112 Nelson Street

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report

Prepared for:

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PN: 2020-88

Table of Contents

1 Screening 1
2 Existing and Planned Conditions 1
2.1 Proposed Development 1
2.2 Existing Conditions 3
2.2.1 Area Road Network 3
2.2.2 Existing Intersections 3
2.2.3 Existing Driveways 4
2.2.4 Cycling and Pedestrian Facilities 5
2.2.5 Existing Transit 7
2.2.6 Existing Area Traffic Management Measures 8
2.2.7 Existing Peak Hour Travel Demand 9
2.2.8 Collision Analysis 10
2.3 Planned Conditions 14
2.3.1 Changes to the Area Transportation Network 14
2.3.2 Other Study Area Developments 14
3 Study Area and Time Periods 14
3.1 Study Area 14
3.2 Time Periods 15
3.3 Horizon Years 15
4 Exemption Review 15
5 Development-Generated Travel Demand 15
5.1 Trip Generation and Mode Shares 15
5.2 Trip Distribution 17
5.3 Trip Assignment 17
6 Background Network Travel Demands 18
6.1 Transportation Network Plans 18
6.2 Background Growth 18
6.3 Other Developments 18
7 Demand Rationalization 18
7.1 2024 and 2029 Future Background Operations 18
7.2 Modal Share Sensitivity and Demand Rationalization Conclusions 20
8 Development Design 20
8.1 Design for Sustainable Modes 20
8.2 Circulation and Access 20
9 Parking 21
9.1 Parking Supply 21
9.2 Spillover Parking 21
9.2.1 Site Design and Tenant Factors 21
9.2.2 Local Area Parking Studies 21
10 Boundary Street Design 22
11 Access Intersections Design 22
11.1 Location and Design of Access 22

11.2 Intersection Control 22
11.3 Access Intersection Design 23
11.3.1 2024 and 2029 Future Total Access Intersection Operations 23
11.3.2 Access Intersection MMLOS 23
11.3.3 Recommended Design Elements 24
12 Transportation Demand Management 24
12.1 Context for TDM 24
12.2 Need and Opportunity 24
12.3 TDM Program 24
13 Neighbourhood Traffic Management 24
14 Transit 25
14.1 Route Capacity 25
14.2 Transit Priority 25
15 Network Intersection Design 25
15.1 Network Intersection Control 25
15.2 Network Intersection Design 26
15.2.1 2024 and 2029 Future Total Network Intersection Operations 26
15.2.2 Network Intersection MMLOS 27
15.2.3 Recommended Design Elements 27
16 Summary of Improvements Indicated and Modifications Options 27
17 Next Steps ..... **Error! Bookmark not defined.**

List of Figures

Figure 1: Area Context Plan 1
Figure 2: Concept Plan 2
Figure 3: Study Area Pedestrian Facilities 5
Figure 4: Study Area Cycling Facilities 6
Figure 5: Existing Pedestrian Volumes 6
Figure 6: Existing Cyclist Volumes 7
Figure 7: Existing Study Area Transit Service 8
Figure 8: Existing Study Area Transit Stops 8
Figure 9: Existing Traffic Counts 9
Figure 10: Study Area Collision Records – Representation of 2015-2019 11
Figure 11: New Site Generation Auto Volumes 17
Figure 12: 2024 and 2029 Future Background Volumes 19
Figure 13: 2024 and 2029 Future Total Volumes 23

Table of Tables

Table 1: Intersection Count Date 9
Table 2: Existing Intersection Operations 10
Table 3: Study Area Collision Summary, 2015-2019 11
Table 4: Summary of Collision Locations, 2015-2019 12

Table 5: Rideau Street at Nelson Street Collision Summary 12
Table 6: Rideau Street between King Edward Avenue and Nelson Street Collision Summary 13
Table 7: Nelson Street between York Street and Rideau Street Collision Summary 13
Table 8: Exemption Review 15
Table 9: Trip Generation Person Trip Rates 15
Table 10: Total Person Trip Generation 16
Table 11: Mode Shares 16
Table 12: Trip Generation by Mode 16
Table 13: OD Survey Distribution – Ottawa Inner 17
Table 14: TRANS Regional Model Projections – Study Area Growth Rates 18
Table 15: 2024 and 2029 Future Background Intersection Operations 19
Table 16: Boundary Street MMLOS Analysis 22
Table 17: 2024 and 2029 Future Total Access Intersection Operations 23
Table 18: Trip Generation by Transit Mode 25
Table 19: 2024 and 2029 Future Total Network Intersection Operations 26
Table 20: Study Area Intersection MMLOS Analysis 27

List of Appendices

Appendix A – TIA Screening Form and Certification Form
Appendix B – Turning Movement Count Data
Appendix C – Synchro Intersection Worksheets – Existing Conditions
Appendix D – Collision Data
Appendix E – TRANS Model Plots
Appendix F – Background Development Volumes
Appendix G – Synchro Intersection Worksheets – Future Background 2024 & 2029
Appendix H – MMLOS Analysis
Appendix I – Synchro Intersection Worksheets – Future Total 2024 & 2029
Appendix J – TDM Checklist

1 Screening

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

2 Existing and Planned Conditions

2.1 Proposed Development

The existing site, previously rezoned as Residential Fifth Density (R5B[2664] S421-h) and previously containing a low-rise commercial building and surface parking lot, is proposed as being redeveloped with a nine-storey residential building comprising 322 dwelling units. Access to underground parking comprising ten tenant vehicle spaces, six visitor vehicle spaces, 322 bicycle spaces, and nine scooter or e-bike spaces is proposed via a full-movement access onto Nelson Street. The development is anticipated to be built out in a single phase by 2024.

Figure 1 illustrates the Study Area Context. Figure 2 illustrates the proposed concept plan.

Figure 1: Area Context Plan

Source: http://maps.ottawa.ca/geoOttawa/ Accessed: March 30, 2021

1 SITE PLAN
SP01 1:125

PROPOSED HEIGHT

	STOREY	HEIGHT IN M.
(purple)	9	30.00
(green)	6	19.80
(yellow)	5	17.00
(grey)	1	4.00

- PROPERTY LINE
- PROPOSED FLUSH PAVERS
- NEW SOD
- MAIN DOOR / EXIT DOOR
- EXISTING TREE
- NEW TREE
- EXISTING TREE TO BE REMOVED

CITY OF OTTAWA ZONNING BY L-LAW 2008-250

CURRENTLY IG1 H [11] (GENERAL INDUSTRIAL, SUBZONE 1) WITHIN THE MATURE NEIGHBOURHOODS OVERLAY (SECTION 199-200)

ZONE MECHANISM	REQUIREMENT	PROPOSED	COMPLIANCE
MINIMUM LOT AREA	1400 m2	3,259 m2	YES
MAXIMUM BUILDING HEIGHT	30 m	30 m	YES
MAXIMUM HEIGHTS FOR INDIVIDUAL STOREYS	1 storey: 4 m	1 storey: 4 m	YES
	4 storeys: 14 m	5 storeys: 17 m	YES
	5 storeys: 17 m	6 storeys: 19.8 m	NO
	9 storeys: 30 m	9 storeys: 30 m	YES
MINIMUM LOT WIDTH	18.4 m	18.4 m	YES
PERMITTED PROJECTIONS ABOVE HEIGHT LIMIT	Mechanical/Service Penthouse: 4.5 m	Height of mechanical penthouse: 4.5 m	YES
MINIMUM FRONT YARD SETBACK	Along Nelson St : 3m and additional 2m stepback above 5th storey	3m and additional 2m stepback above 5th storey	YES
MINIMUM INTERIOR SIDE YARD SETBACK	Southern interior lot line (abutting 134 Nelson): 1.5 m- 4.5 m with additional 1.5 m setback above 4 th storey	1.5m-4.5m with additional stepback of 1.5m above 1st storey	YES
	Southeastern interior lot line: 1.5 m	1.5 m	YES
	Eastern interior lot line (abutting 110 Nelson):4.5 m - Xm with additional 1.5 m stepback above 4 th storey with a 1.7 m stepbkacj above 5th storey	4.5-Xm with additional stepback of 1.5m above 1st storey	NO
	Northern interior lot line (abbuting 100 Nelson): 4.5 m with an additional 1.5 m stepback above 4th storey to a maximum height of 5th storey	6m to a maximum height of 6 storeys	NO
MINIMUM REAR YARD SETBACK	3m - 6.3 m	3m - 6.3 m (including retaining walls)	YES
LANDSCAPE AREA	30 % of the lot area must be provied as landscape area	36 % landscape area	YES
AMENITY AREA	Total min. 6m2/unit=322x6=1932 m2, a minimum of 50 % of the required total amenity area (966 m2) must be communal and aggregated into areasup to 54 m2	Total amenity provided=2996 m2 Interior amenity = 1029 m2 = 53 % of total required.	YES

ZONE MECHANISM	REQUIREMENT	PROPOSED	COMP.
MIN. VEHICLE PARKING SPACES	0.4/DU -12 units = (322-12 x 0.4) = 124 spaces	10 Spaces	NO
MIN. VISITOR PARKING	6 paces	6 spaces	YES
PARKING SPACE DIMENSIONS	Min: 2.6m wide / 5.2m long	Min: 2.6m wide / 5.2m long	YES
BICYCLE PARKING SPACES	Resident: 0.5 spaces per unit = 161 spaces	322 spaces	YES
ACCES AISLE FOR BICYCLE PARING	Minimum width: 1.5m	1.5 m	YES
DIMENSION OF BICYCLE PARKING SPACES	Min: 0.6m wide/1.8m long (horizontal)	0.6m wide/1.8m long(horizontal)	YES
	Min: 0.5m wide/1.5m long (vertical)	0.5m wide/1.5m long(vertical)	YES
DRIVEWAY WIDHT	Minimum width of a driveway providing access to a parking lot or parking garage is 6 m for a single traffic lane for a parking garage.	6m	YES
AISLE WIDTH	Min. 6 m	6m	YES

LEVEL	G.B.A		G.F.A.		G.L.A.	
	AREA SQ M	AREA SQ FT	AREA SQ M	AREA SQ FT	AREA SQ M	AREA SQ FT
1	1 662	17 889	1 183	12 735	338	3 642
2	1 593	17 148	1 411	15 186	1 197	12 888
3	1 593	17 148	1 338	14 402	1 269	13 657
4	1 593	17 148	1 338	14 402	1 269	13 657
5	1 593	17 148	1 338	14 402	1 269	13 657
6	1 595	17 168	1 299	13 982	1 249	13 441
7	1 144	12 314	924	9 944	856	9 215
8	1 144	12 314	924	9 944	891	9 593
9	1 144	12 314	924	9 944	891	9 590
TOTAL UPPER LEVELS	13 061	140 591	10 678	114 941	9 229	99 340

LEVEL	MICRO BACHELOR	TORONTO STUDIO	ONE BEDROOM	TWO BEDROOMS	THREE BEDROOMS	TOTAL BY LEVEL
PARKING 1	0	14	0	0	1	15
1	0	14	0	0	0	14
2	8	22	1	0	6	37
3	11	22	1	0	6	40
4	11	22	1	0	6	40
5	11	22	1	0	6	40
6	11	25	1	0	4	41
7	11	18	1	0	1	31
8	11	19	1	0	1	32
9	11	19	1	0	1	32
TOTAL	85	197	8	0	32	322

CLIENT

KEY PLAN

STAMP

TRUE NORTH

ALL CONTRACTORS TO VERIFY ALL DIMENSIONS ON SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT.

ALL CONTRACTORS MUST COMPLY WITH ALL CODES AND BYLAWS AND OTHER AUTHORITIES HAVING JURISDICTION OVER THE WORK.

DO NOT SCALE DRAWINGS.

THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED BY THE ARCHITECT.

NO.	ISSUED FOR REVIEW	06/17/21
NO.	REVISION	DD/MM/YY DATE

CONSULTANTS:
STRUCTURAL –
MECHANICAL –
ELECTRICAL –
LANDSCAPING –

PROJECT

112 NELSON ST

DRAWING

SITE PLAN

DATE	18/08/2020	JOB No.	
SCALE	1 : 100	REVISION	
DRAWN BY	J.G	DRAWING	SP01
REVIEWED BY	R.W.		

2.2 Existing Conditions

2.2.1 Area Road Network

King Edward Avenue: King Edward Avenue is a City of Ottawa arterial road with a divided six-lane urban cross-section to the north, and a divided four-lane urban cross-section to the south of Rideau Street, with sidewalks on both sides of the road. North of Rideau Street, the southbound curb lane is a shared cycling/transit priority lane during the PM peak period (3:30PM-5:30PM), and on-street parking is permitted on the west side of the road (no stopping 7:00AM-9:00AM & 3:00PM-5:30PM) and on the east side of the road (no stopping 3:30PM-5:30PM to the south and 7:00AM-9:00AM & 3:00PM-5:30PM to the north of York Street). The posted speed limit is 40 km/h, the Ottawa Official Plan reserves a 40.0- metre right of way north of Rideau Street, and the measured right of way is 20.0 metres south of Rideau Street. King Edward Avenue is a truck route.

Rideau Street: Rideau Street is a City of Ottawa arterial road with a four-lane urban cross-section with sidewalks on both sides of the road. Within the study area, the outside lanes are designated for transit, taxis, and cyclists during peak periods (7:00AM-9:00AM & 3:30-5:30PM) and on-street parking is permitted outside of these times. The posted speed limit is 40 km/h and the Ottawa Official Plan reserves a 30.0-metre right of way to the west and a 26.0-metre right of way to the east of King Edward Avenue. Rideau Street is a truck route.

Nelson Street: Nelson Street is a City of Ottawa local road with a two-lane urban cross-section with sidewalks on both sides of the road. South of Rideau Street, Nelson Street is discontinuous with only bicycle and pedestrian access permitted to Besserer Street. North of Rideau Street, on-street parking is permitted on the west side of the road along the 152 Nelson Street frontage and is permitted on the east side of the road between the Loblaws' truck access and Murray Street. On-street parking is also permitted on both sides of the road north of Murray Street and on the west side of the road south of Besserer Street. The unposted speed limit is assumed to be 50 km/h and the measured right of way is 18.5 metres to the north of Rideau Street and varies between 18.5 metres and 20.0 metres to the south of Rideau street.

Friel Street: Friel Street is a City of Ottawa local road with a two-lane urban cross-section with sidewalks on both sides of the road. On-street parking is permitted on the east side of the road north of Rideau Street, in two bays on the east side of the road between Rideau Street and Besserer Street, and on the west side of the road south of Besserer Street. The unposted speed limit is assumed to be 50 km/h and the measured right of way is 20.0 metres.

York Street: York Street is a City of Ottawa local road with a divided four-lane urban cross-section west of King Edward Avenue within the study area and with a two-lane urban cross-section to the east. Sidewalks are provided on both sides of the road. The unposted speed limit is assumed to be 50 km/h and the measured right of way is 38.0 metres to the west and is 20.0 metres to the east of King Edward Avenue.

2.2.2 Existing Intersections

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

York Street at King Edward Avenue

The intersection of York Street at King Edward Avenue is a signalized intersection. The northbound approach consists of an auxiliary left-turn lane, two through lanes, and a shared through/right-turn lane and the southbound approach consists of two through lanes and a shared through/right-turn lane that operates as a shared transit priority through/auxiliary right-turn lane weekdays from 3:00PM-5:30PM. The eastbound and westbound approaches each consist of a right-turn lane. Northbound U-turns, southbound left turns, and eastbound left turns and through movements are restricted and

	directional measures furthermore prevent left turns and through movements on the eastbound approach.
York Street at Nelson Street	The intersection of York Street at Nelson is an all-way stop-controlled intersection. All approaches consist of a shared all-movements lane. Northbound left-turns and westbound through movements are restricted weekdays from 3:30PM-5:30PM, bicycles excepted.
Rideau Street at King Edward Avenue	The intersection of Rideau Street at King Edward Avenue is a signalized intersection. The northbound approach consists of two through lanes and an auxiliary right-turn lane, and the southbound approach consists of an auxiliary left-turn lane, two through lanes, and a right-turn lane. The eastbound approach consists of an auxiliary left-turn lane, a through lane, and a shared through/right-turn lane and the westbound approach consists of a through lane and a shared through/right-turn lane. The curb lanes on the eastbound and westbound approach operate as shared transit priority through/right-turn lanes weekdays from 7:00AM-9:00AM and 3:30-5:30PM. Northbound and westbound left turns are prohibited, and southbound and westbound right turns on red are prohibited from 7:00AM-7:00PM.
Rideau Street at Nelson Street	The intersection of Rideau Street at Nelson Street is a signalized intersection. The northbound and southbound approaches each consist of a shared all-movements lane. The eastbound and westbound approaches each consist of an auxiliary left-turn lane, a through lane, and a shared through/right-turn lane. The curb lanes on the eastbound and westbound approach operate as shared transit priority through/right-turn lanes weekdays from 7:00AM-9:00AM and 3:30-5:30PM. No turn restrictions were noted.
Rideau Street at Friel Street	The intersection of Rideau Street at Friel Street is a signalized intersection. The northbound and southbound approaches each consist of a shared all-movements lane. The eastbound and westbound approaches each consist of a shared left-turn/through lane, and a shared through/right-turn lane. The curb lanes on the eastbound and westbound approach operate as shared transit priority through/right-turn lanes weekdays from 7:00AM-9:00AM and 3:30-5:30PM. Eastbound and westbound left turns are restricted from 7:00AM-9:00AM, bicycles excepted.

