 264 UNITS

REQUIRED PARKING

- RES. PARKING (0.5 PER UNIT)	132
- VISITOR PARKING (0.1 PER UNIT)	26
- TOTAL PARKING REQUIREMENTS	158
PROVIDED PARKING SPACES(4 LEVELS):	152 (+6 TEMPORARY)

PHASE 2 TOWER - 30 STOREYS, 263 UNITS

- RES. PARKING (0.5 PER UNIT)	142
- VISITOR PARKING (0.1 PER UNIT)	28
- TOTAL PARKING REQUIREMENTS	170
PROVIDED PARKING SPACES(4 LEVELS):	152
TOTAL PARKING REQUIREMENTS:	328
TOTAL PROVIDED PARKING SPACES:	304

STORAGE LOCKERS (UNDERGROUND)

PHASE 1 TOWER - 28 STOREYS, 264 UNITS

PROVIDED STORAGE LOCKERS(4 LEVELS):	240

PHASE 2 TOWER - 30 STOREYS, 283 UNITS

PROVIDED STORAGE LOCKERS(4 LEVELS):	244
TOTAL STORAGE LOCKERS :	484
LOCKER RATIO / UNIT :	0.88

HOBIN ARCHITECTURE

267 O'connor

SCHEMATIC PROPOSAL - 2 TOWERS (4 LEVELS OF UNDERGROUND PARKING)

SCALE: 1:300

JULY, 2020

TAGGART REALTY MANAGEMENT

2.1.2. Existing Conditions

Area Road Network

O'Connor Street is a one-way southbound arterial roadway, which extends from Wellington Street in the north to Isabella Street in the south. South of Isabella Street, O'Connor Street continues as a local roadway to Fifth Avenue. Within the study area, O'Connor Street has a two-lane cross section with on-street parking provided along the west side of the roadway from 8am to 5:30pm. There is a bi-directional cycle track along the east side of the roadway. The unposted speed limit is understood to be 50 km/h.

Metcalfe Street is a one-way northbound arterial roadway which extends from Wellington Street in the north to Isabella Street in the south. South of Isabella Street, Metcalfe Street continues as a local roadway to Monkland Avenue. Within the study area, Metcalfe Street has a three-lane cross section with on-street parking provided along the east side of the roadway from 9:30am to 3:30pm. The unposted speed limit is understood to be 50 km/h.

Somerset Street is an east-west arterial roadway which extends from Queen Elizabeth Driveway in the east to Garland Street in the east where it continues as Wellington Street W. Within the study area, Somerset Street has a two-lane cross section. The unposted speed limit is understood to be 50 km/h.

Gladstone Avenue is an east-west major collector roadway which extends from Parkdale Avenue in the west to Elgin Street in the east. East of Elgin Street, Gladstone Avenue continues as a local roadway to Cartier Street. Within the study area, Gladstone Avenue has a two-lane cross section with parking bays provided on the north and south side of the roadway. The unposted speed limit is understood to be 50 km/h.

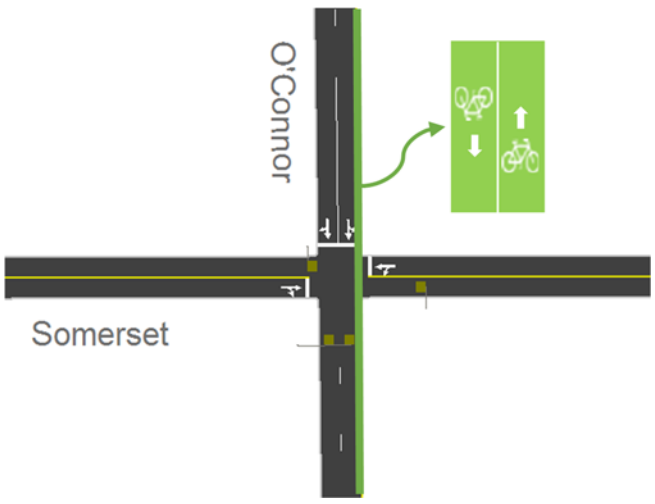
MacLaren Street is a one-way west local roadway that extends from MacDonald Street in the east to Bronson Avenue in the west. Within the study area, MacLaren Street has a two-lane cross section with parking provided on the north side of the roadway. The unposted speed limit is understood to be 50 km/h.

Gilmour Street is a one-way east local roadway that extends from Queen Elizabeth Driveway in the east to Bronson Avenue in the west. Within the study area, Gilmour Street has a two-lane cross section with parking provided on the north side of the roadway. The unposted speed limit is understood to be 50 km/h.

Existing Study Area Intersections

Somerset/O'Connor

The Somerset/O'Connor intersection is a signalized four-legged intersection. The eastbound approach consists of a shared through/right-turn lane. The westbound approach consists of a shared through/left-turn lane. The southbound approach consists of a shared through/right-turn lane and a shared though/left-turn lane. Northbound movements are prohibited at this location as O'Connor Street operates as a one-way in the southbound direction.

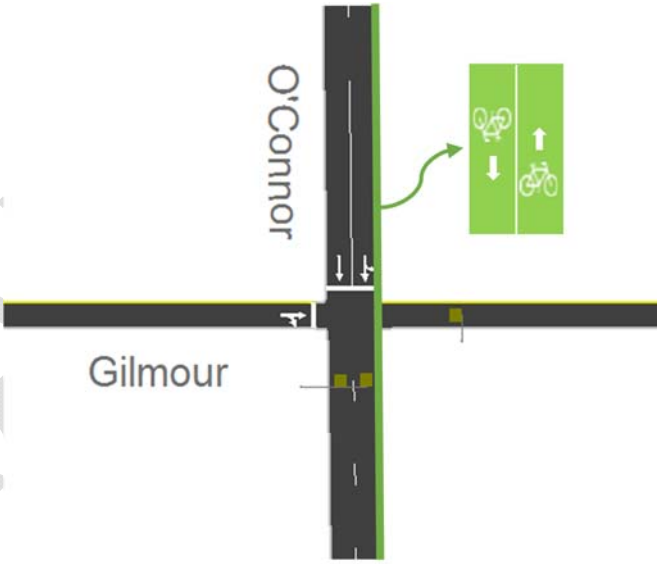


MacLaren/O'Connor

The MacLaren/O'Connor intersection is an unsignalized four-legged intersection with STOP control on the minor approach (MacLaren Street). The southbound approach consists of a through lane and a shared through/right-turn lane. The westbound approach consists of a right-turn lane. Northbound and eastbound and westbound through movements are prohibited at this location as O'Connor Street operates as a one-way in the southbound direction and MacLaren Street operates as a one-way in the westbound direction.

Gilmour/O'Connor

The Gilmour/O'Connor intersection is a signalized four-legged intersection. The eastbound approach consists of a shared through/right-turn lane. The southbound approach consists of a shared through/left-turn lane and a through lane. Northbound and westbound movements are prohibited at this location as O'Connor Street operates as a one-way in the southbound direction and Gilmour Street operates as a one-way in the eastbound direction.

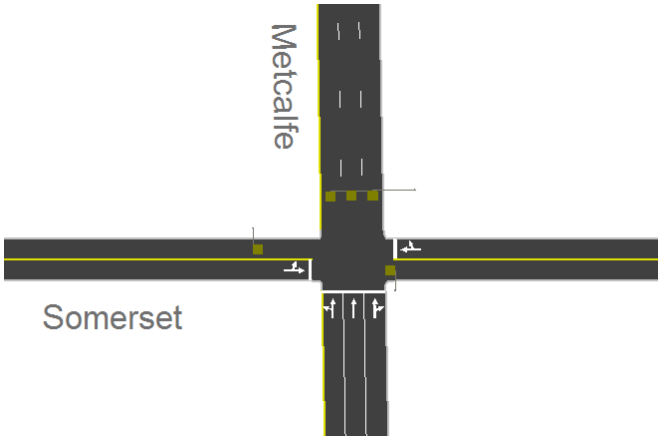


Gladstone/O'Connor

The Gladstone/O'Connor intersection is a signalized four-legged intersection. The eastbound approach consists of a shared through/right-turn lane. The westbound approach consists of a shared through/left-turn lane. The southbound approach consists of a shared through/right-turn lane and a shared though/left-turn lane. Northbound movements are prohibited at this location as O'Connor Street operates as a one-way in the southbound direction.

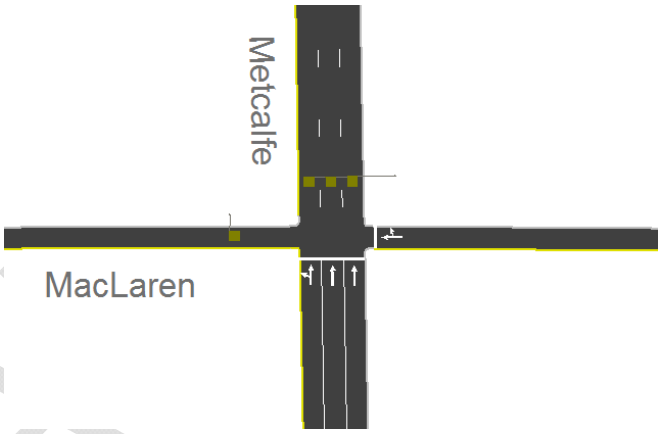
Somerset/Metcalfe

The Somerset/Metcalfe intersection is a signalized four-legged intersection. The eastbound approach consists of a shared through/left-turn lane. The westbound approach consists of a shared through/right-turn lane. The northbound approach consists of a shared through/right-turn lane and a shared though/left-turn lane. Southbound movements are prohibited at this location as Metcalfe Street operates as a one-way in the northbound direction.



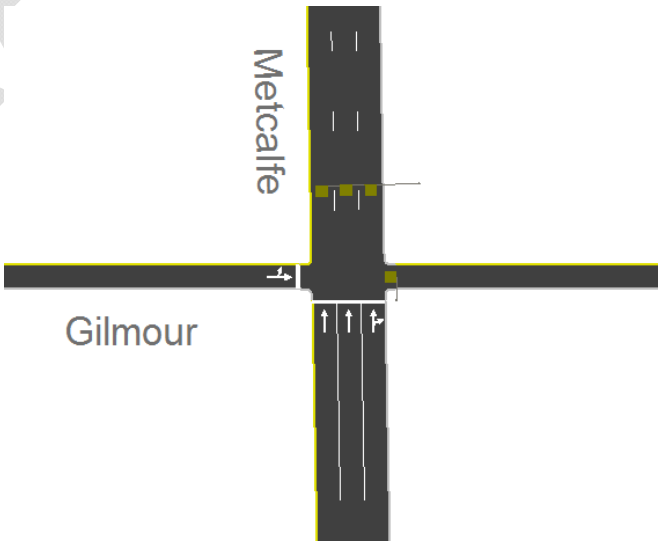
MacLaren/Metcalfe

The MacLaren/Metcalfe intersection is a signalized four-legged intersection. The westbound approach consists of a shared through/left-turn lane. The northbound approach consists of a shared through/left-turn lane and two through lanes. Southbound and eastbound movements are prohibited at this location as Metcalfe Street operates as a one-way in the northbound direction and MacLaren Street operates as a one-way in the westbound direction.



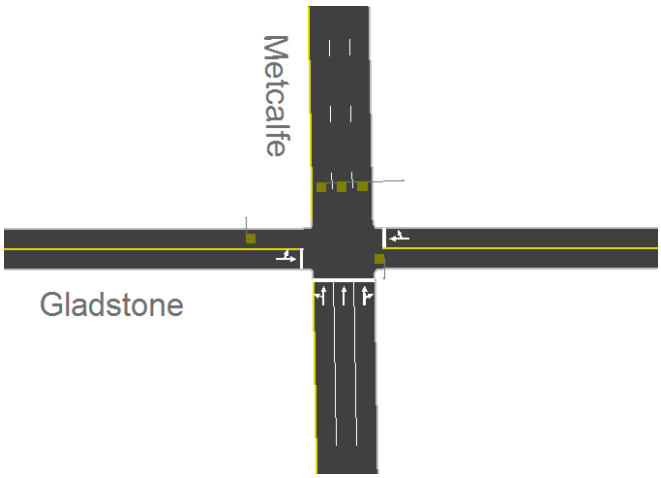
Gilmour/Metcalfe

The Gilmour/O'Connor intersection is a signalized four-legged intersection. The eastbound approach consists of a shared through/left-turn lane. The northbound approach consists of a shared through/right-turn lane and two through lanes. Southbound and westbound movements are prohibited at this location as Metcalfe Street operates as a one-way in the southbound direction and Gilmour Street operates as a one-way in the eastbound direction.



Gladstone/Metcalfe

The Gladstone/Metcalfe intersection is a signalized four-legged intersection. The eastbound approach consists of a shared through/right-turn lane. The westbound approach consists of a shared through/left-turn lane. The northbound approach consists of a shared through/right-turn lane and a shared though/left-turn lane and a through lane. Southbound movements are prohibited at this location as Metcalfe Street operates as a one-way in the northbound direction.



Existing Driveways to Adjacent Developments

On the north side of Gilmour Street, between O'Connor Street and Metcalfe Street, there are four existing driveways to adjacent developments. On the south side there are also four existing driveways.

Pedestrian/Cycling Network

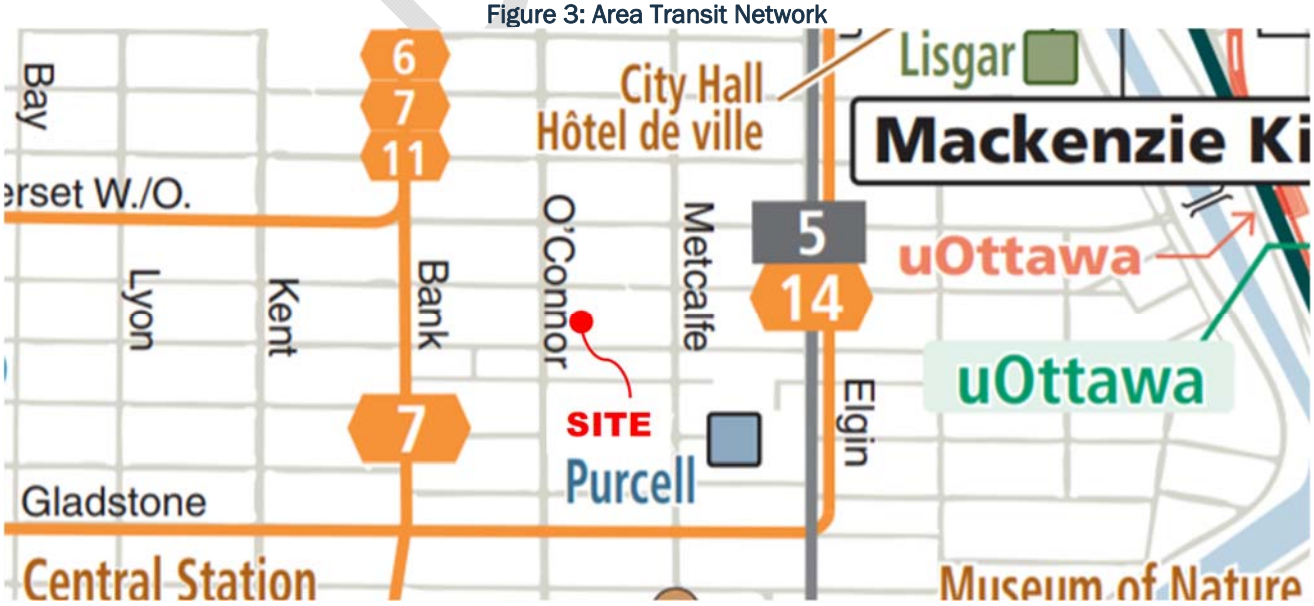
With respect to pedestrians, sidewalk facilities in the vicinity of the site are provided along both sides of Gilmour Street, O'Connor Street, Metcalfe Street, MacLaren Street, Somerset Street, and Gladstone Avenue.

With respect to cyclists, according to the Ottawa Cycling Plan, O'Connor Street, Metcalfe Street, Somerset Street, and Gladstone Avenue are classified as Spine Routes. A bi-directional cycling facility is provided along the east side of O'Connor Street. Somerset Street and Gladstone Avenue are identified as "suggested routes".

Transit Network

Transit service within the vicinity of the site is by OC Transpo Routes #5, 7, and 14. Routes #7 and 14 provide frequent all-day service and Route #5 provides local service. The closest transit stops are located on Elgin Street approximately 330m walking distance northeast of the site and on Bank Street approximately 270m walking distance southwest of the site. Figure 3 illustrates the area transit network within the study area.

Figure 3: Area Transit Network



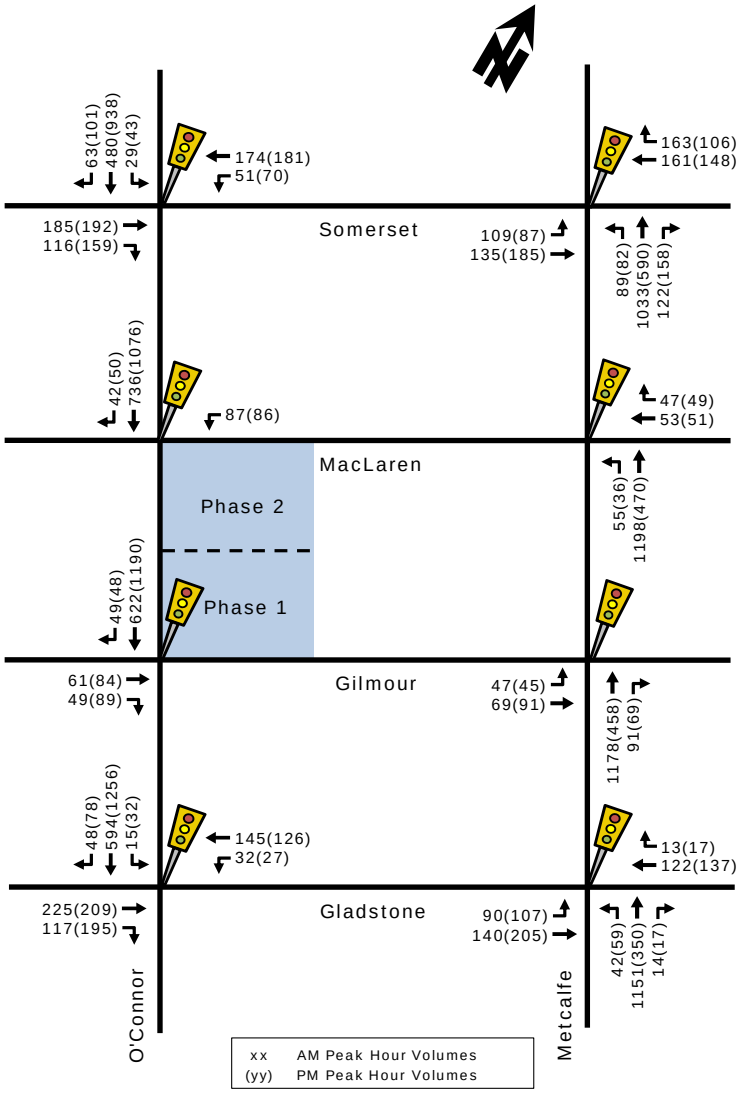
Existing Area Traffic Management Measures

Existing area traffic management measures on Gilmour Street within the study area include speed humps, on-street parking, intersection narrowings and zebra-stripe crosswalks at the Gilmour/O'Connor and Gilmour/Metcalfe intersections.

Existing Peak Hour Volumes

Illustrated as Figure 4 are the most recent weekday morning and afternoon peak hour traffic volumes obtained from the City of Ottawa at the study area intersections. These peak hour traffic volumes are included as Appendix B.

Figure 4: Existing Peak Hour Traffic Volumes



Existing Road Safety Conditions

Collision history for the study area intersections (2013 to 2017, inclusive) was obtained from the City of Ottawa and most collisions (80%) involved only property damage, indicating low impact speeds, and 20% involved personal injuries. The primary causes of collisions cited by police include; turning movement (33%), single vehicle (unattended or other) (28%), sideswipe (16%) and angle (16%) type collisions.

A standard unit of measure for assessing collisions at an intersection is based on the number collisions per million entering vehicles (MEV). At intersections within the study area, reported collisions have historically take place at a rate of:

- 0.31/MEV at the Gilmour/Metcalfe intersection;
- 0.34/MEV at the Gilmour/O'Connor intersection;
- 0.76/MEV at the MacLaren/Metcalfe intersection; and,
- 0.47/MEV at the MacLaren/O'Connor intersection.

It is noteworthy that within the 5-years of recorded collision data there was eight collisions involving a pedestrian and two involving cyclists. The collisions involving pedestrians resulted in non-fatal injuries and the collisions involving cyclists resulted in non-fatal injuries. The source collision data as provided by the City of Ottawa and related analysis is provided as Appendix C.

2.1.3. Planned Conditions

Planned Study Area Transportation Network Changes

Transit Priority Projects

A notable transportation network change within the study area is the Phase I construction of the east-west LRT, which is the conversion of the City's existing BRT corridor to LRT between the current Blair transit station and the Tunney's Pasture station including a tunnel through the City's Downtown. Currently, this phase of construction has been completed and Phase II is underway and is expected to be completed by end of 2025. The nearest LRT station is located at the O'Connor/Queen intersection which approximately 850m walking distance from the site.

Additionally, transit signal priority measures have been identified for both Elgin Street and Bank Street within the Affordable Network and Network Concept plans.

Road Projects

A notable road network change within the study area is Elgin Street Renewal Project, which is now substantially complete. It is currently open to two-way traffic with final work completed by Fall 2020. In addition to updating the sewer and water system, the project has revitalized the roadway and promote active modes.

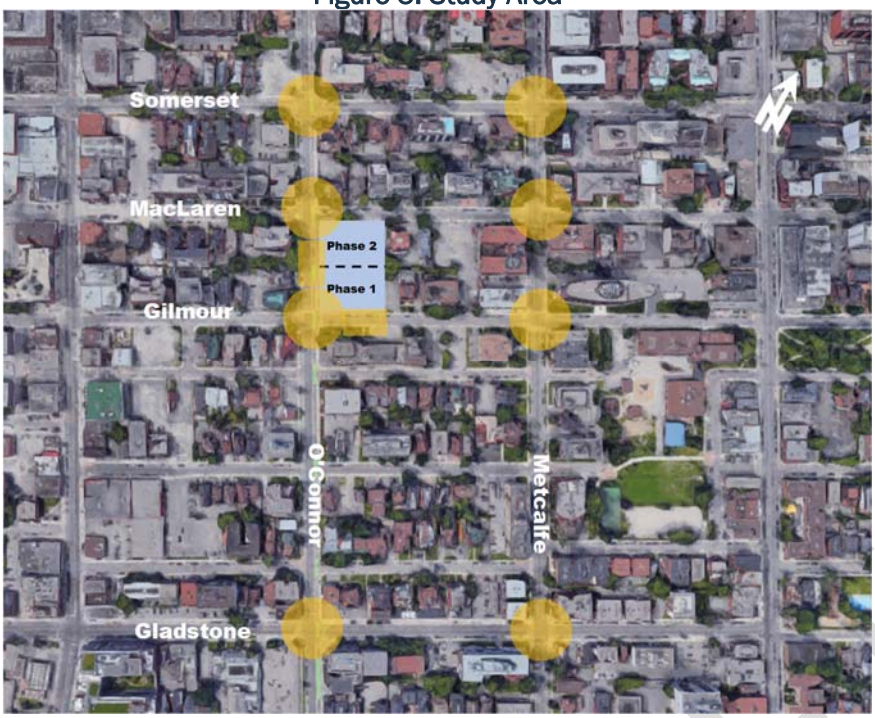
Other Area Development

According to the City's development application search tool, there are no developments planned within the vicinity of the subject site that are expected to have a notable impact on the surrounding transportation network.

2.2. Study Area and Time Periods

The proposed study area for Phase 1 is outlined below and highlighted in Figure 5. Given the trips expected to be generated by this development will be residential trips, the time periods to be assessed are the weekday morning and afternoon commuter peak hours.

Figure 5: Study Area



- Somerset/O'Connor intersection;
- MacLaren/O'Connor intersection;
- Gilmour/O'Connor intersection;
- Gladstone/O'Connor intersection;
- Somerset/Metcalfe intersection;
- MacLaren/Metcalfe intersection;
- Gilmour/Metcalfe intersection;
- Gladstone/Metcalfe intersection;
- Gilmour Street – adjacent to the site; and,
- O'Connor Street – adjacent to the site.

2.3. Exemption Review

Based on the City's TIA guidelines and the subject site, the following sections of the TIA process will be exempt, unless otherwise directed.

Table 1: Exemption Review

Module	Element	Exemption Consideration
Design Review Component (4.1 – 4.4)	All elements	As this is TIA is for a Zoning Application, the Design Review Component is not required.
4.8 Review of Network Concept	All elements	This development is not expected to generate 200 person-trips more than the permitted zoning for the site.

3. Forecasting

3.1. Development Generated Travel Demand

Existing Site Trip Generation

As the existing building on site currently generates trips, it is necessary to assess the current site operations in order to understand the impacts to the surrounding road network. For purposes of this study, the existing traffic volumes will be approximated using ITE Trip rates and the existing shopping centre floor area, which is assumed to be composed of the following:

- ~ 3,710 m^2 (40,000 ft^2) of general office space;
- ~ 75 m^2 (800 ft^2) of fast casual restaurant area (closed during afternoon peak hour);
- ~ 465 m^2 (5,000 ft^2) of sports medical centre; and
- ~ 185m^2 (2,000 ft^2) of pharmacy/drugstore.

Figure 6, shows the existing building and the estimated floor areas. The ITE trip generation rates used for the existing property are shown in Table 2. Note that there are no formal trip generation rates for a sports medical centre land use and as such the trip generation rates for a dental office (ITE 720) have been applied. The description for this land use aligns most closely with how a sports medical centre would function.

Figure 6: Assumed Existing Building Composition

Table 2: ITE Trip Generation Rates – Existing Building

Land Use	Data Source	Trip Rates	
		AM Peak	PM Peak
Pharmacy/Drugstore w/out Drive-Thru	ITE 880	T = 2.94(X)	T = 8.51(X)
Fast Casual Restaurant	ITE 930	T = 2.07(X)	N/A (closed PM peak)
Physiotherapy Office	ITE 720	T = 2.78(X) Ln(T) = 0.89Ln(X) + 1.31	T = 3.46(X) T= 3.39(X) + 2.02
General Office	ITE 710	T = 1.16(X) T= 0.94(X) + 26.49	T = 1.15(X) Ln(T) = 0.95Ln(X) + 0.36
Note: T = Average Vehicle Trip *X= 1,000 ft² of Ground Floor Area*			

As ITE trip generation surveys only record vehicle trips and typically reflect highly suburban locations (with little to no access by travel modes other than private automobiles), adjustment factors appropriate to the Ottawa study area context were applied to attain estimates of person trips for the proposed development. To convert ITE vehicle trip rates to person trips, an auto occupancy factor and a non-auto trip factor were applied to the ITE vehicle trip rates. Our review of available literature suggests that a combined factor of approximately 1.3 is considered reasonable to account for typical North American auto occupancy values of approximately 1.15 and combined transit and non-motorized modal shares of less than 10%. The person trip generation for the existing development is summarized in Table 3.

Table 3: Modified Existing Person Trip Generation

Land Use	Area	AM Peak (Person Trips/hr)			PM Peak (Person Trips/hr)		
		In	Out	Total	In	Out	Total
Pharmacy/Drugstore w/out Drive-Thru	2,000 ft²	5	3	8	10	12	22
Fast Casual Restaurant	800 ft²	1	1	2	0	0	0
Physiotherapy Office	5,000 ft²	15	5	20	6	18	24
General Office	40,000 ft²	70	12	82	9	52	61
Total Existing Person Trips		**91**	**21**	**112**	**25**	**82**	**107**

As shown in Table 3, a total of approximately 110 persons/h are projected to travel to/from the existing development during both the weekday morning and afternoon commuter peak hours. Total person-trip generation values were then reduced to non-auto modal shares using the O-D survey (2011) for a site within the Ottawa Inner Area. Table 4 outlines the mode shares for the Ottawa Inner Area and selected mode splits.

With regard to pass-by trips, the ITE Trip Generation Handbook 9th Edition approximates the average percentage of pass-by trips for a pharmacy/drugstore without a drive-thru is 55% which has been applied. It should be noted that the Handbook did not state an average pass-by rate for a fast-casual restaurant and as such, one has not been included.

Table 4: 2011 OD Survey – Ottawa East Mode Shares

	24H			AM Peak			PM Peak			Average Split	Selected Split
	From District	To District	Within District	From District	To District	Within District	From District	To District	Within District		
Auto Driver	44%	44%	22%	40%	41%	20%	45%	43%	20%	35%	**35%**
Auto Passenger	12%	12%	8%	7%	9%	9%	10%	11%	8%	10%	**10%**
Transit	28%	28%	10%	25%	41%	13%	33%	22%	10%	23%	**25%**
Bike/Walk	13%	14%	58%	25%	7%	52%	10%	22%	60%	29%	**30%**
Other	3%	2%	2%	3%	2%	6%	2%	2%	2%	3%	

Table 5: Total Existing Site Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	35%	34	10	44	11	31	42
Auto Passenger	10%	10	3	13	3	8	11
Transit	25%	21	4	25	5	20	25
Bike/Walk	30%	26	4	30	6	23	29
Total Person Trips	35%	91	21	112	25	82	107
Less Pass-by (55%)		-1	-1	-2	-2	-2	-4
Total 'Existing' Auto Trips		**33**	**9**	**42**	**9**	**29**	**38**

As shown in Table 5 above, the total estimated existing site generated trips are estimated to be approximately 40 to 45 veh/h during the morning and afternoon peak hours. This estimate is consistent with the size of the current on-site parking lot (100 spaces).

Comparison to Traffic Count at Site Driveway

A site visit was completed on July 9th, 2019 to determine existing peak hour enter/egress volumes at the existing site access at O'Connor Street. These observed volumes, in comparison to assumed existing trip generation outlined previously, are summarized in Table 6.

Table 6: Comparison of Existing Site Traffic Estimates

Method	AM Peak (veh/h)			PM Peak (veh/h)		
	In	Out	Total	In	Out	Total
Observed Site Access Volumes	25	4	29	2	28	30
Assumed Trip Generation	33	9	42	9	29	38
Net Auto Trip Difference	**-8**	**-5**	**-13**	**-7**	**-1**	**-8**

As shown in Table 6, the ITE Trip generation analysis for the assumed existing building composition overestimates the total trip generation by approximately 10 veh/h. While this may be considered negligible, the site access volumes will be used in the following analysis when determining the net increase in site traffic to remain conservative.

3.1.1. Trip Generation and Mode Shares

Appropriate trip generation rate for the proposed development consisting of approximately 264 and 283 residential units for Phase I and II, respectively, was obtained from the City's 2009 TRANS Trip Generation – Residential Trip Rates. Table 7 summarizes the trip generation rates.

Table 7: TRANS Residential Trip Rates

Land Use	Data Source	Trip Rates	
		AM Peak	PM Peak
High Rise Apartment	222	T = 0.17(du)	T = 0.16(du)

Note: T = Average Vehicle Trip
du = dwelling units

Phase I Trip Generation

Using the TRANS Trip Generation rates outlined in Table 7 and the TRANS Trip Generation mode splits for the residential component of the site, the total amount of vehicle trips generated by the proposed 264 residential units is summarized in Table 8.

Table 8: Projected Auto Trip Generation – Phase I

Land Use	Area	AM Peak (veh/h)			PM Peak (veh/h)		
		In	Out	Total	In	Out	Total
High Rise Apartments	264 units	10	35	45	26	16	42
Total 'New' Auto Trips		**10**	**35**	**45**	**26**	**16**	**42**

As shown in Table 8, a total of approximately 40 to 45 veh/h are projected to travel to/from the proposed development during both the weekday morning and afternoon commuter peak hours. The vehicle trips shown in Table 8 for the proposed site were converted to total person trips using the auto modal share values in Table 3.6 of the TRANS report which are summarized in Table 9. Total person-trip generation values were then split by mode using the 2011 OD-Survey modal shares outlined in Table 4. The updated anticipated trips generated by the proposed Phase I development are summarized in Table 10.

Table 9: 2009 TRANS Report High Rise Apartments, Person Trip Generation – Phase I

Travel Mode	AM Mode Share	AM Peak (Person Trips/h)			PM Mode Share	PM Peak (Person Trips/h)		
		In	Out	Total		In	Out	Total
Auto Driver	27%	10	35	45	23%	26	16	42
Auto Passenger	3%	1	5	6	6%	6	4	10
Transit	27%	10	35	45	29%	34	20	54
Bike/Walk	43%	17	54	71	42%	48	29	77
Total Person Trips	**100%**	**38**	**129**	**167**	**100%**	**114**	**69**	**183**

Table 10: O-D Modal Site Trip Generation – Phase I

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	35%	14	45	59	40	25	65
Auto Passenger	10%	3	13	16	12	7	19
Transit	25%	9	32	41	28	17	45
Bike/Walk	30%	12	39	51	34	20	54
Total Person Trips	**100%**	**38**	**129**	**167**	**114**	**69**	**183**
Total 'New' Auto Trips		**14**	**45**	**59**	**40**	**25**	**65**

As shown in Table 10, Phase I is projected to generate approximately an additional 170 to 185 person-trips per hour in the weekday commute peak hours. The increase in two-way transit trips is estimated to be approximately 40 to 45 persons per hour, and the increase in bike/walk trips is approximately 50 to 55 persons per hour. The total amount of 'new' vehicle traffic to the study area is projected to be approximately 60 veh/h during the morning peak hour and approximately 65 veh/h in the afternoon peak hour.

Phase II Trip Generation

Using the TRANS Trip Generation rates outlined in Table 7 and the TRANS Trip Generation mode splits for the residential component of the site, the total amount of vehicle trips generated by the proposed 283 residential units is summarized in Table 11.

Table 11: Projected Auto Trip Generation – Phase II

Land Use	Area	AM Peak (veh/h)			PM Peak (veh/h)		
		In	Out	Total	In	Out	Total
High Rise Apartments	283 units	11	37	48	27	18	45
Total 'New' Auto Trips		**11**	**37**	**48**	**27**	**18**	**45**

As shown in Table 8, a total of approximately 45 to 50 veh/h are projected to travel to/from the proposed development during both the weekday morning and afternoon commuter peak hours. The vehicle trips shown in Table 11 for the proposed site were converted to total person trips using the auto modal share values in Table 3.6 of the TRANS report which are summarized in Table 12. Total person-trip generation values were then split by mode using the 2011 OD-Survey modal shares outlined in Table 4. The updated anticipated trips generated by the proposed Phase I development are summarized in Table 13.

Table 12: 2009 TRANS Report High Rise Apartments, Person Trip Generation – Phase II

Travel Mode	AM Mode Share	AM Peak (Person Trips/h)			PM Mode Share	PM Peak (Person Trips/h)		
		In	Out	Total		In	Out	Total
Auto Driver	27%	11	37	48	23%	27	18	45
Auto Passenger	3%	2	4	6	6%	6	5	11
Transit	27%	11	36	47	29%	35	22	57
Bike/Walk	43%	19	57	76	42%	51	32	83
Total Person Trips	**100%**	**43**	**134**	**177**	**100%**	**119**	**77**	**196**

Table 13: O-D Modal Site Trip Generation – Phase II

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	35%	15	47	62	42	27	69
Auto Passenger	10%	5	12	17	11	8	19
Transit	25%	11	33	44	30	19	49
Bike/Walk	30%	12	42	54	36	23	59
Total Person Trips	**100%**	**43**	**134**	**177**	**119**	**77**	**196**
Total 'New' Auto Trips		**15**	**47**	**62**	**42**	**27**	**69**

As shown in Table 10, Phase II is projected to generate approximately an additional 180 to 200 person-trips per hour in the weekday commute peak hours. The increase in two-way transit trips is estimated to be approximately 45 to 50 persons per hour, and the increase in bike/walk trips is approximately 50 to 60 persons per hour. The total amount of 'new' vehicle traffic to the study area is projected to be approximately 60 veh/h during the morning peak hour and approximately 70 veh/h in the afternoon peak hour.

Total Site Trip Generation

The total Phase I and Phase II projected trips for the proposed development are summarized below in Table 14.

Table 14: Total Phase 1 and Phase 2 Site Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	35%	29	92	121	82	52	134
Auto Passenger	10%	8	25	33	23	15	38
Transit	25%	20	65	85	58	36	94
Bike/Walk	30%	24	81	105	70	43	113
Total Person Trips	**100%**	81	263	344	233	146	379
Total 'New' Auto Trips		**29**	**92**	**121**	**82**	**52**	**134**

As shown in Table 14, the site is projected to generate approximately 345 to 380 person-trips per hour in the weekday commute peak hours. The projected two-way transit trips are estimated to be approximately 85 to 95 persons per hour, and the projected bike/walk trips are approximately 105 to 115 persons per hour. The total vehicle trips generated by the site is projected to be approximately 120 veh/h during the morning peak hour and approximately 135 veh/h in the afternoon peak hour.

Net Auto Trip Increase

Using the Phase I and II projected auto trips presented in Table 8 and Table 11, respectively, and subtracting the observed site access volumes shown in Table 6, Table 15 illustrates the total net auto trips generated by the proposed development once Phase I and Phase II has been constructed.

Table 15: Net Vehicle Trip Generation

Mode Share	AM Peak (veh/h)			PM Peak (veh/h)		
	In	Out	Total	In	Out	Total
Observed Site Access Auto Trips	25	4	29	2	28	30
'New' Auto Trips Phase I	14	45	59	40	25	65
'New' Auto Trips Phase I & II	29	92	121	82	52	134
Net 'New' Auto Trips Phase I Increase	*-11*	*41*	*30*	*38*	*-3*	*35*
Net 'New' Auto Trips Phase I & II Increase	*4*	*88*	*92*	*80*	*24*	*104*

As shown in Table 15 above, the total net increase in Phase I trips are anticipated to be 30 veh/h and 35 veh/h during the morning and afternoon peak hours, respectively. The total net increase in Phase I & II trips are anticipated to be 90 veh/h and 105 veh/h during the morning and afternoon peak hours, respectively.

3.1.2. Mode Shares

As the development is not located in a TOD zone and is approximately 850m walking distance from the future O'Connor LRT Station, the future mode shares are expected to be the same as outlined in Table 4.

3.1.3. Trip Distribution

Based on the 2011 OD Survey (Ottawa Inner Area/Ottawa Centre districts) and the location of adjacent arterial roadways and neighbourhoods, the distribution of site-generated traffic volumes was estimated as follows:

- 55% to/from the south via Metcalfe Street and HWY-417;
- 25% to/from the north via O'Connor Street;
- 5% to/from the east via Somerset Street; and,
- 15% to/from the west via Somerset Street and Gilmour Street.

3.1.4. Trip Assignment

The expected 'new' site-generated auto trips for Phase I (Table 8) and Phase 2 (Table 11) of the proposed development (Figure 2) are assigned to the road networks as shown in Figure 7 and Figure 8, respectively. Figure 9 illustrates the total site generated trips applied to the network, including pass-by trips.

3.2. Background Network Travel Demands

3.2.1. Transportation Network Plans

See Section 2.3.1.

3.2.2. Background Growth

The following background traffic growth (summarized in Table 16) was calculated based on historical traffic count data (years 2003, 2007, 2010, and 2017) provided by the City of Ottawa at the Somerset/O'Connor intersection north of the site. Detailed background traffic growth analysis is included as Appendix D.

Table 16: Somerset/O'Connor Historical Background Growth (2003-2017)

Time Period	Percent Annual Change				
	North Leg	South Leg	East Leg	West Leg	Overall
8 hrs	-2.22%	-1.66%	-0.41%	-0.19%	**-1.34%**
AM Peak	-2.20%	-1.76%	-0.65%	-0.17%	**-1.31%**
PM Peak	-2.22%	-1.99%	-1.19%	-0.42%	**-1.67%**

As shown in Table 16, the Somerset/O'Connor intersection has experienced approximately 1.31 to 1.67% overall annual decrease in traffic within recent years. This is consistent with the decline in vehicular traffic outlined in the TMP. Rather than use a negative growth rate, a more conservative growth rate will be used of 0% annual growth as advised by City of Ottawa (Jennifer Armstrong; Program Manager Transportation Policy and Networks) on April 11th, 2019.

Figure 7: Phase I 'New' Site Generated Traffic

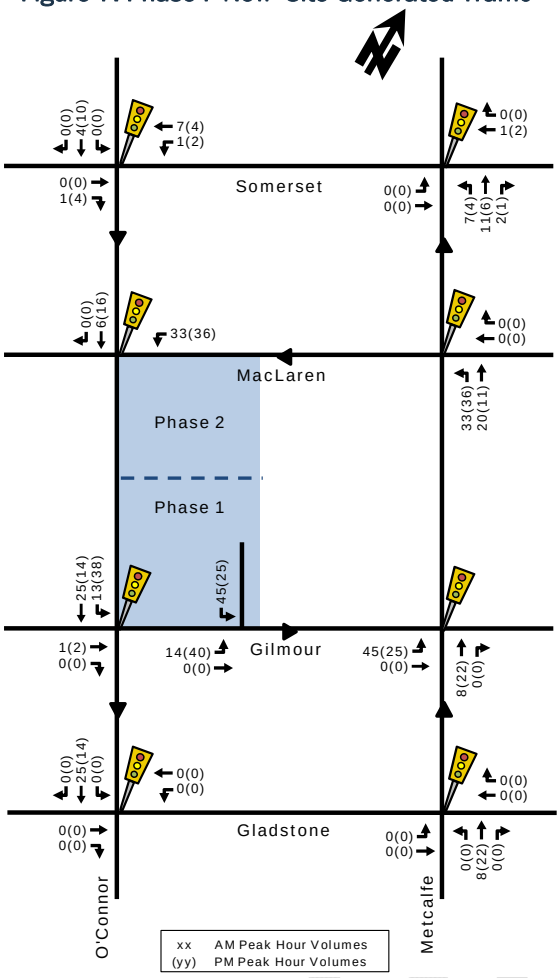


Figure 8: Phase II 'New' Site Generated Traffic

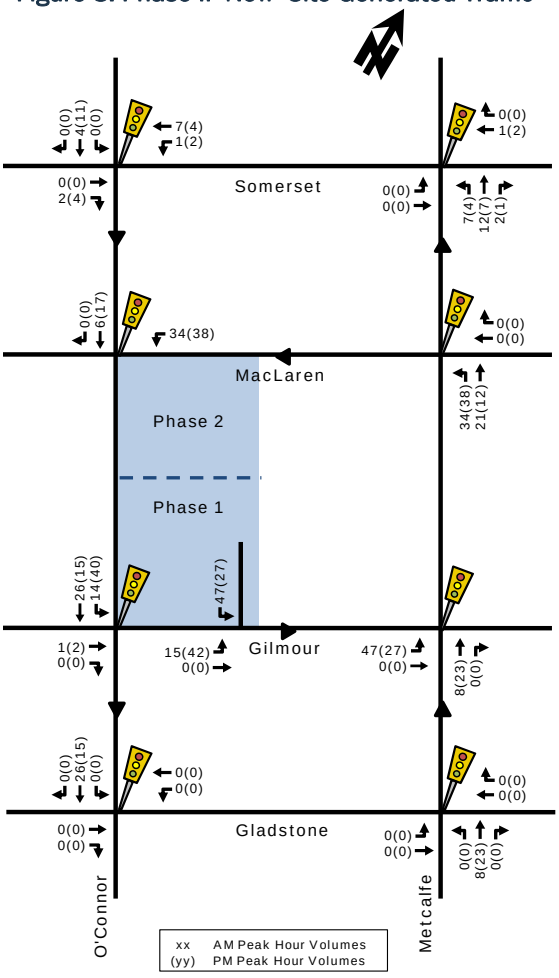
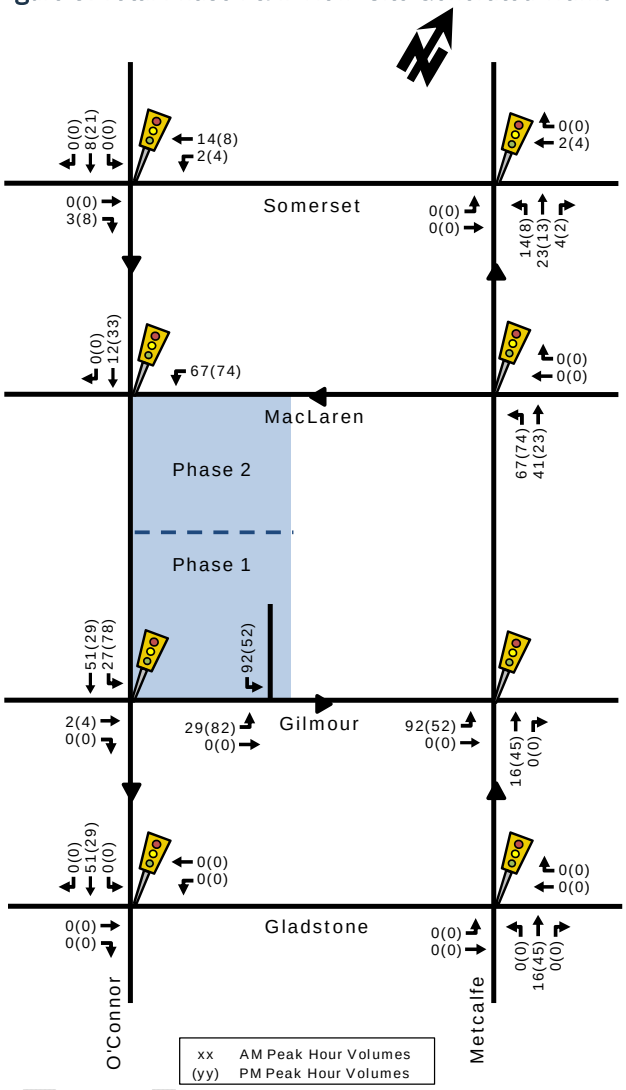


Figure 9: Total Phase I & II 'New' Site Generated Traffic



3.2.3. Other Developments

See Section 2.1.4.

3.3. Demand Rationalization

The 2022 and 2025 total projected volumes are composed of the existing traffic volumes (Figure 4) combined with the anticipated site generated vehicle volumes. Figure 10 displays the 2023 total projected volumes and Figure 11 illustrates the total 2025 projected volumes. As there is no projected background traffic growth, the 2030 horizon year traffic volumes are anticipated to be similar to the 2025 horizon year.

The TAC Guide for Signalized Intersection (2008) identifies the typical saturation flow rate for through lanes and left turn lanes as approximately 1,800 veh/h/ln and 1,750 veh/h/ln, respectively. While there are not any movements at study area intersections reaching this threshold. This will be further explored in Section 4.9 of the Strategy Report.

Figure 10: Total Projected Volumes – Phase I

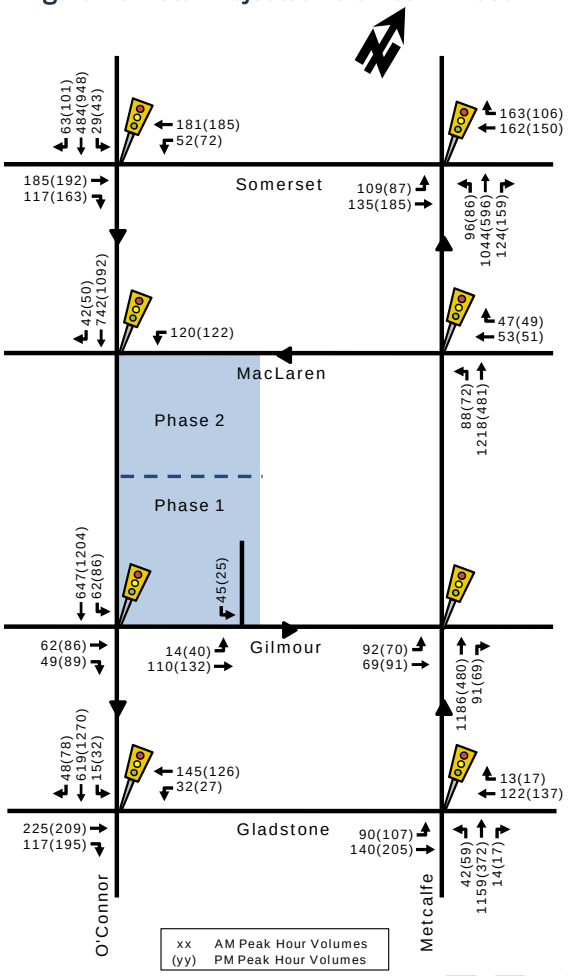
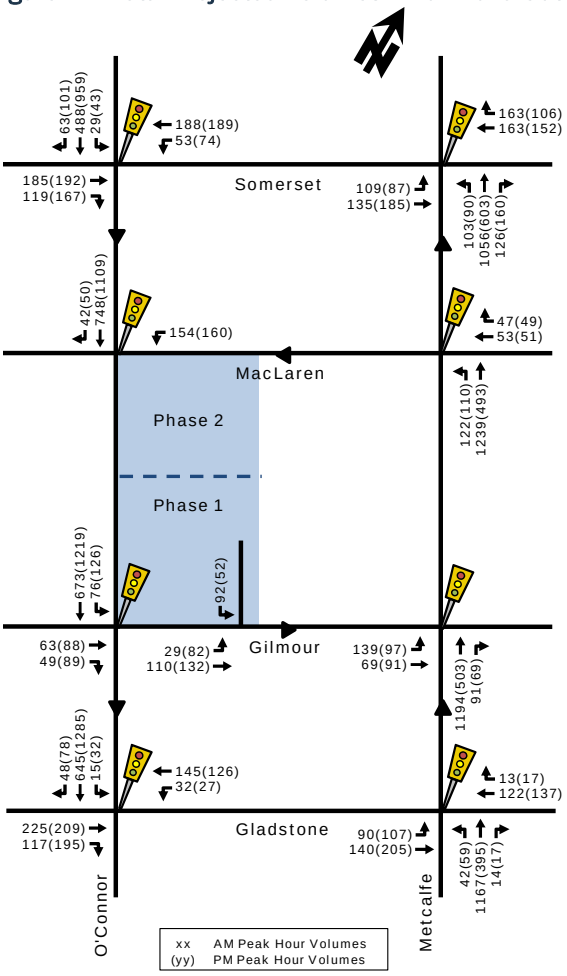


Figure 11: Total Projected Volumes – Full Build-Out



4. Strategy

4.1. Development Design

Exempt – See Section 2.3.

As this is TIA is for a Zoning Application, the Design Review Component is not required. It will be included in the subsequent TIA in support of the SPA.

4.2. Parking

Exempt – See Section 2.3.

Vehicle Parking

A total of 304 vehicle parking spaces are expected to be provided for residents of the planned development. A total of 152 vehicle parking spaces will be provided for each Phase I and II, totalling 304 parking spaces at full build-out. The number of parking spaces provided meets the minimum parking space rates set by the City of Ottawa parking provisions.

Bicycle Parking

Based on bicycle parking rates outlined in City of Ottawa By-laws, approximately 274 bicycle parking spaces are needed to meet the minimum requirement. A minimum of 25% (69 spaces) of these spaces must be located within a secure structure with no more than 50% (137 spaces) of them vertical spaces.

Final parking statistics will be confirmed in the subsequent TIA in support of the SPA.

4.3. Boundary Street Design

Exempt – See Section 2.3.

As this is TIA is for a Zoning Application, the Design Review Component is not required. It will be included in the subsequent TIA in support of the SPA.

4.4. Access Intersection Design

Exempt – See Section 2.3.

As this is TIA is for a Zoning Application, the Design Review Component is not required. It will be included in the subsequent TIA in support of the SPA.

4.5. Transportation Demand Management

The proposed residential development is located within walking distance to transit stops located along Bank Street and Elgin Street, and the future Queen LRT Station and adjacent to the O'Connor Bikeway. As such, the location of the site is ideal in promoting non-auto travel during the weekday peak hours and outside peak hours. The TDM-Supportive Development Design and Infrastructure Checklist and TDM Measures Checklist have been provided as Appendix E. Some of the TDM measures that the proponent is providing/considering are as follows:

- Display walking/cycling maps in building lobby and/or amenity areas;
- Display transit maps in building lobby and/or amenity areas;
- Provide a multimodal travel option information package to new residents in tenant move-in package;
- Contract with provider to install on-site carshare vehicles and promote their use by residents;
- Unbundle parking costs from monthly rent;
- Provide pedestrian connections to existing City sidewalks; and,
- Building entrances located close to street front to minimize walking distances.

Given the type of development and its location within the urban inner area, and given the existing and future cycling and pedestrian facilities within the area, the development is well positioned to promote travel via transit and active modes.

4.6. Neighbourhood Traffic Management (NTM)

The following section discusses the development's impact on the surrounding neighbourhood and local access route. Table 17 summarizes Gilmour Street's roadway classification, the TIA Guideline's roadway threshold, and the approximate existing and projected total site traffic (Phase I and II) on the main access route to the site.

Table 17: Roadway Classification Analysis of Site Access Routes

Roadway	Classification	Daily Threshold (veh/day)	Peak Hour Peak Direction Threshold (veh/h)	Peak Hour Peak Direction Volumes AM Peak (PM Peak)	
				Existing	Projected
Gilmour Street – O'Connor Street to Metcalfe Street	Local	1,000	120	110 (130)	220 (265)

As shown in Table 17, the existing morning peak hour peak directional volumes are approaching the suggested threshold and the existing afternoon peak hour peak directional volumes exceed them. With the addition of site traffic, the directional thresholds are exceeded during both peak hours. The proposed development could maintain the existing vehicle access on O'Connor Street; however, this access would provide a conflict point with the existing O'Connor Bikeway. As such, potential NTM measures that could be considered to lessen the impact to Gilmour Street include speed humps, midblock narrowings, intersection narrowings etc. It should be noted that these measures would require monitoring and a comprehensive study completed by the City prior to implementation.

4.7. Transit

As shown in Section 3.1, the total "new" two-way transit trips for the proposed development are approximately 45-50 and 40-45 persons/h during the weekday peak hours for Phase I and II, respectively. This amount of person trips can be accommodated by the existing transit located on Bank Street, Elgin Street, and the Queen LRT Station.

4.8. Review of Network Concept

Exempt – See Section 2.3.

4.9. Intersection Design

4.9.1. Existing Conditions

The following Table 18 provides a summary of the existing traffic operations at the study area intersections based on the SYNCHRO (V9) traffic analysis software and the existing traffic volumes (Figure 4). The subject signalized intersection was assessed in terms of the volume-to-capacity (v/c) ratio and the corresponding Level of Service (LoS) for the critical movement(s). The subject signalized intersection 'as a whole' was assessed based on weighted v/c ratio. The unsignalized intersections were assessed based on delay and the corresponding level of service. The SYNCHRO model output of existing conditions is provided within Appendix F.

Table 18: Existing Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Somerset/O'Connor	C(E)	0.74(0.93)	EBT(EBT)	22.3(32.7)	A(D)	0.50(0.83)
Gilmour/O'Connor	A(A)	0.38(0.59)	EBT(EBT)	8.0(7.5)	A(A)	0.31(0.59)
Gladstone/O'Connor	C(E)	0.78(0.91)	EBT(EBT)	23.3(22.6)	A(C)	0.53(0.78)
Somerset/Metcalfe	F(E)	1.05(0.92)	EBT(EBT)	28.4(24.1)	B(A)	0.61(0.51)
MacLaren/Metcalfe	A(A)	0.37(0.30)	NBT(WBT)	3.7(4.4)	A(A)	0.37(0.17)
Gilmour/Metcalfe	A(A)	0.42(0.33)	NBT(EBT)	4.2(6.8)	A(A)	0.41(0.22)
Gladstone/Metcalfe	C(C)	0.73(0.76)	EBT(EBT)	15.7(19.9)	A(A)	0.46(0.42)
MacLaren/O'Connor (unsignalized)	B(C)	12.4(15.1)	WB(WB)	1.2(1.1)	A(A)	-
O'Connor/Site (unsignalized)	C(C)	18.0(19.9)	WB(WB)	0.7(0.9)	A(A)	-
Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

As shown in Table 18, all study area intersections 'as a whole' currently operate at an acceptable LoS 'C' or better during the morning and afternoon peak hours. With regard to 'critical movements' at study area intersections, they are operating at an acceptable LoS 'E' or better during peak hours with the exception of the Somerset/Metcalfe intersection. The critical

eastbound movement at this location operates at an LoS 'F' during the morning peak hour. This is likely due to the high volume of left-turning vehicles at this location (approximately 110 veh/h during the morning peak hour) and high number of pedestrians crossing.

Multi-Modal Level of Service – Existing Conditions

The MMLoS analysis for the signalized study area intersection is summarized in Table 19. The existing detailed MMLoS analysis is provided as Appendix G.

Table 19: MMLoS – Signalized Intersection, Existing Conditions

Intersection	Level of Service									
	Pedestrian (PLoS)		Bicycle (BLoS)		Transit (TLoS)		Truck (TkLoS)		Vehicle (LoS)	
	PLoS	Target	BLoS	Target	TLoS	Target	TkLoS	Target	LoS	Target
Somerset/O'Connor	D	A	D	A	N/A	No Target	F	D	D	E
Gilmour/O'Connor	D	A	D	A	N/A		D	N/A	A	E
Gladstone/O'Connor	C	A	D	A	F		F	D	C	E
Somerset/Metcalfe	C	A	D	C	N/A		F	N/A	B	E
MacLaren/Metcalfe	C	A	D	C	N/A		F	N/A	A	E
Gilmour/Metcalfe	C	A	D	C	N/A		D	N/A	A	E
Gladstone/Metcalfe	C	A	D	C	F		F	N/A	A	E

The letters identified in red text in Table 19 do not meet the MMLoS Targets for their designated area (within 300m of a school). There are only transit routes travelling east and west through the Gladstone/O'Connor and Gladstone/Metcalfe intersections and as such, these are the only locations with a TLoS component. As there are no transit priority measures currently on Gladstone, there is no transit level of service target. As Gilmour Street, Metcalfe Street, MacLaren Street and Gladstone Avenue do not form part of the truck route and, as such, there are no TkLoS targets for these intersections.

With regard to pedestrians, the low effective walk time is the main factor for the failing levels of service. The pedestrian level of service at these intersections could be improved by considering major geometric and signal timing changes.

With regard to cyclists, there are no facilities provided on the east/west roadways and on Metcalfe Street which results in the failing levels of service as cyclists must travel in mixed traffic. Potential mitigative measures include cross-rides, bike boxes, or pocket bike lanes. Note that implementation of bike boxes would require the right-turn-on-red to be prohibited.

With regard to trucks, as Somerset Street and Gladstone Avenue only have one receiving lane, the resulting level of service is an TkLoS 'F'. It should be noted however, that the TkLoS on the remaining north legs of these intersection are TkLoS 'D' which meets the target.

Total Projected 2023 Conditions – Phase I

The following Table 20 provides a summary of the total 2023 projected operations at the study area intersections based on the Synchro (V10) traffic analysis software. The Synchro model output of total projected conditions is provided within Appendix F.

Table 20: Total Projected 2023 Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Somerset/O'Connor	C(E)	0.74(0.93)	EBT(EBT)	22.3(33.4)	A(D)	0.51(0.83)
Gilmour/O'Connor	A(B)	0.38(0.62)	EBT(SBT)	7.9(8.4)	A(B)	0.33(0.62)
Gladstone/O'Connor	C(E)	0.78(0.91)	EBT(EBT)	23.3(23.2)	A(C)	0.53(0.80)
Somerset/Metcalfe	F(E)	1.06(0.93)	EBT(EBT)	28.4(24.3)	B(A)	0.62(0.51)
MacLaren/Metcalfe	A(A)	0.39(0.30)	NBT(WBT)	3.7(4.2)	A(A)	0.39(0.19)
Gilmour/Metcalfe	A(A)	0.44(0.41)	EBT(EBT)	4.9(7.3)	A(A)	0.42(0.24)
Gladstone/Metcalfe	C(C)	0.73(0.76)	EBT(EBT)	15.7(19.6)	A(A)	0.47(0.42)
MacLaren/O'Connor (unsignalized)	B(C)	13.0(16.5)	WB(WB)	1.7(1.6)	A(A)	-
O'Connor/Site (unsignalized)	A(A)	9.5(9.9)	SB(SB)	2.6(1.3)	A(A)	-
Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

As shown in Table 20, study area intersections are projected to operate similar to 2022 conditions with slight increases to v/c ratios and delay. Study area intersections 'as a whole' are projected to operate at an acceptable LoS 'C' or better during the morning and afternoon peak hours. With regard to 'critical movements' at study area intersections, they are projected to continue operating at an acceptable LoS 'E' or better during peak hours with the exception of the Somerset/Metcalfe intersection. The critical eastbound through movement at this location is projected to operate at an LoS 'F' during the morning peak hour.

Total Projected 2025 Conditions – Full Build-Out (Phase I and II)

The following Table 21 provides a summary of the total 2025 projected operations at the study area intersections based on the Synchro (V10) traffic analysis software. The Synchro model output of total projected conditions is provided within Appendix F.

Table 21: Total Projected 2025 Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Somerset/O'Connor	C(E)	0.74(0.94)	EBT(EBT)	22.4(34.1)	A(D)	0.51(0.84)
Gilmour/O'Connor	A(B)	0.39(0.65)	EBT(SBT)	7.6(9.3)	A(B)	0.35(0.65)
Gladstone/O'Connor	C(E)	0.78(0.91)	EBT(EBT)	23.1(22.5)	A(D)	0.54(0.81)
Somerset/Metcalfe	F(E)	1.06(0.93)	EBT(EBT)	28.4(24.1)	B(A)	0.62(0.52)
MacLaren/Metcalfe	A(A)	0.41(0.30)	NBT(WBT)	3.6(4.0)	A(A)	0.40(0.21)
Gilmour/Metcalfe	A(A)	0.57(0.46)	EBT(EBT)	6.2(7.4)	A(A)	0.44(0.26)
Gladstone/Metcalfe	C(C)	0.73(0.76)	EBT(EBT)	15.7(19.4)	A(A)	0.47(0.42)
MacLaren/O'Connor (unsignalized)	B(C)	13.7(18.3)	WB(WB)	2.2(2.2)	A(A)	-
O'Connor/Site (unsignalized)	B(B)	10.0(10.7)	SB(SB)	4.0(2.1)	A(A)	-
Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

As shown in Table 21, study area intersections are projected to operate similar to 2022 conditions with slight increases to v/c ratios and delay. Study area intersections 'as a whole' are projected to operate at an acceptable LoS 'D' or better during the morning and afternoon peak hours. With regard to 'critical movements' at study area intersections, they are projected to continue operating at an acceptable LoS 'E' or better during peak hours with the exception of the Somerset/Metcalfe

intersection. The critical eastbound through movement at this location is projected to operate at an LoS 'F' during the morning peak hour.

Total Projected 2030 Conditions – Full Build-Out + 5 Years

As there is no projected background traffic, the projected 2030 horizon year traffic operations are expected to be similar to the 2025 horizon year. As such, the results shown in Table 21 and accompanying conclusions will remain constant for the 2030 horizon year.

Multi-Modal Level of Service – Projected 2023, 2025, 2030 Conditions

As there are no planned changes to the study area intersections, the projected MMLoS is expected to be the same as the existing MMLoS reported in Table 19.

5. Findings, Conclusions and Recommendations

Based on the results summarized herein, the following transportation related conclusions are offered:

Proposed Site

- Taggart is proposing a mixed-use development comprised of 2 high-rise residential towers totalling 547 units;
- Phase 1 build-out is expected in 2023 with the build-out of Phase 2 expected in 2025;
- Approximately 300 parking spaces are proposed in an underground parking structure which meet the minimum requirements outlined in City By-laws;
  - Approximately 274 bicycle parking spaces are required to be in compliance with City By-laws;
  - Parking statistics will be confirmed in the supporting TIA for the SPA; and,
- Vehicle access to the development is proposed via a new all movement driveway connection to Gilmour Street.