2.2.3 Existing Driveways

Within 200 metres of the site access, driveways to a rear parking lot for a hotel, to a mid-rise residential building, to a paid parking lot and an auto garage, to single residences, and to a restaurant exist on the west side of Nelson Street. Two driveways to parking lots for attached housing, a driveway to a grocery store loading area and one to its underground parking exist on the east side of Nelson Street. South of Rideau Street, a driveway to a community health centre is on the east side of Nelson Street, and driveways to a restaurant and to low-rise residential land uses are present on the west side of the road.

On Rideau Street, within 200 metres of the site access, driveways to a hotel, and to a convenience store are present on the north side of the road, and driveways to a drug store, to detached commercial and restaurant land uses, to rear parking for a commercial strip, are present as well as an inlet to a restaurant on the south side of the road.

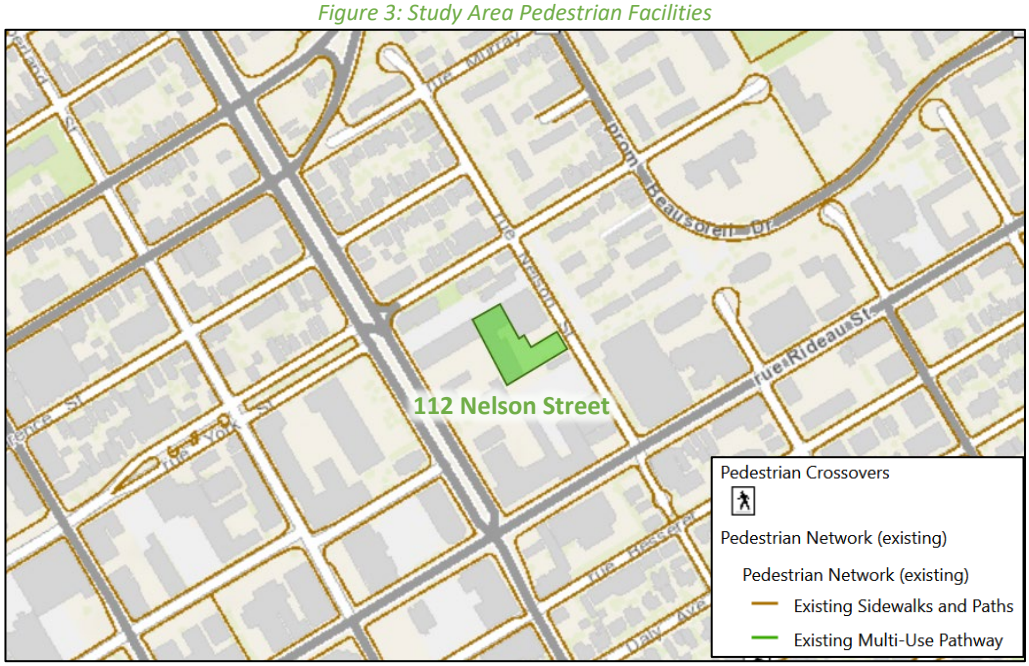
2.2.4 Cycling and Pedestrian Facilities

Figure 3 illustrates the pedestrian facilities in the study area and Figure 4 illustrates the cycling facilities.

Sidewalks are provided along both sides of all study area roadways. Cycling facilities include a curbed bike lane on Cumberland Street between Besserer Street and George Street and a bike lane on Stewart Street and Wilbrod Street.

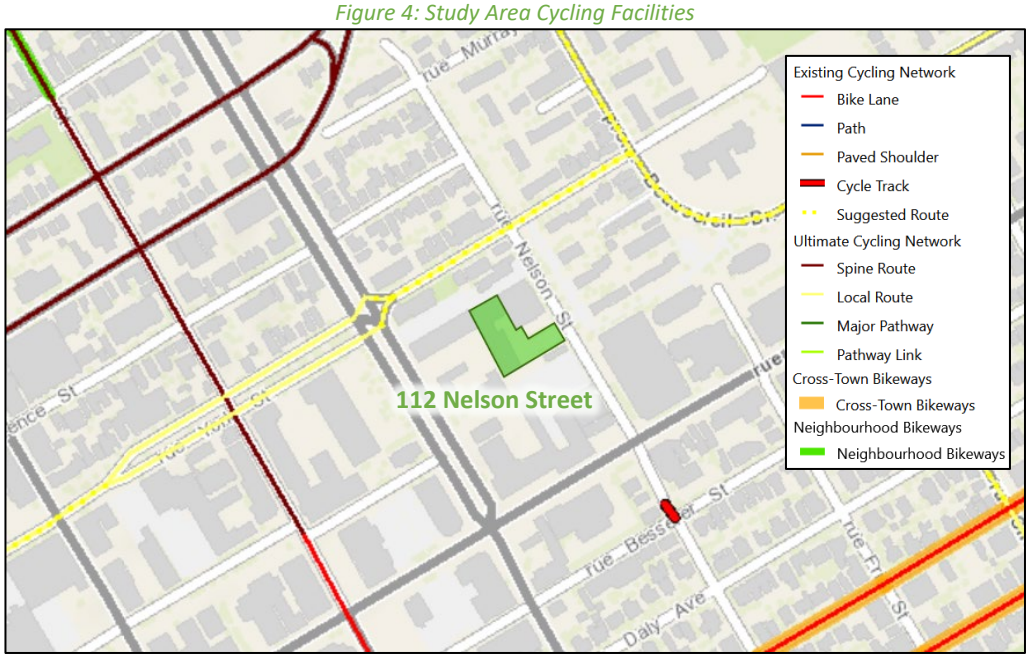
St. Patrick Street, Murray Street, Stewart Street, Wilbrod Street, and Cumberland Street south of St. Andrew Street are spine routes. York Street, Beausoleil Drive, Laurier Street, Cumberland Street north of St. Andrew Street and Chapel Street are local routes. Stewart Street east of Cumberland Street, Wilbrod Street, and Cumberland Street south of Stewart Street are cross-town bikeways, and Cumberland Street north of Guigues Avenue is a neighbourhood bikeway.

Figure 3: Study Area Pedestrian Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: March 30, 2021

Figure 4: Study Area Cycling Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: March 30, 2021

Pedestrian and cyclist volumes included in study area intersection counts, presented in Section 2.2.7, have been compiled and are illustrated in Figure 5 and Figure 6 respectively.

Figure 5: Existing Pedestrian Volumes

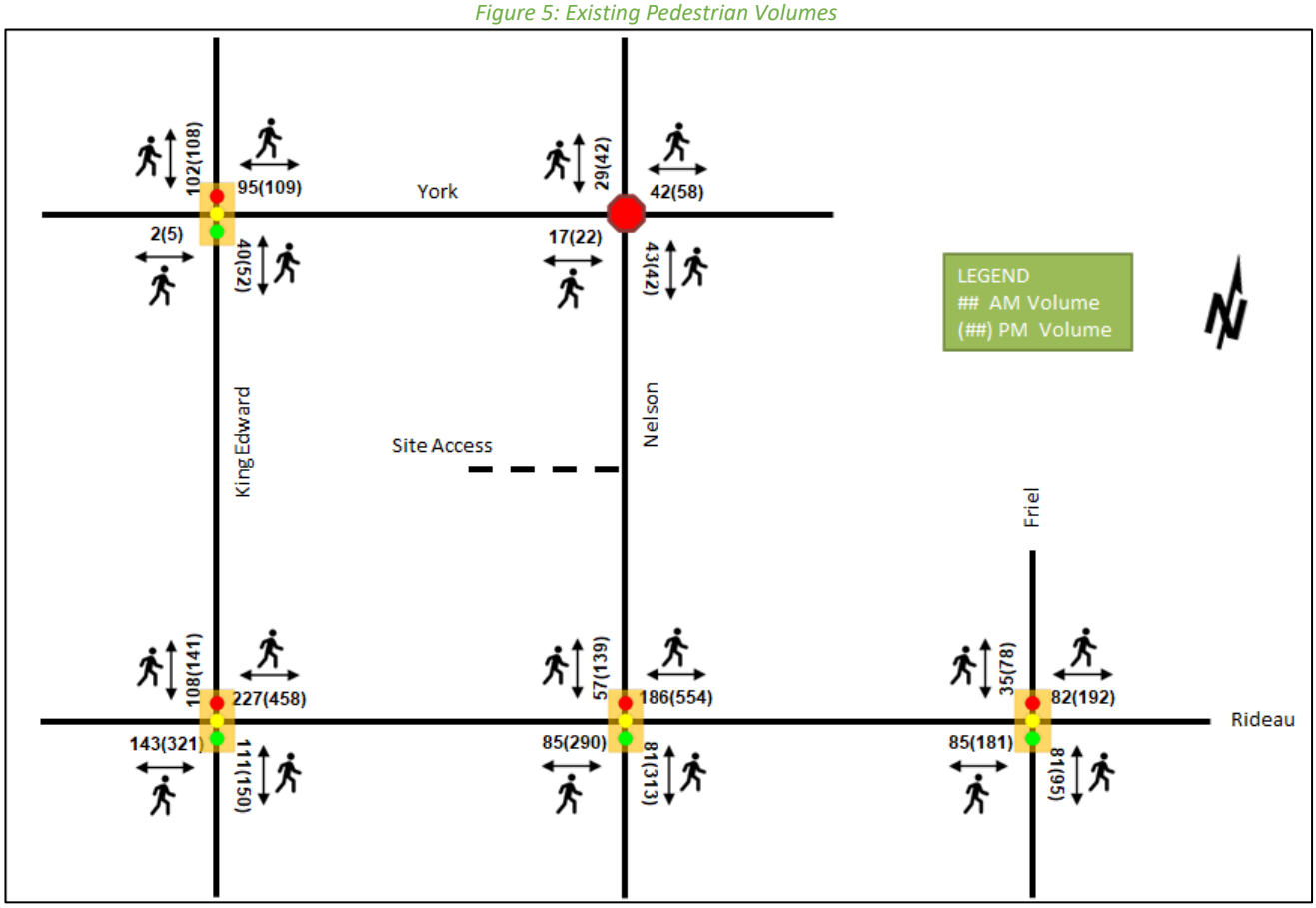
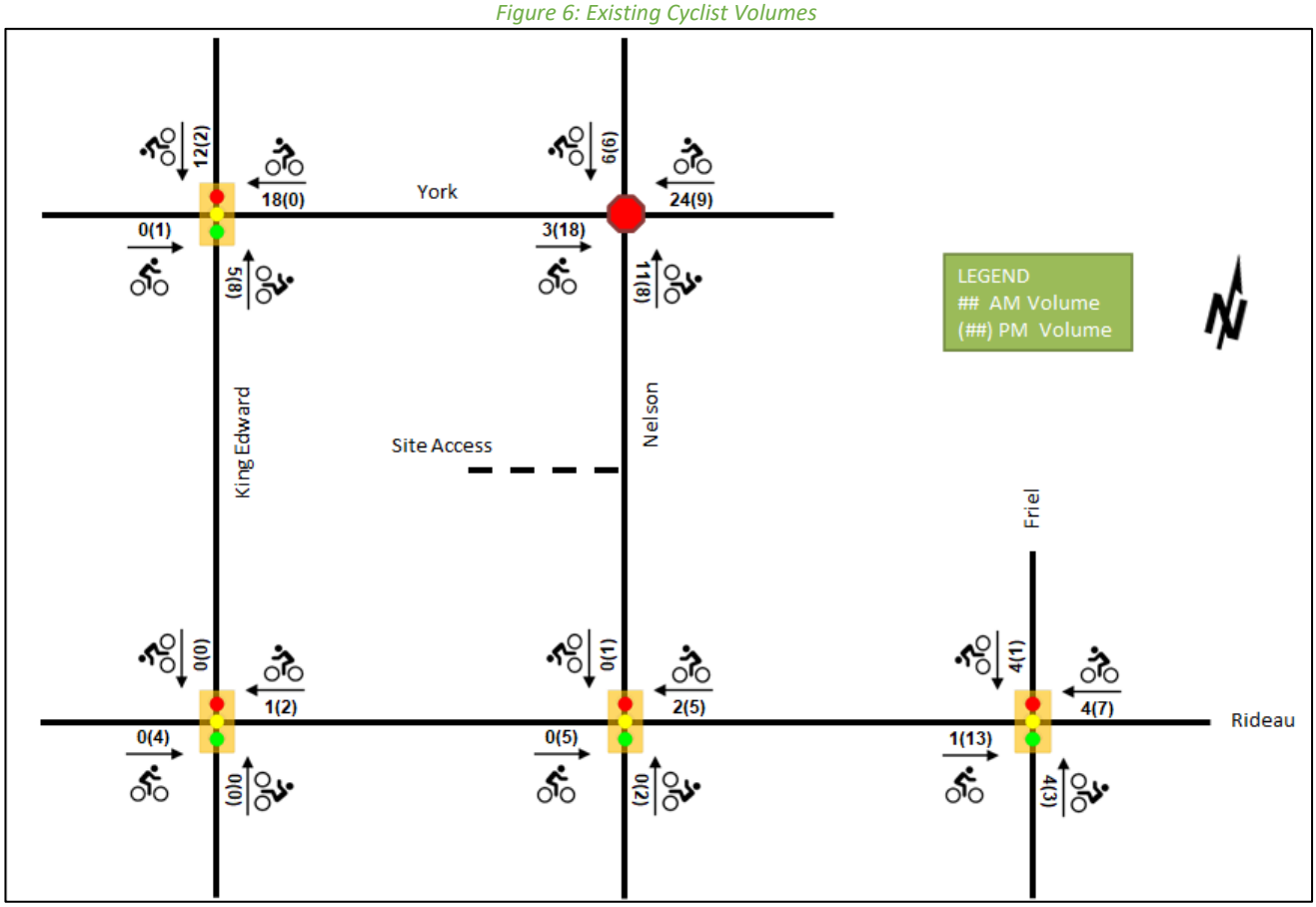


Figure 6: Existing Cyclist Volumes



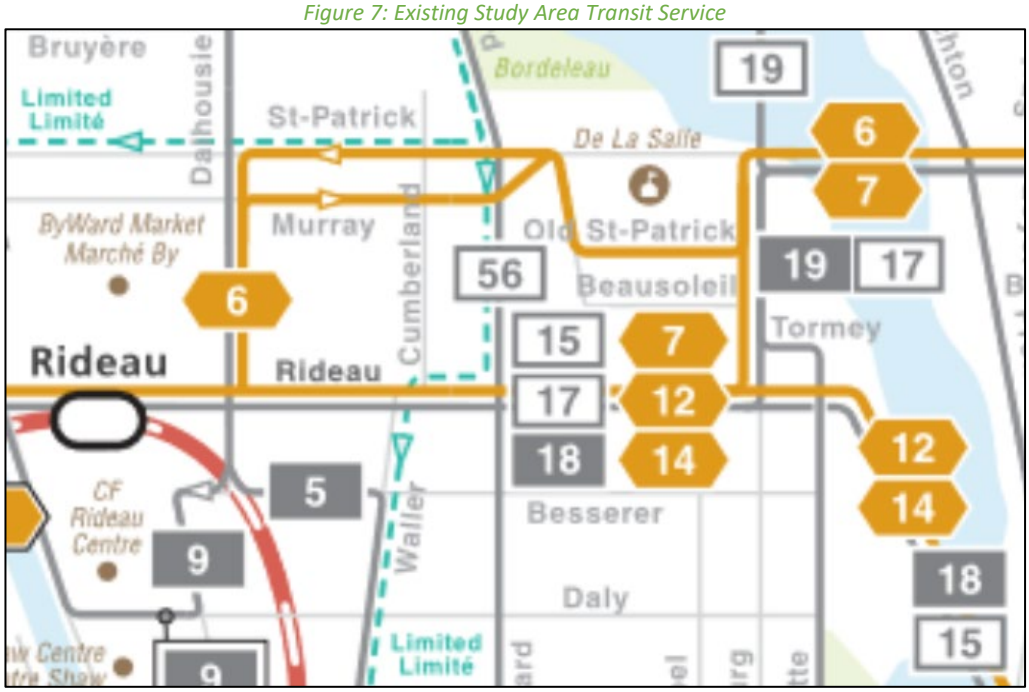
2.2.5 Existing Transit

Within the study area, the route #56 travels along King Edward Avenue, and the routes #7, #12, #14, #15, #17, and #18 travel along Rideau Street. The site lies just over 800 metres walking distance from the Rideau Station LRT terminal. The frequency of these routes within proximity of the proposed site currently are:

- Route # 7 – 5-10 minute service during the peak periods, and 15-30 minute during the off-peak times
- Route # 12 – 15-minute service all day
- Route # 14 – 15-minute daytime service, 30-minute service after 7:00PM
- Route # 15 – 5-10 minute service during the peak periods, and 15-30 minute during the off-peak times
- Route # 17 – 30 minute service in the peak period/direction only
- Route # 18 – 15-minute service in the peak period/direction, 30-minute service all day
- Route # 56 – 15-minute service in the peak period/direction, 30-minute service during the peak period in the off-peak direction

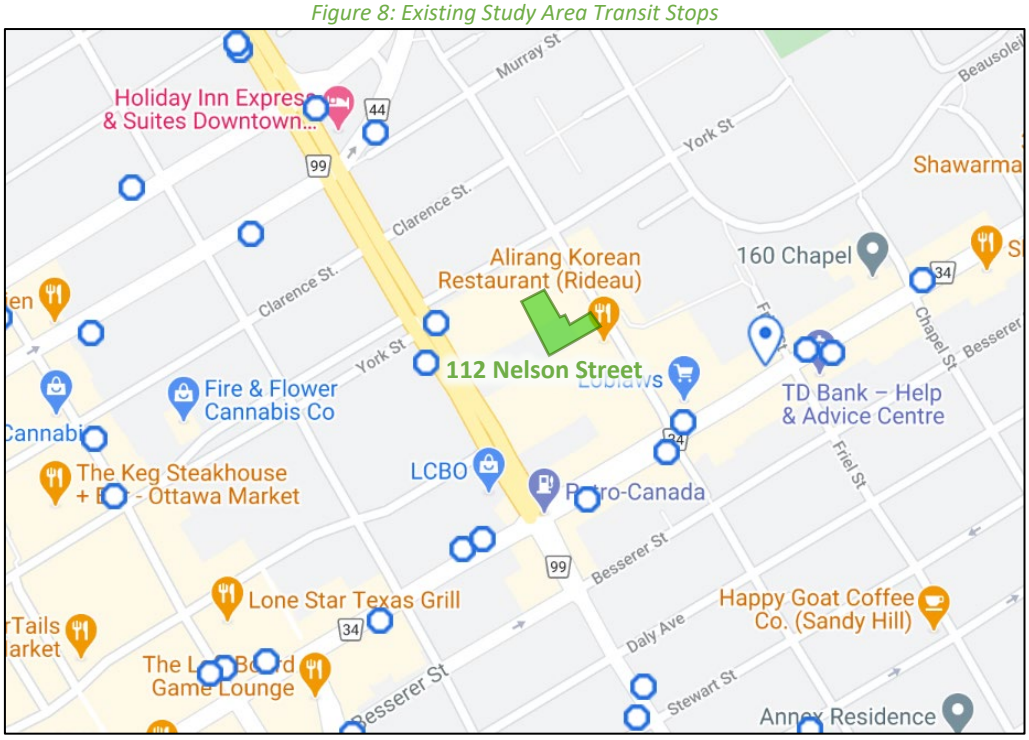
Figure 7 illustrates the transit system map in the study area and Figure 8 illustrates nearby transit stops.

Figure 7: Existing Study Area Transit Service



Source: http://www.octranspo.com/ Accessed: March 30, 2021

Figure 8: Existing Study Area Transit Stops



Source: http://www.octranspo.com/ Accessed: March 30, 2021

2.2.6 Existing Area Traffic Management Measures

Bulb-outs on local roads intersecting Rideau Street, on-road speed limit messaging pavement markings on King Edward Avenue, vehicular directional closures on York Street, and vehicle access closures on Nelson Street constitute the primary traffic management measures within the study area.

2.2.7 Existing Peak Hour Travel Demand

Existing turning movement counts were acquired from the City of Ottawa for the existing Study Area intersection. Table 1 summarizes the intersection count dates.

Table 1: Intersection Count Date

Intersection	Count Date
York Street at King Edward Avenue	Wednesday, September 21, 2016
York Street at Nelson Street	Wednesday, September 21, 2016
Rideau Street at King Edward Avenue	Tuesday, January 14, 2020
Rideau Street at Nelson Street	Tuesday, January 14, 2020
Rideau Street at Friel Street	Tuesday, May 9, 2017

Figure 9 illustrates the existing traffic counts, balanced along King Edward Avenue, and Table 2 summarizes the existing intersection operations. Additionally, given the turn restrictions at the intersection of York Street and Nelson Street were not in effect at the time of the traffic counts, these volumes have been removed along York Street. The level of service for signalized intersections is based on HCM 2010 v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and HCM average delay for unsignalized intersections. Detailed turning movement count data is included in Appendix B and the Synchro worksheets are provided in Appendix C.

Figure 9: Existing Traffic Counts

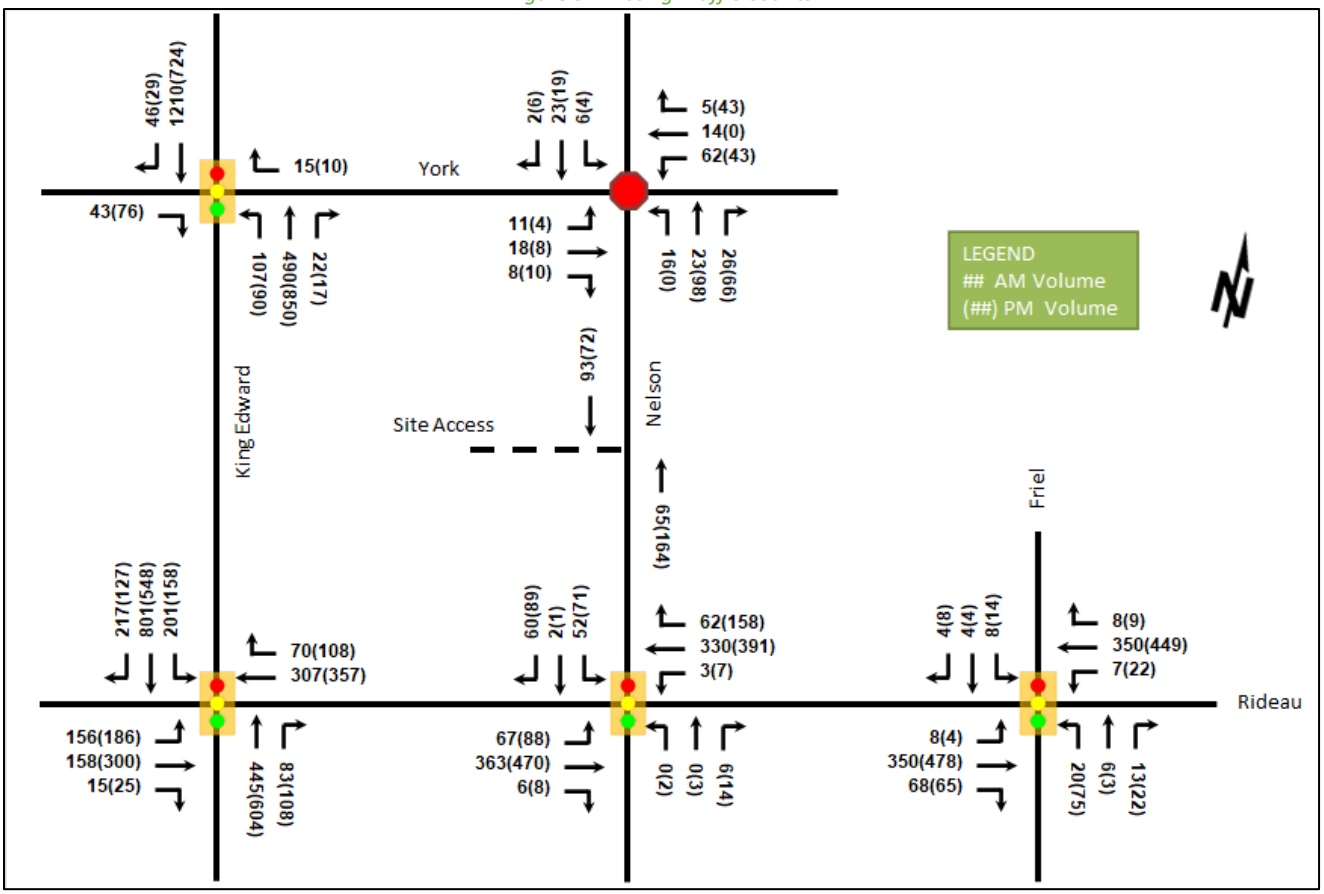


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
York Street at King Edward Avenue *Signalized*	EBR	A	0.03	0.0	0.0	A	0.06	0.1	0.0
	WBR	A	0.03	0.1	0.0	A	0.02	0.1	0.0
	NBL	A	0.19	1.4	0.4	A	0.13	0.8	0.4
	NBT/R	A	0.19	9.9	25.1	A	0.33	11.3	44.9
	SBT(/R)†	A	0.48	13.0	71.4	A	0.39	12.2	59.1
	SBR†	-	-	-	-	A	0.05	2.8	3.5
	Overall	**A**	**0.39**	**11.2**	**-**	**A**	**0.34**	**10.8**	**-**
York Street at Nelson Street *Unsignalized*	EB	A	0.05	7.4	0.8	A	0.03	7.4	0.8
	WB	A	0.11	7.8	3.0	A	0.11	7.7	3.0
	NB	A	0.08	7.4	2.3	A	0.20	8.0	5.3
	SB	A	0.04	7.5	0.8	A	0.04	7.4	0.8
	Overall	**A**	**-**	**7.6**	**-**	**A**	**-**	**7.8**	**-**
Rideau Street at King Edward Avenue *Signalized*	EBL	A	0.48	43.0	53.9	B	0.66	52.6	66.4
	EBT/R	A	0.10	9.1	13.1	A	0.20	11.7	26.0
	WBT/R	A	0.45	31.8	52.2	A	0.58	34.5	66.0
	NBT	B	0.61	40.5	66.9	B	0.70	39.2	87.6
	NBR	A	0.28	2.2	0.0	A	0.37	3.3	0.0
	SBL	D	0.84	68.5	**#78.0**	D	0.83	71.5	**#61.2**
	SBT	C	0.72	33.6	108.1	A	0.46	25.7	65.4
	SBR	A	0.36	12.6	35.8	A	0.22	11.0	21.2
	Overall	**C**	**0.71**	**33.4**	**-**	**C**	**0.79**	**31.9**	**-**
Rideau Street at Nelson Street *Signalized*	EBL	A	0.15	8.5	10.9	A	0.26	9.5	12.8
	EBT	A	0.34	9.0	47.1	A	0.50	12.8	70.8
	EBR	A	0.01	0.0	0.0	A	0.02	0.1	0.0
	WBL	A	0.01	6.7	m0.5	A	0.03	10.3	m1.1
	WBT	A	0.31	7.3	30.6	A	0.50	12.9	39.8
	WBR	A	0.11	1.9	3.1	A	0.56	9.5	8.7
	NB	A	0.01	0.0	0.0	A	0.09	14.6	6.2
	SB	A	0.38	16.2	20.9	B	0.63	29.2	**#40.5**
	Overall	**A**	**0.34**	**8.6**	**-**	**A**	**0.59**	**14.2**	**-**
Rideau Street at Friel Street *Signalized*	EBL/T	A	0.36	5.1	11.3	A	0.48	5.0	23.2
	EBR	A	0.09	0.5	0.3	A	0.13	0.9	m1.0
	WBL/T	A	0.36	10.4	50.9	A	0.49	11.5	72.2
	WBR	A	0.01	0.0	0.0	A	0.02	0.2	0.3
	NB	A	0.12	16.2	10.2	A	0.41	28.5	27.8
	SB	A	0.05	17.6	5.7	A	0.10	20.2	9.1
	Overall	**A**	**0.30**	**7.6**	**-**	**A**	**0.46**	**9.8**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 0.90
m = metered queue
# = queue exceeds storage or mid-block length
†Per Section 2.2.2, curb lane is a SBT/R during AM peak and a transit/right-turn lane during PM peak

During both the AM and PM peak hours, the study area intersections operate well as modelled. Extended queuing is noted on the southbound left movement during both peak hours at the intersection of Rideau Street and King Edward Avenue, and on the southbound movement at the intersection of Rideau Street and Nelson Street.

2.2.8 Collision Analysis

Collision data have been acquired from the City of Ottawa open data website (data.ottawa.ca) for five years prior to the commencement of this TIA for the surrounding study are road network. Table 3 summarizes the collisions

types and conditions in the study area, Figure 10 illustrates the intersections and segments analyzed, and Table 4 summarizes the total collisions for each of these locations. Collision data are included in Appendix D.

Table 3: Study Area Collision Summary, 2015-2019

		Number	%
Total Collisions		99	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	25	25%
	Property Damage Only	74	75%
Initial Impact Type	**Angled**	21	21%
	Rear end	16	16%
	Sideswipe	17	17%
	Turning Movement	17	17%
	SMV Unattended	8	8%
	SMV Other	16	16%
	Other	4	4%
Road Surface Condition	**Dry**	71	72%
	Wet	16	16%
	Loose Snow	6	6%
	Slush	2	2%
	Packed Snow	1	1%
	Ice	3	3%
Pedestrian Involved		11	11%
Cyclists Involved		3	3%

Figure 10: Study Area Collision Records – Representation of 2015-2019

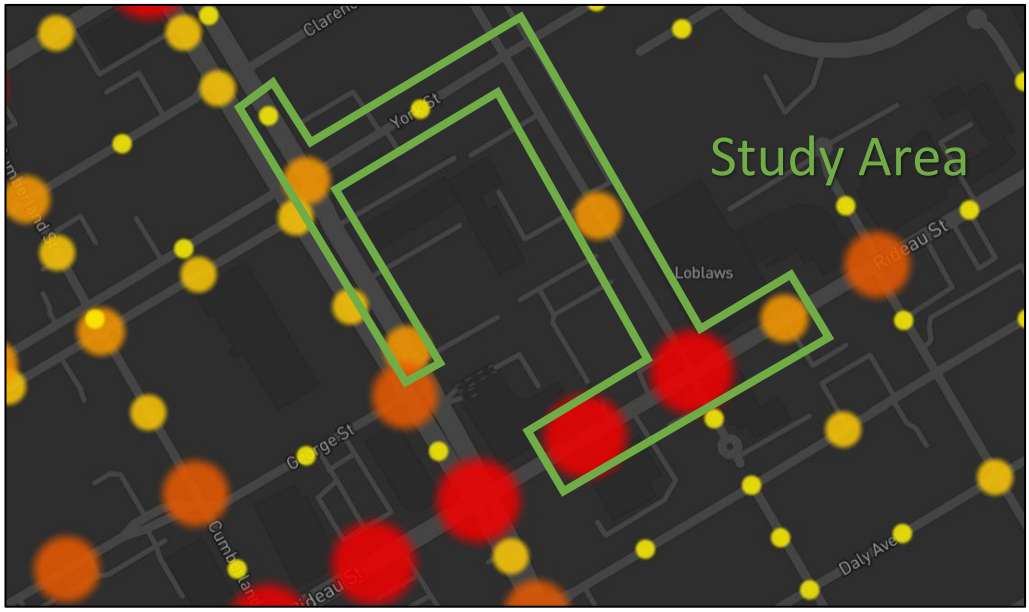


Table 4: Summary of Collision Locations, 2015-2019

Intersections / Segments	Number 99	% 100%
York St @ King Edward Ave	14	14%
Rideau St @ Nelson St	23	23%
King Edward Ave NB between Clarence St & York St	3	3%
King Edward Ave NB between York St & Rideau St	10	10%
Nelson St between York St & Rideau St	11	11%
York St between Turn Lane & Nelson St	1	1%
Rideau St between King Edward Ave & Nelson St	27	27%
Rideau St between Nelson St & Friel St	10	10%

Within the study area, the intersection of Rideau Street at Nelson Street and the segments of Rideau Street between King Edward Avenue and Nelson Street, and Nelson Street between York Street and Rideau Street are noted to have experienced higher collisions than other locations. Table 5, Table 6, and Table 7 summarize the collision types and conditions for each of the Rideau Street and Nelson Street intersection and the segments of Rideau Street between King Edward Avenue and Nelson Street, and Nelson Street between York Street and Rideau Street.