Site Trip Generation

- Phase 1 is projected to generate approximately 60 – 65 veh/h during the morning and afternoon peak hours;
  - The net increase/decrease of trips compared to existing trip generation is 30 veh/h and 35 veh/h during the morning and afternoon peak hours respectively;
- Phase 2 is projected to generate approximately 60 veh/h and 70 veh/h during the morning and afternoon peak hours respectively;
- The total site is projected to generate approximately 120 veh/h and 135 veh/h during the morning and afternoon peak hours respectively; and,
  - The net increase of trips compared to existing trip generation is 90 veh/h and 105 veh/h during the morning and afternoon peak hours respectively.

Existing and Projected Conditions

- The study area intersections operate 'as a whole' with a LoS 'D' or better during peak hours. Critical movements operate at a LoS 'E' or better during peak hours with the exception of the eastbound movement at the Somerset/Metcalfe intersection during the morning peak hour;
  - The high volume of eastbound left-turning vehicles and high number of pedestrians at this location are likely the cause of this movement failing;
- For the 2023 and 2025 horizon years, study area intersections are projected to operate 'as a whole' with a LoS 'D' or better during peak hours. Critical movements operate at a LoS 'E' or better during peak hours with the exception of the EBT at the Somerset/Metcalfe intersection during the morning peak hour; and,
- The MMLoS targets for existing conditions are not met at all locations for pedestrian and cycling modes. The target TkLoS is not met at the Somerset/O'Connor and Gladstone/O'Connor intersections;
  - PLoS is not met mainly due to effective walks time but can be improved with major geometric and signal timing changes;

- BLoS is not met due to cyclists travelling in mixed traffic. Potential mitigative measures include cross-rides, bike boxes, or pocket bike lanes.

Based on the foregoing, the proposed residential development fits well into the context of the surrounding area, and its location and design serve to promote use of walking, cycling, and transit modes, thus supporting City of Ottawa policies, goals and objectives with respect to redevelopment, intensification and modal share. Therefore, approval from a transportation perspective of the proposed residential development is recommended.

Once the ZBA submission is approved, the next steps for the Site Plan Application will include updating this report to include Modules 4.1 to 4.2 and assess the design review component of the proposed development.

Prepared By:	Reviewed by:
Rani Nahas, E.I.T. Transportation Analyst	Mark Baker, P.Eng. Senior Transportation Engineer

Appendix A

Screening Form

PARSONS

1223 Michael Street, Suite 100, Ottawa, Ontario, K1J 7T2
P: +1 613.738.4160 | F: +1 613.739.7105 | www.parsons.com

City of Ottawa 2017 TIA Guidelines

TIA Screening Form

Date	8/18/2020
Project	267 O'Connor TIA
Project Number	477191-01000

Results of Screening	Yes/No
Development Satisfies the Trip Generation Trigger	Yes
Development Satisfies the Location Trigger	No
Development Satisfies the Safety Trigger	Yes

Module 1.1 - Description of Proposed Development	
Municipal Address	267 O'Connor Street
Description of location	Bounded by O'Connor Street, MacLaren Street, and Gilmour Street. Phase 1 is located on the south portion of the site and Phase 2 is located on the north portion of the site.
Land Use	Primarily residential
Development Size	263 units (Phase 1) 284 units (Phase 2)
Number of Accesses and Locations	One access to Gilmour Street
Development Phasing	Two phases. It should be noted that the focus of the TIA is Phase 1, however Phase 2 will also be included in the analysis.
Buildout Year	Phase 1 - 2023; Phase 2 - 2025
Sketch Plan / Site Plan	See attached

Module 1.2 - Trip Generation Trigger		
Land Use Type	Townhomes or Apartments	
Development Size	547	Units
Trip Generation Trigger Met?	Yes	

Module 1.3 - Location Triggers		
Development Proposes a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit, or Spine Bicycle Networks (See Sheet 3)	No	O'Connor Street is a Spine Cycling Route, however driveway connection unlikely at this street.
Development is in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone. (See Sheet 3)	No	
Location Trigger Met?	No	

Module 1.4 - Safety Triggers		
Posted Speed Limit on any boundary road	<80	km/h
Horizontal / Vertical Curvature on a boundary street limits sight lines at a proposed driveway	No	
A proposed driveway is 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) or within auxiliary lanes of an intersection;	Yes	
A proposed driveway makes use of an existing median break that serves an existing site	No	
There is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development	Yes	Proximity to O'Connor Bikeway
The development includes a drive-thru facility	No	
Safety Trigger Met?	Yes	

From: Nahas, Rani
To: Nahas, Rani
Subject: FW: 267 O"Connor St - Transportation Comments
Date: Tuesday, August 18, 2020 11:26:43 AM

From: Dubyk, Wally <Wally.Dubyk@ottawa.ca>
Sent: Thursday, July 11, 2019 12:07 PM
To: Sponder, Andre <Andre.Sponder@parsons.com>
Cc: Deiaco, Simon <Simon.Deiaco@ottawa.ca>
Subject: [EXTERNAL] 267 O'Connor St - Transportation Comments

Andre,

Please review the following comments;

Project No.: TBD	Project Address: 267 O'Connor Street
Consultant: Parsons	Ward/Councillor: 14/McKenney

Transportation

List of Report reviewed:

- **TIA Forecasting Report, Parsons Proj. No. 477191-01000, Dated June 27, 2019**

Comments:

- Table 2's title incorrectly refers to vehicle trips.
- To maintain the transit and active modal share percentages recorded in this Traffic Assessment Zone, please ensure that all proposed TDM measures include implementation details and reference to the site/concept plan.

Wally Dubyk
Project Manager - Transportation Approvals
Development Review, Central & South Branches
613-580-2424 x13783

Appendix B

Traffic Count Data

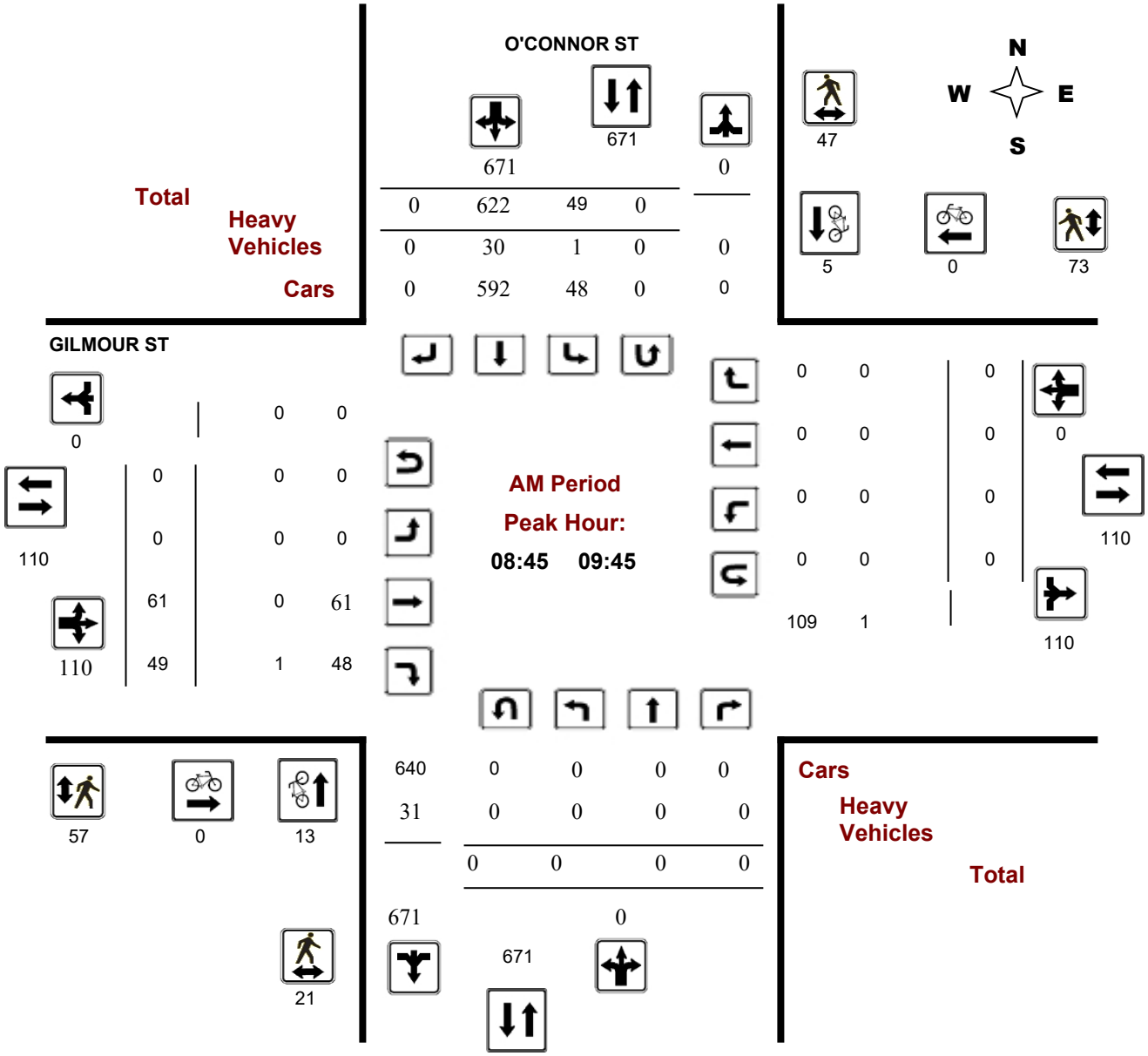
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GILMOUR ST @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36785

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



Comments

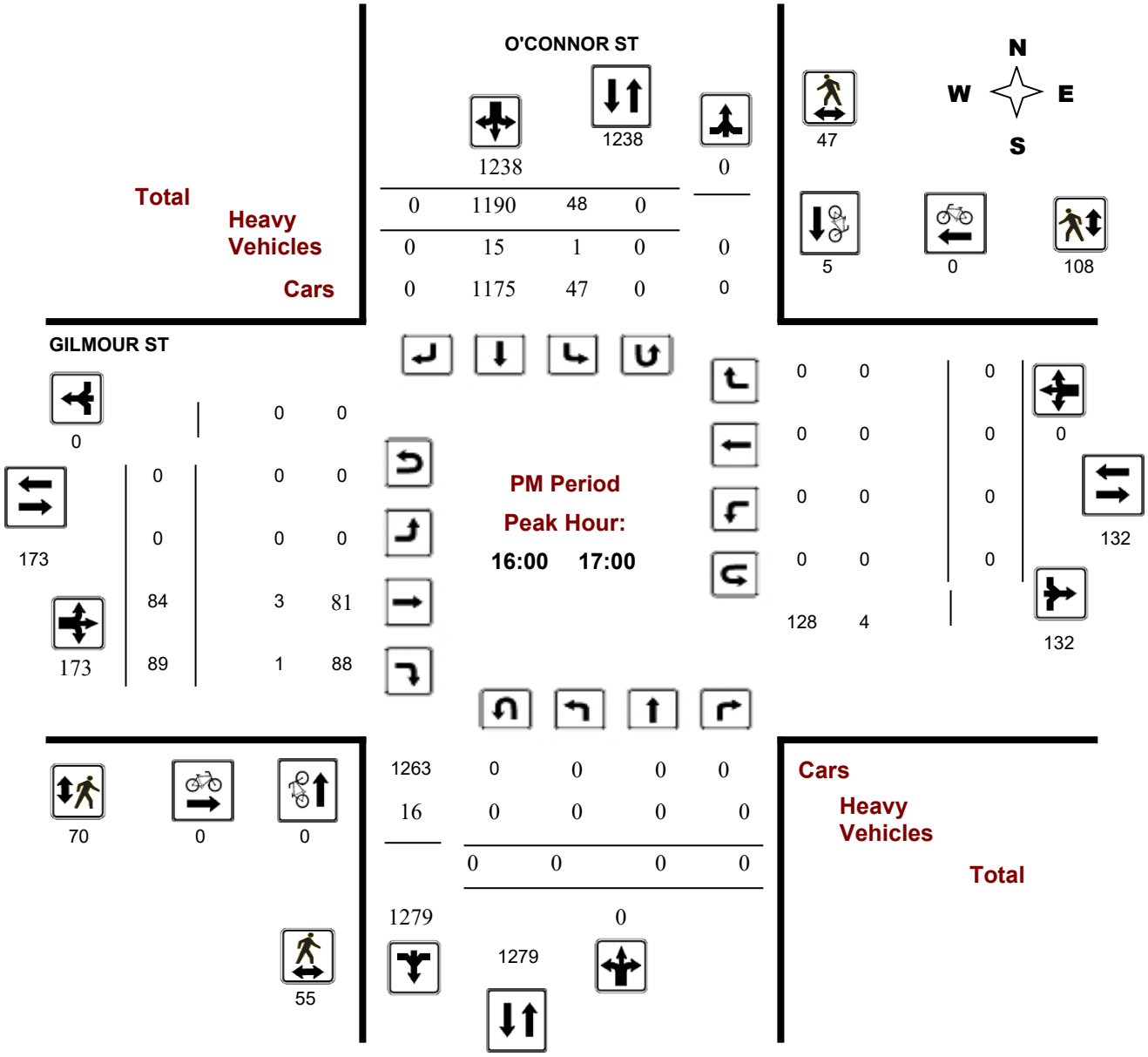
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GILMOUR ST @ O'CONNOR ST

Survey Date: Tuesday, March 21, 2017
Start Time: 07:00

WO No: 36785
Device: Miovision



Comments

5299373 - Metcalfe and Gladstone - Apr - 4th - TMC

Tue Apr 4, 2017
AM Peak (8AM - 9AM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road)
All Movements
ID: 397175, Location: 45.413818, -75.689574, Site Code: 36833103

Provided by: City of Ottawa
100 Constellation Dr, Nepean, ON, K2G 5J9, CA

Leg	West						East						South						North						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2017-04-04 8:00AM	30	39	0	0	**69**	19	0	26	6	0	**32**	23	10	277	2	0	**289**	14	0	0	0	0	**0**	11	**390**
8:15AM	21	34	0	0	**55**	13	0	36	2	0	**38**	11	12	326	4	0	**342**	16	0	0	0	0	**0**	19	**435**
8:30AM	21	37	0	0	**58**	19	0	28	0	0	**28**	6	9	261	4	0	**274**	9	0	0	0	0	**0**	10	**360**
8:45AM	18	30	0	0	**48**	15	0	32	5	0	**37**	20	11	287	4	1	**303**	13	0	0	0	0	**0**	18	**388**
Total	90	140	0	0	**230**	66	0	122	13	0	**135**	60	42	1151	14	1	**1208**	52	0	0	0	0	**0**	58	**1573**
% Approach	39.1%	60.9%	0%	0%	**-**	-	0%	90.4%	9.6%	0%	**-**	-	3.5%	95.3%	1.2%	0.1%	**-**	-	0%	0%	0%	0%	**-**	-	**-**
% Total	5.7%	8.9%	0%	0%	**14.6%**	-	0%	7.8%	0.8%	0%	**8.6%**	-	2.7%	73.2%	0.9%	0.1%	**76.8%**	-	0%	0%	0%	0%	**0%**	-	**-**
PHF	0.750	0.897	-	-	**0.833**	-	-	0.847	0.542	-	**0.888**	-	0.875	0.883	0.875	0.250	**0.883**	-	-	-	-	-	**-**	-	0.904
Lights and Motorcycles	86	128	0	0	**214**	-	0	114	13	0	**127**	-	41	1145	14	1	**1201**	-	0	0	0	0	**0**	-	1542
% Lights and Motorcycles	95.6%	91.4%	0%	0%	**93.0%**	-	0%	93.4%	100%	0%	**94.1%**	-	97.6%	99.5%	100%	100%	**99.4%**	-	0%	0%	0%	0%	**-**	-	98.0%
Heavy	4	9	0	0	**13**	-	0	7	0	0	**7**	-	0	5	0	0	**5**	-	0	0	0	0	**0**	-	25
% Heavy	4.4%	6.4%	0%	0%	**5.7%**	-	0%	5.7%	0%	0%	**5.2%**	-	0%	0.4%	0%	0%	**0.4%**	-	0%	0%	0%	0%	**-**	-	1.6%
Bicycles on Road	0	3	0	0	**3**	-	0	1	0	0	**1**	-	1	1	0	0	**2**	-	0	0	0	0	**0**	-	6
% Bicycles on Road	0%	2.1%	0%	0%	**1.3%**	-	0%	0.8%	0%	0%	**0.7%**	-	2.4%	0.1%	0%	0%	**0.2%**	-	0%	0%	0%	0%	**-**	-	0.4%
Pedestrians	-	-	-	-	-	66	-	-	-	-	-	60	-	-	-	-	-	52	-	-	-	-	-	58	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5299373 - Metcalfe and Gladstone - Apr - 4th - TMC

Tue Apr 4, 2017
PM Peak (4:15PM - 5:15PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road)
All Movements
ID: 397175, Location: 45.413818, -75.689574, Site Code: 36833103

Provided by: City of Ottawa
100 Constellation Dr, Nepean, ON, K2G 5J9, CA

Leg Direction	West Eastbound						East Westbound						South Northbound						North Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2017-04-04 4:15PM	27	49	0	0	**76**	12	0	38	4	0	**42**	10	8	99	10	0	**117**	9	0	0	0	0	**0**	14	**235**
4:30PM	22	73	0	0	**95**	15	0	41	3	0	**44**	6	11	86	2	0	**99**	7	0	0	0	0	**0**	12	**238**
4:45PM	31	47	0	0	**78**	15	0	25	3	0	**28**	13	20	79	4	0	**103**	20	0	0	0	0	**0**	13	**209**
5:00PM	27	46	0	0	**73**	20	0	33	7	0	**40**	14	20	86	1	0	**107**	14	0	0	0	0	**0**	12	**220**
Total	107	215	0	0	**322**	62	0	137	17	0	**154**	43	59	350	17	0	**426**	50	0	0	0	0	**0**	51	**902**
% Approach	33.2%	66.8%	0%	0%	**-**	-	0%	89.0%	11.0%	0%	**-**	-	13.8%	82.2%	4.0%	0%	**-**	-	0%	0%	0%	0%	**-**	-	-
% Total	11.9%	23.8%	0%	0%	**35.7%**	-	0%	15.2%	1.9%	0%	**17.1%**	-	6.5%	38.8%	1.9%	0%	**47.2%**	-	0%	0%	0%	0%	**0%**	-	-
PHF	0.863	0.736	-	-	**0.847**	-	-	0.835	0.607	-	**0.875**	-	0.738	0.884	0.425	-	**0.910**	-	-	-	-	-	**-**	-	0.947
Lights and Motorcycles	106	207	0	0	**313**	-	0	127	16	0	**143**	-	59	346	17	0	**422**	-	0	0	0	0	**0**	-	878
% Lights and Motorcycles	99.1%	96.3%	0%	0%	**97.2%**	-	0%	92.7%	94.1%	0%	**92.9%**	-	100%	98.9%	100%	0%	**99.1%**	-	0%	0%	0%	0%	**-**	-	97.3%
Heavy	1	7	0	0	**8**	-	0	6	1	0	**7**	-	0	4	0	0	**4**	-	0	0	0	0	**0**	-	19
% Heavy	0.9%	3.3%	0%	0%	**2.5%**	-	0%	4.4%	5.9%	0%	**4.5%**	-	0%	1.1%	0%	0%	**0.9%**	-	0%	0%	0%	0%	**-**	-	2.1%
Bicycles on Road	0	1	0	0	**1**	-	0	4	0	0	**4**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	5
% Bicycles on Road	0%	0.5%	0%	0%	**0.3%**	-	0%	2.9%	0%	0%	**2.6%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**-**	-	0.6%
Pedestrians	-	-	-	-	-	62	-	-	-	-	-	43	-	-	-	-	-	50	-	-	-	-	-	51	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5299374 - Gladstone Ave and O'Connor St - TMC

Tue Mar 21, 2017
AM Peak (8AM - 9AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road)
All Movements
ID: 393991, Location: 45.413048, -75.691547, Site Code: 36793103

Provided by: City of Ottawa
100 Constellation Dr, Nepean, ON, K2G 5J9, CA

Leg Direction	West Eastbound						East Westbound						South Northbound						North Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2017-03-21 8:00AM	0	57	28	0	**85**	17	12	25	0	0	**37**	19	0	4	0	0	**4**	17	4	162	17	0	**183**	13	**309**
8:15AM	0	62	27	0	**89**	17	7	41	0	0	**48**	17	0	8	0	0	**8**	15	3	125	7	0	**135**	9	**280**
8:30AM	0	45	38	0	**83**	20	8	38	0	0	**46**	29	0	7	0	0	**7**	21	4	163	7	0	**174**	19	**310**
8:45AM	0	61	24	0	**85**	24	5	41	0	0	**46**	27	0	6	0	0	**6**	19	4	144	17	0	**165**	12	**302**
Total	0	225	117	0	**342**	78	32	145	0	0	**177**	92	0	25	0	0	**25**	72	15	594	48	0	**657**	53	**1201**
% Approach	0%	65.8%	34.2%	0%	**-**	-	18.1%	81.9%	0%	0%	**-**	-	0%	100%	0%	0%	**-**	-	2.3%	90.4%	7.3%	0%	**-**	-	-
% Total	0%	18.7%	9.7%	0%	**28.5%**	-	2.7%	12.1%	0%	0%	**14.7%**	-	0%	2.1%	0%	0%	**2.1%**	-	1.2%	49.5%	4.0%	0%	**54.7%**	-	-
PHF	-	0.907	0.770	-	**0.961**	-	0.667	0.884	-	-	**0.922**	-	-	0.781	-	-	**0.781**	-	0.938	0.911	0.706	-	**0.898**	-	0.969
Lights and Motorcycles	0	212	116	0	**328**	-	30	133	0	0	**163**	-	0	0	0	0	**0**	-	15	578	45	0	**638**	-	1129
% Lights and Motorcycles	0%	94.2%	99.1%	0%	**95.9%**	-	93.8%	91.7%	0%	0%	**92.1%**	-	0%	0%	0%	0%	**0%**	-	100%	97.3%	93.8%	0%	**97.1%**	-	94.0%
Heavy	0	10	1	0	**11**	-	2	7	0	0	**9**	-	0	0	0	0	**0**	-	0	16	3	0	**19**	-	39
% Heavy	0%	4.4%	0.9%	0%	**3.2%**	-	6.3%	4.8%	0%	0%	**5.1%**	-	0%	0%	0%	0%	**0%**	-	0%	2.7%	6.3%	0%	**2.9%**	-	3.2%
Bicycles on Road	0	3	0	0	**3**	-	0	5	0	0	**5**	-	0	25	0	0	**25**	-	0	0	0	0	**0**	-	33
% Bicycles on Road	0%	1.3%	0%	0%	**0.9%**	-	0%	3.4%	0%	0%	**2.8%**	-	0%	100%	0%	0%	**100%**	-	0%	0%	0%	0%	**0%**	-	2.7%
Pedestrians	-	-	-	-	-	78	-	-	-	-	-	92	-	-	-	-	-	72	-	-	-	-	-	53	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5299374 - Gladstone Ave and O'Connor St - TMC

Tue Mar 21, 2017
PM Peak (3:45PM - 4:45PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road)
All Movements
ID: 393991, Location: 45.413048, -75.691547, Site Code: 36793103

Provided by: City of Ottawa
100 Constellation Dr, Nepean, ON, K2G 5J9, CA

Leg Direction	West Eastbound						East Westbound						South Northbound						North Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2017-03-21 3:45PM	0	53	52	0	**105**	14	8	28	0	0	**36**	14	0	0	0	0	**0**	15	5	317	19	0	**341**	15	**482**
4:00PM	0	54	55	0	**109**	17	6	35	0	0	**41**	31	0	1	0	0	**1**	13	9	316	19	0	**344**	22	**495**
4:15PM	0	50	43	0	**93**	16	5	28	0	0	**33**	11	0	0	0	0	**0**	22	8	321	21	0	**350**	21	**476**
4:30PM	0	52	45	0	**97**	11	8	35	0	0	**43**	15	0	0	0	0	**0**	23	10	302	19	0	**331**	13	**471**
Total	0	209	195	0	**404**	58	27	126	0	0	**153**	71	0	1	0	0	**1**	73	32	1256	78	0	**1366**	71	**1924**
% Approach	0%	51.7%	48.3%	0%	**-**	-	17.6%	82.4%	0%	0%	**-**	-	0%	100%	0%	0%	**-**	-	2.3%	91.9%	5.7%	0%	**-**	-	-
% Total	0%	10.9%	10.1%	0%	**21.0%**	-	1.4%	6.5%	0%	0%	**8.0%**	-	0%	0.1%	0%	0%	**0.1%**	-	1.7%	65.3%	4.1%	0%	**71.0%**	-	-
PHF	-	0.968	0.886	-	**0.927**	-	0.844	0.900	-	-	**0.890**	-	-	0.250	-	-	**0.250**	-	0.800	0.978	0.929	-	**0.976**	-	0.972
Lights and Motorcycles	0	204	190	0	**394**	-	27	118	0	0	**145**	-	0	0	0	0	**0**	-	31	1238	78	0	**1347**	-	1886
% Lights and Motorcycles	0%	97.6%	97.4%	0%	**97.5%**	-	100%	93.7%	0%	0%	**94.8%**	-	0%	0%	0%	0%	**0%**	-	96.9%	98.6%	100%	0%	**98.6%**	-	98.0%
Heavy	0	5	5	0	**10**	-	0	7	0	0	**7**	-	0	0	0	0	**0**	-	0	18	0	0	**18**	-	35
% Heavy	0%	2.4%	2.6%	0%	**2.5%**	-	0%	5.6%	0%	0%	**4.6%**	-	0%	0%	0%	0%	**0%**	-	0%	1.4%	0%	0%	**1.3%**	-	1.8%
Bicycles on Road	0	0	0	0	**0**	-	0	1	0	0	**1**	-	0	1	0	0	**1**	-	1	0	0	0	**1**	-	3
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0.8%	0%	0%	**0.7%**	-	0%	100%	0%	0%	**100%**	-	3.1%	0%	0%	0%	**0.1%**	-	0.2%
Pedestrians	-	-	-	-	-	58	-	-	-	-	-	71	-	-	-	-	-	73	-	-	-	-	-	71	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

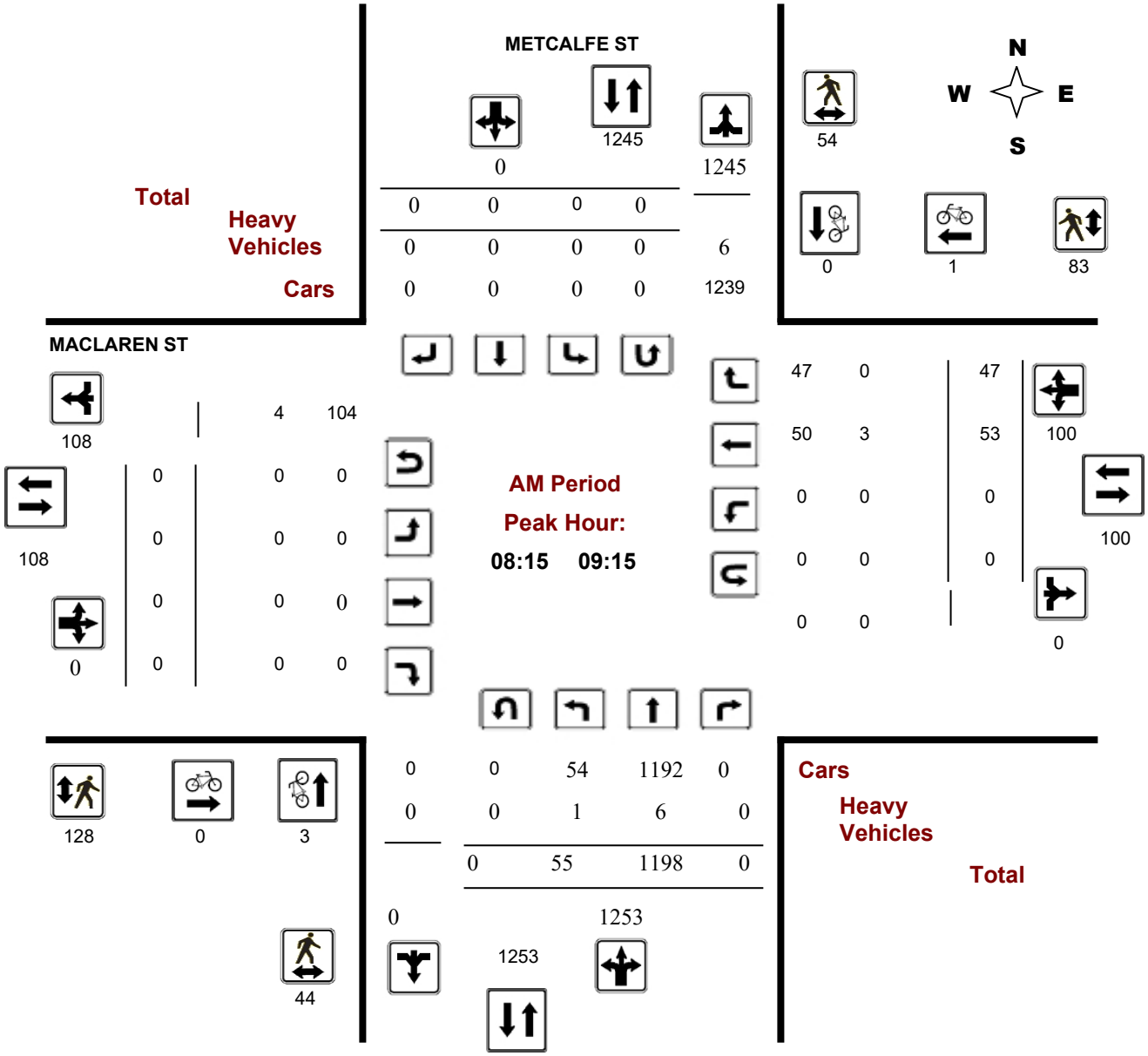
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

MACLAREN ST @ METCALFE ST

Survey Date: Tuesday, April 04, 2017
Start Time: 07:00

WO No: 36835
Device: Miovision



Comments

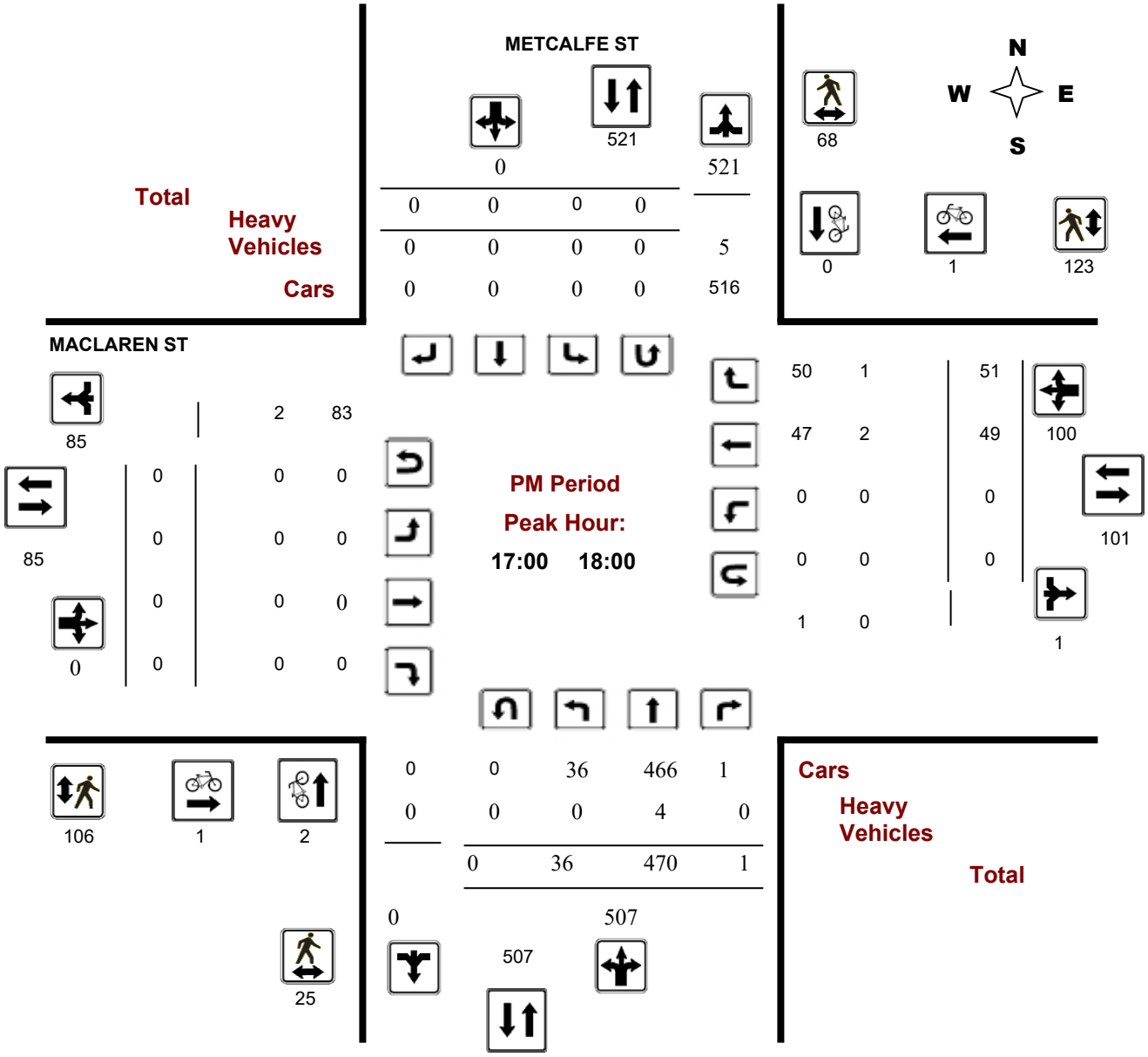
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

MACLAREN ST @ METCALFE ST

Survey Date: Tuesday, April 04, 2017 **WO No:** 36835

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



Comments

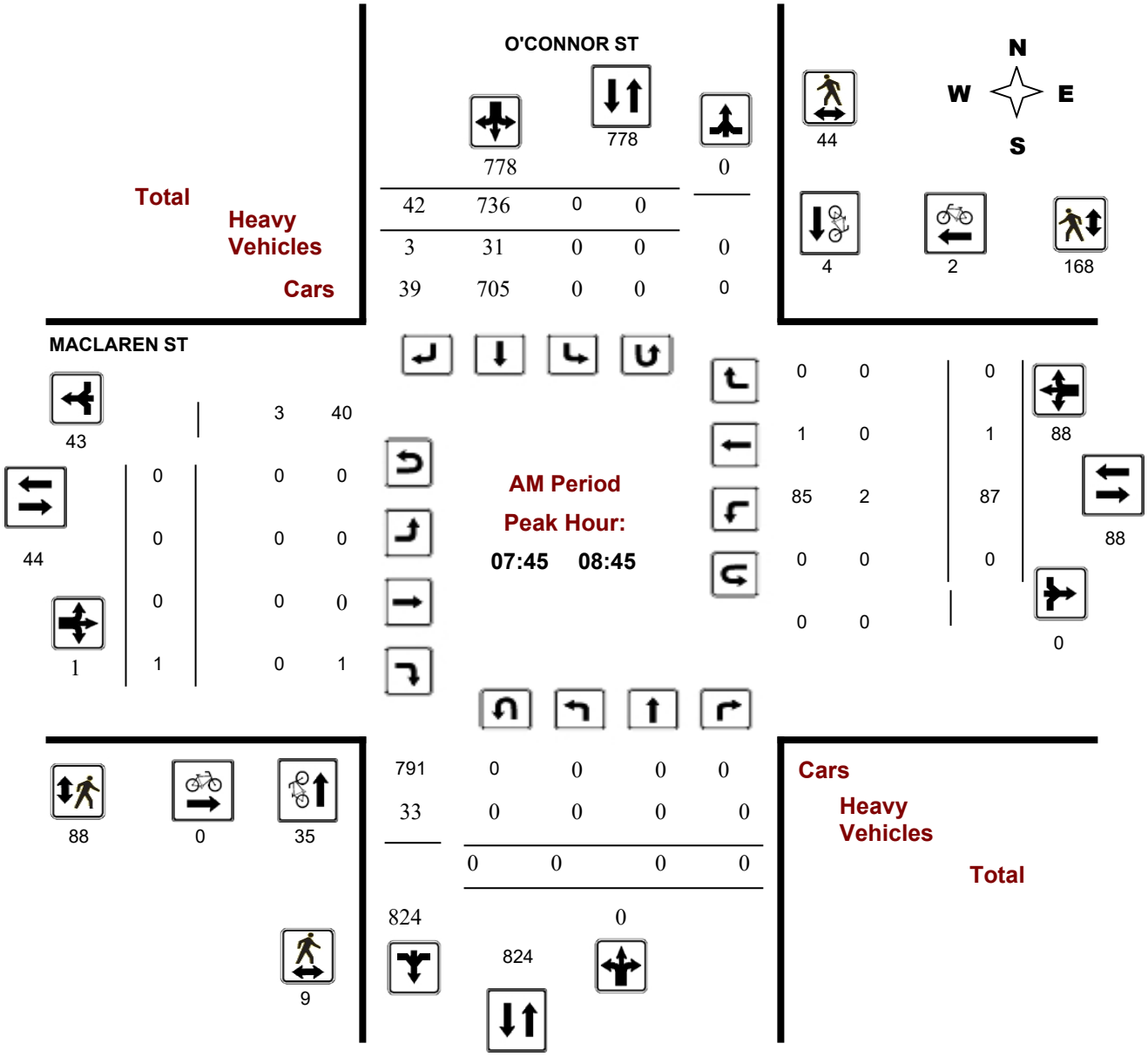
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

MACLAREN ST @ O'CONNOR ST

Survey Date: Thursday, March 21, 2019 **WO No:** 38457

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



Comments

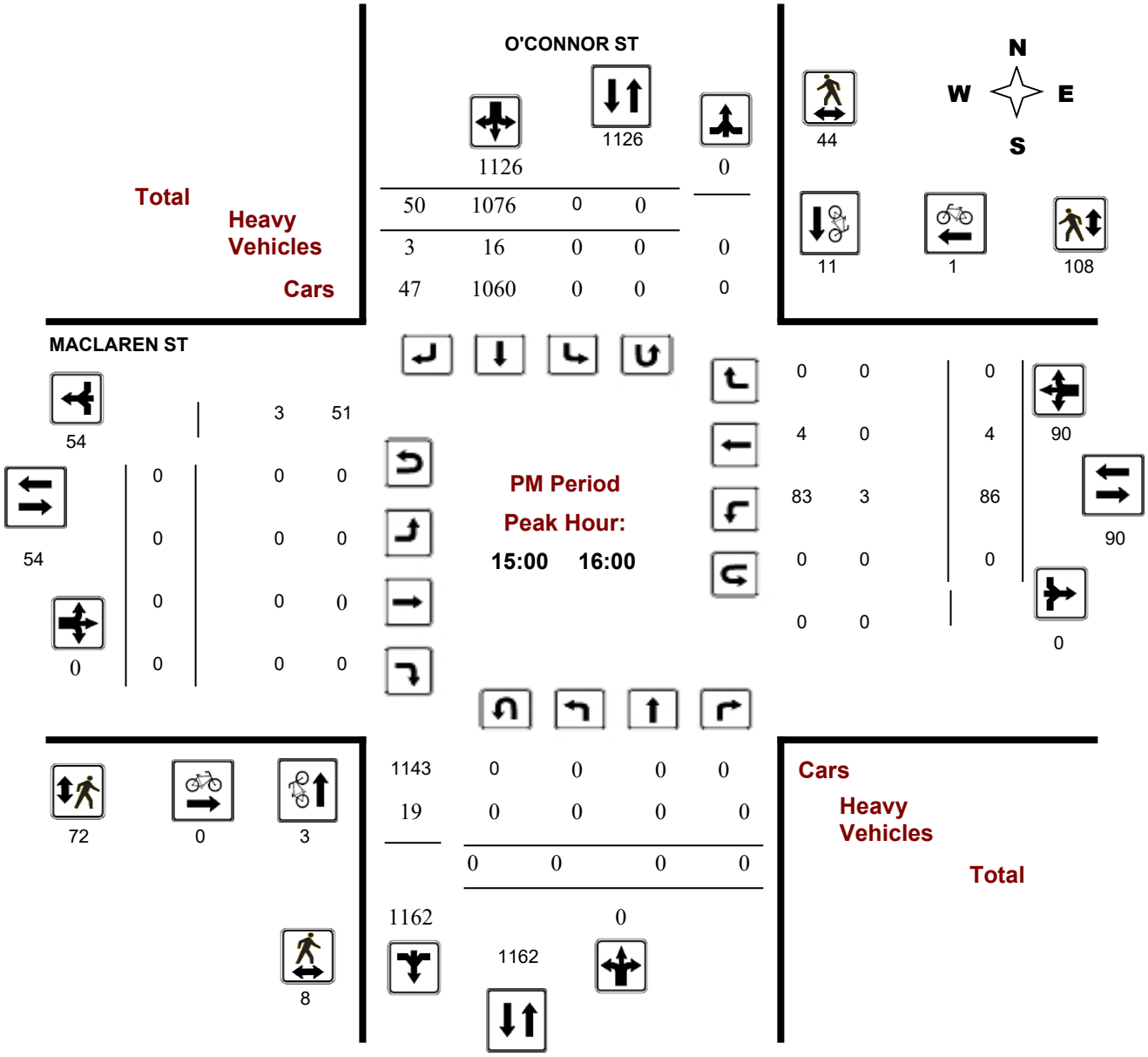
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

MACLAREN ST @ O'CONNOR ST

Survey Date: Thursday, March 21, 2019
Start Time: 07:00

WO No: 38457
Device: Miovision



Comments

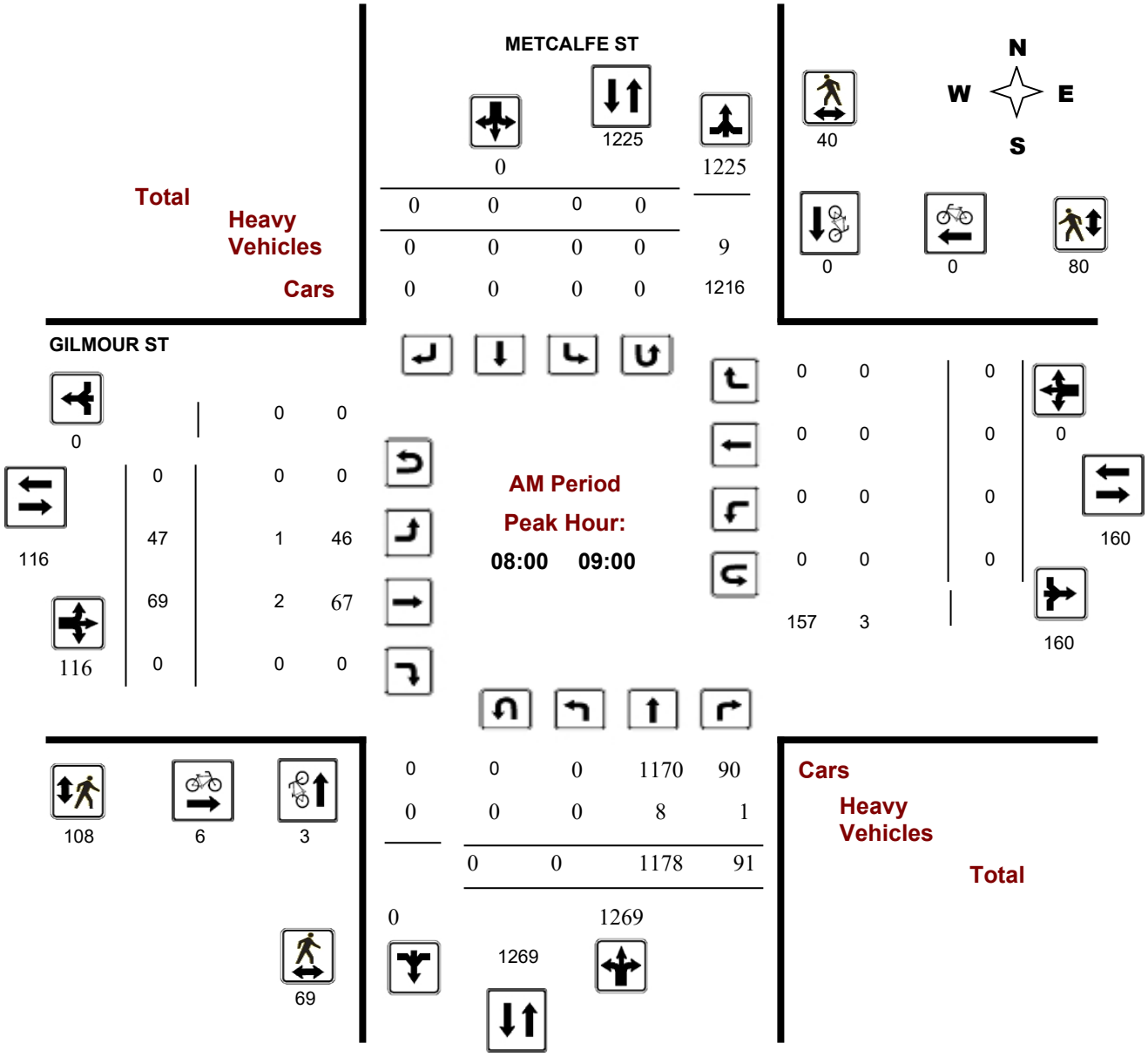
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

METCALFE ST @ GILMOUR ST

Survey Date: Tuesday, April 04, 2017
Start Time: 07:00

WO No: 36834
Device: Miovision



Comments

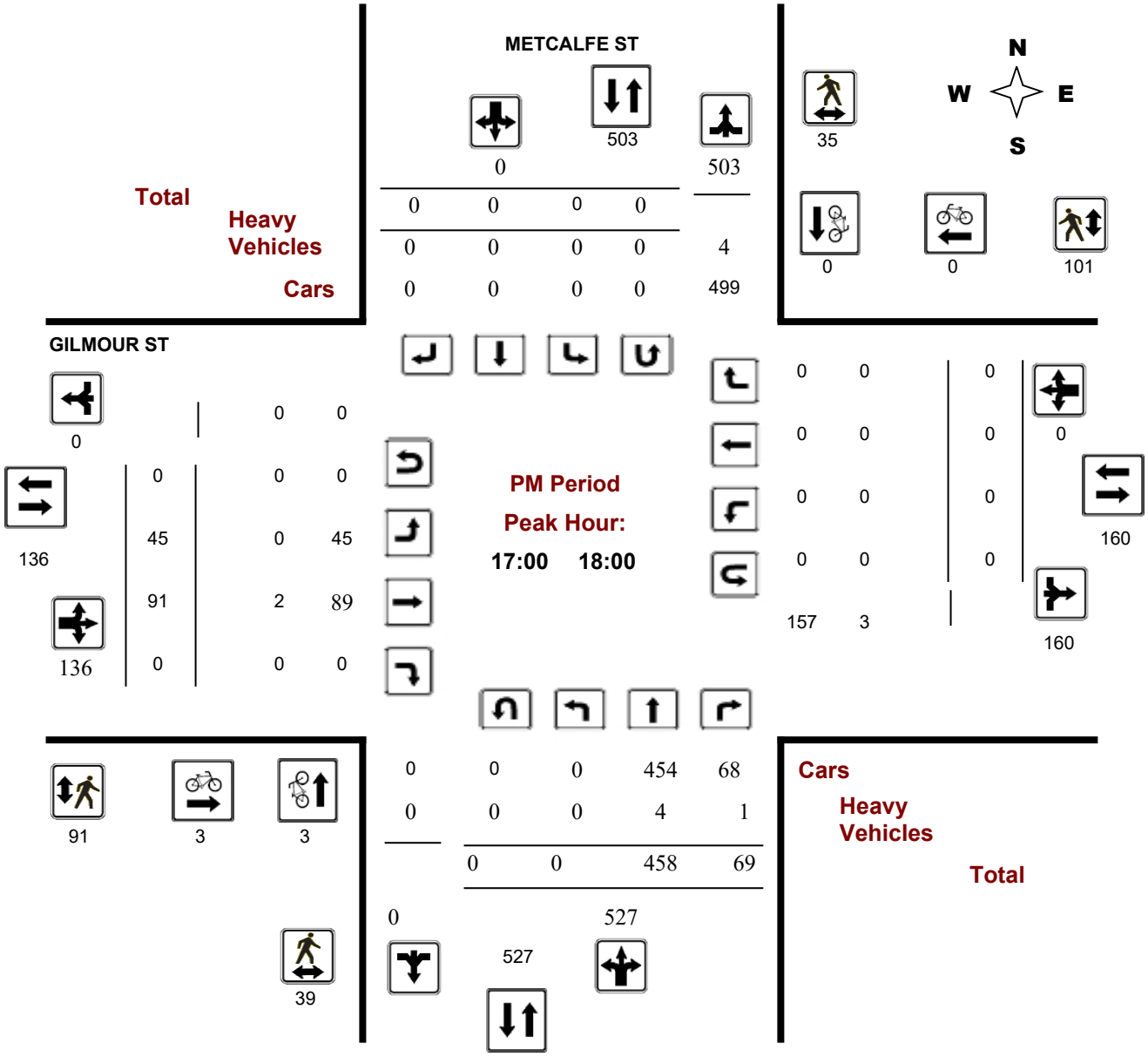
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

METCALFE ST @ GILMOUR ST

Survey Date: Tuesday, April 04, 2017 **WO No:** 36834

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



Comments

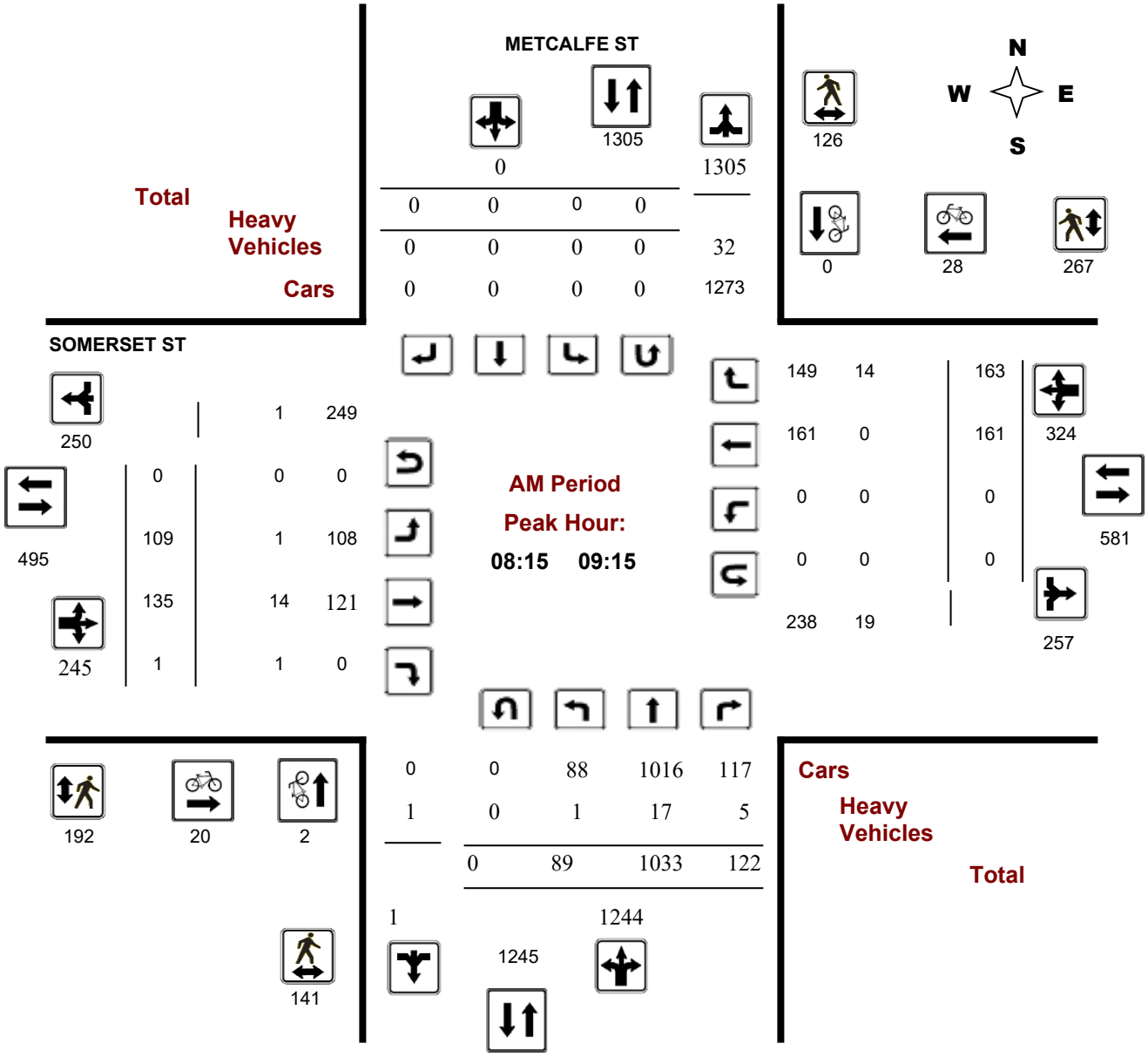
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

METCALFE ST @ SOMERSET ST

Survey Date: Thursday, May 02, 2019 **WO No:** 38599

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



Comments

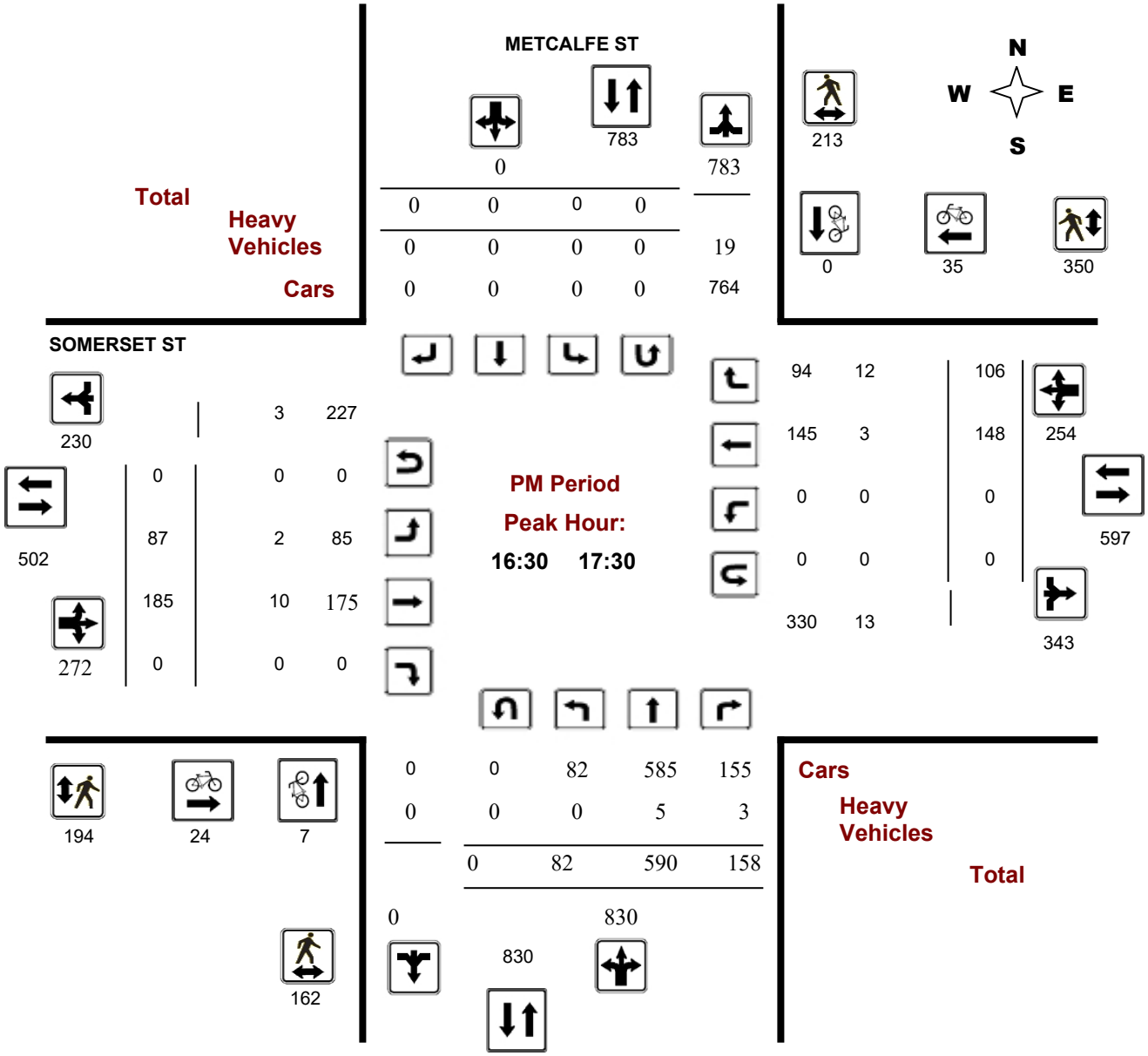
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

METCALFE ST @ SOMERSET ST

Survey Date: Thursday, May 02, 2019 **WO No:** 38599

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



Comments

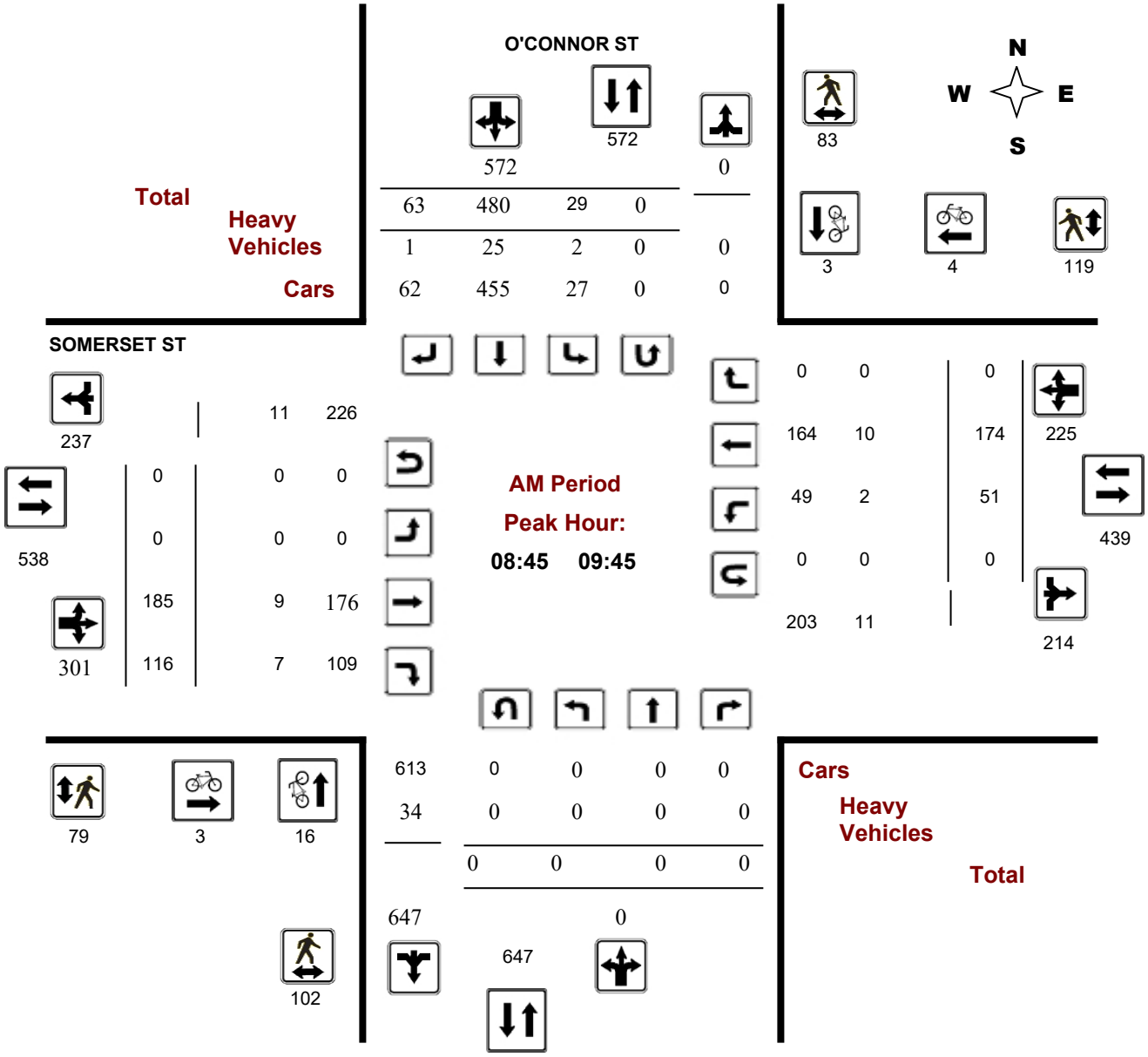
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

O'CONNOR ST @ SOMERSET ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36787

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



Comments

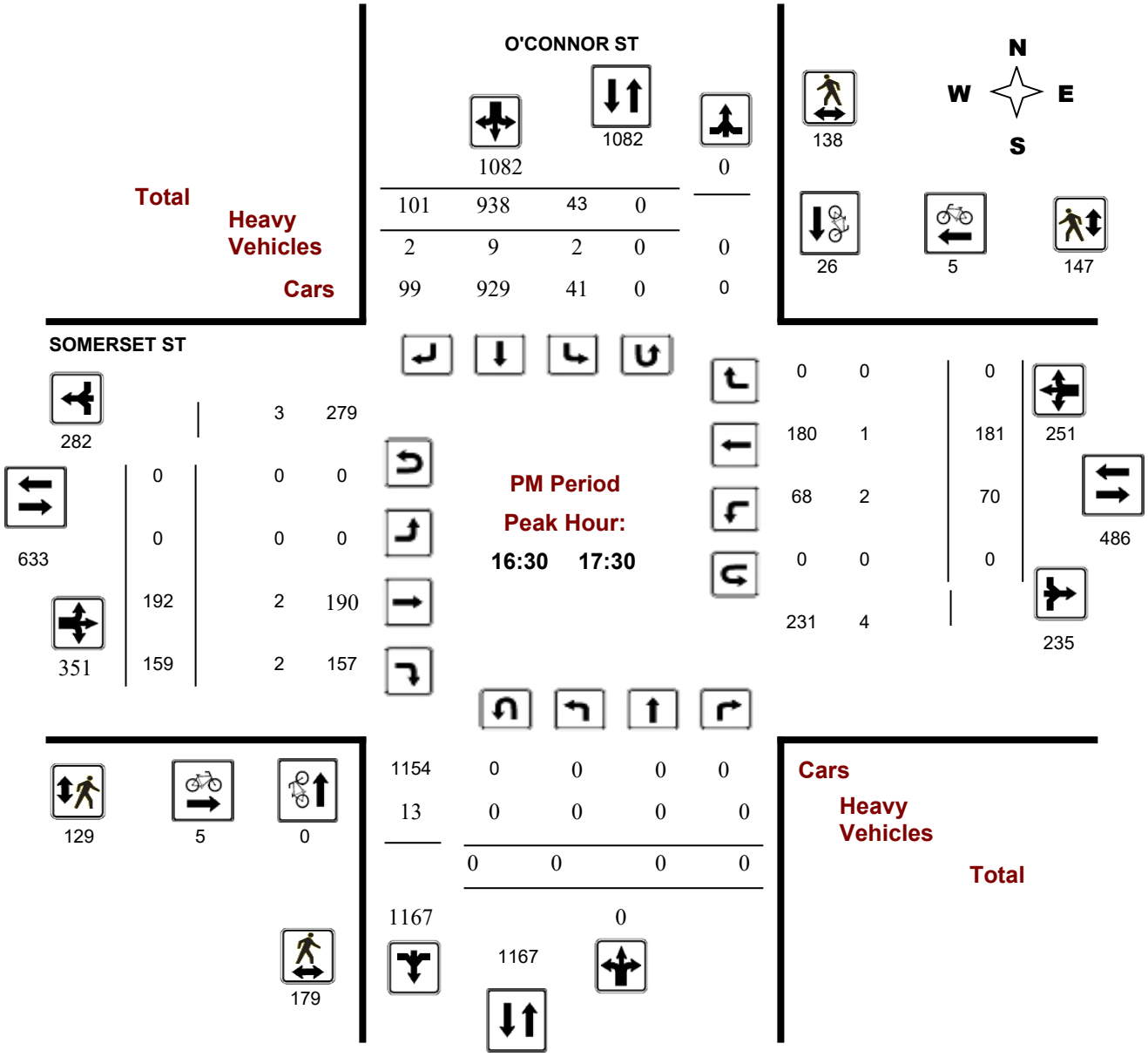
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