Table 5: Rideau Street at Nelson Street Collision Summary

		Number	%
Total Collisions		**23**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	9	39%
	Property Damage Only	14	61%
Initial Impact Type	**Angle**	1	4%
	Rear end	4	17%
	Sideswipe	4	17%
	Turning Movement	8	35%
	SMV Other	5	22%
	Other	1	4%
Road Surface Condition	**Dry**	19	83%
	Wet	3	13%
	Slush	1	4%
Pedestrian Involved		5	22%
Cyclists Involved		2	9%

The Rideau Street at Nelson Street intersection had a total of 23 collisions during the 2015-2019 time period, with 14 involving property damage only and the remaining nine having non-fatal injuries. The collision types are most represented by turning movement with eight collisions, followed by SMV (other) with five, four each as rear end and sideswipe, and one each as angle and other. It is additionally noteworthy that five collisions involved pedestrians. The City's Cycling Safety Review of High-Volume Intersections (March 2020) completed a review of this intersection for pedestrian and cycling-related observations and movements. The report suggested improvements such as the reduction of the skew on the west leg crosswalk and of the north-south horizontal offset, and the removal of the turn lanes for the inclusion of cycle tracks at the intersection, which may help address a variety of collisions noted at this intersection. Weather conditions do not affect collisions at this location.

Table 6: Rideau Street between King Edward Avenue and Nelson Street Collision Summary

		Number	%
Total Collisions		**27**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	8	30%
	Property Damage Only	19	70%
Initial Impact Type	**Angle**	13	48%
	Sideswipe	3	11%
	Turning Movement	5	19%
	SMV Other	5	19%
	Other	1	4%
Road Surface Condition	**Dry**	21	78%
	Wet	3	11%
	Loose Snow	1	4%
	Slush	1	4%
	Ice	1	4%
Pedestrian Involved		1	4%
Cyclists Involved		1	4%

The segment of Rideau Street between King Edward Avenue and Nelson Street had a total of 27 collisions during the 2015-2019 time period, with 19 involving property damage only and the remaining eight having non-fatal injuries. The collision types are most represented by angle with 13 collisions, followed by turning movement and SMV (other) with five each, sideswipe with three, and other with one. Angle and turning movement collisions may be associated with the convenience store and hotel accesses on the north side of this segment of Rideau Street and the combined drug store/music store access and the gas station access on the south side of the road. Weather conditions do not affect collisions at this location.

Table 7: Nelson Street between York Street and Rideau Street Collision Summary

		Number	%
Total Collisions		**11**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	0	0%
	Property Damage Only	11	100%
Initial Impact Type	**Angle**	3	27%
	Sideswipe	4	36%
	SMV Unattended	4	36%
Road Surface Condition	**Dry**	7	64%
	Wet	2	18%
	Loose Snow	1	9%
	Packed Snow	1	9%
Pedestrian Involved		0	0%
Cyclists Involved		0	0%

The segment of Nelson Street between York Street and Rideau Street had a total of 11 collisions during the 2015-2019 time period, with all 11 involving property damage only. The collision types are most represented by sideswipe and SMV (unattended) with four collisions each, followed by angle with three collisions. SMV (unattended) and sideswipe collisions may be influenced by on-street parking, and angle collisions may be influenced by the private accesses on this segment of Nelson Street. Weather conditions do not affect collisions at this location.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

The subject development is not within a CDP Area and no changes are listed within the Planned Construction Projects portal.

Within the Transportation Master Plan, the Rapid Transit and Transit Priority (RTTP) Network's Network Concept diagram shows a continuous measures transit priority corridor along King Edward Avenue north of Rideau Street, however it is not included in the Affordable Network. Both networks include a continuous measures transit priority corridor along Rideau Street and an isolated measures transit priority corridor along Murray Street and St. Patrick Street north of the study area.

2.3.2 Other Study Area Developments

261-277 King Edward Avenue, 260 Murray Street

The proposed development application includes a site plan for the construction of a mixed-use building comprising 23 residential dwelling units and 5,500 ft^2 of retail space. The expected build-out date is unknown, and the development is anticipated to generate only a marginal traffic increase. (Novatech, 2016)

216 Murray Street

The proposed development application includes a zoning by-law amendment to permit the construction of an eight-storey, 48-unit mixed-use supportive housing development. A memo is included with the application addressing development design elements only. (WSP, 2021)

250 Besserer Street

The proposed development application includes a site plan for the construction of a residential building comprising 99 units. The development is anticipated to be built out in 2021 and to generate 10 new AM and PM peak hour two-way auto trips. (CGH, 2019)

110 York Street, 137 George Street

The proposed development application includes a zoning by-law amendment to permit the expansion of a proposed hotel by 128 rooms. The development is anticipated to be built out in 2021 and to generate 31 new AM and 36 new PM peak hour two-way auto trips. (Novatech, 2018)

141 George Street

The proposed development application includes a site plan for a temporary surface parking lot. No TIA is available for this development.

3 Study Area and Time Periods

3.1 Study Area

The study area will include the intersections of:

- York Street at:
  - King Edward Avenue
  - Nelson Street
- Rideau Street at:
  - King Edward Avenue
  - Nelson Street
  - Friel Street

The boundary road will be Nelson Street, and TRANS Screenline SL37, while not reviewed within this report, is within proximity to the site along King Edward Avenue.

3.2 Time Periods

As the proposed development is composed entirely of residential units the AM and PM peak hours will be examined.

3.3 Horizon Years

The anticipated build-out year is 2024. As a result, the full build-out plus five years horizon year is 2029.

4 Exemption Review

Table 8 summarizes the exemptions for this TIA.

Table 8: Exemption Review

Module	Element	Explanation	Exempt/Required
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans	Required
	4.2.3 New Street Networks	Only required for plans of subdivision	Exempt
4.2 Parking	4.2.1 Parking Supply	Only required for site plans	Required
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Required
Network Impact Component			
4.5 Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Required
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Required
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Exempt

5 Development-Generated Travel Demand

5.1 Trip Generation and Mode Shares

This TIA has been prepared using the vehicle and person trip rates for the residential building using the TRANS Trip Generation Study Report (2009). Table 9 summarizes the person trip rates for the proposed land use.

Table 9: Trip Generation Person Trip Rates

Dwelling Type	Land Use Code	Peak Hour	Vehicle Trip Rate	Person Trip Rates
High-rise Apartments	222 (TRANS)	AM	0.24	0.65
		PM	0.27	0.68

Using the above Person Trip rates, the total person trip generation has been estimates. Table 10 below illustrates the total person trip generation for the high-rise apartment dwelling type.

Table 10: Total Person Trip Generation

Land Use	Units / GFA	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
High-rise Apartments	322	50	159	209	136	83	219

Using the most recent National Capital Region Origin-Destination survey (OD Survey), the existing mode shares for Ottawa Inner have been determined and compared to various modes share breakdowns identified by City Staff as potential interpretations of the data.

The development is proposing only ten vehicle spaces for tenants and six for visitors, thereby limiting the opportunity for auto trips, but is also looking to convert up to four tenant spaces to carshare spaces, is including nine scooter or e-bike spaces, and is proposing secure bicycle parking at one space per unit as Transportation Demand Management (TDM) measures. The development is also situated approximately 120 metres walk from Rideau Street which has a high density of supportive land uses, including a large grocery store at the corner of Rideau Street and Nelson Street, and continuous lanes transit priority connecting to Rideau Station on the Confederation LRT line which is additionally 900 metres-walk from the development. Given the foregoing, a unique mode share breakdown is additionally presented for the development. Table 11 summarizes these modal shares.

Table 11: Mode Shares

Travel Mode	Ottawa Inner (average)	Ottawa Inner (AM from/within)	Ottawa Inner (PM to/within)	Proposed Site Shares
Auto Driver	40%	35%	35%	10%
Auto Passenger	10%	10%	10%	10%
Transit	25%	20%	20%	35%
Cycling	5%	5%	5%	5%
Walking	20%	30%	30%	40%
Total	**100%**	**100%**	**100%**	**100%**

Using the above Proposed Site mode share targets for the subject development and the person trip rates the person trips by mode have been projected. Table 12 summarizes the trip generation by mode.

Table 12: Trip Generation by Mode

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Auto Driver	10%	5	16	21	14	8	22
Auto Passenger	10%	5	16	21	14	8	22
Transit	35%	18	56	73	48	29	77
Cycling	5%	3	8	10	7	4	11
Walking	40%	20	64	84	54	33	88
Total	**100%**	**50**	**159**	**209**	**136**	**83**	**219**

As shown above, 21 AM and 22 PM new peak hour two-way vehicle trips are projected as a result of the proposed development.

5.2 Trip Distribution

To understand the travel of the subject development, the OD Survey has been reviewed to determine the district residential travel patterns which were then applied based on the build-out of Ottawa Inner. Table 13 below summarizes the distributions.

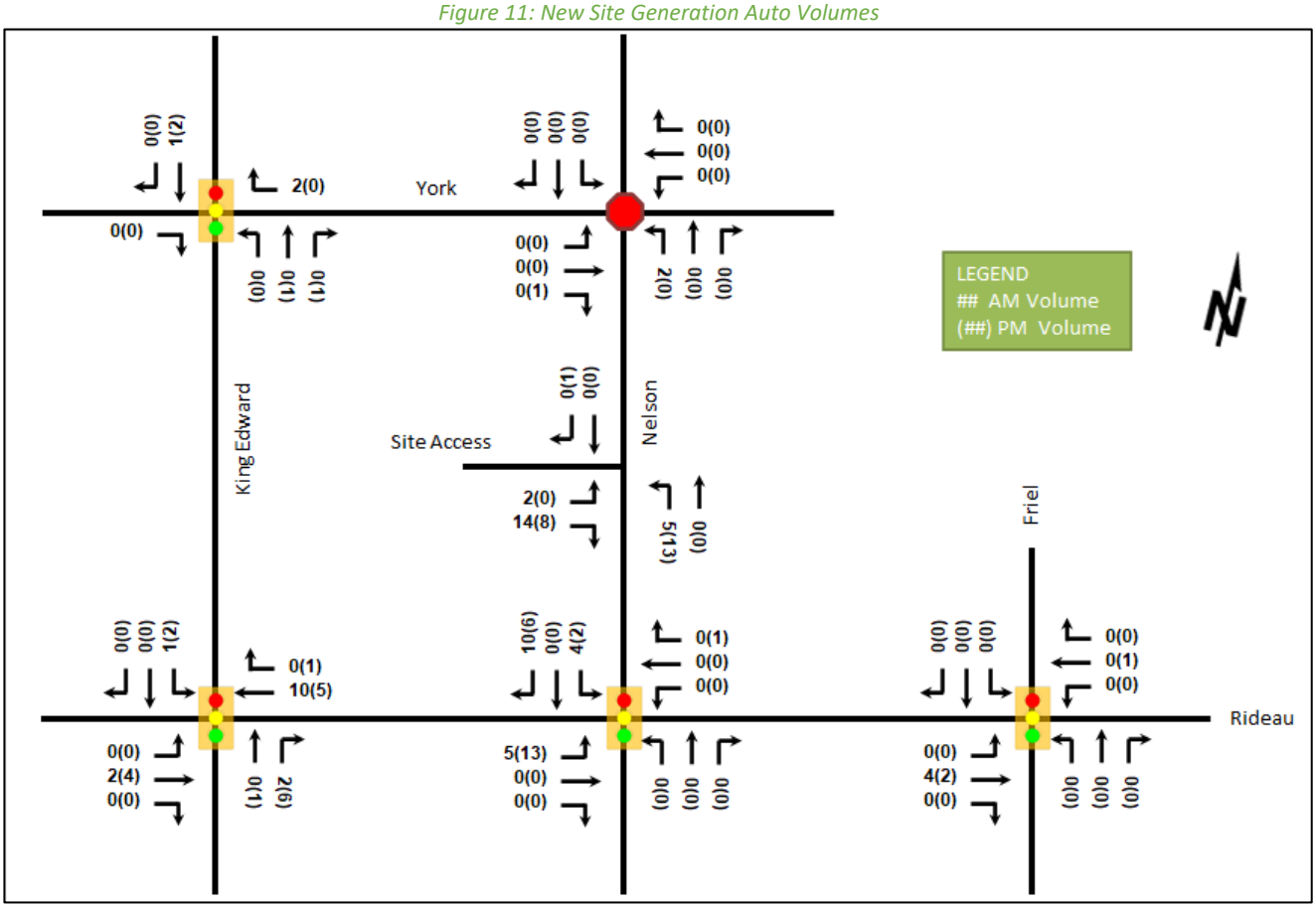
Table 13: OD Survey Distribution – Ottawa Inner

To/From	Residential % of Trips	Inbound Via	Outbound Via
North	10%	King Edward Ave	King Edward Ave
South	40%	King Edward Ave	25% Rideau St(W), 15% Rideau St (E)
East	10%	Rideau St	Rideau St
West	40%	10% King Edward Ave (S), 30% Rideau St	Rideau St
Total	**100%**	-	-

5.3 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the study area road network. Figure 11 illustrates the new site generated volumes.

Figure 11: New Site Generation Auto Volumes



6 Background Network Travel Demands

6.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3. None of the projects listed are expected to occur within the TIA horizons or to have any notable impact on the study area traffic volumes and travel patterns.

6.2 Background Growth

A review of the background projections from the City's TRANS Regional Model for the 2011 and 2031 horizons was completed to determine the background growth for each of the study area roadways. Table 14 summarizes the results of the model, and the projections are provided in Appendix E.

Table 14: TRANS Regional Model Projections – Study Area Growth Rates

Street	Direction Growth % from 2011 to 2031		Direction Growth % from 2011 to Existing	
	Eastbound	Westbound	Eastbound	Westbound
Rideau St	0.61%	0.50%	-5.63%	-4.49%
	Northbound	**Southbound**	**Northbound**	**Southbound**
King Edward Ave	0.16%	0.53%	-3.29%	-5.65%

A review of the 2011 and 2031 TRANS model horizons anticipated that a slight increase in network volumes would be observed in the area. Noting discrepancy from these forecasted trends through the examination of the existing volumes, it was concluded that a comparison of the existing volumes to the TRANS 2011 horizon was required to determine the extent of the historic trends. The last columns of Table 14 summarize this growth, showing a significant decrease in volumes on the study area arterials. As such, no background growth will be applied to the study area roadways.

6.3 Other Developments

As the only active files with TIAs and non-negligible traffic generation within the study area, the background developments explicitly considered in the background conditions (Section 6.2) include:

- 250 Besserer Street
- 110 York Street, 137 George Street

Both of these developments are anticipated to be completed prior to 2024 and are included in the background volumes in Section 7.1. The background development volumes within the study area have been provided in Appendix F.

7 Demand Rationalization

7.1 2024 and 2029 Future Background Operations

Figure 12 illustrates the 2024 and 2029 background volumes and Table 15 summarizes the 2024 and 2029 background intersection operations. The level of service for signalized intersections is based on HCM 2010 v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and HCM average delay for unsignalized intersections. The synchro worksheets for the 2024 and 2029 future background horizon are provided in Appendix G.