O'CONNOR ST @ SOMERSET ST

Survey Date: Tuesday, March 21, 2017 **WO No:** 36787

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



Comments

Appendix C

Collision Data and Analysis

Total Area

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	3	16	7	7	0	1	5	0	39	80%
Non-fatal injury	0	0	1	1	0	8	0	0	10	20%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**3**	**16**	**8**	**8**	**0**	**9**	**5**	**0**	**49**	100%
	#6 or 6%	#1 or 33%	#3 or 16%	#3 or 16%	#7 or 0%	#2 or 18%	#5 or 10%	#7 or 0%		

GILMOUR ST / O'CONNOR ST

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2017	9	14,348	1825	**0.34**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	1	3	1	1	0	0	1	0	7	78%
Non-fatal injury	0	0	1	0	0	1	0	0	2	22%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**1**	**3**	**2**	**1**	**0**	**1**	**1**	**0**	**9**	100%
	11%	33%	22%	11%	0%	11%	11%	0%		

MACLAREN ST / METCALFE ST

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2017	14	10,122	1825	**0.76**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	1	8	3	1	0	1	0	0	14	100%
Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**1**	**8**	**3**	**1**	**0**	**1**	**0**	**0**	**14**	100%
	7%	57%	21%	7%	0%	7%	0%	0%		

MACLAREN ST / O'CONNOR ST

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2017	12	14,068	1825	**0.47**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	1	1	0	3	0	0	0	0	5	42%
Non-fatal injury	0	0	0	1	0	6	0	0	7	58%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**1**	**1**	**0**	**4**	**0**	**6**	**0**	**0**	**12**	100%
	8%	8%	0%	33%	0%	50%	0%	0%		

METCALFE ST / GILMOUR ST

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2017	6	10,505	1825	**0.31**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	0	3	2	1	0	0	0	0	6	100%
Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**3**	**2**	**1**	**0**	**0**	**0**	**0**	**6**	100%
	0%	50%	33%	17%	0%	0%	0%	0%		

METCALFE ST , MACLAREN ST to GILMOUR ST

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2017	1	n/a	1825	**n/a**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	0	0	0	0	0	0	1	0	1	100%
Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	100%
	0%	0%	0%	0%	0%	0%	100%	0%		

O'CONNOR ST , MACLAREN ST to GILMOUR ST

Years	*Total # Collisions*	*24 Hr AADT Veh Volume*	*Days*	*Collisions/MEV*
2013-2017	4	n/a	1825	**n/a**

Classification of Accident	*Rear End*	*Turning Movement*	*Sideswipe*	*Angle*	*Approaching*	*Single Vehicle (other)*	*Single vehicle (Unattended vehicle)*	*Other*	*Total*	
P.D. only	0	1	1	0	0	0	1	0	3	75%
Non-fatal injury	0	0	0	0	0	1	0	0	1	25%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**1**	**1**	**0**	**0**	**1**	**1**	**0**	**4**	100%
	0%	25%	25%	0%	0%	25%	25%	0%		

GILMOUR ST , O'CONNOR ST to METCALFE ST

Years	*Total # Collisions*	*24 Hr AADT Veh Volume*	*Days*	*Collisions/MEV*
2013-2017	3	n/a	1825	**n/a**

Classification of Accident	*Rear End*	*Turning Movement*	*Sideswipe*	*Angle*	*Approaching*	*Single Vehicle (other)*	*Single vehicle (Unattended vehicle)*	*Other*	*Total*	
P.D. only	0	0	0	1	0	0	2	0	3	100%
Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**3**	100%
	0%	0%	0%	33%	0%	0%	67%	0%		

City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2013 **To:** December 31, 2017

Location: GILMOUR ST @ O'CONNOR ST

Traffic Control: Traffic signal **Total Collisions:** 9

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2013-Feb-05, Tue,09:29	Clear	Turning movement	P.D. only	Wet	South	Turning left	Delivery van	Other motor vehicle	
					South	Going ahead	Delivery van	Other motor vehicle	
2014-Feb-05, Wed,17:23	Clear	Sideswipe	Non-fatal injury	Slush	South	Changing lanes	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Jan-02, Fri,09:07	Clear	Angle	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	
					South	Going ahead	Pick-up truck	Other motor vehicle	
2015-Dec-14, Mon,15:53	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Pick-up truck	Other motor vehicle	
2016-Jun-24, Fri,12:34	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Pick-up truck	Other motor vehicle	
2016-Sep-19, Mon,12:01	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	

					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Mar-01, Wed,11:30	Rain	SMV other	Non-fatal injury	Wet	East	Turning right	Unknown	Pedestrian	1
2017-Aug-21, Mon,00:00	Clear	SMV unattended vehicle	P.D. only	Dry	Unknown	Unknown	Unknown	Unattended vehicle	
2017-Oct-20, Fri,22:01	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	

Location: GILMOUR ST btwn O'CONNOR ST & METCALFE ST

Traffic Control: No control

Total Collisions: 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2013-Mar-15, Fri,12:30	Snow	Angle	P.D. only	Loose snow	South	Turning left	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Pick-up truck	Other motor vehicle	
2014-Jun-15, Sun,00:00	Clear	SMV unattended vehicle	P.D. only	Dry	Unknown	Unknown	Unknown	Unattended vehicle	
2017-Nov-01, Wed,00:00	Clear	SMV unattended vehicle	P.D. only	Dry	Unknown	Unknown	Unknown	Unattended vehicle	

Location: MACLAREN ST @ METCALFE ST

Traffic Control: Traffic signal

Total Collisions: 14

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2013-May-11, Sat,07:58	Rain	Turning movement	P.D. only	Wet	North	Turning left	Automobile, station wagon	Other motor vehicle	

					North	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Oct-23, Wed,11:53	Clear	Turning movement	P.D. only	Dry	North	Turning left	Pick-up truck	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Dec-07, Sat,11:48	Clear	SMV other	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Snowbank/drift
2014-Aug-18, Mon,09:24	Clear	Turning movement	P.D. only	Dry	North	Turning left	Truck - open	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2014-Aug-18, Mon,11:27	Clear	Angle	P.D. only	Dry	North	Going ahead	Passenger van	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Oct-22, Wed,16:41	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Pick-up truck	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Mar-11, Wed,07:40	Clear	Turning movement	P.D. only	Wet	North	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2015-Apr-11, Sat,19:00	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle

2015-Oct-15, Thu,18:58	Rain	Sideswipe	P.D. only	Wet	North	Changing lanes	Pick-up truck	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Apr-08, Fri,08:58	Snow	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2016-Aug-17, Wed,12:57	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Jan-06, Fri,16:38	Clear	Turning movement	P.D. only	Ice	North	Turning left	Pick-up truck	Other motor vehicle
					North	Turning left	Automobile, station wagon	Other motor vehicle
2017-Sep-21, Thu,14:55	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Nov-24, Fri,12:50	Clear	Turning movement	P.D. only	Dry	North	Turning left	Pick-up truck	Other motor vehicle
					North	Going ahead	Passenger van	Other motor vehicle

Location: MACLAREN ST @ O'CONNOR ST

Traffic Control: Stop sign

Total Collisions: 12

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2013-Feb-06, Wed,17:52	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	

					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2013-Mar-06, Wed,18:43	Clear	SMV other	Non-fatal injury	Wet	West	Going ahead	Automobile, station wagon	Pedestrian	1
2013-Nov-11, Mon,13:45	Rain	SMV other	Non-fatal injury	Wet	West	Turning left	Automobile, station wagon	Pedestrian	1
2014-Feb-12, Wed,21:52	Clear	Rear end	P.D. only	Packed snow	West	Going ahead	Pick-up truck	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Dec-01, Tue,17:55	Clear	SMV other	Non-fatal injury	Wet	West	Turning left	Automobile, station wagon	Pedestrian	1
2016-Feb-13, Sat,17:46	Clear	Angle	P.D. only	Ice	West	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Pick-up truck	Other motor vehicle	
2016-Feb-14, Sun,12:50	Clear	SMV other	Non-fatal injury	Dry	West	Turning left	Pick-up truck	Pedestrian	1
2016-Mar-01, Tue,16:49	Clear	SMV other	Non-fatal injury	Wet	South	Going ahead	Automobile, station wagon	Pedestrian	1
2016-Jul-09, Sat,22:45	Rain	Turning movement	P.D. only	Wet	South	Turning right	Automobile, station wagon	Cyclist	
					South	Going ahead	Bicycle	Other motor vehicle	
2016-Aug-18, Thu,17:00	Clear	Angle	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	

					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Jun-23, Fri,15:11	Clear	SMV other	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Pedestrian	1
2017-Sep-01, Fri,15:42	Clear	Angle	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Cyclist	
					North	Going ahead	Bicycle	Other motor vehicle	

Location: METCALFE ST @ GILMOUR ST

Traffic Control: Traffic signal **Total Collisions:** 6

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2013-Jan-30, Wed,13:20	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Police vehicle	Other motor vehicle	
2014-Sep-27, Sat,04:21	Clear	Angle	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Pick-up truck	Other motor vehicle	
2014-Oct-25, Sat,12:49	Clear	Turning movement	P.D. only	Dry	North	Turning left	Pick-up truck	Other motor vehicle	
					North	Going ahead	Pick-up truck	Other motor vehicle	
2015-Apr-30, Thu,14:53	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Pick-up truck	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	

2016-May-04, Wed,13:59	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Nov-07, Tue,12:08	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Passenger van	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: METCALFE ST btwn MACLAREN ST & GILMOUR ST

Traffic Control: No control

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Jul-20, Wed,20:00	Clear	SMV unattended vehicle	P.D. only	Dry	Unknown	Unknown	Unknown	Unattended vehicle	

Location: O'CONNOR ST btwn MACLAREN ST & GILMOUR ST

Traffic Control: No control

Total Collisions: 4

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Mar-30, Mon,17:46	Clear	Turning movement	P.D. only	Dry	South	Turning left	Passenger van	Other motor vehicle	
					South	Going ahead	Pick-up truck	Other motor vehicle	
2017-Aug-15, Tue,11:20	Clear	SMV other	Non-fatal injury	Dry	South	Going ahead	Pick-up truck	Pedestrian	1
2017-Oct-10, Tue,10:20	Clear	SMV unattended vehicle	P.D. only	Dry	West	Reversing	Automobile, station wagon	Unattended vehicle	
2017-Nov-08, Wed,18:32	Clear	Sideswipe	P.D. only	Dry	South	Pulling away from shoulder or curb	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	

Appendix D

Background Traffic Growth

O'Connor / Somerset
8 hrs

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2003	Tuesday 20 May	8114			8475	1576	1860	2411	1766	24202
2007	Friday 10 August	6889			7004	1379	1579	1992	1680	20523
2010	Friday 30 July	6571			6891	1142	1394	1906	1334	19238
2017	Tuesday 21 March	5879			6587	1617	1598	2357	1668	19706

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003		8114		24202				
2007		6889		20523		-15.1%		-15.2%
2010		6571		19238		-4.6%		-6.3%
2017		5879		19706		-10.5%		2.4%

Regression Estimate	2003	7801
Regression Estimate	2017	5700
Average Annual Change		**-2.22%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	2411	1766	4177	24202				
2007	1992	1680	3672	20523	-17.4%	-4.9%	-12.1%	-15.2%
2010	1906	1334	3240	19238	-4.3%	-20.6%	-11.8%	-6.3%
2017	2357	1668	4025	19706	23.7%	25.0%	24.2%	2.4%

Regression Estimate	2003	2158	1665	3823
Regression Estimate	2017	2177	1546	3723
Average Annual Change		**0.06%**	**-0.53%**	**-0.19%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	1860	1576	3436	24202				
2007	1579	1379	2958	20523	-15.1%	-12.5%	-13.9%	-15.2%
2010	1394	1142	2536	19238	-11.7%	-17.2%	-14.3%	-6.3%
2017	1598	1617	3215	19706	14.6%	41.6%	26.8%	2.4%

Regression Estimate	2003	1712	1403	3115
Regression Estimate	2017	1478	1461	2939
Average Annual Change		**-1.04%**	**0.29%**	**-0.41%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003		8475		24202				
2007		7004		20523		-17.4%		-15.2%
2010		6891		19238		-1.6%		-6.3%
2017		6587		19706		-4.4%		2.4%

Regression Estimate	2003	7986
Regression Estimate	2017	6314
Average Annual Change		**-1.66%**

O'Connor / Somerset
AM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2003	Tuesday 20 May	793			840	247	244	307	263	2694
2007	Friday 10 August	591			615	152	182	224	170	1934
2010	Friday 30 July	562			545	76	144	160	109	1596
2017	Tuesday 21 March	572			647	225	214	301	237	2196

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003		793		2694				
2007		591		1934		-25.5%		-28.2%
2010		562		1596		-4.9%		-17.5%
2017		572		2196		1.8%		37.6%

Regression Estimate	2003	715	
Regression Estimate	2017	524	
Average Annual Change		**-2.20%**	

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	307	263	570	2694				
2007	224	170	394	1934	-27.0%	-35.4%	-30.9%	-28.2%
2010	160	109	269	1596	-28.6%	-35.9%	-31.7%	-17.5%
2017	301	237	538	2196	88.1%	117.4%	100.0%	37.6%

Regression Estimate	2003	246	201	447
Regression Estimate	2017	250	187	437
Average Annual Change		**0.12%**	**-0.53%**	**-0.17%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	244	247	491	2694				
2007	182	152	334	1934	-25.4%	-38.5%	-32.0%	-28.2%
2010	144	76	220	1596	-20.9%	-50.0%	-34.1%	-17.5%
2017	214	225	439	2196	48.6%	196.1%	99.5%	37.6%

Regression Estimate	2003	206	180	386
Regression Estimate	2017	184	169	352
Average Annual Change		**-0.82%**	**-0.46%**	**-0.65%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003		840		2694				
2007		615		1934		-26.8%		-28.2%
2010		545		1596		-11.4%		-17.5%
2017		647		2196		18.7%		37.6%

Regression Estimate	2003	734	
Regression Estimate	2017	572	
Average Annual Change		**-1.76%**	

O'Connor / Somerset
PM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2003	Tuesday 20 May	1527			1609	252	338	423	255	4404
2007	Friday 10 August	1281			1275	222	251	323	300	3652
2010	Friday 30 July	1366			1416	231	244	334	271	3862
2017	Tuesday 21 March	1082			1167	251	235	351	282	3368

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003		1527		4404				
2007		1281		3652		-16.1%		-17.1%
2010		1366		3862		6.6%		5.8%
2017		1082		3368		-20.8%		-12.8%

Regression Estimate	2003	1494	
Regression Estimate	2017	1091	
Average Annual Change		**-2.22%**	

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	423	255	678	4404				
2007	323	300	623	3652	-23.6%	17.6%	-8.1%	-17.1%
2010	334	271	605	3862	3.4%	-9.7%	-2.9%	5.8%
2017	351	282	633	3368	5.1%	4.1%	4.6%	-12.8%

Regression Estimate	2003	382	270	651
Regression Estimate	2017	328	286	614
Average Annual Change		**-1.07%**	**0.41%**	**-0.42%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2003	338	252	590	4404				
2007	251	222	473	3652	-25.7%	-11.9%	-19.8%	-17.1%
2010	244	231	475	3862	-2.8%	4.1%	0.4%	5.8%
2017	235	251	486	3368	-3.7%	8.7%	2.3%	-12.8%

Regression Estimate	2003	307	236	544
Regression Estimate	2017	217	242	459
Average Annual Change		**-2.44%**	**0.18%**	**-1.19%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2003		1609		4404				
2007		1275		3652		-20.8%		-17.1%
2010		1416		3862		11.1%		5.8%
2017		1167		3368		-17.6%		-12.8%

Regression Estimate	2003	1535	
Regression Estimate	2017	1158	
Average Annual Change		**-1.99%**	

Appendix E

TDM Checklist

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)*	✔ *Maps could be displayed in building lobby or ground-floor amenity areas*
		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)*	✔ *Transit information could be displayed in building lobby or ground-floor amenity areas*
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	✔ *Taggart is already doing this on another development currently under construction (Bank & Flora)*
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)*	✔ *This is the typical approach in all rental buildings managed by Taggart Realty Management*

			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	✔ *Information on multimodal travel options can be included in new tenant move-in package*
		6.2	**Personalized trip planning**	
BETTER	★	6.2.1	Offer personalized trip planning to new residents	☐

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)*	☐ No transit stations or major stops within 600m
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)*	☐ To be addressed in the SPA
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)*	☐ To be addressed in the SPA
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)*	☐ To be addressed in the SPA
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)*	☐ To be addressed in the SPA
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)*	☐ To be addressed in the SPA
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	☐ No 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	☐ No off-site transit stops
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	☐ To be addressed in the SPA
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)	☐

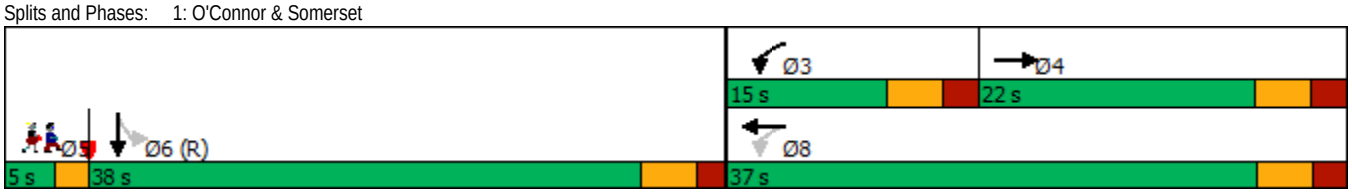
Appendix F

Synchro Analysis

Lane Group	EBT	WBL	WBT	SBT	Ø5
Lane Configurations					
Traffic Volume (vph)	185	51	174	480	
Future Volume (vph)	185	51	174	480	
Lane Group Flow (vph)	317	54	183	602	
Turn Type	NA	pm+pt	NA	NA	
Protected Phases	4	3	8	6	5
Permitted Phases		8			
Detector Phase	4	3	8	6	
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	1.0
Minimum Split (s)	20.6	10.5	20.5	19.1	5.0
Total Split (s)	22.0	15.0	37.0	38.0	5.0
Total Split (%)	27.5%	18.8%	46.3%	47.5%	6%
Yellow Time (s)	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.3	2.2	2.2	1.8	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.6	5.5	5.5	5.1	
Lead/Lag	Lag	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	None
Act Effct Green (s)	20.5	28.3	28.3	37.1	
Actuated g/C Ratio	0.26	0.35	0.35	0.46	
v/c Ratio	0.74	0.20	0.29	0.40	
Control Delay	34.7	15.5	17.9	17.7	
Queue Delay	0.0	0.0	0.0	0.0	
Total Delay	34.7	15.5	17.9	17.7	
LOS	C	B	B	B	
Approach Delay	34.7		17.3	17.7	
Approach LOS	C		B	B	
Queue Length 50th (m)	38.4	4.7	17.2	36.6	
Queue Length 95th (m)	64.4	10.4	28.3	52.2	
Internal Link Dist (m)	145.1		162.8	42.7	
Turn Bay Length (m)		1.0			
Base Capacity (vph)	436	316	757	1624	
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	0.73	0.17	0.24	0.37	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 44 (55%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 22.3	Intersection LOS: C
Intersection Capacity Utilization 58.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: O'Connor & Somerset



Lane Group	EBT	SBT	Ø5
Lane Configurations			
Traffic Volume (vph)	61	622	
Future Volume (vph)	61	622	
Lane Group Flow (vph)	116	707	
Turn Type	NA	NA	
Protected Phases	4	6	5
Permitted Phases			
Detector Phase	4	6	
Switch Phase			
Minimum Initial (s)	10.0	10.0	1.0
Minimum Split (s)	20.6	26.1	5.0
Total Split (s)	21.0	54.0	5.0
Total Split (%)	26.3%	67.5%	6%
Yellow Time (s)	3.3	3.3	2.0
All-Red Time (s)	2.3	1.8	0.0
Lost Time Adjust (s)	0.0	0.0	
Total Lost Time (s)	5.6	5.1	
Lead/Lag		Lag	Lead
Lead-Lag Optimize?		Yes	Yes
Recall Mode	None	C-Min	None
Act Effct Green (s)	13.0	55.9	
Actuated g/C Ratio	0.16	0.70	
v/c Ratio	0.38	0.30	
Control Delay	22.4	5.6	
Queue Delay	0.0	0.0	
Total Delay	22.4	5.6	
LOS	C	A	
Approach Delay	22.4	5.6	
Approach LOS	C	A	
Queue Length 50th (m)	9.3	14.1	
Queue Length 95th (m)	23.2	27.8	
Internal Link Dist (m)	147.3	15.1	
Turn Bay Length (m)			
Base Capacity (vph)	352	2407	
Starvation Cap Reductn	0	0	
Spillback Cap Reductn	0	0	
Storage Cap Reductn	0	0	
Reduced v/c Ratio	0.33	0.29	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 46 (58%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.38	
Intersection Signal Delay: 8.0	Intersection LOS: A
Intersection Capacity Utilization 42.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: O'Connor & Gilmour

Lane Group	EBT	WBL	WBT	SBT	Ø5
Lane Configurations					
Traffic Volume (vph)	225	32	145	594	
Future Volume (vph)	225	32	145	594	
Lane Group Flow (vph)	360	0	187	692	
Turn Type	NA	Perm	NA	NA	
Protected Phases	4		8	6	5
Permitted Phases		8			
Detector Phase	4	8	8	6	
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	1.0
Minimum Split (s)	25.5	25.5	25.5	31.3	5.0
Total Split (s)	28.0	28.0	28.0	47.0	5.0
Total Split (%)	35.0%	35.0%	35.0%	58.8%	6%
Yellow Time (s)	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.2	2.2	2.2	2.0	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	
Total Lost Time (s)	5.5		5.5	5.3	
Lead/Lag				Lag	Lead
Lead-Lag Optimize?				Yes	Yes
Recall Mode	None	None	None	C-Min	None
Act Effct Green (s)	21.5		21.5	43.2	
Actuated g/C Ratio	0.27		0.27	0.54	
v/c Ratio	0.78		0.55	0.39	
Control Delay	36.0		30.3	14.8	
Queue Delay	0.0		0.0	0.0	
Total Delay	36.0		30.3	14.8	
LOS	D		C	B	
Approach Delay	36.0		30.3	14.8	
Approach LOS	D		C	B	
Queue Length 50th (m)	45.8		24.2	21.8	
Queue Length 95th (m)	66.8		38.5	66.8	
Internal Link Dist (m)	152.8		164.9	226.6	
Turn Bay Length (m)					
Base Capacity (vph)	515		382	1913	
Starvation Cap Reductn	0		0	0	
Spillback Cap Reductn	0		0	0	
Storage Cap Reductn	0		0	0	
Reduced v/c Ratio	0.70		0.49	0.36	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 44 (55%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 23.3	Intersection LOS: C
Intersection Capacity Utilization 69.2%	ICU Level of Service C
Analysis Period (min) 15	

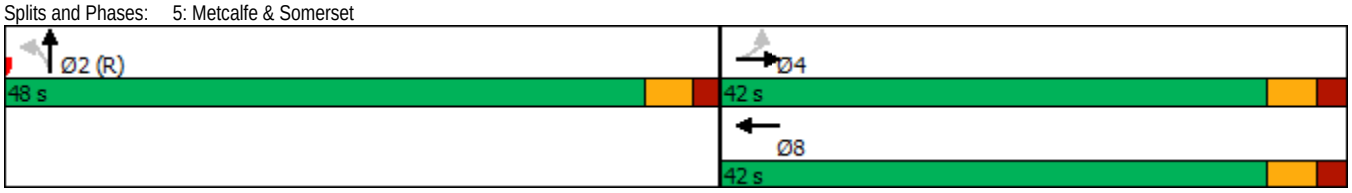
Splits and Phases: 4: O'Connor & Gladstone

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Traffic Volume (vph)	109	135	161	1033
Future Volume (vph)	109	135	161	1033
Lane Group Flow (vph)	0	257	341	1309
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	19.5	19.5	19.5	18.2
Total Split (s)	42.0	42.0	42.0	48.0
Total Split (%)	46.7%	46.7%	46.7%	53.3%
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	1.9
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	5.2
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	C-Min
Act Effct Green (s)		27.6	27.6	51.7
Actuated g/C Ratio		0.31	0.31	0.57
v/c Ratio		1.05	0.76	0.52
Control Delay		103.4	37.4	11.2
Queue Delay		0.0	0.0	0.1
Total Delay		103.4	37.4	11.3
LOS		F	D	B
Approach Delay		103.4	37.4	11.3
Approach LOS		F	D	B
Queue Length 50th (m)		~46.3	50.7	29.0
Queue Length 95th (m)		#80.3	70.5	46.4
Internal Link Dist (m)		162.8	146.4	54.5
Turn Bay Length (m)				
Base Capacity (vph)		322	592	2496
Starvation Cap Reductn		0	0	298
Spillback Cap Reductn		0	0	0
Storage Cap Reductn		0	0	0
Reduced v/c Ratio		0.80	0.58	0.60

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 29 (32%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 28.4	Intersection LOS: C
Intersection Capacity Utilization 79.0%	ICU Level of Service D
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.

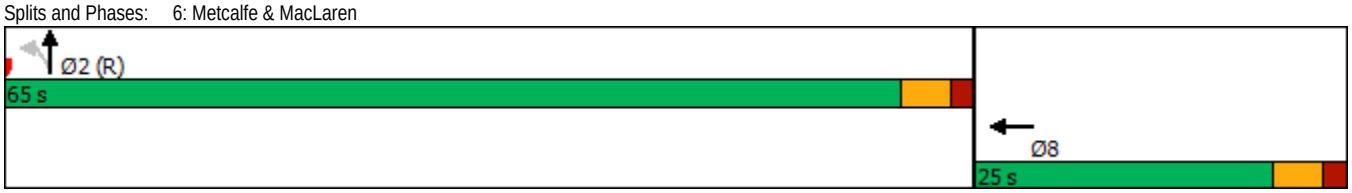
Splits and Phases: 5: Metcalfe & Somerset



Lane Group	WBT	NBT
Lane Configurations		
Traffic Volume (vph)	53	1198
Future Volume (vph)	53	1198
Lane Group Flow (vph)	105	1319
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Detector Phase	8	2
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	23.1	20.0
Total Split (s)	25.0	65.0
Total Split (%)	27.8%	72.2%
Yellow Time (s)	3.3	3.3
All-Red Time (s)	1.8	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	None	C-Min
Act Effct Green (s)	16.4	67.5
Actuated g/C Ratio	0.18	0.75
v/c Ratio	0.32	0.37
Control Delay	21.5	2.2
Queue Delay	0.0	0.0
Total Delay	21.5	2.3
LOS	C	A
Approach Delay	21.5	2.3
Approach LOS	C	A
Queue Length 50th (m)	8.7	9.9
Queue Length 95th (m)	22.5	11.3
Internal Link Dist (m)	155.2	64.2
Turn Bay Length (m)		
Base Capacity (vph)	388	3591
Starvation Cap Reductn	0	457
Spillback Cap Reductn	1	109
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.27	0.42

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 59 (66%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.37	
Intersection Signal Delay: 3.7	Intersection LOS: A
Intersection Capacity Utilization 51.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 6: Metcalfe & MacLaren



Lane Group	EBT	NBT
Lane Configurations		
Traffic Volume (vph)	69	1178
Future Volume (vph)	69	1178
Lane Group Flow (vph)	122	1336
Turn Type	NA	NA
Protected Phases	4	2
Permitted Phases		
Detector Phase	4	2
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	26.3	23.1
Total Split (s)	27.0	63.0
Total Split (%)	30.0%	70.0%
Yellow Time (s)	3.3	3.3
All-Red Time (s)	2.0	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.3	5.1
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	C-Min
Act Effct Green (s)	18.8	60.8
Actuated g/C Ratio	0.21	0.68
v/c Ratio	0.32	0.42
Control Delay	22.7	2.5
Queue Delay	0.0	0.0
Total Delay	22.7	2.5
LOS	C	A
Approach Delay	22.7	2.5
Approach LOS	C	A
Queue Length 50th (m)	12.2	8.4
Queue Length 95th (m)	26.6	12.4
Internal Link Dist (m)	163.6	226.4
Turn Bay Length (m)		
Base Capacity (vph)	439	3212
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.28	0.42

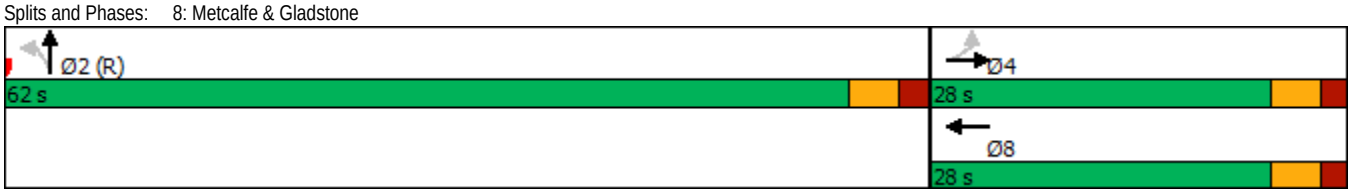
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 58 (64%), Referenced to phase 2:NBT, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.42	
Intersection Signal Delay: 4.2	Intersection LOS: A
Intersection Capacity Utilization 52.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 7: Metcalfe & Gilmour

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Traffic Volume (vph)	90	140	122	1151
Future Volume (vph)	90	140	122	1151
Lane Group Flow (vph)	0	242	142	1271
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	27.2	27.2	27.2	31.5
Total Split (s)	28.0	28.0	28.0	62.0
Total Split (%)	31.1%	31.1%	31.1%	68.9%
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	1.9	1.9	1.9	2.2
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.2	5.2	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	C-Min
Act Effct Green (s)		21.9	21.9	57.4
Actuated g/C Ratio		0.24	0.24	0.64
v/c Ratio		0.73	0.33	0.41
Control Delay		43.7	27.6	9.1
Queue Delay		0.0	0.0	0.0
Total Delay		43.7	27.6	9.1
LOS		D	C	A
Approach Delay		43.7	27.6	9.1
Approach LOS		D	C	A
Queue Length 50th (m)		38.5	19.3	35.5
Queue Length 95th (m)		58.7	31.9	53.5
Internal Link Dist (m)		164.9	144.6	38.8
Turn Bay Length (m)				
Base Capacity (vph)		367	472	3151
Starvation Cap Reductn		0	0	0
Spillback Cap Reductn		0	0	0
Storage Cap Reductn		0	0	0
Reduced v/c Ratio		0.66	0.30	0.40

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 43 (48%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 15.7	Intersection LOS: B
Intersection Capacity Utilization 74.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 8: Metcalfe & Gladstone



Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	87	0	0	0	0	0	0	736	42
Future Vol, veh/h	0	0	0	87	0	0	0	0	0	0	736	42
Conflicting Peds, #/hr	44	0	9	9	0	44	86	0	168	168	0	86
Sign Control	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	92	0	0	0	0	0	0	775	44

Major/Minor	Minor1			Major2		
Conflicting Flow All	397	-	-	-	-	0
Stage 1	0	-	-	-	-	-
Stage 2	397	-	-	-	-	-
Critical Hdwy	6.84	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	-	-	-	-	-
Pot Cap-1 Maneuver	580	0	0	0	-	-
Stage 1	-	0	0	0	-	-
Stage 2	648	0	0	0	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	580	0	-	-	-	-
Mov Cap-2 Maneuver	580	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	648	0	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	12.4	0
HCM LOS	B	

Minor Lane/Major Mvmt	WBLn1	SBT	SBR
Capacity (veh/h)	580	-	-
HCM Lane V/C Ratio	0.158	-	-
HCM Control Delay (s)	12.4	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.6	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	0	0	0	50	823
Future Vol, veh/h	8	0	0	0	50	823
Conflicting Peds, #/hr	0	0	0	174	174	0
Sign Control	Stop	Stop	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	0	0	0	53	866

Major/Minor	Minor1		Major2	
Conflicting Flow All	713	-	174	0
Stage 1	174	-	-	-
Stage 2	539	-	-	-
Critical Hdwy	6.84	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-
Follow-up Hdwy	3.52	-	2.22	-
Pot Cap-1 Maneuver	366	0	1400	-
Stage 1	-	0	-	-
Stage 2	549	0	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	285	-	1194	-
Mov Cap-2 Maneuver	285	-	-	-
Stage 1	-	-	-	-
Stage 2	502	-	-	-

Approach	WB	SB
HCM Control Delay, s	18	0.5
HCM LOS	C	

Minor Lane/Major Mvmt	WBLn1	SBL	SBT
Capacity (veh/h)	285	1194	-
HCM Lane V/C Ratio	0.03	0.044	-
HCM Control Delay (s)	18	8.2	-
HCM Lane LOS	C	A	-
HCM 95th %tile Q(veh)	0.1	0.1	-

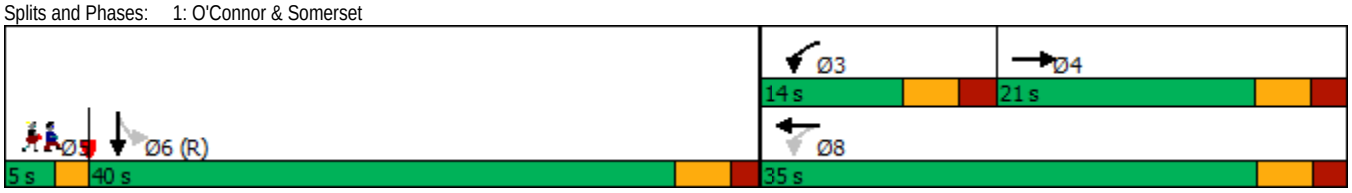
Lane Group	EBT	WBL	WBT	SBT	Ø5
Lane Configurations					
Traffic Volume (vph)	192	70	181	938	
Future Volume (vph)	192	70	181	938	
Lane Group Flow (vph)	369	74	191	1138	
Turn Type	NA	pm+pt	NA	NA	
Protected Phases	4	3	8	6	5
Permitted Phases		8			
Detector Phase	4	3	8	6	
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	1.0
Minimum Split (s)	20.6	10.5	20.5	19.1	5.0
Total Split (s)	21.0	14.0	35.0	40.0	5.0
Total Split (%)	26.3%	17.5%	43.8%	50.0%	6%
Yellow Time (s)	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.3	2.2	2.2	1.8	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.6	5.5	5.5	5.1	
Lead/Lag	Lag	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	None
Act Effct Green (s)	20.1	30.9	30.9	34.5	
Actuated g/C Ratio	0.25	0.39	0.39	0.43	
v/c Ratio	0.93	0.27	0.28	0.83	
Control Delay	61.9	19.5	18.9	26.3	
Queue Delay	0.0	0.0	0.0	0.0	
Total Delay	61.9	19.5	18.9	26.3	
LOS	E	B	B	C	
Approach Delay	61.9		19.1	26.3	
Approach LOS	E		B	C	
Queue Length 50th (m)	~59.8	7.3	20.1	75.9	
Queue Length 95th (m)	#112.6	15.7	35.3	102.2	
Internal Link Dist (m)	145.1		162.8	42.7	
Turn Bay Length (m)		1.0			
Base Capacity (vph)	398	288	687	1385	
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	0.93	0.26	0.28	0.82	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 58 (73%), Referenced to phase 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 32.7 — Intersection LOS: C
Intersection Capacity Utilization 78.1% — ICU Level of Service D
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: 1: O'Connor & Somerset

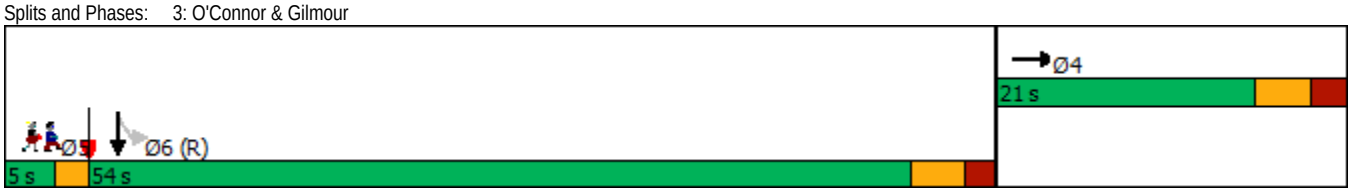


Lane Group	EBT	SBT	Ø5
Lane Configurations			
Traffic Volume (vph)	84	1190	
Future Volume (vph)	84	1190	
Lane Group Flow (vph)	182	1304	
Turn Type	NA	NA	
Protected Phases	4	6	5
Permitted Phases			
Detector Phase	4	6	
Switch Phase			
Minimum Initial (s)	10.0	10.0	1.0
Minimum Split (s)	20.6	26.1	5.0
Total Split (s)	21.0	54.0	5.0
Total Split (%)	26.3%	67.5%	6%
Yellow Time (s)	3.3	3.3	2.0
All-Red Time (s)	2.3	1.8	0.0
Lost Time Adjust (s)	0.0	0.0	
Total Lost Time (s)	5.6	5.1	
Lead/Lag		Lag	Lead
Lead-Lag Optimize?		Yes	Yes
Recall Mode	None	C-Min	None
Act Effct Green (s)	13.1	52.2	
Actuated g/C Ratio	0.16	0.65	
v/c Ratio	0.59	0.59	
Control Delay	28.4	4.6	
Queue Delay	0.0	0.0	
Total Delay	28.4	4.6	
LOS	C	A	
Approach Delay	28.4	4.6	
Approach LOS	C	A	
Queue Length 50th (m)	16.5	23.4	
Queue Length 95th (m)	35.4	m31.6	
Internal Link Dist (m)	147.3	15.1	
Turn Bay Length (m)			
Base Capacity (vph)	351	2246	
Starvation Cap Reductn	0	0	
Spillback Cap Reductn	0	0	
Storage Cap Reductn	0	0	
Reduced v/c Ratio	0.52	0.58	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 71 (89%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 7.5	Intersection LOS: A
Intersection Capacity Utilization 61.0%	ICU Level of Service B
Analysis Period (min) 15	

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

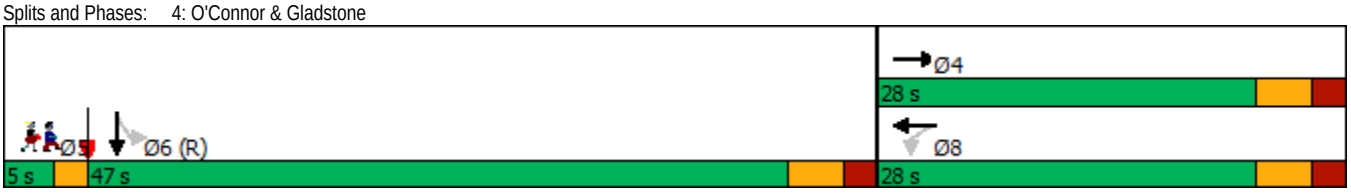
Splits and Phases: 3: O'Connor & Gilmour



Lane Group	EBT	WBL	WBT	SBT	Ø5
Lane Configurations					
Traffic Volume (vph)	209	27	126	1256	
Future Volume (vph)	209	27	126	1256	
Lane Group Flow (vph)	425	0	161	1438	
Turn Type	NA	Perm	NA	NA	
Protected Phases	4		8	6	5
Permitted Phases		8			
Detector Phase	4	8	8	6	
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	1.0
Minimum Split (s)	25.5	25.5	25.5	31.3	5.0
Total Split (s)	28.0	28.0	28.0	47.0	5.0
Total Split (%)	35.0%	35.0%	35.0%	58.8%	6%
Yellow Time (s)	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.2	2.2	2.2	2.0	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	
Total Lost Time (s)	5.5		5.5	5.3	
Lead/Lag				Lag	Lead
Lead-Lag Optimize?				Yes	Yes
Recall Mode	None	None	None	C-Min	None
Act Effct Green (s)	21.4		21.4	44.8	
Actuated g/C Ratio	0.27		0.27	0.56	
v/c Ratio	0.91		0.55	0.77	
Control Delay	50.0		32.9	13.3	
Queue Delay	0.0		0.0	0.0	
Total Delay	50.0		32.9	13.3	
LOS	D		C	B	
Approach Delay	50.0		32.9	13.3	
Approach LOS	D		C	B	
Queue Length 50th (m)	53.5		20.6	112.8	
Queue Length 95th (m)	#103.8		39.2	139.2	
Internal Link Dist (m)	152.8		164.9	226.6	
Turn Bay Length (m)					
Base Capacity (vph)	488		306	1865	
Starvation Cap Reductn	0		0	0	
Spillback Cap Reductn	0		0	0	
Storage Cap Reductn	0		0	0	
Reduced v/c Ratio	0.87		0.53	0.77	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 13 (16%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 22.6	Intersection LOS: C
Intersection Capacity Utilization 84.3%	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.	

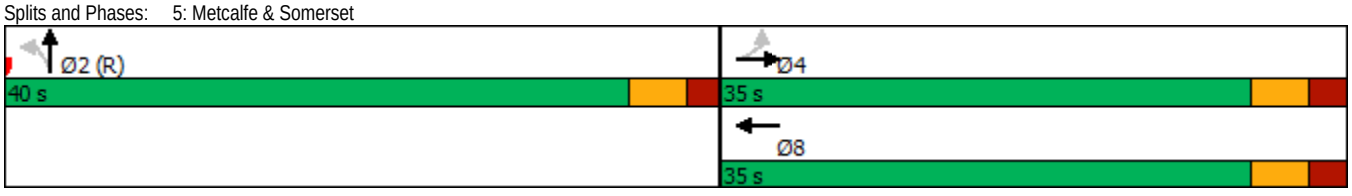
Splits and Phases: 4: O'Connor & Gladstone



Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Traffic Volume (vph)	87	185	148	590
Future Volume (vph)	87	185	148	590
Lane Group Flow (vph)	0	287	268	873
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	19.5	19.5	19.5	18.2
Total Split (s)	35.0	35.0	35.0	40.0
Total Split (%)	46.7%	46.7%	46.7%	53.3%
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	1.9
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	5.2
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	C-Min
Act Effct Green (s)		21.2	21.2	43.1
Actuated g/C Ratio		0.28	0.28	0.57
v/c Ratio		0.92	0.63	0.38
Control Delay		60.0	27.1	11.1
Queue Delay		0.0	0.0	0.3
Total Delay		60.0	27.1	11.3
LOS		E	C	B
Approach Delay		60.0	27.1	11.3
Approach LOS		E	C	B
Queue Length 50th (m)		39.0	29.9	23.5
Queue Length 95th (m)		#61.6	45.2	33.4
Internal Link Dist (m)		162.8	146.4	54.5
Turn Bay Length (m)				
Base Capacity (vph)		434	586	2312
Starvation Cap Reductn		0	0	724
Spillback Cap Reductn		0	0	0
Storage Cap Reductn		0	0	0
Reduced v/c Ratio		0.66	0.46	0.55

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 20 (27%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 24.1	Intersection LOS: C
Intersection Capacity Utilization 68.7%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

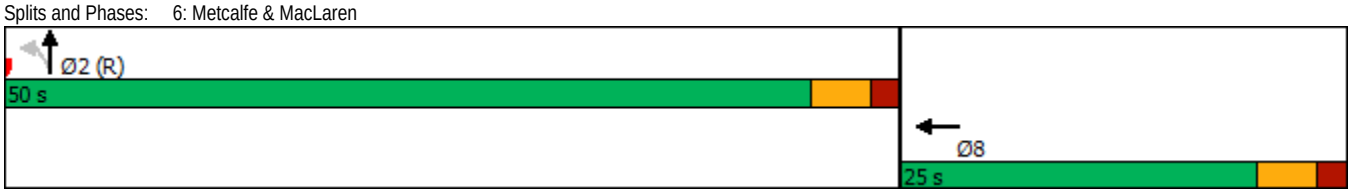
Splits and Phases: 5: Metcalfe & Somerset



Lane Group	WBT	NBT
Lane Configurations		
Traffic Volume (vph)	51	470
Future Volume (vph)	51	470
Lane Group Flow (vph)	106	533
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Detector Phase	8	2
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	23.1	20.0
Total Split (s)	25.0	50.0
Total Split (%)	33.3%	66.7%
Yellow Time (s)	3.3	3.3
All-Red Time (s)	1.8	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	None	C-Min
Act Effct Green (s)	14.8	54.1
Actuated g/C Ratio	0.20	0.72
v/c Ratio	0.30	0.15
Control Delay	15.8	2.1
Queue Delay	0.0	0.0
Total Delay	15.8	2.1
LOS	B	A
Approach Delay	15.8	2.1
Approach LOS	B	A
Queue Length 50th (m)	6.0	3.2
Queue Length 95th (m)	17.7	5.3
Internal Link Dist (m)	155.2	64.2
Turn Bay Length (m)		
Base Capacity (vph)	459	3443
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.23	0.15

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 56 (75%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 4.4	Intersection LOS: A
Intersection Capacity Utilization 55.2%	ICU Level of Service B
Analysis Period (min) 15	

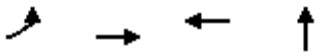
Splits and Phases: 6: Metcalfe & MacLaren



Lane Group	EBT	NBT
Lane Configurations		
Traffic Volume (vph)	91	458
Future Volume (vph)	91	458
Lane Group Flow (vph)	143	555
Turn Type	NA	NA
Protected Phases	4	2
Permitted Phases		
Detector Phase	4	2
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	26.3	23.1
Total Split (s)	27.0	48.0
Total Split (%)	36.0%	64.0%
Yellow Time (s)	3.3	3.3
All-Red Time (s)	2.0	1.8
Lost Time Adjust (s)	-1.3	0.0
Total Lost Time (s)	4.0	5.1
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	C-Min
Act Effct Green (s)	17.9	48.0
Actuated g/C Ratio	0.24	0.64
v/c Ratio	0.33	0.19
Control Delay	18.4	3.9
Queue Delay	0.0	0.0
Total Delay	18.4	3.9
LOS	B	A
Approach Delay	18.4	3.9
Approach LOS	B	A
Queue Length 50th (m)	11.5	8.4
Queue Length 95th (m)	24.5	9.6
Internal Link Dist (m)	163.6	226.4
Turn Bay Length (m)		
Base Capacity (vph)	555	2987
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.26	0.19

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 52 (69%), Referenced to phase 2:NBT, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 6.8	Intersection LOS: A
Intersection Capacity Utilization 39.2%	ICU Level of Service A
Analysis Period (min) 15	

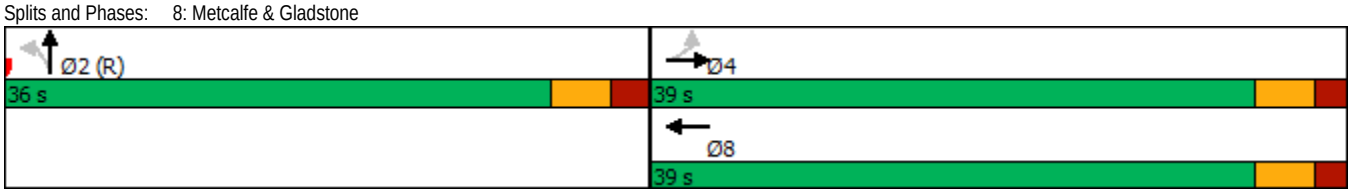
Splits and Phases: 7: Metcalfe & Gilmour



Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Traffic Volume (vph)	107	205	137	350
Future Volume (vph)	107	205	137	350
Lane Group Flow (vph)	0	329	162	448
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	27.2	27.2	27.2	31.5
Total Split (s)	39.0	39.0	39.0	36.0
Total Split (%)	52.0%	52.0%	52.0%	48.0%
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	1.9	1.9	1.9	2.2
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.2	5.2	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	C-Min
Act Effct Green (s)		22.4	22.4	41.9
Actuated g/C Ratio		0.30	0.30	0.56
v/c Ratio		0.76	0.31	0.17
Control Delay		35.0	18.7	9.2
Queue Delay		0.0	0.0	0.0
Total Delay		35.0	18.7	9.2
LOS		C	B	A
Approach Delay		35.0	18.7	9.2
Approach LOS		C	B	A
Queue Length 50th (m)		42.3	16.4	9.9
Queue Length 95th (m)		57.9	25.1	19.4
Internal Link Dist (m)		164.9	144.6	38.8
Turn Bay Length (m)				
Base Capacity (vph)		650	792	2646
Starvation Cap Reductn		0	0	0
Spillback Cap Reductn		0	0	0
Storage Cap Reductn		0	0	0
Reduced v/c Ratio		0.51	0.20	0.17

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 39 (52%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 19.9	Intersection LOS: B
Intersection Capacity Utilization 69.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 8: Metcalfe & Gladstone



Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	86	0	0	0	0	0	0	1076	50
Future Vol, veh/h	0	0	0	86	0	0	0	0	0	0	1076	50
Conflicting Peds, #/hr	44	0	8	8	0	44	72	0	108	108	0	72
Sign Control	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	91	0	0	0	0	0	0	1133	53

Major/Minor	Minor1			Major2		
Conflicting Flow All	575	-	-	-	-	0
Stage 1	0	-	-	-	-	-
Stage 2	575	-	-	-	-	-
Critical Hdwy	6.84	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	-	-	-	-	-
Pot Cap-1 Maneuver	448	0	0	0	-	-
Stage 1	-	0	0	0	-	-
Stage 2	526	0	0	0	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	448	0	-	-	-	-
Mov Cap-2 Maneuver	448	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	526	0	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	15.1	0
HCM LOS	C	

Minor Lane/Major Mvmt	WBLn1	SBT	SBR
Capacity (veh/h)	448	-	-
HCM Lane V/C Ratio	0.202	-	-
HCM Control Delay (s)	15.1	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	0.7	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	56	0	0	0	4	1162
Future Vol, veh/h	56	0	0	0	4	1162
Conflicting Peds, #/hr	0	0	0	138	138	0
Sign Control	Stop	Stop	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	59	0	0	0	4	1223

Major/Minor	Minor1		Major2	
Conflicting Flow All	758	-	138	0
Stage 1	138	-	-	-
Stage 2	620	-	-	-
Critical Hdwy	6.84	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-
Follow-up Hdwy	3.52	-	2.22	-
Pot Cap-1 Maneuver	343	0	1443	-
Stage 1	-	0	-	-
Stage 2	499	0	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	300	-	1274	-
Mov Cap-2 Maneuver	300	-	-	-
Stage 1	-	-	-	-
Stage 2	494	-	-	-

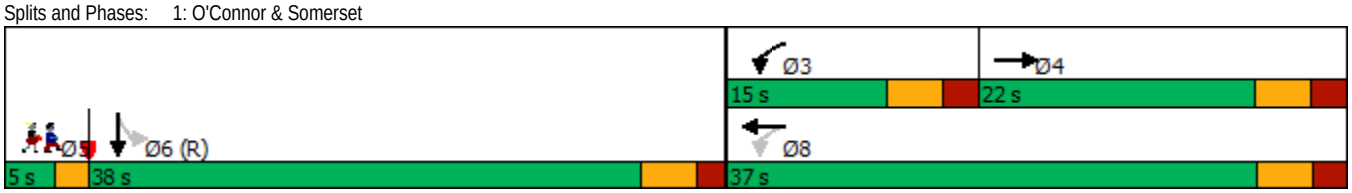
Approach	WB	SB
HCM Control Delay, s	19.9	0
HCM LOS	C	

Minor Lane/Major Mvmt	WBLn1	SBL	SBT
Capacity (veh/h)	300	1274	-
HCM Lane V/C Ratio	0.196	0.003	-
HCM Control Delay (s)	19.9	7.8	-
HCM Lane LOS	C	A	-
HCM 95th %tile Q(veh)	0.7	0	-

Lane Group	EBT	WBL	WBT	SBT	Ø5
Lane Configurations					
Traffic Volume (vph)	185	52	181	484	
Future Volume (vph)	185	52	181	484	
Lane Group Flow (vph)	319	55	191	606	
Turn Type	NA	pm+pt	NA	NA	
Protected Phases	4	3	8	6	5
Permitted Phases		8			
Detector Phase	4	3	8	6	
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	1.0
Minimum Split (s)	20.6	10.5	20.5	19.1	5.0
Total Split (s)	22.0	15.0	37.0	38.0	5.0
Total Split (%)	27.5%	18.8%	46.3%	47.5%	6%
Yellow Time (s)	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.3	2.2	2.2	1.8	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.6	5.5	5.5	5.1	
Lead/Lag	Lag	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	None
Act Effct Green (s)	20.6	28.4	28.4	37.0	
Actuated g/C Ratio	0.26	0.36	0.36	0.46	
v/c Ratio	0.74	0.20	0.30	0.41	
Control Delay	34.6	15.5	18.0	17.8	
Queue Delay	0.0	0.0	0.0	0.0	
Total Delay	34.6	15.5	18.0	17.8	
LOS	C	B	B	B	
Approach Delay	34.6		17.4	17.8	
Approach LOS	C		B	B	
Queue Length 50th (m)	38.5	4.8	18.1	37.0	
Queue Length 95th (m)	64.8	10.5	29.7	52.4	
Internal Link Dist (m)	145.1		162.8	42.7	
Turn Bay Length (m)		1.0			
Base Capacity (vph)	438	317	758	1622	
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	0.73	0.17	0.25	0.37	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 44 (55%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 22.3	Intersection LOS: C
Intersection Capacity Utilization 58.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: O'Connor & Somerset



Lane Group	EBT	SBT	Ø5
Lane Configurations			
Traffic Volume (vph)	62	648	
Future Volume (vph)	62	648	
Lane Group Flow (vph)	117	748	
Turn Type	NA	NA	
Protected Phases	4	6	5
Permitted Phases			
Detector Phase	4	6	
Switch Phase			
Minimum Initial (s)	10.0	10.0	1.0
Minimum Split (s)	20.6	26.1	5.0
Total Split (s)	21.0	54.0	5.0
Total Split (%)	26.3%	67.5%	6%
Yellow Time (s)	3.3	3.3	2.0
All-Red Time (s)	2.3	1.8	0.0
Lost Time Adjust (s)	0.0	0.0	
Total Lost Time (s)	5.6	5.1	
Lead/Lag		Lag	Lead
Lead-Lag Optimize?		Yes	Yes
Recall Mode	None	C-Min	None
Act Effct Green (s)	13.0	55.9	
Actuated g/C Ratio	0.16	0.70	
v/c Ratio	0.38	0.32	
Control Delay	22.5	5.6	
Queue Delay	0.0	0.0	
Total Delay	22.5	5.6	
LOS	C	A	
Approach Delay	22.5	5.6	
Approach LOS	C	A	
Queue Length 50th (m)	9.4	15.0	
Queue Length 95th (m)	23.2	27.5	
Internal Link Dist (m)	147.3	65.4	
Turn Bay Length (m)			
Base Capacity (vph)	352	2402	
Starvation Cap Reductn	0	0	
Spillback Cap Reductn	0	0	
Storage Cap Reductn	0	0	
Reduced v/c Ratio	0.33	0.31	

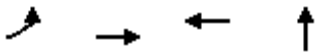
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 46 (58%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.38	
Intersection Signal Delay: 7.9	Intersection LOS: A
Intersection Capacity Utilization 43.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: O'Connor & Gilmour

Lane Group	EBT	WBL	WBT	SBT	Ø5
Lane Configurations					
Traffic Volume (vph)	225	32	145	620	
Future Volume (vph)	225	32	145	620	
Lane Group Flow (vph)	360	0	187	720	
Turn Type	NA	Perm	NA	NA	
Protected Phases	4		8	6	5
Permitted Phases		8			
Detector Phase	4	8	8	6	
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	1.0
Minimum Split (s)	25.5	25.5	25.5	31.3	5.0
Total Split (s)	28.0	28.0	28.0	47.0	5.0
Total Split (%)	35.0%	35.0%	35.0%	58.8%	6%
Yellow Time (s)	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.2	2.2	2.2	2.0	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	
Total Lost Time (s)	5.5		5.5	5.3	
Lead/Lag				Lag	Lead
Lead-Lag Optimize?				Yes	Yes
Recall Mode	None	None	None	C-Min	None
Act Effct Green (s)	21.5		21.5	43.2	
Actuated g/C Ratio	0.27		0.27	0.54	
v/c Ratio	0.78		0.55	0.40	
Control Delay	36.0		30.3	15.1	
Queue Delay	0.0		0.0	0.0	
Total Delay	36.0		30.3	15.1	
LOS	D		C	B	
Approach Delay	36.0		30.3	15.1	
Approach LOS	D		C	B	
Queue Length 50th (m)	45.8		24.2	23.9	
Queue Length 95th (m)	66.8		38.5	68.4	
Internal Link Dist (m)	152.8		164.9	226.6	
Turn Bay Length (m)					
Base Capacity (vph)	515		382	1914	
Starvation Cap Reductn	0		0	0	
Spillback Cap Reductn	0		0	0	
Storage Cap Reductn	0		0	0	
Reduced v/c Ratio	0.70		0.49	0.38	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 44 (55%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 23.3	Intersection LOS: C
Intersection Capacity Utilization 69.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: O'Connor & Gladstone

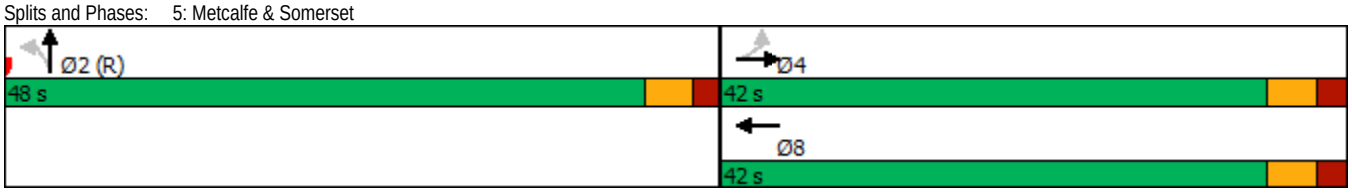


Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Traffic Volume (vph)	109	135	162	1045
Future Volume (vph)	109	135	162	1045
Lane Group Flow (vph)	0	257	343	1332
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	19.5	19.5	19.5	18.2
Total Split (s)	42.0	42.0	42.0	48.0
Total Split (%)	46.7%	46.7%	46.7%	53.3%
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	1.9
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	5.2
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	C-Min
Act Effct Green (s)		27.7	27.7	51.6
Actuated g/C Ratio		0.31	0.31	0.57
v/c Ratio		1.06	0.76	0.54
Control Delay		103.6	37.4	11.3
Queue Delay		0.0	0.0	0.1
Total Delay		103.6	37.4	11.4
LOS		F	D	B
Approach Delay		103.6	37.4	11.4
Approach LOS		F	D	B
Queue Length 50th (m)		~46.4	51.0	30.1
Queue Length 95th (m)		#80.5	70.8	48.7
Internal Link Dist (m)		162.8	146.4	54.5
Turn Bay Length (m)				
Base Capacity (vph)		320	592	2485
Starvation Cap Reductn		0	0	307
Spillback Cap Reductn		0	0	0
Storage Cap Reductn		0	0	0
Reduced v/c Ratio		0.80	0.58	0.61

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 29 (32%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 28.3	Intersection LOS: C
Intersection Capacity Utilization 79.5%	ICU Level of Service D
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.