Figure 12: 2024 and 2029 Future Background Volumes

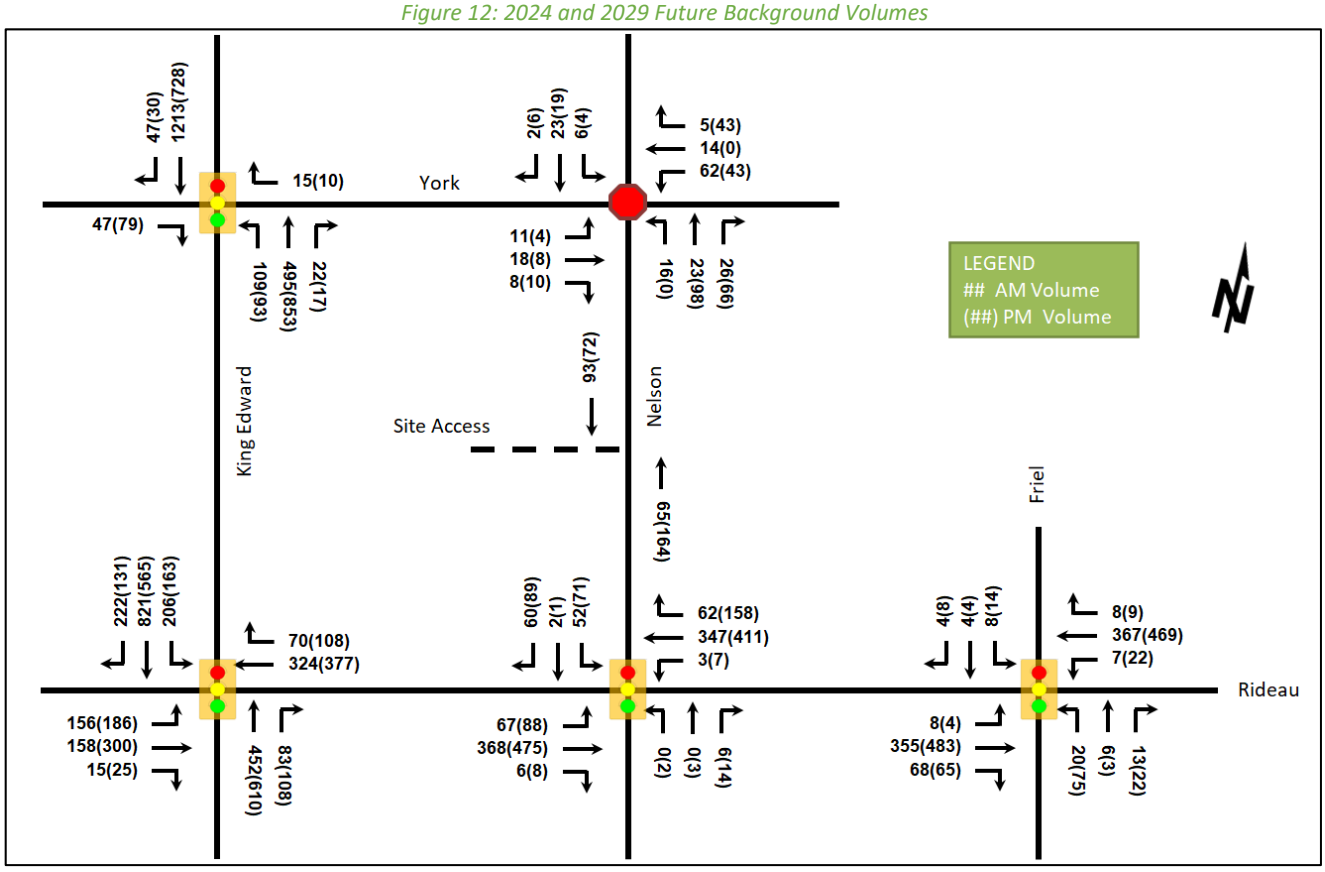


Table 15: 2024 and 2029 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
York Street at King Edward Avenue *Signalized*	EBR	A	0.03	0.0	0.0	A	0.05	0.1	0.0
	WBR	A	0.03	0.1	0.0	A	0.02	0.1	0.0
	NBL	A	0.17	1.1	0.4	A	0.11	0.7	0.3
	NBT/R	A	0.18	9.8	22.7	A	0.30	11.0	39.9
	SBT(/R)†	A	0.43	12.4	62.4	A	0.36	11.8	52.4
	SBR†	-	-	-	-	A	0.04	2.6	3.1
	Overall	**A**	**0.35**	**10.7**	-	**A**	**0.28**	**10.1**	-
York Street at Nelson Street *Unsignalized*	EB	A	0.04	7.3	0.8	A	0.03	7.3	0.8
	WB	A	0.10	7.8	2.3	A	0.10	7.6	2.3
	NB	A	0.07	7.4	1.5	A	0.18	7.8	4.5
	SB	A	0.04	7.4	0.8	A	0.03	7.4	0.8
	Overall	**A**	-	**7.5**	-	**A**	-	**7.7**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Rideau Street at King Edward Avenue *Signalized*	EBL	A	0.44	41.8	49.2	A	0.59	49.6	60.0
	EBT/R	A	0.09	9.0	11.8	A	0.18	11.5	23.4
	WBT/R	A	0.43	31.3	48.8	A	0.54	33.6	61.3
	NBT	A	0.56	39.3	61.0	B	0.63	37.4	78.7
	NBR	A	0.25	1.9	0.0	A	0.34	2.8	0.0
	SBL	C	0.74	55.3	**#63.0**	B	0.70	54.7	**#48.4**
	SBT	B	0.66	32.0	97.7	A	0.43	25.1	60.2
	SBR	A	0.33	12.3	32.8	A	0.21	10.9	19.8
	Overall	**B**	**0.65**	**31.4**	-	**B**	**0.70**	**29.9**	-
Rideau Street at Nelson Street *Signalized*	EBL	A	0.12	8.1	9.6	A	0.22	8.9	11.7
	EBT	A	0.31	8.7	42.2	A	0.45	11.5	62.5
	EBR	A	0.01	0.0	0.0	A	0.02	0.1	0.0
	WBL	A	0.01	6.7	m0.6	A	0.02	10.1	m1.0
	WBT	A	0.30	7.2	29.0	A	0.48	12.6	37.4
	WBR	A	0.10	2.0	3.0	A	0.50	8.0	7.6
	NB	A	0.01	0.0	0.0	A	0.08	15.1	5.9
	SB	A	0.35	15.9	19.3	A	0.57	25.6	34.5
	Overall	**A**	**0.31**	**8.4**	-	**A**	**0.50**	**13.0**	-
Rideau Street at Friel Street *Signalized*	EBL/T	A	0.33	4.8	9.6	A	0.44	4.8	21.1
	EBR	A	0.08	0.5	0.2	A	0.12	0.8	m0.8
	WBL/T	A	0.33	10.2	47.3	A	0.46	11.0	66.1
	WBR	A	0.01	0.0	0.0	A	0.02	0.1	0.1
	NB	A	0.11	16.0	9.5	A	0.37	27.1	25.4
	SB	A	0.04	17.4	5.5	A	0.09	20.1	8.4
	Overall	**A**	**0.28**	**7.5**	-	**A**	**0.43**	**9.3**	-

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00
m = metered queue
# = queue exceeds storage or mid-block length
†Per Section 2.2.2, curb lane is a SBT/R during AM peak and a transit/right-turn lane during PM peak

During both the AM and PM peak hours, the study area intersections operate well and similarly to existing conditions. No capacity issues are noted.

7.2 Modal Share Sensitivity and Demand Rationalization Conclusions

Given that no capacity constraints have been identified within the study area, increases in site-generated traffic from forecasted through failure to meet the target mode shares are not anticipated to have to impact the study area intersections. Therefore, no rationalization for adjusted demand is required for this TIA.

8 Development Design

8.1 Design for Sustainable Modes

The proposed development is a residential building with the main entrance and parking garage entrance located on the Nelson Street frontage. A hard surface connection is proposed from the main entrance to the sidewalk on Nelson Street. Bicycles are proposed as accessing the parking garage ramp to three secure bicycle storage rooms on the parking level.

8.2 Circulation and Access

Garbage collection is proposed as taking place on Nelson Street, and emergency services are proposed as accessing the site via the Nelson Street frontage, without circulating the site parking facilities via the ramp.

9 Parking

9.1 Parking Supply

The site proposes ten vehicle parking spaces for residents, six vehicle parking spaces for guests, and 322 bicycle parking spaces, all located below ground. The site additionally proposes the inclusion of nine scooter or e-bike spaces and the potential for up to four carshare spaces, each below ground.

From the zoning by-law, the required parking for the proposed site is 140 vehicle spaces for tenants, 30 vehicle spaces for visitors and 161 bicycle spaces.

The proposed parking is under the by-law requirement of 140 and the reduced parking spaces will serve as a TDM measure for the site.

9.2 Spillover Parking

As the proposed parking provision is more than 15% below that prescribed by the by-law, spillover parking should be considered. The zoning by-law prescribes 140 parking spaces for tenants and the site plan proposes 10 spaces for tenants, leaving 130 spaces fewer than otherwise required.

9.2.1 Site Design and Tenant Factors

A number of mitigating factors are present within the proposed development, however, chief among them will be the composition of the tenancy, and the marketing of units as not to have access to parking. Another mitigating factor includes the site's context of being 120 metres-walk from Rideau Street, which includes a transit priority corridor and a high density of supportive land uses. Rideau Station on the Confederation LRT line is 900 metres-walk from the building entrance.

The building is marketed to prospective tenants who work in the market, attend school nearby, or generally have an urban lifestyle. Furthermore, making these prospective tenants aware that they will have no parking space early in the process of engagement will select for tenants who do not require regular use of a car, especially given the availability of scooter and e-bike parking, the potential for carshare onsite, and the proximity to transit. Only a minority of prospective tenants with vehicles might proceed to lease a unit with no access to parking and, coupled with the low rate of personal auto access, the resultant overall potential for spillover parking will be low.

9.2.2 Local Area Parking Studies

Notwithstanding the site and tenant factors reducing the likelihood of spill over parking, a review the adjacent parking conditions and area parking studies was completed to gain an understanding of the residual capacity in the area. It is noted that no parking surveys could be completed during the current pandemic and a desktop review was completed.

On-street parking on Nelson Street, York Street east of Nelson Street, is restricted to one hour, and York Street is within a parking permitting area. On-street parking on York Street west of Nelson Street is restricted to two hours. On-street parking on King Edward Avenue is restricted to one hour on the east side with no stopping during the weekday PM peak period, and to three hours on the west side with no stopping during both weekday peak periods. On-street parking on Rideau Street is restricted to two hours, with no stopping during the weekday peak periods. Three-hour on-street parking is permitted on Murray Street east of King Edward Avenue.

The parking restrictions for all but Murray Street are considered to discourage their use as spillover parking for the site users. Furthermore, within the immediate site context, private paid off-street parking is available to the public within the Loblaws grocer across the street from the site, and within a surface lot that shares the north and much of the west property lines of the building.

No local area parking studies are available for the immediate project area but are available for several areas within 400 metres-walk of the site. The ByWard Market Local Area Parking Study (LAPS) was completed in 2011 for an area north of George Street and west of King Edward Avenue, and the Downtown Rideau Local Area Parking Study (LAPS) was completed in 2011 for an area south of George Street and west of King Edward Avenue. The Downtown Rideau LAPS found an average occupancy rate of 57%, a peak occupancy rate of 77%, and an average duration of 2.9 hours within its study area, notably with a peak on-street parking occupancy rate of over 100%. The Byward Market LAPS found an average occupancy rate of 61%, a peak occupancy rate of 84%, and an average duration of 3.0 hours within its study area, notably with a peak on-street parking occupancy rate of over 91%. Some residual parking capacity may be available to site-generated autos in the off-street parking facilities in these study areas.

Should the adjacent community remain concerned with the potential spillover parking, it is recommended through the public consultation process that further permitting areas can be created to assist in area enforcement or signed parking be modified to further restrict parking beyond the existing stipulations. It should be noted, however, that these measures are not without impact on the residents of the concerned community and should be considered when discussing with City Staff and the Ward Councillor.

10 Boundary Street Design

Table 16 summarizes the MMLOS analysis for the boundary streets of Nelson Street. The existing and future conditions for both streets will be the same and are considered in one row. The boundary street analysis is based on the policy area of "Within 300m of a school" as the segment of Nelson Street analyzed is within this distance of York Street Public School. The MMLOS worksheets has been provided in Appendix H.

Table 16: Boundary Street MMLOS Analysis

Segment	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target
Nelson Street	C	A	D	D	-	-	-	-

Nelson Street does not meet the pedestrian LOS targets given the high target set by the policy area of being within 300 metres of a school. To meet this target, a boulevard of 0.5-to-2.0 metres would need to be introduced within the cross-section. Given the relatively short site frontage of approximately 18.5 metres and the context of the existing facilities, implementing this treatment would be considered inappropriate and the existing facilities are considered adequate.

11 Access Intersections Design

11.1 Location and Design of Access

The development proposes access to Nelson Street via a full-moves two-way access. The two-way access is proposed being approximately 6.5 metres-wide and proposes a cycle-friendly 6% grade on the ramp. The westbound lane is proposed as being separated from the adjacent property line by approximately 20 centimetres.

From the private approach by-law, a setback of three metres from an adjacent property line is required, for which an exemption would be required.

11.2 Intersection Control

The site access is proposed as being stop-controlled on its approach with Nelson Street operating under free-flow conditions.

11.3 Access Intersection Design

11.3.1 2024 and 2029 Future Total Access Intersection Operations

The 2024 and 2029 future total intersection volumes are illustrated in Figure 13 and the access intersection operations are summarized below in Table 17. The level of service is based on HCM average delay for unsignalized intersections. The synchro worksheets have been provided in Appendix I.

Figure 13: 2024 and 2029 Future Total Volumes

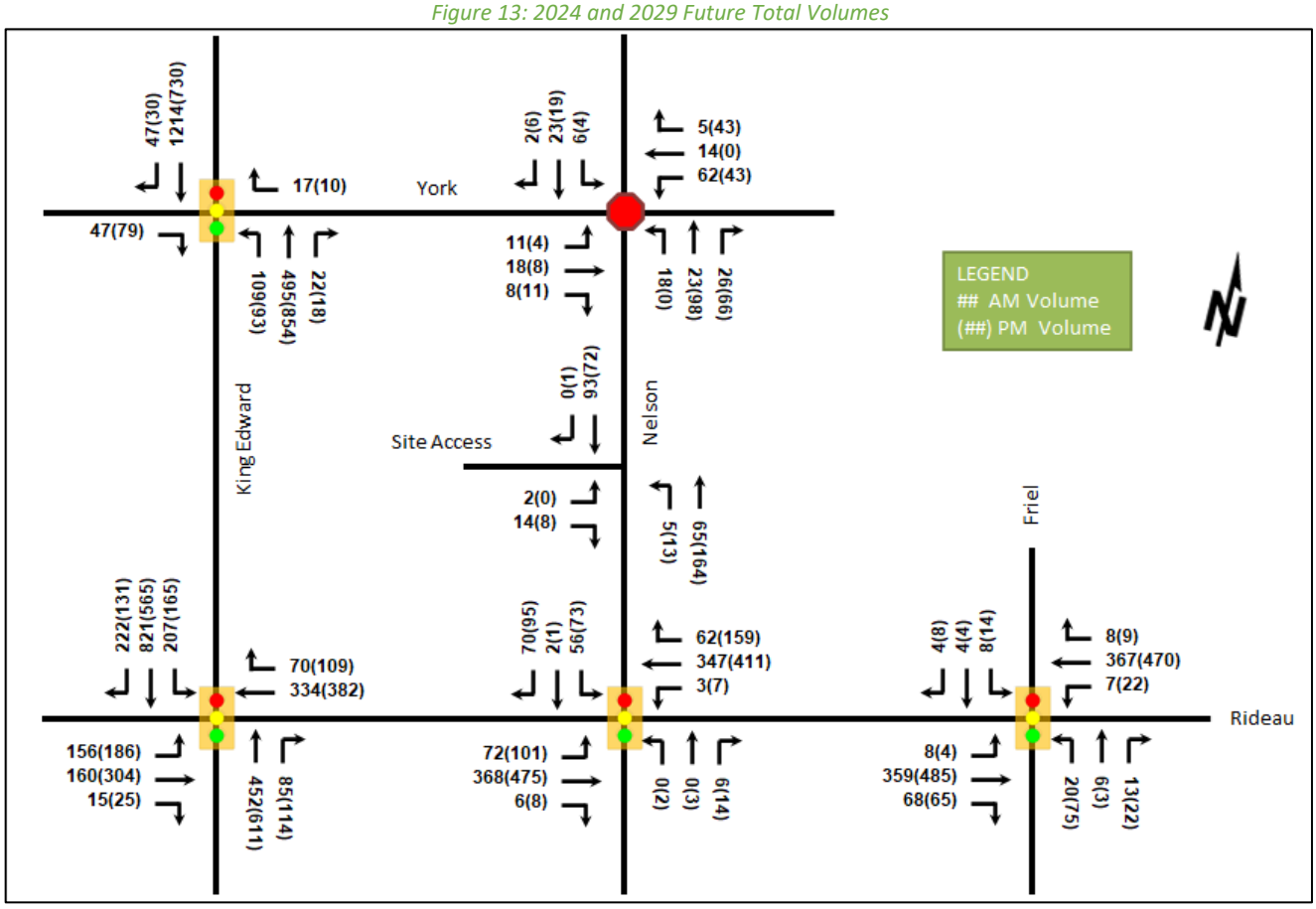


Table 17: 2024 and 2029 Future Total Access Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Site Access and Nelson Street *Signalized*	EBL/R	A	0.02	8.9	0.8	A	0.01	8.7	0.0
	NBL/T	A	0.00	7.4	0.0	A	0.01	7.4	0.0
	SBT/R	-	-	-	-	-	-	-	-
	Overall	**A**	**-**	**1.0**	**-**	**A**	**-**	**0.6**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00
m = metered queue
# = queue exceeds storage or mid-block length

The access intersection at the 2024 and 2029 future total horizon operates well. No capacity issues are noted.

11.3.2 Access Intersection MMLOS

As the access intersection is not signalized, no access intersection MMLOS analysis has been conducted.

11.3.3 Recommended Design Elements

The site would require an exemption to the private approach by-law based upon the distance from the driveway to the adjacent property line.

12 Transportation Demand Management

12.1 Context for TDM

The mode shares used within the TIA represent a shift from auto modes to transit and walking modes. Given the characteristics of the residents discussed within Section 5.1, the modal shares are likely to be achieved and strong supporting TDM measures should be provided to ensure this outcome.

The subject site is not within a design priority area and no age restrictions are noted. The total bedroom count within the development is 386 across 290 bachelor or on-bedroom units and 32 three bedroom units.

12.2 Need and Opportunity

The subject site has been assumed to rely predominantly on active modes and transit based upon the proximity to supportive land uses and high order transit. The increase in these sustainable modes was additionally arrived at by the composition of the tenancy having a low level of access to personal auto travel. The study area intersections are anticipated to have residual capacity and the increase in sustainable modes is considered achievable.

12.3 TDM Program

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

- Display area walking, cycling, and transit maps with route schedules
- Provide a multimodal travel option information package to new residents
- Provide a permanent bicycle repair station adjacent to secure bicycle parking area
- Contract with provider to install on-site bikeshare (or other micromobility, e.g. scooter) station
- Contract with provider to install on-site carshare vehicles and promote their use by residents
- Inclusion of a 1-year Presto card for first time new apartment rental, with a set time frame for this offer (e.g. 6-months) from the initial opening of the site
- Unbundle parking cost from purchase or rental cost

13 Neighbourhood Traffic Management

The proposed development will connect to the arterial road network at Rideau Street via Nelson Street (a local road) and King Edward Avenue via Nelson Street and York Street (a local road) except during the PM peak hour where the outbound link is broken by turn restrictions. The TIA guidelines outline a volume threshold for road classifications for local roads of 120 vehicles per peak hour, which from City guidance are to be interpreted as two-way volumes.

Projected two-way volumes at the existing and 2024 and 2029 future background horizons on York Street east of King Edward Street are 37 vehicles in the AM peak hour and 27 vehicles in the PM peak hour. The site is anticipated to add two vehicles to this roadway in the AM peak hour and one vehicle in the PM peak hour. York Street is anticipated to be below and remain below the local road classification thresholds with the addition of site traffic.

Existing two-way volumes and projected two-way volumes at the 2024 and 2029 future background horizons on Nelson Street north of Rideau Street are 243 in the AM peak hour and 410 during the PM peak hour. The site is anticipated to add 19 two-way vehicles to this section of roadway during the AM peak hour (approximately 7% of the total volumes) and 22 two-way vehicles in the PM peak hour (approximately 5% of the total volumes).

The thresholds for roadway classification from the TIA guidelines are too low when considered as two-way volumes and are even typically too low when considered as one-way volumes when compared to the City's inventory of roads by their existing classifications. One-way volumes on Nelson Street, for example, are between one-and-a-half to two times the thresholds for local road classification considered to be two-way volumes. Given the high existing volumes and the low volumes for the projected site traffic, no change to the function or classification of Nelson Street is anticipated from the addition of site traffic.

14 Transit

14.1 Route Capacity

In Section 5.1 the trip generation by mode was estimated, including an estimate of the number of transit trips that will be generated by the proposed development. Table 18 summarizes the transit trip generation.

Table 18: Trip Generation by Transit Mode

Travel Mode	Mode Share	AM Peak Period			PM Peak Period		
		In	Out	Total	In	Out	Total
Transit	35%	18	56	73	48	29	77

The proposed development is anticipated to generate an additional 73 AM peak hour transit trips and 77 PM peak hour transit trips. Of these trips, 56 outbound AM trips and 48 inbound PM trips are anticipated. From the trip distribution found in Section 5.2, these values can be further broken down.

Site-generated outbound AM trips break down to six trips to each the north and east, and 22 trips to each the south and west. Site-generated inbound PM trips break down to five trips from each the north and east, and 19 trips from each the south and west.

Given the frequency of the area routes, northbound and eastbound routes should accommodate these additional trips without service changes. Trips bound for the south and west, or for the university, would be accommodated largely by the LRT, by the six routes that connect to Rideau Station, or by a combination of these, where given the number and frequencies of these routes, is not anticipated to require changes in existing service. The route #56 may be especially impacted by increases in ridership, however, and increases in ridership from site-generated trips may require the substitution of a higher capacity bus (i.e. an articulated bus in place of a standard bus) or possibly two per peak hour, depending on favourability of this route over the others.

14.2 Transit Priority

The site does not propose a driveway onto the Rideau Street transit priority corridor. No delays or other impacts from site turning movements are anticipated to affect transit priority or transit level of service.

15 Network Intersection Design

15.1 Network Intersection Control

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

15.2 Network Intersection Design

15.2.1 2024 and 2029 Future Total Network Intersection Operations

The 2024 and 2029 future total network intersection operations are summarized below in Table 19. The level of service for signalized intersections is based on HCM 2010 v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection, and HCM average delay for unsignalized intersections. The synchro worksheets have been provided in Appendix I.

Table 19: 2024 and 2029 Future Total Network Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
York Street at King Edward Avenue *Signalized*	EBR	A	0.03	0.0	0.0	A	0.05	0.1	0.0
	WBR	A	0.03	0.1	0.0	A	0.02	0.1	0.0
	NBL	A	0.17	1.1	0.4	A	0.12	0.8	0.3
	NBT/R	A	0.18	9.8	22.7	A	0.30	11.0	40.0
	SBT(/R)†	A	0.43	12.4	62.4	A	0.36	11.8	52.6
	SBR†	-	-	-	-	A	0.04	2.6	3.1
	Overall	**A**	**0.35**	**10.7**	**-**	**A**	**0.28**	**10.1**	**-**
York Street at Nelson Street *Unsignalized*	EB	A	0.08	7.4	1.5	A	0.18	7.8	4.5
	WB	A	0.04	7.3	0.8	A	0.03	7.3	0.8
	NB	A	0.10	7.8	2.3	A	0.10	7.6	2.3
	SB	A	0.04	7.4	0.8	A	0.03	7.4	0.8
	Overall	**A**	**-**	**7.5**	**-**	**A**	**-**	**7.7**	**-**
Rideau Street at King Edward Avenue *Signalized*	EBL	A	0.44	41.8	49.2	A	0.59	49.6	60.0
	EBT/R	A	0.09	9.1	12.0	A	0.19	11.5	23.6
	WBT/R	A	0.43	31.5	50.1	A	0.55	33.7	62.2
	NBT	A	0.56	39.3	61.0	B	0.63	37.4	78.8
	NBR	A	0.26	1.9	0.0	A	0.37	3.3	0.0
	SBL	C	0.74	55.6	**#63.5**	C	0.71	55.5	**#49.4**
	SBT	B	0.66	32.0	97.7	A	0.43	25.1	60.2
	SBR	A	0.33	12.3	32.8	A	0.21	11.0	19.8
	Overall	**B**	**0.65**	**31.4**	**-**	**C**	**0.71**	**29.9**	**-**
Rideau Street at Nelson Street *Signalized*	EBL	A	0.16	8.6	10.6	A	0.27	9.5	13.1
	EBT	A	0.34	9.2	42.2	A	0.45	11.5	62.5
	EBR	A	0.01	0.0	0.0	A	0.02	0.1	0.0
	WBL	A	0.01	6.7	m0.6	A	0.02	10.1	m1.0
	WBT	A	0.32	7.7	29.0	A	0.48	12.6	37.4
	WBR	A	0.10	2.1	3.0	A	0.53	8.9	7.7
	NB	A	0.01	0.0	0.0	A	0.08	15.1	5.9
	SB	A	0.38	15.7	20.7	B	0.61	27.8	37.1
	Overall	**A**	**0.32**	**8.9**	**-**	**A**	**0.52**	**13.4**	**-**
Rideau Street at Friel Street *Signalized*	EBL/T	A	0.33	4.9	10.1	A	0.44	4.8	21.4
	EBR	A	0.09	0.5	0.3	A	0.12	0.8	m0.7
	WBL/T	A	0.34	10.2	47.3	A	0.46	11.0	66.3
	WBR	A	0.01	0.0	0.0	A	0.02	0.1	0.1
	NB	A	0.11	16.0	9.5	A	0.37	27.1	25.5
	SB	A	0.04	17.4	5.5	A	0.09	20.1	8.4
	Overall	**A**	**0.28**	**7.5**	**-**	**A**	**0.43**	**9.3**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
PHF = 1.00
m = metered queue
# = queue exceeds storage or mid-block length
†Per Section 2.2.2, curb lane is a SBT/R during AM peak and a transit/right-turn lane during PM peak

During both the AM and PM peak hours, the study area intersections at the 2024 and 2029 future total horizon operate well and similarly to 2024 and 2029 future background conditions. No new capacity issues are noted.

15.2.2 Network Intersection MMLOS

Table 20 summarizes the MMLOS analysis for the network intersections of York Street at King Edward Avenue and Rideau Street at King Edward Avenue, Rideau Street at Nelson Street, and Rideau Street at Friel Street. The existing and future conditions for the intersections will be the same and are considered in one row. The intersection analysis is based on the land use designation "Central Area" for the intersections of York Street at King Edward Avenue and Rideau Street at King Edward Avenue, and on the policy area of "Within 300m of a school" for the intersections of Rideau Street at Nelson Street and Rideau Street at Friel Street, as each are within this distance of York Street Public School. The MMLOS worksheets has been provided in Appendix H.

Table 20: Study Area Intersection MMLOS Analysis

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
York Street at King Edward Avenue	F	A	F	B	C	D	-	-	B	E
Rideau Street at King Edward Avenue	F	A	F	D	E	C	A	D	C	E
Rideau Street at Nelson Street	E	A	E	D	C	C	-	-	B	E
Rideau Street at Friel Street	D	A	E	D	C	C	-	-	A	E

The MMLOS targets will not be met for the pedestrian and bicycle LOS at all study area intersections, and transit LOS at the intersection of Rideau Street and King Edward Avenue.

To meet pedestrian LOS targets, the maximum crossing distance on all pedestrian crossings would need to be reduced to two lane-widths.

Bicycle LOS is limited by the mixed-flow left-turn conditions and would require two-stage left turns or bike boxes on all approaches that permit left turns. Bicycle LOS is also limited by the mixed-flow right-turn conditions at the intersection of Rideau Street and King Edward Avenue, and would require separated facilities on the north and southbound approaches on King Edward Avenue.

Transit LOS at the intersection of Rideau Street and King Edward Avenue is limited by delays on the northbound, southbound and westbound approaches, which would need to be below 20 seconds to meet targets.

15.2.3 Recommended Design Elements

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

16 Summary of Improvements Indicated and Modifications Options

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

Proposed Site and Screening

- The proposed site includes 322 apartment units
- Accesses will be provided to Nelson Street via a full-moves access
- The development is proposed to be completed as a single phase by 2024
- The Trip Generation and Safety triggers were met for the TIA Screening

- This report supports a site plan application

Existing Conditions

- King Edward Avenue and Rideau Street are arterial roads in the study area
- Sidewalks are provided on both sides of the study area roadways, a curbed bike lane is on Cumberland Street and bike lanes are on Stewart Street and Wilbrod Street
- St. Patrick Street, Murray Street, Stewart Street, Wilbrod Street, and Cumberland Street south of St. Andrew Street are spine routes. York Street, Beausoleil Drive, Laurier Street, Cumberland Street north of St. Andrew Street and Chapel Street are local routes. Stewart Street east of Cumberland Street, Wilbrod Street, and Cumberland Street south of Stewart Street are cross-town bikeways, and Cumberland Street north of Guigues Avenue is a neighbourhood bikeway
- The high volumes roadways have produced a high number of collisions at the study area intersections, primarily at the Rideau Street at Nelson Street intersection, and on Rideau Street between King Edward Avenue and Nelson Street
- The collisions are predominantly SMV other, rear end, and sideswipe indicating that they are a result of congestion
- Collisions on Rideau Street between King Edward Avenue and Nelson Street were largely angle collisions, likely influenced by the private accesses onto the roadway
- Some queueing is noted on the southbound left movement at the Rideau Street at King Edward Avenue intersection, but the study area intersections generally operate well

Development Generated Travel Demand

- The proposed development is forecasted produce 209 two-way people trips during the AM peak hour and 219 two-way people trips during the PM peak hour
- Of the forecasted people trips, 21 two-way trips will be vehicle trips during the AM peak hour and 22 two-way trips will be vehicle trips during the PM peak hour based on a 10% auto mode share target
- Of the forecasted auto trips, 10% are anticipated to travel each north and east, and 40% to travel each west and south

Background Conditions

- Through examining historical trends for the study area roadways, no growth was identified in or applied to the network
- The background developments were explicitly included in the background conditions
- All study area intersections will operate similarly to the existing conditions

Development Design

- The bike and auto parking areas are to be located underground
- Pedestrian connections will be made from the building entrance to Nelson Street
- Emergency vehicles and garbage collection vehicles are anticipated to access the Nelson Street frontage, and not to circulate the site

Parking

- Ten vehicle spaces for residents, six for visitors are proposed, along with 322 bicycle spaces, nine scooter or e-bike spaces, and potentially up to four carshare spaces

- Required tenant parking from the zoning by-law is not being met
- Mitigating factors such as the site context and access to transit and marketing the units as not having access to parking would select for tenants who do not rely on personal auto travel
- Off-street parking availability has been demonstrated within 400 metres-walk of the site, off-street private paid parking is available in close proximity to the site, and signed on-street parking in the neighbourhood is generally restricted to one or two hours
- Spillover parking is not anticipated to be an issue, but local residents can request permitting areas or further time restrictions to area parking if desirable

Boundary Street Design

- The boundary streets will not meet the high pedestrian LOS targets for being within 300 metres of a school
- To meet targets, a boulevard would have to be introduced along the site's limited frontage which would be inconsistent with area facilities which are generally considered adequate, thus no improvements are recommended as part of this study

Access Intersections Design

- A full-moves two-way access with a 6% grade accessing the underground, is proposed along the northern property line of the site's Nelson Street frontage
- The separation from the property line does not meet minimums from the private approach by-law
- The access intersection is assumed to be stop-controlled on the minor approach of the site driveway, with Nelson Street operating under free flow conditions
- An exemption will need to be sought for the separation from the adjacent property line

TDM

- To further support the reduced parking beyond the inherent function and context of the development, supportive TDM measures should be included as part of the development
- Supportive TDM measures to be included within the proposed development should include:
  - Display area walking, cycling, and transit maps with route schedules
  - Provide a multimodal travel option information package to new residents
  - Provide a permanent bicycle repair station adjacent to secure bicycle parking area
  - Contract with provider to install on-site bikeshare (or other micromobility, e.g. scooter) station
  - Contract with provider to install on-site carshare vehicles and promote their use by residents
  - Inclusion of a 1-year Presto card for first time new townhome purchase and apartment rental, with a set time frame for this offer (e.g. 6-months) from the initial opening of the site
  - Unbundle parking cost from purchase or rental costs