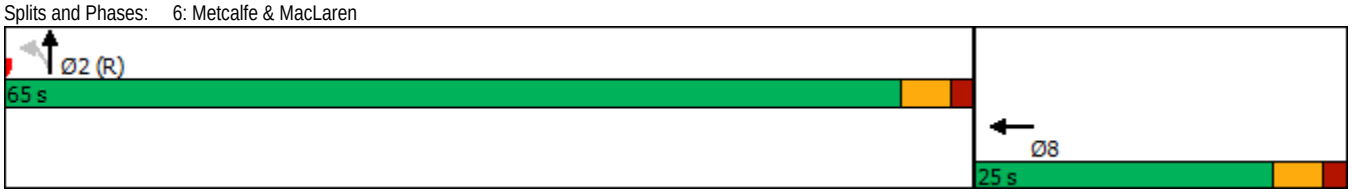
Splits and Phases: 5: Metcalfe & Somerset



Lane Group	WBT	NBT
Lane Configurations		
Traffic Volume (vph)	53	1219
Future Volume (vph)	53	1219
Lane Group Flow (vph)	105	1377
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Detector Phase	8	2
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	23.1	20.0
Total Split (s)	25.0	65.0
Total Split (%)	27.8%	72.2%
Yellow Time (s)	3.3	3.3
All-Red Time (s)	1.8	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	None	C-Min
Act Effct Green (s)	16.4	67.5
Actuated g/C Ratio	0.18	0.75
v/c Ratio	0.32	0.39
Control Delay	21.5	2.3
Queue Delay	0.0	0.0
Total Delay	21.5	2.3
LOS	C	A
Approach Delay	21.5	2.3
Approach LOS	C	A
Queue Length 50th (m)	8.7	10.9
Queue Length 95th (m)	22.5	12.6
Internal Link Dist (m)	155.2	64.2
Turn Bay Length (m)		
Base Capacity (vph)	388	3555
Starvation Cap Reductn	0	414
Spillback Cap Reductn	0	80
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.27	0.44

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 59 (66%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.39	
Intersection Signal Delay: 3.7	Intersection LOS: A
Intersection Capacity Utilization 53.3%	ICU Level of Service A
Analysis Period (min) 15	

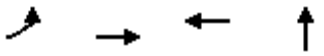
Splits and Phases: 6: Metcalfe & MacLaren



Lane Group	EBT	NBT
Lane Configurations		
Traffic Volume (vph)	69	1186
Future Volume (vph)	69	1186
Lane Group Flow (vph)	172	1344
Turn Type	NA	NA
Protected Phases	4	2
Permitted Phases		
Detector Phase	4	2
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	26.3	23.1
Total Split (s)	27.0	63.0
Total Split (%)	30.0%	70.0%
Yellow Time (s)	3.3	3.3
All-Red Time (s)	2.0	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.3	5.1
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	C-Min
Act Effct Green (s)	18.8	60.8
Actuated g/C Ratio	0.21	0.68
v/c Ratio	0.44	0.42
Control Delay	24.2	2.5
Queue Delay	0.0	0.0
Total Delay	24.2	2.5
LOS	C	A
Approach Delay	24.2	2.5
Approach LOS	C	A
Queue Length 50th (m)	17.2	8.5
Queue Length 95th (m)	35.0	12.4
Internal Link Dist (m)	121.1	226.4
Turn Bay Length (m)		
Base Capacity (vph)	445	3212
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.39	0.42

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 58 (64%), Referenced to phase 2:NBT, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 4.9	Intersection LOS: A
Intersection Capacity Utilization 52.7%	ICU Level of Service A
Analysis Period (min) 15	

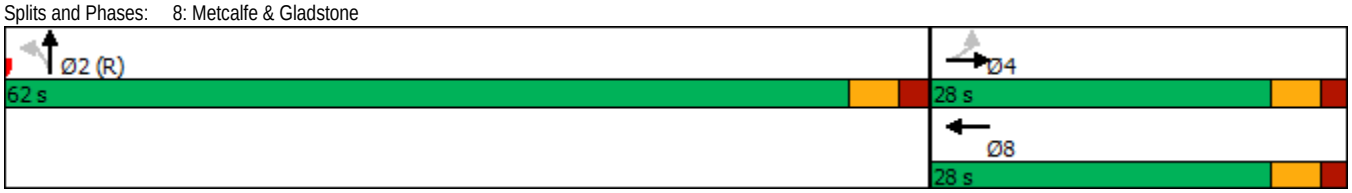
Splits and Phases: 7: Metcalfe & Gilmour



Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Traffic Volume (vph)	90	140	122	1159
Future Volume (vph)	90	140	122	1159
Lane Group Flow (vph)	0	242	142	1279
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	27.2	27.2	27.2	31.5
Total Split (s)	28.0	28.0	28.0	62.0
Total Split (%)	31.1%	31.1%	31.1%	68.9%
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	1.9	1.9	1.9	2.2
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.2	5.2	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	C-Min
Act Effct Green (s)		21.9	21.9	57.4
Actuated g/C Ratio		0.24	0.24	0.64
v/c Ratio		0.73	0.33	0.42
Control Delay		43.7	27.6	9.1
Queue Delay		0.0	0.0	0.0
Total Delay		43.7	27.6	9.1
LOS		D	C	A
Approach Delay		43.7	27.6	9.1
Approach LOS		D	C	A
Queue Length 50th (m)		38.5	19.3	35.8
Queue Length 95th (m)		58.7	31.9	54.0
Internal Link Dist (m)		164.9	144.6	38.8
Turn Bay Length (m)				
Base Capacity (vph)		367	472	3151
Starvation Cap Reductn		0	0	0
Spillback Cap Reductn		0	0	0
Storage Cap Reductn		0	0	0
Reduced v/c Ratio		0.66	0.30	0.41

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 43 (48%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 15.7	Intersection LOS: B
Intersection Capacity Utilization 74.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 8: Metcalfe & Gladstone



Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	121	0	0	0	0	0	0	742	42
Future Vol, veh/h	0	0	0	121	0	0	0	0	0	0	742	42
Conflicting Peds, #/hr	44	0	9	9	0	44	86	0	168	168	0	86
Sign Control	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	127	0	0	0	0	0	0	781	44

Major/Minor	Minor1			Major2		
Conflicting Flow All	400	-	-	-	-	0
Stage 1	0	-	-	-	-	-
Stage 2	400	-	-	-	-	-
Critical Hdwy	6.84	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	-	-	-	-	-
Pot Cap-1 Maneuver	578	0	0	0	-	-
Stage 1	-	0	0	0	-	-
Stage 2	646	0	0	0	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	578	0	-	-	-	-
Mov Cap-2 Maneuver	578	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	646	0	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	13	0
HCM LOS	B	

Minor Lane/Major Mvmt	WBLn1	SBT	SBR
Capacity (veh/h)	578	-	-
HCM Lane V/C Ratio	0.22	-	-
HCM Control Delay (s)	13	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.8	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	110	0	0	47	0
Future Vol, veh/h	15	110	0	0	47	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	-	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	116	0	0	49	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	0	0	148	-
Stage 1	-	-	0	-
Stage 2	-	-	148	-
Critical Hdwy	4.12	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.42	-
Follow-up Hdwy	2.218	-	3.518	-
Pot Cap-1 Maneuver	-	-	844	0
Stage 1	-	-	-	0
Stage 2	-	-	880	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	844	-
Mov Cap-2 Maneuver	-	-	844	-
Stage 1	-	-	-	-
Stage 2	-	-	880	-

Approach	EB	SB
HCM Control Delay, s		9.5
HCM LOS		A

Minor Lane/Major Mvmt	EBL	EBT	SBLn1
Capacity (veh/h)	-	-	844
HCM Lane V/C Ratio	-	-	0.059
HCM Control Delay (s)	-	-	9.5
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0.2

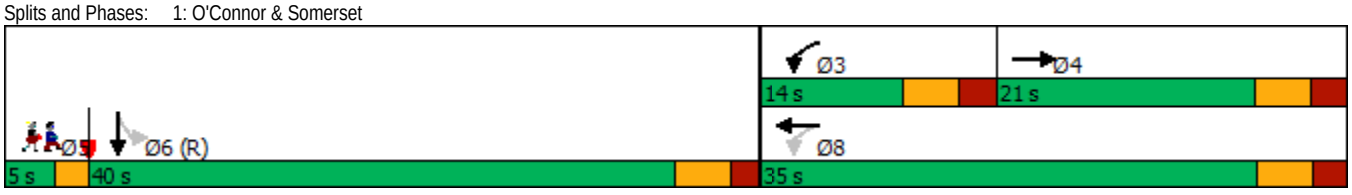
Lane Group	EBT	WBL	WBT	SBT	Ø5
Lane Configurations					
Traffic Volume (vph)	192	72	185	949	
Future Volume (vph)	192	72	185	949	
Lane Group Flow (vph)	374	76	195	1150	
Turn Type	NA	pm+pt	NA	NA	
Protected Phases	4	3	8	6	5
Permitted Phases		8			
Detector Phase	4	3	8	6	
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	1.0
Minimum Split (s)	20.6	10.5	20.5	19.1	5.0
Total Split (s)	21.0	14.0	35.0	40.0	5.0
Total Split (%)	26.3%	17.5%	43.8%	50.0%	6%
Yellow Time (s)	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.3	2.2	2.2	1.8	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.6	5.5	5.5	5.1	
Lead/Lag	Lag	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	None
Act Effct Green (s)	20.3	31.1	31.1	34.3	
Actuated g/C Ratio	0.25	0.39	0.39	0.43	
v/c Ratio	0.93	0.28	0.28	0.84	
Control Delay	62.9	19.6	18.9	27.1	
Queue Delay	0.0	0.0	0.0	0.0	
Total Delay	62.9	19.6	18.9	27.1	
LOS	E	B	B	C	
Approach Delay	62.9		19.1	27.1	
Approach LOS	E		B	C	
Queue Length 50th (m)	~61.4	7.5	20.6	77.2	
Queue Length 95th (m)	#114.1	16.0	35.8	103.9	
Internal Link Dist (m)	145.1		162.8	42.7	
Turn Bay Length (m)		1.0			
Base Capacity (vph)	401	288	692	1386	
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	0.93	0.26	0.28	0.83	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 58 (73%), Referenced to phase 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 33.4 — Intersection LOS: C
Intersection Capacity Utilization 78.7% — ICU Level of Service D
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: 1: O'Connor & Somerset

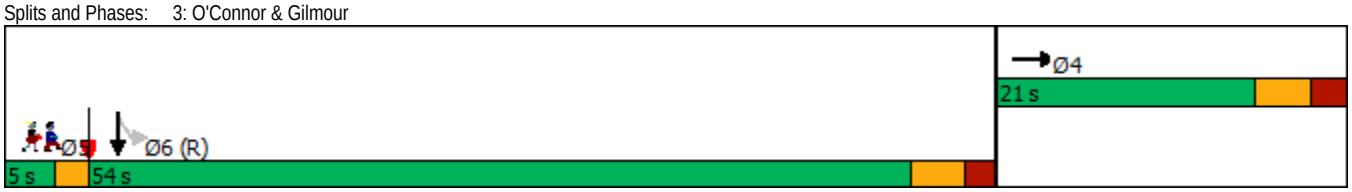


Lane Group	EBT	SBT	Ø5
Lane Configurations			
Traffic Volume (vph)	86	1205	
Future Volume (vph)	86	1205	
Lane Group Flow (vph)	185	1361	
Turn Type	NA	NA	
Protected Phases	4	6	5
Permitted Phases			
Detector Phase	4	6	
Switch Phase			
Minimum Initial (s)	10.0	10.0	1.0
Minimum Split (s)	20.6	26.1	5.0
Total Split (s)	21.0	54.0	5.0
Total Split (%)	26.3%	67.5%	6%
Yellow Time (s)	3.3	3.3	2.0
All-Red Time (s)	2.3	1.8	0.0
Lost Time Adjust (s)	0.0	0.0	
Total Lost Time (s)	5.6	5.1	
Lead/Lag		Lag	Lead
Lead-Lag Optimize?		Yes	Yes
Recall Mode	None	C-Min	None
Act Effct Green (s)	13.1	52.2	
Actuated g/C Ratio	0.16	0.65	
v/c Ratio	0.60	0.62	
Control Delay	29.4	5.3	
Queue Delay	0.0	0.2	
Total Delay	29.4	5.5	
LOS	C	A	
Approach Delay	29.4	5.5	
Approach LOS	C	A	
Queue Length 50th (m)	17.2	25.4	
Queue Length 95th (m)	36.5	m43.0	
Internal Link Dist (m)	147.3	65.4	
Turn Bay Length (m)			
Base Capacity (vph)	350	2231	
Starvation Cap Reductn	0	229	
Spillback Cap Reductn	0	0	
Storage Cap Reductn	0	0	
Reduced v/c Ratio	0.53	0.68	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 71 (89%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 8.4	Intersection LOS: A
Intersection Capacity Utilization 62.8%	ICU Level of Service B
Analysis Period (min) 15	

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

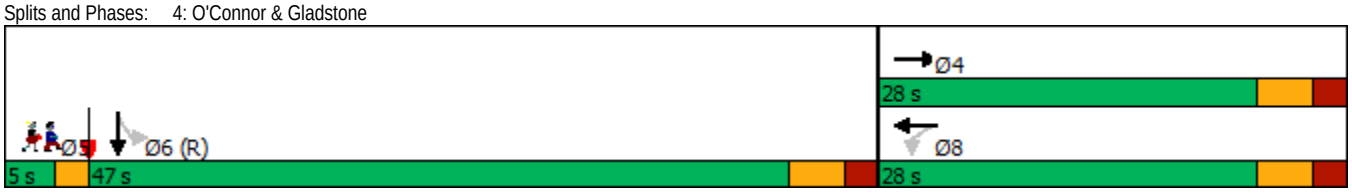
Splits and Phases: 3: O'Connor & Gilmour



Lane Group	EBT	WBL	WBT	SBT	Ø5
Lane Configurations					
Traffic Volume (vph)	209	27	126	1271	
Future Volume (vph)	209	27	126	1271	
Lane Group Flow (vph)	425	0	161	1454	
Turn Type	NA	Perm	NA	NA	
Protected Phases	4		8	6	5
Permitted Phases		8			
Detector Phase	4	8	8	6	
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	1.0
Minimum Split (s)	25.5	25.5	25.5	31.3	5.0
Total Split (s)	28.0	28.0	28.0	47.0	5.0
Total Split (%)	35.0%	35.0%	35.0%	58.8%	6%
Yellow Time (s)	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.2	2.2	2.2	2.0	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	
Total Lost Time (s)	5.5		5.5	5.3	
Lead/Lag				Lag	Lead
Lead-Lag Optimize?				Yes	Yes
Recall Mode	None	None	None	C-Min	None
Act Effct Green (s)	21.5		21.5	43.6	
Actuated g/C Ratio	0.27		0.27	0.54	
v/c Ratio	0.91		0.55	0.80	
Control Delay	50.6		32.6	14.1	
Queue Delay	0.0		0.0	0.0	
Total Delay	50.6		32.6	14.1	
LOS	D		C	B	
Approach Delay	50.6		32.6	14.1	
Approach LOS	D		C	B	
Queue Length 50th (m)	53.7		20.5	118.1	
Queue Length 95th (m)	#104.5		39.1	106.8	
Internal Link Dist (m)	152.8		164.9	226.6	
Turn Bay Length (m)					
Base Capacity (vph)	485		309	1822	
Starvation Cap Reductn	0		0	0	
Spillback Cap Reductn	0		0	0	
Storage Cap Reductn	0		0	0	
Reduced v/c Ratio	0.88		0.52	0.80	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 13 (16%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 23.2	Intersection LOS: C
Intersection Capacity Utilization 84.7%	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: 4: O'Connor & Gladstone

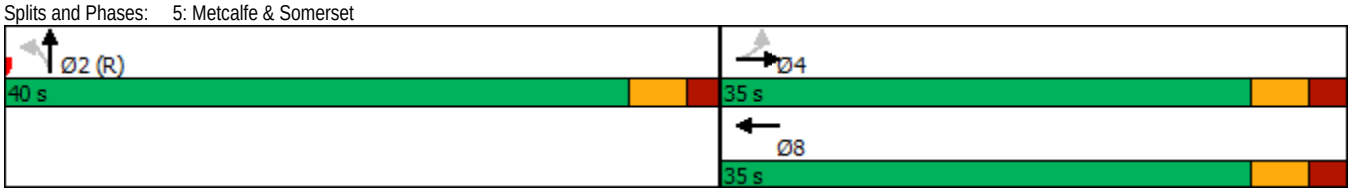


Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Traffic Volume (vph)	87	185	150	597
Future Volume (vph)	87	185	150	597
Lane Group Flow (vph)	0	287	270	886
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	19.5	19.5	19.5	18.2
Total Split (s)	35.0	35.0	35.0	40.0
Total Split (%)	46.7%	46.7%	46.7%	53.3%
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	1.9
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	5.2
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	C-Min
Act Effct Green (s)		21.1	21.1	43.2
Actuated g/C Ratio		0.28	0.28	0.58
v/c Ratio		0.93	0.63	0.38
Control Delay		62.2	27.4	10.9
Queue Delay		0.0	0.0	0.3
Total Delay		62.2	27.4	11.1
LOS		E	C	B
Approach Delay		62.2	27.4	11.1
Approach LOS		E	C	B
Queue Length 50th (m)		39.2	30.4	23.8
Queue Length 95th (m)		#62.9	45.5	33.8
Internal Link Dist (m)		162.8	146.4	54.5
Turn Bay Length (m)				
Base Capacity (vph)		430	587	2313
Starvation Cap Reductn		0	0	719
Spillback Cap Reductn		0	0	0
Storage Cap Reductn		0	0	0
Reduced v/c Ratio		0.67	0.46	0.56

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 20 (27%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 24.3	Intersection LOS: C
Intersection Capacity Utilization 69.0%	ICU Level of Service C
Analysis Period (min) 15	

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

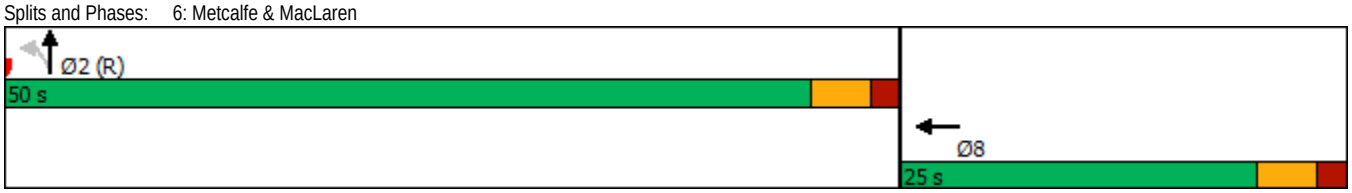
Splits and Phases: 5: Metcalfe & Somerset



Lane Group	WBT	NBT
Lane Configurations		
Traffic Volume (vph)	51	482
Future Volume (vph)	51	482
Lane Group Flow (vph)	106	585
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Detector Phase	8	2
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	23.1	20.0
Total Split (s)	25.0	50.0
Total Split (%)	33.3%	66.7%
Yellow Time (s)	3.3	3.3
All-Red Time (s)	1.8	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	None	C-Min
Act Effct Green (s)	14.8	54.1
Actuated g/C Ratio	0.20	0.72
v/c Ratio	0.30	0.17
Control Delay	15.8	2.1
Queue Delay	0.0	0.0
Total Delay	15.8	2.1
LOS	B	A
Approach Delay	15.8	2.1
Approach LOS	B	A
Queue Length 50th (m)	6.0	3.7
Queue Length 95th (m)	17.7	6.3
Internal Link Dist (m)	155.2	64.2
Turn Bay Length (m)		
Base Capacity (vph)	459	3386
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.23	0.17

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 56 (75%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 4.2	Intersection LOS: A
Intersection Capacity Utilization 55.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Metcalfe & MacLaren



Lane Group	EBT	NBT
Lane Configurations		
Traffic Volume (vph)	91	481
Future Volume (vph)	91	481
Lane Group Flow (vph)	172	579
Turn Type	NA	NA
Protected Phases	4	2
Permitted Phases		
Detector Phase	4	2
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	26.3	23.1
Total Split (s)	27.0	48.0
Total Split (%)	36.0%	64.0%
Yellow Time (s)	3.3	3.3
All-Red Time (s)	2.0	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.3	5.1
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	C-Min
Act Effct Green (s)	16.6	48.0
Actuated g/C Ratio	0.22	0.64
v/c Ratio	0.41	0.19
Control Delay	18.7	3.9
Queue Delay	0.0	0.0
Total Delay	18.7	3.9
LOS	B	A
Approach Delay	18.7	3.9
Approach LOS	B	A
Queue Length 50th (m)	13.0	8.5
Queue Length 95th (m)	28.0	9.9
Internal Link Dist (m)	121.1	226.4
Turn Bay Length (m)		
Base Capacity (vph)	534	2992
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.32	0.19

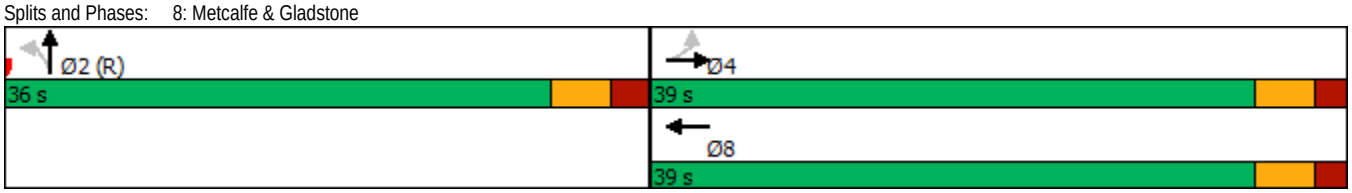
Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 52 (69%), Referenced to phase 2:NBT, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 7.3	Intersection LOS: A
Intersection Capacity Utilization 40.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 7: Metcalfe & Gilmour

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Traffic Volume (vph)	107	205	137	373
Future Volume (vph)	107	205	137	373
Lane Group Flow (vph)	0	329	162	473
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	27.2	27.2	27.2	31.5
Total Split (s)	39.0	39.0	39.0	36.0
Total Split (%)	52.0%	52.0%	52.0%	48.0%
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	1.9	1.9	1.9	2.2
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.2	5.2	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	C-Min
Act Effct Green (s)		22.4	22.4	41.9
Actuated g/C Ratio		0.30	0.30	0.56
v/c Ratio		0.76	0.31	0.18
Control Delay		35.0	18.7	9.3
Queue Delay		0.0	0.0	0.0
Total Delay		35.0	18.7	9.3
LOS		C	B	A
Approach Delay		35.0	18.7	9.3
Approach LOS		C	B	A
Queue Length 50th (m)		42.3	16.4	10.6
Queue Length 95th (m)		57.9	25.1	20.5
Internal Link Dist (m)		164.9	144.6	38.8
Turn Bay Length (m)				
Base Capacity (vph)		650	792	2648
Starvation Cap Reductn		0	0	0
Spillback Cap Reductn		0	0	0
Storage Cap Reductn		0	0	0
Reduced v/c Ratio		0.51	0.20	0.18

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 39 (52%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 19.6	Intersection LOS: B
Intersection Capacity Utilization 69.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 8: Metcalfe & Gladstone



Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	124	0	0	0	0	0	0	1093	50
Future Vol, veh/h	0	0	0	124	0	0	0	0	0	0	1093	50
Conflicting Peds, #/hr	44	0	8	8	0	44	72	0	108	108	0	72
Sign Control	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	131	0	0	0	0	0	0	1151	53

Major/Minor	Minor1			Major2		
Conflicting Flow All	584	-	-	-	-	0
Stage 1	0	-	-	-	-	-
Stage 2	584	-	-	-	-	-
Critical Hdwy	6.84	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	-	-	-	-	-
Pot Cap-1 Maneuver	443	0	0	0	-	-
Stage 1	-	0	0	0	-	-
Stage 2	521	0	0	0	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	443	0	-	-	-	-
Mov Cap-2 Maneuver	443	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	521	0	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	16.5	0
HCM LOS	C	

Minor Lane/Major Mvmt	WBLn1	SBT	SBR
Capacity (veh/h)	443	-	-
HCM Lane V/C Ratio	0.295	-	-
HCM Control Delay (s)	16.5	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	1.2	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	42	132	0	0	27	0
Future Vol, veh/h	42	132	0	0	27	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	-	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	139	0	0	28	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	0	0	227	-
Stage 1	-	-	0	-
Stage 2	-	-	227	-
Critical Hdwy	4.12	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.42	-
Follow-up Hdwy	2.218	-	3.518	-
Pot Cap-1 Maneuver	-	-	761	0
Stage 1	-	-	-	0
Stage 2	-	-	811	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	761	-
Mov Cap-2 Maneuver	-	-	761	-
Stage 1	-	-	-	-
Stage 2	-	-	811	-

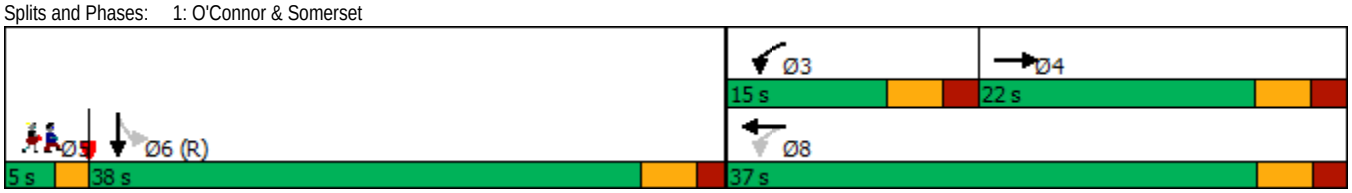
Approach	EB	SB
HCM Control Delay, s		9.9
HCM LOS		A

Minor Lane/Major Mvmt	EBL	EBT	SBLn1
Capacity (veh/h)	-	-	761
HCM Lane V/C Ratio	-	-	0.037
HCM Control Delay (s)	-	-	9.9
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0.1

Lane Group	EBT	WBL	WBT	SBT	Ø5
Lane Configurations					
Traffic Volume (vph)	185	53	188	488	
Future Volume (vph)	185	53	188	488	
Lane Group Flow (vph)	320	56	198	611	
Turn Type	NA	pm+pt	NA	NA	
Protected Phases	4	3	8	6	5
Permitted Phases		8			
Detector Phase	4	3	8	6	
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	1.0
Minimum Split (s)	20.6	10.5	20.5	19.1	5.0
Total Split (s)	22.0	15.0	37.0	38.0	5.0
Total Split (%)	27.5%	18.8%	46.3%	47.5%	6%
Yellow Time (s)	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.3	2.2	2.2	1.8	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.6	5.5	5.5	5.1	
Lead/Lag	Lag	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	None
Act Effct Green (s)	20.6	28.4	28.4	37.0	
Actuated g/C Ratio	0.26	0.36	0.36	0.46	
v/c Ratio	0.74	0.20	0.31	0.41	
Control Delay	34.8	15.5	18.2	17.8	
Queue Delay	0.0	0.0	0.0	0.0	
Total Delay	34.8	15.5	18.2	17.8	
LOS	C	B	B	B	
Approach Delay	34.8		17.6	17.8	
Approach LOS	C		B	B	
Queue Length 50th (m)	38.6	4.9	18.7	37.5	
Queue Length 95th (m)	65.3	10.7	30.7	52.8	
Internal Link Dist (m)	145.1		162.8	42.7	
Turn Bay Length (m)		1.0			
Base Capacity (vph)	437	317	758	1621	
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	0.73	0.18	0.26	0.38	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 44 (55%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 22.4	Intersection LOS: C
Intersection Capacity Utilization 59.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: O'Connor & Somerset



Lane Group	EBT	SBT	Ø5
Lane Configurations			
Traffic Volume (vph)	63	673	
Future Volume (vph)	63	673	
Lane Group Flow (vph)	118	788	
Turn Type	NA	NA	
Protected Phases	4	6	5
Permitted Phases			
Detector Phase	4	6	
Switch Phase			
Minimum Initial (s)	10.0	10.0	1.0
Minimum Split (s)	20.6	26.1	5.0
Total Split (s)	21.0	54.0	5.0
Total Split (%)	26.3%	67.5%	6%
Yellow Time (s)	3.3	3.3	2.0
All-Red Time (s)	2.3	1.8	0.0
Lost Time Adjust (s)	0.0	0.0	
Total Lost Time (s)	5.6	5.1	
Lead/Lag		Lag	Lead
Lead-Lag Optimize?		Yes	Yes
Recall Mode	None	C-Min	None
Act Effct Green (s)	13.0	55.9	
Actuated g/C Ratio	0.16	0.70	
v/c Ratio	0.39	0.34	
Control Delay	22.8	5.4	
Queue Delay	0.0	0.0	
Total Delay	22.8	5.4	
LOS	C	A	
Approach Delay	22.8	5.4	
Approach LOS	C	A	
Queue Length 50th (m)	9.7	16.6	
Queue Length 95th (m)	23.7	25.3	
Internal Link Dist (m)	147.3	65.4	
Turn Bay Length (m)			
Base Capacity (vph)	352	2396	
Starvation Cap Reductn	0	0	
Spillback Cap Reductn	0	0	
Storage Cap Reductn	0	0	
Reduced v/c Ratio	0.34	0.33	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 46 (58%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.39	
Intersection Signal Delay: 7.6	Intersection LOS: A
Intersection Capacity Utilization 44.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: O'Connor & Gilmour

Lane Group	EBT	WBL	WBT	SBT	Ø5
Lane Configurations					
Traffic Volume (vph)	225	32	145	645	
Future Volume (vph)	225	32	145	645	
Lane Group Flow (vph)	360	0	187	746	
Turn Type	NA	Perm	NA	NA	
Protected Phases	4		8	6	5
Permitted Phases		8			
Detector Phase	4	8	8	6	
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	1.0
Minimum Split (s)	25.5	25.5	25.5	31.3	5.0
Total Split (s)	28.0	28.0	28.0	47.0	5.0
Total Split (%)	35.0%	35.0%	35.0%	58.8%	6%
Yellow Time (s)	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.2	2.2	2.2	2.0	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	
Total Lost Time (s)	5.5		5.5	5.3	
Lead/Lag				Lag	Lead
Lead-Lag Optimize?				Yes	Yes
Recall Mode	None	None	None	C-Min	None
Act Effct Green (s)	21.5		21.5	43.2	
Actuated g/C Ratio	0.27		0.27	0.54	
v/c Ratio	0.78		0.55	0.42	
Control Delay	36.0		30.3	15.1	
Queue Delay	0.0		0.0	0.0	
Total Delay	36.0		30.3	15.1	
LOS	D		C	B	
Approach Delay	36.0		30.3	15.1	
Approach LOS	D		C	B	
Queue Length 50th (m)	45.8		24.2	25.4	
Queue Length 95th (m)	66.8		38.5	69.2	
Internal Link Dist (m)	152.8		164.9	226.6	
Turn Bay Length (m)					
Base Capacity (vph)	515		382	1917	
Starvation Cap Reductn	0		0	0	
Spillback Cap Reductn	0		0	0	
Storage Cap Reductn	0		0	0	
Reduced v/c Ratio	0.70		0.49	0.39	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 44 (55%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 23.1	Intersection LOS: C
Intersection Capacity Utilization 70.6%	ICU Level of Service C
Analysis Period (min) 15	

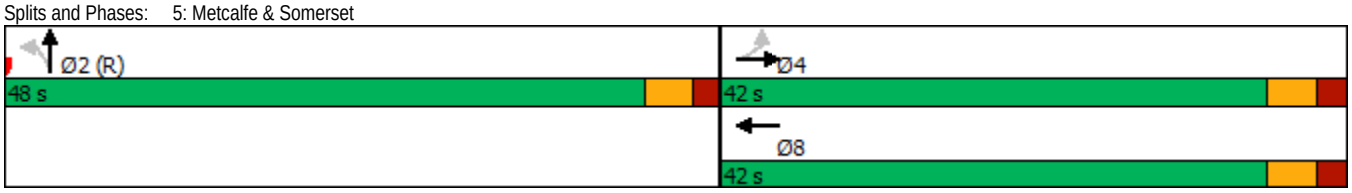
Splits and Phases: 4: O'Connor & Gladstone

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Traffic Volume (vph)	109	135	163	1056
Future Volume (vph)	109	135	163	1056
Lane Group Flow (vph)	0	257	344	1353
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	19.5	19.5	19.5	18.2
Total Split (s)	42.0	42.0	42.0	48.0
Total Split (%)	46.7%	46.7%	46.7%	53.3%
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	1.9
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	5.2
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	C-Min
Act Effct Green (s)		27.8	27.8	51.5
Actuated g/C Ratio		0.31	0.31	0.57
v/c Ratio		1.05	0.76	0.55
Control Delay		103.4	37.7	11.3
Queue Delay		0.0	0.0	0.1
Total Delay		103.4	37.7	11.4
LOS		F	D	B
Approach Delay		103.4	37.7	11.4
Approach LOS		F	D	B
Queue Length 50th (m)		~46.4	51.3	30.1
Queue Length 95th (m)		#80.5	71.2	51.7
Internal Link Dist (m)		162.8	146.4	54.5
Turn Bay Length (m)				
Base Capacity (vph)		320	592	2479
Starvation Cap Reductn		0	0	297
Spillback Cap Reductn		0	0	0
Storage Cap Reductn		0	0	0
Reduced v/c Ratio		0.80	0.58	0.62

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 29 (32%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 28.1	Intersection LOS: C
Intersection Capacity Utilization 80.0%	ICU Level of Service D
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.

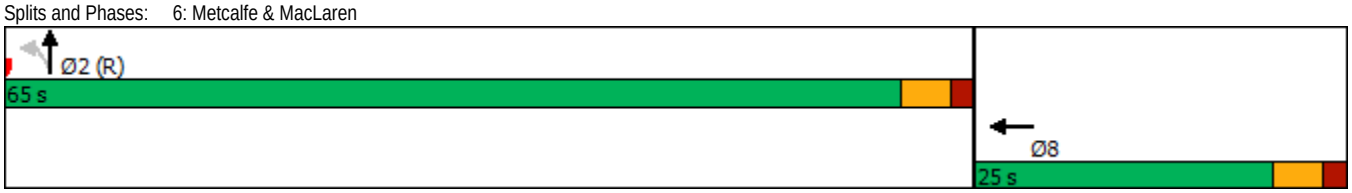
Splits and Phases: 5: Metcalfe & Somerset



Lane Group	WBT	NBT
Lane Configurations		
Traffic Volume (vph)	53	1239
Future Volume (vph)	53	1239
Lane Group Flow (vph)	105	1432
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Detector Phase	8	2
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	23.1	20.0
Total Split (s)	25.0	65.0
Total Split (%)	27.8%	72.2%
Yellow Time (s)	3.3	3.3
All-Red Time (s)	1.8	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	None	C-Min
Act Effct Green (s)	16.4	67.5
Actuated g/C Ratio	0.18	0.75
v/c Ratio	0.32	0.41
Control Delay	21.5	2.3
Queue Delay	0.0	0.0
Total Delay	21.5	2.3
LOS	C	A
Approach Delay	21.5	2.3
Approach LOS	C	A
Queue Length 50th (m)	8.7	12.3
Queue Length 95th (m)	22.5	13.9
Internal Link Dist (m)	155.2	64.2
Turn Bay Length (m)		
Base Capacity (vph)	388	3524
Starvation Cap Reductn	0	377
Spillback Cap Reductn	0	43
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.27	0.46

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 59 (66%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 3.6	Intersection LOS: A
Intersection Capacity Utilization 54.6%	ICU Level of Service A
Analysis Period (min) 15	

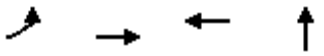
Splits and Phases: 6: Metcalfe & MacLaren



Lane Group	EBT	NBT
Lane Configurations		
Traffic Volume (vph)	69	1194
Future Volume (vph)	69	1194
Lane Group Flow (vph)	219	1353
Turn Type	NA	NA
Protected Phases	4	2
Permitted Phases		
Detector Phase	4	2
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	26.3	23.1
Total Split (s)	27.0	63.0
Total Split (%)	30.0%	70.0%
Yellow Time (s)	3.3	3.3
All-Red Time (s)	2.0	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.3	5.1
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	C-Min
Act Effct Green (s)	18.8	60.8
Actuated g/C Ratio	0.21	0.68
v/c Ratio	0.57	0.42
Control Delay	29.8	2.4
Queue Delay	0.0	0.0
Total Delay	29.8	2.4
LOS	C	A
Approach Delay	29.8	2.4
Approach LOS	C	A
Queue Length 50th (m)	25.1	8.5
Queue Length 95th (m)	46.9	11.7
Internal Link Dist (m)	121.1	226.4
Turn Bay Length (m)		
Base Capacity (vph)	440	3213
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.50	0.42

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 58 (64%), Referenced to phase 2:NBT, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 6.2	Intersection LOS: A
Intersection Capacity Utilization 54.2%	ICU Level of Service A
Analysis Period (min) 15	

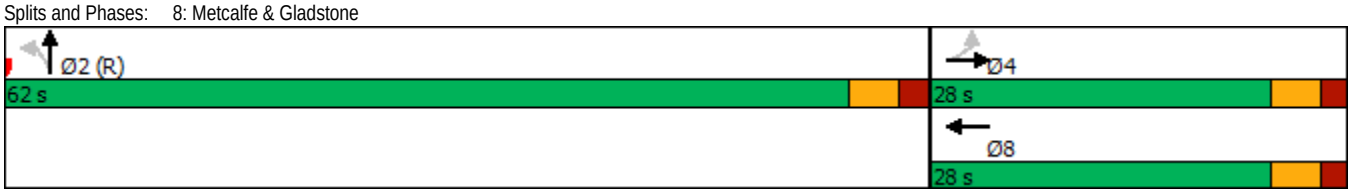
Splits and Phases: 7: Metcalfe & Gilmour



Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Traffic Volume (vph)	90	140	122	1167
Future Volume (vph)	90	140	122	1167
Lane Group Flow (vph)	0	242	142	1287
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	27.2	27.2	27.2	31.5
Total Split (s)	28.0	28.0	28.0	62.0
Total Split (%)	31.1%	31.1%	31.1%	68.9%
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	1.9	1.9	1.9	2.2
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.2	5.2	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	C-Min
Act Effct Green (s)		21.9	21.9	57.4
Actuated g/C Ratio		0.24	0.24	0.64
v/c Ratio		0.73	0.33	0.42
Control Delay		43.7	27.6	9.1
Queue Delay		0.0	0.0	0.0
Total Delay		43.7	27.6	9.1
LOS		D	C	A
Approach Delay		43.7	27.6	9.1
Approach LOS		D	C	A
Queue Length 50th (m)		38.5	19.3	36.1
Queue Length 95th (m)		58.7	31.9	54.4
Internal Link Dist (m)		164.9	144.6	38.8
Turn Bay Length (m)				
Base Capacity (vph)		367	472	3151
Starvation Cap Reductn		0	0	0
Spillback Cap Reductn		0	0	0
Storage Cap Reductn		0	0	0
Reduced v/c Ratio		0.66	0.30	0.41

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 43 (48%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 15.7	Intersection LOS: B
Intersection Capacity Utilization 74.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 8: Metcalfe & Gladstone



Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	154	0	0	0	0	0	0	748	42
Future Vol, veh/h	0	0	0	154	0	0	0	0	0	0	748	42
Conflicting Peds, #/hr	44	0	9	9	0	44	86	0	168	168	0	86
Sign Control	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	162	0	0	0	0	0	0	787	44

Major/Minor	Minor1			Major2		
Conflicting Flow All	403	-	-	-	-	0
Stage 1	0	-	-	-	-	-
Stage 2	403	-	-	-	-	-
Critical Hdwy	6.84	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	-	-	-	-	-
Pot Cap-1 Maneuver	575	0	0	0	-	-
Stage 1	-	0	0	0	-	-
Stage 2	644	0	0	0	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	575	0	-	-	-	-
Mov Cap-2 Maneuver	575	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	644	0	-	-	-	-

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

Minor Lane/Major Mvmt	WBLn1	SBT	SBR
Capacity (veh/h)	575	-	-
HCM Lane V/C Ratio	0.282	-	-
HCM Control Delay (s)	13.7	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	1.2	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	29	110	0	0	92	0
Future Vol, veh/h	29	110	0	0	92	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	-	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	31	116	0	0	97	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	0	0	178	-
Stage 1	-	-	0	-
Stage 2	-	-	178	-
Critical Hdwy	4.12	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.42	-
Follow-up Hdwy	2.218	-	3.518	-
Pot Cap-1 Maneuver	-	-	812	0
Stage 1	-	-	-	0
Stage 2	-	-	853	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	812	-
Mov Cap-2 Maneuver	-	-	812	-
Stage 1	-	-	-	-
Stage 2	-	-	853	-

Approach	EB	SB
HCM Control Delay, s		10
HCM LOS		B

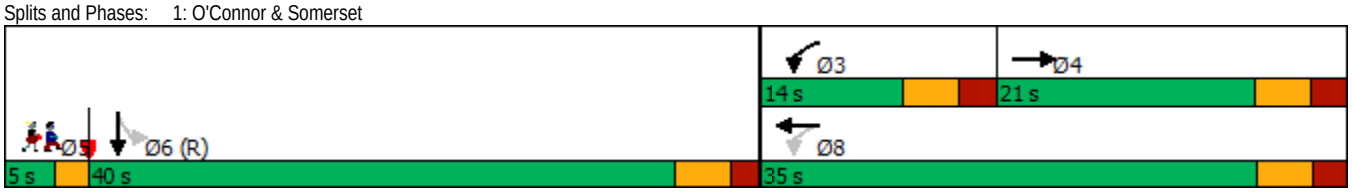
Minor Lane/Major Mvmt	EBL	EBT	SBLn1
Capacity (veh/h)	-	-	812
HCM Lane V/C Ratio	-	-	0.119
HCM Control Delay (s)	-	-	10
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.4

Lane Group	EBT	WBL	WBT	SBT	Ø5
Lane Configurations					
Traffic Volume (vph)	192	74	189	959	
Future Volume (vph)	192	74	189	959	
Lane Group Flow (vph)	378	78	199	1160	
Turn Type	NA	pm+pt	NA	NA	
Protected Phases	4	3	8	6	5
Permitted Phases		8			
Detector Phase	4	3	8	6	
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	1.0
Minimum Split (s)	20.6	10.5	20.5	19.1	5.0
Total Split (s)	21.0	14.0	35.0	40.0	5.0
Total Split (%)	26.3%	17.5%	43.8%	50.0%	6%
Yellow Time (s)	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.3	2.2	2.2	1.8	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.6	5.5	5.5	5.1	
Lead/Lag	Lag	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	None
Act Effct Green (s)	20.2	31.0	31.0	34.4	
Actuated g/C Ratio	0.25	0.39	0.39	0.43	
v/c Ratio	0.94	0.29	0.29	0.85	
Control Delay	65.3	19.8	19.0	27.4	
Queue Delay	0.0	0.0	0.0	0.0	
Total Delay	65.3	19.8	19.0	27.4	
LOS	E	B	B	C	
Approach Delay	65.3		19.2	27.4	
Approach LOS	E		B	C	
Queue Length 50th (m)	~62.6	7.7	21.1	78.3	
Queue Length 95th (m)	#115.7	16.4	36.6	105.3	
Internal Link Dist (m)	145.1		162.8	42.7	
Turn Bay Length (m)		1.0			
Base Capacity (vph)	400	284	691	1387	
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	0.94	0.27	0.29	0.84	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 58 (73%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 34.1	Intersection LOS: C
Intersection Capacity Utilization 79.4%	ICU Level of Service D
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: 1: O'Connor & Somerset

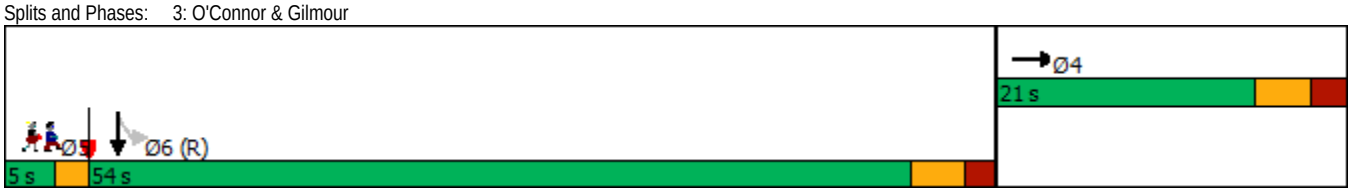


Lane Group	EBT	SBT	Ø5
Lane Configurations			
Traffic Volume (vph)	88	1219	
Future Volume (vph)	88	1219	
Lane Group Flow (vph)	187	1416	
Turn Type	NA	NA	
Protected Phases	4	6	5
Permitted Phases			
Detector Phase	4	6	
Switch Phase			
Minimum Initial (s)	10.0	10.0	1.0
Minimum Split (s)	20.6	26.1	5.0
Total Split (s)	21.0	54.0	5.0
Total Split (%)	26.3%	67.5%	6%
Yellow Time (s)	3.3	3.3	2.0
All-Red Time (s)	2.3	1.8	0.0
Lost Time Adjust (s)	0.0	0.0	
Total Lost Time (s)	5.6	5.1	
Lead/Lag		Lag	Lead
Lead-Lag Optimize?		Yes	Yes
Recall Mode	None	C-Min	None
Act Effct Green (s)	13.1	52.4	
Actuated g/C Ratio	0.16	0.66	
v/c Ratio	0.61	0.65	
Control Delay	30.3	6.2	
Queue Delay	0.0	0.3	
Total Delay	30.3	6.5	
LOS	C	A	
Approach Delay	30.3	6.5	
Approach LOS	C	A	
Queue Length 50th (m)	17.8	23.6	
Queue Length 95th (m)	37.1	m57.7	
Internal Link Dist (m)	147.3	65.4	
Turn Bay Length (m)			
Base Capacity (vph)	349	2215	
Starvation Cap Reductn	0	266	
Spillback Cap Reductn	0	0	
Storage Cap Reductn	0	0	
Reduced v/c Ratio	0.54	0.73	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 71 (89%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 64.4%	ICU Level of Service C
Analysis Period (min) 15	

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

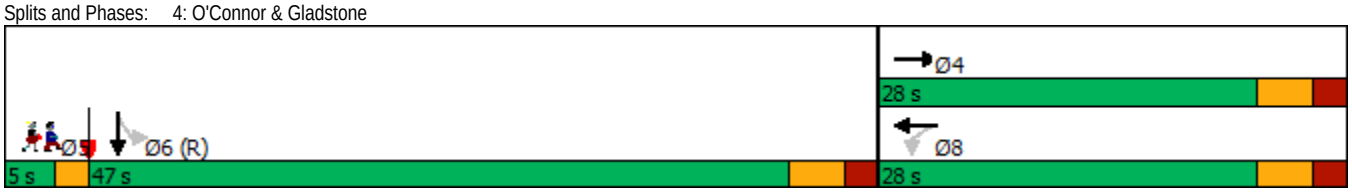
Splits and Phases: 3: O'Connor & Gilmour



Lane Group	EBT	WBL	WBT	SBT	Ø5
Lane Configurations					
Traffic Volume (vph)	209	27	126	1285	
Future Volume (vph)	209	27	126	1285	
Lane Group Flow (vph)	425	0	161	1469	
Turn Type	NA	Perm	NA	NA	
Protected Phases	4		8	6	5
Permitted Phases		8			
Detector Phase	4	8	8	6	
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	1.0
Minimum Split (s)	25.5	25.5	25.5	31.3	5.0
Total Split (s)	28.0	28.0	28.0	47.0	5.0
Total Split (%)	35.0%	35.0%	35.0%	58.8%	6%
Yellow Time (s)	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.2	2.2	2.2	2.0	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	
Total Lost Time (s)	5.5		5.5	5.3	
Lead/Lag				Lag	Lead
Lead-Lag Optimize?				Yes	Yes
Recall Mode	None	None	None	C-Min	None
Act Effct Green (s)	21.5		21.5	43.7	
Actuated g/C Ratio	0.27		0.27	0.55	
v/c Ratio	0.91		0.55	0.81	
Control Delay	50.6		32.6	13.3	
Queue Delay	0.0		0.0	0.0	
Total Delay	50.6		32.6	13.3	
LOS	D		C	B	
Approach Delay	50.6		32.6	13.3	
Approach LOS	D		C	B	
Queue Length 50th (m)	53.7		20.5	117.5	
Queue Length 95th (m)	#104.5		39.1	80.6	
Internal Link Dist (m)	152.8		164.9	226.6	
Turn Bay Length (m)					
Base Capacity (vph)	485		309	1823	
Starvation Cap Reductn	0		0	0	
Spillback Cap Reductn	0		0	0	
Storage Cap Reductn	0		0	0	
Reduced v/c Ratio	0.88		0.52	0.81	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 13 (16%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 22.5	Intersection LOS: C
Intersection Capacity Utilization 85.1%	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.	

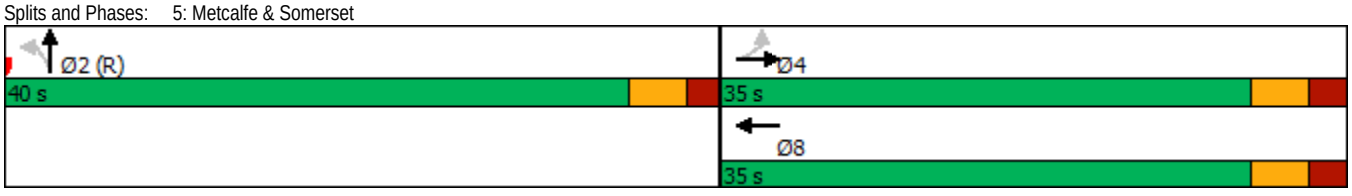
Splits and Phases: 4: O'Connor & Gladstone



Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Traffic Volume (vph)	87	185	152	603
Future Volume (vph)	87	185	152	603
Lane Group Flow (vph)	0	287	272	898
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	19.5	19.5	19.5	18.2
Total Split (s)	35.0	35.0	35.0	40.0
Total Split (%)	46.7%	46.7%	46.7%	53.3%
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	1.9
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	5.2
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	C-Min
Act Effct Green (s)		21.2	21.2	43.1
Actuated g/C Ratio		0.28	0.28	0.57
v/c Ratio		0.93	0.64	0.39
Control Delay		61.8	27.5	10.8
Queue Delay		0.0	0.0	0.3
Total Delay		61.8	27.5	11.1
LOS		E	C	B
Approach Delay		61.8	27.5	11.1
Approach LOS		E	C	B
Queue Length 50th (m)		39.1	30.6	24.4
Queue Length 95th (m)		#63.0	45.9	34.3
Internal Link Dist (m)		162.8	146.4	54.5
Turn Bay Length (m)				
Base Capacity (vph)		430	588	2308
Starvation Cap Reductn		0	0	704
Spillback Cap Reductn		0	0	0
Storage Cap Reductn		0	0	0
Reduced v/c Ratio		0.67	0.46	0.56

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 20 (27%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 24.1	Intersection LOS: C
Intersection Capacity Utilization 69.3%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

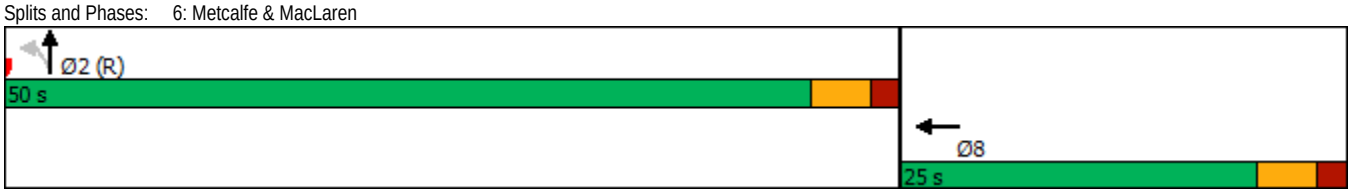
Splits and Phases: 5: Metcalfe & Somerset



Lane Group	WBT	NBT
Lane Configurations		
Traffic Volume (vph)	51	493
Future Volume (vph)	51	493
Lane Group Flow (vph)	106	635
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Detector Phase	8	2
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	23.1	20.0
Total Split (s)	25.0	50.0
Total Split (%)	33.3%	66.7%
Yellow Time (s)	3.3	3.3
All-Red Time (s)	1.8	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	None	C-Min
Act Effct Green (s)	14.8	54.1
Actuated g/C Ratio	0.20	0.72
v/c Ratio	0.30	0.19
Control Delay	15.8	2.0
Queue Delay	0.0	0.0
Total Delay	15.8	2.0
LOS	B	A
Approach Delay	15.8	2.0
Approach LOS	B	A
Queue Length 50th (m)	6.0	3.8
Queue Length 95th (m)	17.7	6.8
Internal Link Dist (m)	155.2	64.2
Turn Bay Length (m)		
Base Capacity (vph)	459	3347
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.23	0.19

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 56 (75%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 4.0	Intersection LOS: A
Intersection Capacity Utilization 56.2%	ICU Level of Service B
Analysis Period (min) 15	

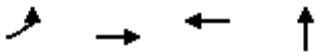
Splits and Phases: 6: Metcalfe & MacLaren



Lane Group	EBT	NBT
Lane Configurations		
Traffic Volume (vph)	91	503
Future Volume (vph)	91	503
Lane Group Flow (vph)	198	602
Turn Type	NA	NA
Protected Phases	4	2
Permitted Phases		
Detector Phase	4	2
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	26.3	23.1
Total Split (s)	27.0	48.0
Total Split (%)	36.0%	64.0%
Yellow Time (s)	3.3	3.3
All-Red Time (s)	2.0	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.3	5.1
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	C-Min
Act Effct Green (s)	16.6	48.0
Actuated g/C Ratio	0.22	0.64
v/c Ratio	0.46	0.20
Control Delay	18.1	3.9
Queue Delay	0.0	0.0
Total Delay	18.1	3.9
LOS	B	A
Approach Delay	18.1	3.9
Approach LOS	B	A
Queue Length 50th (m)	13.8	8.7
Queue Length 95th (m)	30.1	10.3
Internal Link Dist (m)	121.1	226.4
Turn Bay Length (m)		
Base Capacity (vph)	544	2997
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.36	0.20

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 52 (69%), Referenced to phase 2:NBT, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.46	
Intersection Signal Delay: 7.4	Intersection LOS: A
Intersection Capacity Utilization 41.1%	ICU Level of Service A
Analysis Period (min) 15	

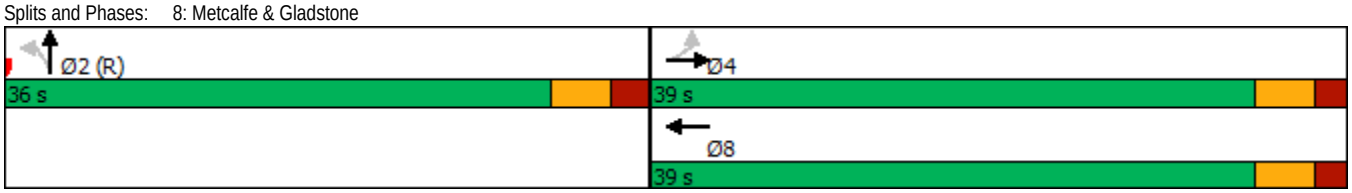
Splits and Phases: 7: Metcalfe & Gilmour



Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Traffic Volume (vph)	107	205	137	395
Future Volume (vph)	107	205	137	395
Lane Group Flow (vph)	0	329	162	496
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	27.2	27.2	27.2	31.5
Total Split (s)	39.0	39.0	39.0	36.0
Total Split (%)	52.0%	52.0%	52.0%	48.0%
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	1.9	1.9	1.9	2.2
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.2	5.2	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	C-Min
Act Effct Green (s)		22.4	22.4	41.9
Actuated g/C Ratio		0.30	0.30	0.56
v/c Ratio		0.76	0.31	0.19
Control Delay		35.0	18.7	9.4
Queue Delay		0.0	0.0	0.0
Total Delay		35.0	18.7	9.4
LOS		C	B	A
Approach Delay		35.0	18.7	9.4
Approach LOS		C	B	A
Queue Length 50th (m)		42.3	16.4	11.2
Queue Length 95th (m)		57.9	25.1	21.4
Internal Link Dist (m)		164.9	144.6	38.8
Turn Bay Length (m)				
Base Capacity (vph)		650	792	2656
Starvation Cap Reductn		0	0	0
Spillback Cap Reductn		0	0	0
Storage Cap Reductn		0	0	0
Reduced v/c Ratio		0.51	0.20	0.19

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 39 (52%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 19.4	Intersection LOS: B
Intersection Capacity Utilization 69.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 8: Metcalfe & Gladstone



Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	160	0	0	0	0	0	0	1109	50
Future Vol, veh/h	0	0	0	160	0	0	0	0	0	0	1109	50
Conflicting Peds, #/hr	44	0	8	8	0	44	72	0	108	108	0	72
Sign Control	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	168	0	0	0	0	0	0	1167	53

Major/Minor	Minor1			Major2		
Conflicting Flow All	592	-	-	-	-	0
Stage 1	0	-	-	-	-	-
Stage 2	592	-	-	-	-	-
Critical Hdwy	6.84	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	-	-	-	-	-
Pot Cap-1 Maneuver	437	0	0	0	-	-
Stage 1	-	0	0	0	-	-
Stage 2	516	0	0	0	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	437	0	-	-	-	-
Mov Cap-2 Maneuver	437	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	516	0	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	18.3	0
HCM LOS	C	

Minor Lane/Major Mvmt	WBLn1	SBT	SBR
Capacity (veh/h)	437	-	-
HCM Lane V/C Ratio	0.385	-	-
HCM Control Delay (s)	18.3	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	1.8	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	82	132	0	0	52	0
Future Vol, veh/h	82	132	0	0	52	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	-	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	86	139	0	0	55	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	0	0	311	-
Stage 1	-	-	0	-
Stage 2	-	-	311	-
Critical Hdwy	4.12	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.42	-
Follow-up Hdwy	2.218	-	3.518	-
Pot Cap-1 Maneuver	-	-	681	0
Stage 1	-	-	-	0
Stage 2	-	-	743	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	681	-
Mov Cap-2 Maneuver	-	-	681	-
Stage 1	-	-	-	-
Stage 2	-	-	743	-

Approach	EB	SB
HCM Control Delay, s		10.7
HCM LOS		B

Minor Lane/Major Mvmt	EBL	EBT	SBLn1
Capacity (veh/h)	-	-	681
HCM Lane V/C Ratio	-	-	0.08
HCM Control Delay (s)	-	-	10.7
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.3

Appendix G

MMLoS Analysis

Multi-Modal Level of Service - Intersections Form

Consultant	PARSONS	**Project**	477191-01000
Scenario	267 O'Connor TIA	**Date**	Aug-20
Comments			

INTERSECTIONS		Sommerset/O'Connor				Gilmour/O'Connor			
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	3	3	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2
	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
	Conflicting Left Turns	No left turn / Prohib.	Protected/ Permissive	Permissive	No left turn / Prohib.	No left turn / Prohib.	No left turn / Prohib.	Permissive	No left turn / Prohib.
	Conflicting Right Turns	No right turn	Permissive or yield control	Permissive or yield control	Permissive or yield control	No right turn	Permissive or yield control	No right turn	Permissive or yield control
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR prohibited	RTOR allowed
	Ped Signal Leading Interval?	No	No	Yes	Yes	No	No	Yes	Yes
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Right Turn	No Channel	No Right Turn	No Channel
	Corner Radius	5-10m	5-10m	5-10m	5-10m	No Right Turn	5-10m	No Right Turn	3-5m
	Crosswalk Type	Std transverse markings	Std transverse markings	Textured/coloured pavement	Textured/coloured pavement	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Std transverse markings
	PETSI Score	**84**	**71**	**91**	**99**	**111**	**97**	**108**	**97**
	Ped. Exposure to Traffic LoS	**B**	**C**	**A**	**A**	**A**	**A**	**A**	**A**
	Cycle Length	75	75	75	75	75	75	75	75
	Effective Walk Time	24	8	26	26	8	8	44	44
	Average Pedestrian Delay	**17**	**30**	**16**	**16**	**30**	**30**	**6**	**6**
	Pedestrian Delay LoS	**B**	**D**	**B**	**B**	**D**	**D**	**A**	**A**
	Level of Service	**B**	**D**	**B**	**B**	**D**	**D**	**A**	**A**
		D				**D**			
	Approach From	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	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP		Mixed Traffic
	Right Turn Lane Configuration			≤ 50 m	≤ 50 m	Not Applicable	Not Applicable		≤ 50 m
	Right Turning Speed			≤ 25 km/h	≤ 25 km/h	Not Applicable	Not Applicable		≤ 25 km/h
	Cyclist relative to RT motorists	**Not Applicable**	**Not Applicable**	**D**	**D**	**Not Applicable**	**Not Applicable**	**-**	**D**
	Separated or Mixed Traffic	**Separated**	**Separated**	**Mixed Traffic**	**Mixed Traffic**	**Separated**	**Separated**	**-**	**Mixed Traffic**
	Left Turn Approach	2-stage, LT box	2-stage, LT box	No lane crossed	No lane crossed	2-stage, LT box	2-stage, LT box		No lane crossed
	Operating Speed	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	≤ 40 km/h	≤ 40 km/h	> 40 to ≤ 50 km/h	≤ 40 km/h		≤ 40 km/h
	Left Turning Cyclist	**A**	**A**	**B**	**B**	**A**	**A**	**-**	**B**
	Level of Service	**A**	**A**	**D**	**D**	**A**	**A**	**-**	**D**
		D				**D**			
Transit	Average Signal Delay								
	Level of Service	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
		-				**-**			
Truck	Effective Corner Radius	< 10 m			< 10 m	< 10 m			< 10 m
	Number of Receiving Lanes on Departure from Intersection	1			≥ 2	≥ 2			≥ 2
	Level of Service	**F**	**-**	**-**	**D**	**D**	**-**	**-**	**D**
		F				**D**			
Auto	Volume to Capacity Ratio								
	Level of Service	**-**				**-**			

Gladstone/O'Connor				Somerset/Metcalfe				MacLaren/Metcalfe		
NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST
0 - 2	0 - 2	0 - 2	0 - 2	3	3	0 - 2	0 - 2	3	3	0 - 2
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 left turn / Prohib.	Permissive	Permissive	No left turn / Prohib.	Permissive	No left turn / Prohib.	No left turn / Prohib.	Permissive	No left turn / Prohib.	No left turn / Prohib.	No left turn / Prohib.
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	Permissive or yield control	No right turn	No right turn
RTOR allowed	RTOR allowed	RTOR prohibited	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR prohibited	RTOR allowed	RTOR prohibited	RTOR prohibited
No	No	Yes	Yes	No	No	No	No	No	No	No
No Channel	No Channel	No Right Turn	No Channel	No Channel	No Channel	No Channel	No Right Turn	No Right Turn	No Right Turn	No Channel
5-10m	5-10m	No Right Turn	5-10m	5-10m	5-10m	3-5m	No Right Turn	No Right Turn	No Right Turn	3-5m
Std transverse markings	Std transverse markings	Textured/coloured pavement	Textured/coloured pavement	Std transverse markings	Std transverse markings	Std transverse markings	Textured/coloured pavement	Std transverse markings	Std transverse markings	Std transverse markings
99	**86**	**108**	**99**	**71**	**84**	**95**	**106**	**88**	**96**	**103**
A	**B**	**A**	**A**	**C**	**B**	**A**	**A**	**B**	**A**	**A**
75	75	75	75	75	75	75	75	75	75	75
12	12	28	28	28	28	24	24	12	12	40
26	**26**	**15**	**15**	**15**	**15**	**17**	**17**	**26**	**26**	**8**
C	**C**	**B**	**B**	**B**	**B**	**B**	**B**	**C**	**C**	**A**
C	**C**	**B**	**B**	**C**	**B**	**B**	**B**	**C**	**C**	**A**
C				**C**				**C**		
NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST
Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic		Mixed Traffic	Mixed Traffic				Mixed Traffic
			≤ 50 m		≤ 50 m	≤ 50 m				≤ 50 m
			≤ 25 km/h		≤ 25 km/h	≤ 25 km/h				≤ 25 km/h
Not Applicable	**Not Applicable**	**#N/A**	**D**	**-**	**D**	**D**	**-**	**-**	**-**	**D**
Separated	**Separated**	**Mixed Traffic**	**Mixed Traffic**	**-**	**Mixed Traffic**	**Mixed Traffic**	**-**	**-**	**-**	**Mixed Traffic**
2-stage, LT box	2-stage, LT box	No lane crossed	No lane crossed		One lane crossed		No lane crossed		One lane crossed	
> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	≤ 40 km/h	≤ 40 km/h		> 40 to ≤ 50 km/h		> 40 to ≤ 50 km/h		> 40 to ≤ 50 km/h	
A	**A**	**B**	**B**	**-**	**D**	**-**	**B**	**-**	**D**	**-**
A	**A**	**#N/A**	**D**	**-**	**D**	**-**	**-**	**-**	**-**	**-**
#N/A				**D**				**-**		
		≤ 40 sec	> 40 sec							
-	**-**	**E**	**F**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
F				**-**				**-**		
< 10 m			< 10 m		< 10 m	< 10 m			< 10 m	< 10 m
1			≥ 2		1	≥ 2			1	≥ 2
F	**-**	**-**	**D**	**-**	**F**	**D**	**-**	**-**	**F**	**D**
F				**F**				**F**		
-				**-**				**-**		

Gilmour/Metcalfe					Gladstone/Metcalfe			
WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
0 - 2	3	3	0 - 2	0 - 2	3	3	0 - 2	0 - 2
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
Permissive	Permissive	No left turn / Prohib.	No left turn / Prohib.	Permissive	Permissive	No left turn / Prohib.	No left turn / Prohib.	Permissive
No right turn	No right turn	No right turn	Permissive or yield control	No right turn	Permissive or yield control	No right turn	Permissive or yield control	No right turn
RTOR prohibited	RTOR allowed	RTOR prohibited	RTOR prohibited	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR prohibited
No	No	No	No	No	No	No	No	No
No Right Turn	No Right Turn	No Right Turn	No Channel	No Right Turn	No Channel	No Channel	No Channel	No Right Turn
No Right Turn	No Right Turn	No Right Turn	5-10m	No Right Turn	3-5m	3-5m	3-5m	No Right Turn
Std transverse markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Textured/coloured pavement	Std transverse markings	Std transverse markings	Std transverse markings	Textured/coloured pavement	Textured/coloured pavement
103	**88**	**99**	**100**	**100**	**72**	**85**	**98**	**106**
A	**B**	**A**	**A**	**A**	**C**	**B**	**A**	**A**
75	75	75	75	75	75	75	75	75
40	13	13	37	37	25	25	18	18
8	**26**	**26**	**10**	**10**	**17**	**17**	**22**	**22**
A	**C**	**C**	**B**	**B**	**B**	**B**	**C**	**C**
A	**C**	**C**	**B**	**B**	**C**	**B**	**C**	**C**
	C				**C**			
WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
		Mixed Traffic ≤ 50 m ≤ 25 km/h	Mixed Traffic ≤ 50 m ≤ 25 km/h			Mixed Traffic ≤ 50 m ≤ 25 km/h	Mixed Traffic ≤ 50 m ≤ 25 km/h	
-	-	**D**	**D**	-	-	**D**	**D**	-
-	-	**Mixed Traffic**	**Mixed Traffic**	-	-	**Mixed Traffic**	**Mixed Traffic**	-
				No lane crossed > 40 to ≤ 50 km/h		One lane crossed > 40 to ≤ 50 km/h		No lane crossed > 40 to ≤ 50 km/h
-	-	-	-	**B**	-	**D**	-	**B**
-	-	-	-	-	-	**D**	-	-
	-					**D**		
							≤ 30 sec	> 40 sec
-	-	-	-	-	-	-	**D**	**F**
	-					**F**		
		< 10 m ≥ 2		< 10 m ≥ 2		< 10 m 1	< 10 m ≥ 2	
-	-	**D**	-	**D**	-	**F**	**D**	-
	D					**F**		
	-					-		