NTM

- York Street is anticipated to be below NTM thresholds for local roads, and Nelson Street is between three and four times over the threshold for local roads, where site-generated traffic would comprise roughly 5-7% of the overall volumes at build-out
- No change to the classification of the study area local roadways is resultant from development traffic

Transit

- Fifty-six outbound AM transit trips and 48 inbound PM transit trips are anticipated from the development

- The O-Train Line 1 and the Rideau Street routes should be able to accommodate increases in ridership generated by the site without service changes, the route #56 may require increases service, potentially on the order of the substitution of one or two higher capacity buses per peak hour
- Transit priority is not anticipated to be affected by the development either via newly proposed driveways or from turning movements on the priority corridor

Network Intersection Design

- Generally, the network intersections will operate similarly to the background conditions with the addition of site traffic
- The MMLOS targets will not be met for the pedestrian and cycling LOS at all study area intersections, and transit LOS at the intersection of Rideau Street at King Edward Avenue
- Pedestrian LOS targets cannot be met without reducing all study area crossings to two lane-widths and cycling LOS targets require left-turn configurations out of mixed flow for all permitted left turn movements and separated facilities for the northbound and southbound approaches at the intersection of Rideau Street at King Edward Avenue
- Transit LOS would require reduction in delay on the northbound southbound and westbound approaches at the intersection of Rideau Street at King Edward Avenue

17 Conclusion

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

Prepared By:

John Kingsley, EIT
Transportation Engineering Intern

Reviewed By:

Andrew Harte, P.Eng.
Senior Transportation Engineer

Appendix A

TIA Screening Form and PM Certification Form

13 Markham Avenue
Ottawa ON K2G 3Z1

City of Ottawa 2017 TIA Guidelines
Step 1 - Screening Form

Date: 13-Oct-20
Project Number: 2020-88
Project Reference: 112 Nelson

1.1 Description of Proposed Development	
Municipal Address	112 Nelson Street
Description of Location	L-shaped parcel fronting Nelson Street between Rideau Street and York Street
Land Use Classification	R5 application approved 2018-07-11
Development Size	320 residential dwelling units
Accesses	One onto Nelson St
Phase of Development	Single
Buildout Year	2024
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger		
Land Use Type	Townhomes or apartments	
Development Size	320	Units
Trip Generation Trigger	Yes	

1.3 Location Triggers	
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?	No
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?	No
Location Trigger	No

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

TIA Plan Reports

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

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

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

CERTIFICATION

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

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

City Of Ottawa
Infrastructure Services and Community Sustainability
Planning and Growth Management
110 Laurier Avenue West, 4th fl.
Ottawa, ON K1P 1J1
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Ville d'Ottawa
Services d 'infrastructure et Viabilité des collectivités
Urbanisme et Gestion de la croissance
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Ottawa (Ontario) K1P 1J1
Tél. : 613-580-2424
Télécopieur: 613-560-6006

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

Name: _____Andrew Harte_____
(Please Print)

Professional Title: _____Professional Engineer_____

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

Office Contact Information (Please Print)
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City / Postal Code: Ottawa / K2G 3Z1
Telephone / Extension: (613) 697-3797
E-Mail Address: Andrew.Harte@CGHTransportation.com

Appendix B

Turning Movement Counts

Transportation Services - Traffic Services

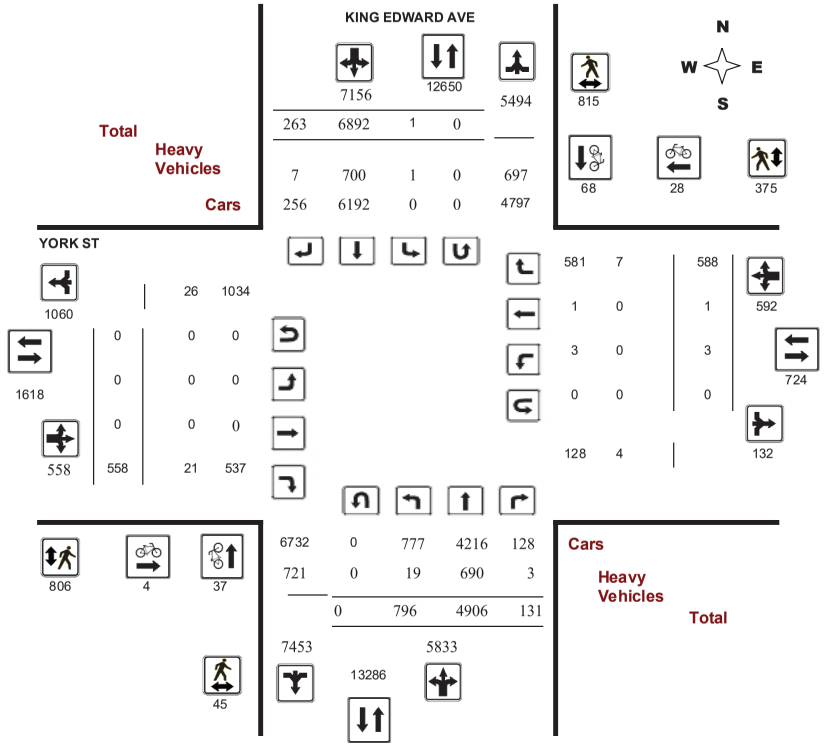
Turning Movement Count - Study Results

KING EDWARD AVE @ YORK ST

Survey Date: Wednesday, September 21, 2016 **WO No:** 36337

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

Full Study Diagram



Transportation Services - Traffic Services

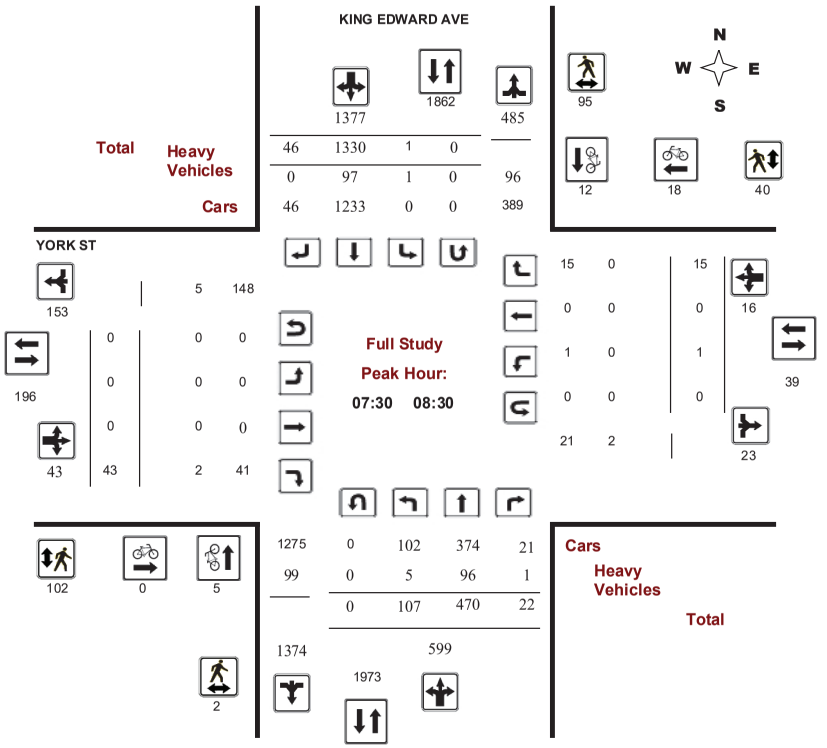
Turning Movement Count - Study Results

KING EDWARD AVE @ YORK ST

Survey Date: Wednesday, September 21, 2016 **WO No:** 36337

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

Full Study Peak Hour Diagram



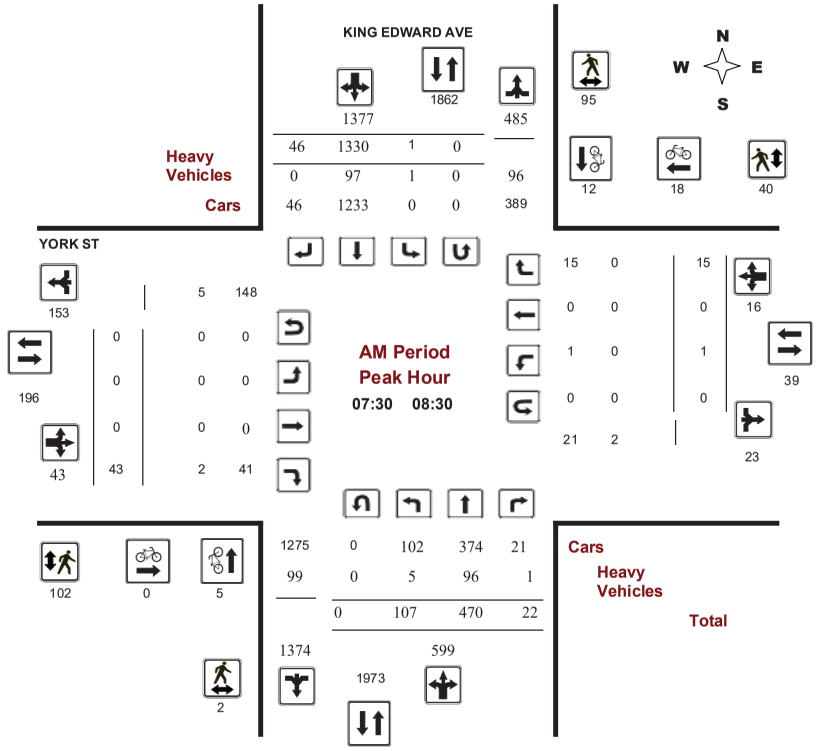
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

KING EDWARD AVE @ YORK ST

Survey Date: Wednesday, September 21, 2016 **WO No:** 36337

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



Comments

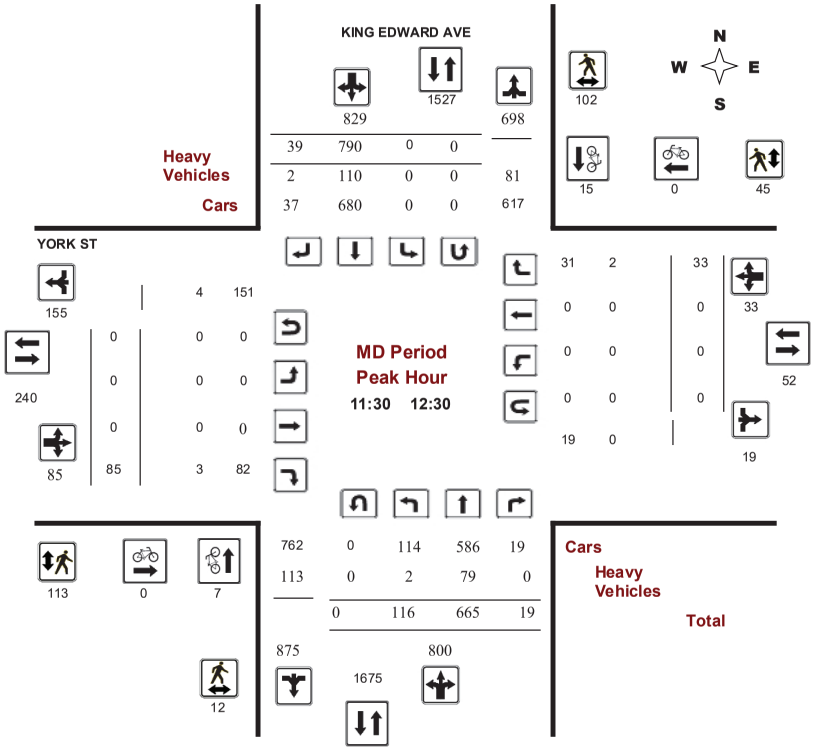
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

KING EDWARD AVE @ YORK ST

Survey Date: Wednesday, September 21, 2016 **WO No:** 36337

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



Comments

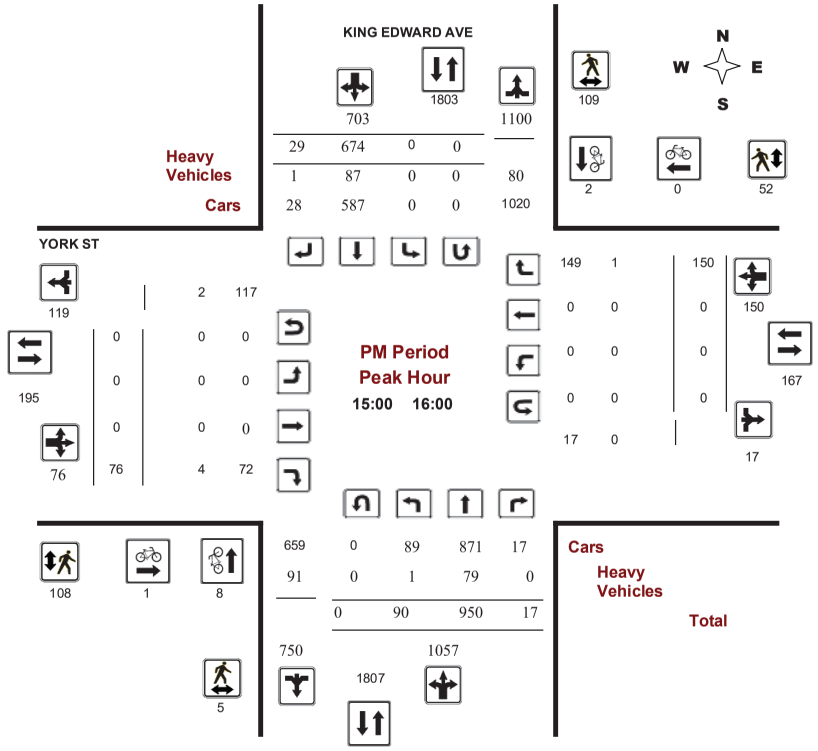
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

KING EDWARD AVE @ YORK ST

Survey Date: Wednesday, September 21, 2016 **WO No:** 36337

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



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KING EDWARD AVE @ YORK ST

Survey Date: Wednesday, September 21, 2016 **WO No:** 36337

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

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, September 21, 2016

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor 1.00

	KING EDWARD AVE								YORK ST									
	Northbound				Southbound				Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	97	460	23	**580**	0	1200	30	**1230**	**1810**	0	0	40	**40**	1	0	10	**11**	**51**	**1861**
08:00 09:00	102	494	26	**622**	1	1203	51	**1255**	**1877**	0	0	40	**40**	0	0	18	**18**	**58**	**1935**
09:00 10:00	124	546	10	**680**	0	975	46	**1021**	**1701**	0	0	61	**61**	0	1	19	**20**	**81**	**1782**
11:30 12:30	116	665	19	**800**	0	790	39	**829**	**1629**	0	0	85	**85**	0	0	33	**33**	**118**	**1747**
12:30 13:30	127	640	12	**779**	0	782	19	**801**	**1580**	0	0	82	**82**	2	0	24	**26**	**108**	**1688**
15:00 16:00	90	950	17	**1057**	0	674	29	**703**	**1760**	0	0	76	**76**	0	0	150	**150**	**226**	**1986**
16:00 17:00	58	437	10	**505**	0	633	25	**658**	**1163**	0	0	91	**91**	0	0	185	**185**	**276**	**1439**
17:00 18:00	82	714	14	**810**	0	635	24	**659**	**1469**	0	0	83	**83**	0	0	149	**149**	**232**	**1701**
Sub Total	796	4906	131	**5833**	1	6892	263	**7156**	**12989**	0	0	558	**558**	3	1	588	**592**	**1150**	**14139**
U Turns	0			**0**	0			**0**	**0**	**0**			**0**	0			**0**	**0**	**0**
Total	796	4906	131	**5833**	1	6892	263	**7156**	**12989**	0	0	558	**558**	3	1	588	**592**	**1150**	**14139**
EQ 12Hr	1106	6819	182	**8107**	1	9580	366	**9947**	**18054**	0	0	776	**776**	4	1	817	**822**	**1598**	**19652**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	1106	6819	182	**8107**	1	9580	366	**9947**	**18054**	0	0	776	**776**	4	1	817	**822**	**1598**	**19652**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**1.00**					
AVG 24Hr	1449	8933	238	**10620**	1	12550	479	**13030**	**23650**	0	0	1017	**1017**	5	1	1070	**1076**	**2093**	**25743**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																	**1.31**		

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KING EDWARD AVE @ YORK ST

Survey Date: Wednesday, September 21, 2016 **WO No:** 36337

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

Full Study 15 Minute Increments

		KING EDWARD AVE									YORK ST									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	18	123	2	143	0	262	6	268	**411**	0	0	5	5	0	0	2	2	**7**	**418**
07:15	07:30	21	93	6	120	0	268	6	274	**394**	0	0	8	8	0	0	1	1	**9**	**403**
07:30	07:45	32	114	8	154	0	311	9	320	**474**	0	0	18	18	1	0	4	5	**23**	**497**
07:45	08:00	26	130	7	163	0	359	9	368	**531**	0	0	9	9	0	0	3	3	**12**	**543**
08:00	08:15	28	120	4	152	0	351	10	361	**513**	0	0	12	12	0	0	3	3	**15**	**528**
08:15	08:30	21	106	3	130	1	309	18	328	**458**	0	0	4	4	0	0	5	5	**9**	**467**
08:30	08:45	25	126	12	163	0	275	8	283	**446**	0	0	14	14	0	0	6	6	**20**	**466**
08:45	09:00	28	142	7	177	0	268	15	283	**460**	0	0	10	10	0	0	4	4	**14**	**474**
09:00	09:15	36	130	2	168	0	250	18	268	**436**	0	0	9	9	0	1	5	6	**15**	**451**
09:15	09:30	39	139	2	180	0	253	8	261	**441**	0	0	17	17	0	0	3	3	**20**	**461**
09:30	09:45	28	136	2	166	0	246	12	258	**424**	0	0	17	17	0	0	6	6	**23**	**447**
09:45	10:00	21	141	4	166	0	226	8	234	**400**	0	0	18	18	0	0	5	5	**23**	**423**
11:30	11:45	30	212	5	247	0	186	11	197	**444**	0	0	18	18	0	0	13	13	**31**	**475**
11:45	12:00	37	139	5	181	0	187	11	198	**379**	0	0	26	26	0	0	12	12	**38**	**417**
12:00	12:15	31	162	3	196	0	195	11	206	**402**	0	0	19	19	0	0	3	3	**22**	**424**
12:15	12:30	18	152	6	176	0	222	6	228	**404**	0	0	22	22	0	0	5	5	**27**	**431**
12:30	12:45	25	134	5	164	0	212	2	214	**378**	0	0	21	21	2	0	5	7	**28**	**406**
12:45	13:00	29	163	1	193	0	198	8	206	**399**	0	0	22	22	0	0	7	7	**29**	**428**
13:00	13:15	45	175	1	221	0	173	2	175	**396**	0	0	29	29	0	0	6	6	**35**	**431**
13:15	13:30	28	168	5	201	0	199	7	206	**407**	0	0	10	10	0	0	6	6	**16**	**423**
15:00	15:15	19	227	5	251	0	192	9	201	**452**	0	0	21	21	0	0	28	28	**49**	**501**
15:15	15:30	27	249	3	279	0	167	9	176	**455**	0	0	20	20	0	0	32	32	**52**	**507**
15:30	15:45	20	219	4	243	0	149	8	157	**400**	0	0	19	19	0	0	43	43	**62**	**462**
15:45	16:00	24	255	5	284	0	166	3	169	**453**	0	0	16	16	0	0	47	47	**63**	**516**
16:00	16:15	24	147	4	175	0	126	6	132	**307**	0	0	29	29	0	0	44	44	**73**	**380**
16:15	16:30	9	107	3	119	0	178	8	186	**305**	0	0	27	27	0	0	49	49	**76**	**381**
16:30	16:45	14	117	2	133	0	157	7	164	**297**	0	0	15	15	0	0	59	59	**74**	**371**
16:45	17:00	11	66	1	78	0	172	4	176	**254**	0	0	20	20	0	0	33	33	**53**	**307**
17:00	17:15	15	148	2	165	0	183	7	190	**355**	0	0	28	28	0	0	56	56	**84**	**439**
17:15	17:30	19	143	3	165	0	161	6	167	**332**	0	0	19	19	0	0	37	37	**56**	**388**
17:30	17:45	25	222	3	250	0	140	3	143	**393**	0	0	14	14	0	0	32	32	**46**	**439**
17:45	18:00	23	201	6	230	0	151	8	159	**389**	0	0	22	22	0	0	24	24	**46**	**435**
Total:		796	4906	131	5833	1	6892	263	7156	**12989**	0	0	558	558	3	1	588	592	**12989**	**14,139**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KING EDWARD AVE @ YORK ST

Survey Date: Wednesday, September 21, 2016 **WO No:** 36337

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

Full Study Cyclist Volume

		KING EDWARD AVE			YORK ST			
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	1	**1**	0	1	**1**	**2**
07:15	07:30	1	0	**1**	0	0	**0**	**1**
07:30	07:45	1	4	**5**	0	1	**1**	**6**
07:45	08:00	0	2	**2**	0	4	**4**	**6**
08:00	08:15	3	3	**6**	0	7	**7**	**13**
08:15	08:30	1	3	**4**	0	6	**6**	**10**
08:30	08:45	0	0	**0**	3	4	**7**	**7**
08:45	09:00	2	1	**3**	0	2	**2**	**5**
09:00	09:15	1	0	**1**	0	3	**3**	**4**
09:15	09:30	0	1	**1**	0	0	**0**	**1**
09:30	09:45	0	1	**1**	0	0	**0**	**1**
09:45	10:00	4	1	**5**	0	0	**0**	**5**
11:30	11:45	0	1	**1**	0	0	**0**	**1**
11:45	12:00	4	5	**9**	0	0	**0**	**9**
12:00	12:15	2	6	**8**	0	0	**0**	**8**
12:15	12:30	1	3	**4**	0	0	**0**	**4**
12:30	12:45	1	2	**3**	0	0	**0**	**3**
12:45	13:00	0	1	**1**	0	0	**0**	**1**
13:00	13:15	1	0	**1**	0	0	**0**	**1**
13:15	13:30	0	2	**2**	0	0	**0**	**2**
15:00	15:15	3	0	**3**	1	0	**1**	**4**
15:15	15:30	0	0	**0**	0	0	**0**	**0**
15:30	15:45	2	1	**3**	0	0	**0**	**3**
15:45	16:00	3	1	**4**	0	0	**0**	**4**
16:00	16:15	2	5	**7**	0	0	**0**	**7**
16:15	16:30	1	1	**2**	0	0	**0**	**2**
16:30	16:45	1	3	**4**	0	0	**0**	**4**
16:45	17:00	0	3	**3**	0	0	**0**	**3**
17:00	17:15	0	6	**6**	0	0	**0**	**6**
17:15	17:30	1	5	**6**	0	0	**0**	**6**
17:30	17:45	0	4	**4**	0	0	**0**	**4**
17:45	18:00	2	2	**4**	0	0	**0**	**4**
Total		37	68	**105**	4	28	**32**	**137**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KING EDWARD AVE @ YORK ST

Survey Date: Wednesday, September 21, 2016 **WO No:** 36337

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

Full Study Pedestrian Volume

	KING EDWARD AVE			YORK ST			
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	2	15	**17**	11	7	**18**	**35**
07:15 07:30	0	17	**17**	17	4	**21**	**38**
07:30 07:45	0	21	**21**	19	4	**23**	**44**
07:45 08:00	0	28	**28**	19	8	**27**	**55**
08:00 08:15	0	21	**21**	38	16	**54**	**75**
08:15 08:30	2	25	**27**	26	12	**38**	**65**
08:30 08:45	1	15	**16**	30	8	**38**	**54**
08:45 09:00	1	21	**22**	17	9	**26**	**48**
09:00 09:15	0	16	**16**	17	8	**25**	**41**
09:15 09:30	4	19	**23**	26	15	**41**	**64**
09:30 09:45	1	15	**16**	15	10	**25**	**41**
09:45 10:00	1	15	**16**	14	14	**28**	**44**
11:30 11:45	4	21	**25**	29	12	**41**	**66**
11:45 12:00	2	29	**31**	29	10	**39**	**70**
12:00 12:15	1	21	**22**	23	14	**37**	**59**
12:15 12:30	5	31	**36**	32	9	**41**	**77**
12:30 12:45	2	21	**23**	41	18	**59**	**82**
12:45 13:00	9	30	**39**	34	9	**43**	**82**
13:00 13:15	0	25	**25**	19	8	**27**	**52**
13:15 13:30	1	20	**21**	12	14	**26**	**47**
15:00 15:15	1	27	**28**	25	9	**34**	**62**
15:15 15:30	0	21	**21**	27	14	**41**	**62**
15:30 15:45	0	35	**35**	24	15	**39**	**74**
15:45 16:00	4	26	**30**	32	14	**46**	**76**
16:00 16:15	1	29	**30**	27	7	**34**	**64**
16:15 16:30	0	35	**35**	25	14	**39**	**74**
16:30 16:45	0	29	**29**	33	10	**43**	**72**
16:45 17:00	1	29	**30**	29	19	**48**	**78**
17:00 17:15	0	43	**43**	41	18	**59**	**102**
17:15 17:30	0	35	**35**	18	10	**28**	**63**
17:30 17:45	0	37	**37**	25	18	**43**	**80**
17:45 18:00	2	43	**45**	32	18	**50**	**95**
Total	45	815	**860**	806	375	**1181**	**2041**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KING EDWARD AVE @ YORK ST

Survey Date: Wednesday, September 21, 2016 **WO No:** 36337

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

Full Study Heavy Vehicles

		KING EDWARD AVE									YORK ST									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	27	0	**27**	0	11	0	**11**	**38**	0	0	0	**0**	0	0	0	**0**	**0**	**38**
07:15	07:30	4	28	0	**32**	0	20	0	**20**	**52**	0	0	1	**1**	0	0	0	**0**	**1**	**53**
07:30	07:45	1	16	1	**18**	0	27	0	**27**	**45**	0	0	1	**1**	0	0	0	**0**	**1**	**46**
07:45	08:00	1	29	0	**30**	0	23	0	**23**	**53**	0	0	0	**0**	0	0	0	**0**	**0**	**53**
08:00	08:15	3	29	0	**32**	0	25	0	**25**	**57**	0	0	1	**1**	0	0	0	**0**	**1**	**58**
08:15	08:30	0	22	0	**22**	1	22	0	**23**	**45**	0	0	0	**0**	0	0	0	**0**	**0**	**45**
08:30	08:45	0	31	0	**31**	0	24	0	**24**	**55**	0	0	0	**0**	0	0	0	**0**	**0**	**55**
08:45	09:00	0	43	0	**43**	0	32	0	**32**	**75**	0	0	0	**0**	0	0	0	**0**	**0**	**75**
09:00	09:15	2	30	0	**32**	0	26	1	**27**	**59**	0	0	0	**0**	0	0	0	**0**	**0**	**59**
09:15	09:30	2	33	0	**35**	0	23	1	**24**	**59**	0	0	1	**1**	0	0	0	**0**	**1**	**60**
09:30	09:45	0	32	0	**32**	0	31	0	**31**	**63**	0	0	1	**1**	0	0	0	**0**	**1**	**64**
09:45	10:00	0	31	1	**32**	0	30	0	**30**	**62**	0	0	2	**2**	0	0	0	**0**	**2**	**64**
11:30	11:45	2	24	0	**26**	0	30	1	**31**	**57**	0	0	1	**1**	0	0	0	**0**	**1**	**58**
11:45	12:00	0	16	0	**16**	0	27	0	**27**	**43**	0	0	0	**0**	0	0	2	**2**	**2**	**45**
12:00	12:15	0	19	0	**19**	0	29	0	**29**	**48**	0	0	0	**0**	0	0	0	**0**	**0**	**48**
12:15	12:30	0	20	0	**20**	0	24	1	**25**	**45**	0	0	2	**2**	0	0	0	**0**	**2**	**47**
12:30	12:45	0	19	0	**19**	0	28	0	**28**	**47**	0	0	0	**0**	0	0	0	**0**	**0**	**47**
12:45	13:00	1	20	0	**21**	0	22	1	**23**	**44**	0	0	0	**0**	0	0	0	**0**	**0**	**44**
13:00	13:15	2	24	0	**26**	0	21	0	**21**	**47**	0	0	1	**1**	0	0	0	**0**	**1**	**48**
13:15	13:30	0	19	0	**19**	0	28	1	**29**	**48**	0	0	0	**0**	0	0	0	**0**	**0**	**48**
15:00	15:15	0	16	0	**16**	0	23	0	**23**	**39**	0	0	1	**1**	0	0	0	**0**	**1**	**40**
15:15	15:30	1	21	0	**22**	0	23	1	**24**	**46**	0	0	0	**0**	0	0	0	**0**	**0**	**46**
15:30	15:45	0	23	0	**23**	0	19	0	**19**	**42**	0	0	1	**1**	0	0	1	**1**	**2**	**44**
15:45	16:00	0	19	0	**19**	0	22	0	**22**	**41**	0	0	2	**2**	0	0	0	**0**	**2**	**43**
16:00	16:15	0	8	1	**9**	0	13	0	**13**	**22**	0	0	0	**0**	0	0	0	**0**	**0**	**22**
16:15	16:30	0	10	0	**10**	0	13	0	**13**	**23**	0	0	2	**2**	0	0	0	**0**	**2**	**25**
16:30	16:45	0	7	0	**7**	0	18	0	**18**	**25**	0	0	0	**0**	0	0	0	**0**	**0**	**25**
16:45	17:00	0	9	0	**9**	0	15	0	**15**	**24**	0	0	0	**0**	0	0	1	**1**	**1**	**25**
17:00	17:15	0	18	0	**18**	0	9	0	**9**	**27**	0	0	3	**3**	0	0	0	**0**	**3**	**30**
17:15	17:30	0	12	0	**12**	0	16	0	**16**	**28**	0	0	0	**0**	0	0	1	**1**	**1**	**29**
17:30	17:45	0	15	0	**15**	0	13	0	**13**	**28**	0	0	1	**1**	0	0	2	**2**	**3**	**31**
17:45	18:00	0	20	0	**20**	0	13	0	**13**	**33**	0	0	0	**0**	0	0	0	**0**	**0**	**33**
Total:	None	19	690	3	**712**	1	700	7	**708**	**1420**	0	0	21	**21**	0	0	7	**7**	**28**	**1,448**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KING EDWARD AVE @ YORK ST

Survey Date: Wednesday, September 21, 2016 **WO No:** 36337

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

Full Study 15 Minute U-Turn Total

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

Transportation Services - Traffic Services

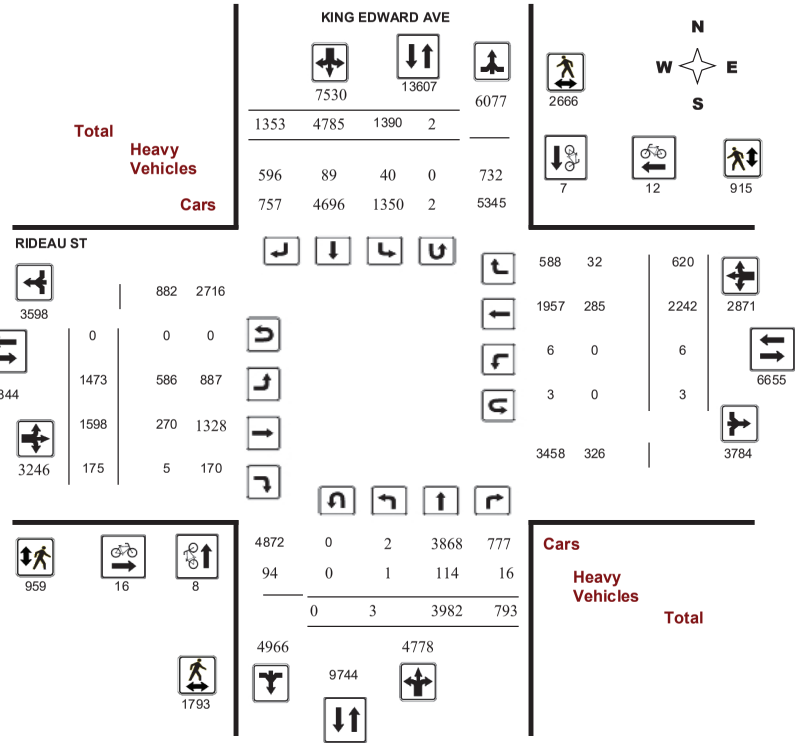
Turning Movement Count - Study Results

KING EDWARD AVE @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39318

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

Full Study Diagram



5470795 - TUE JAN 14, 2020 - 8HRS - LORETTA

Transportation Services - Traffic Services

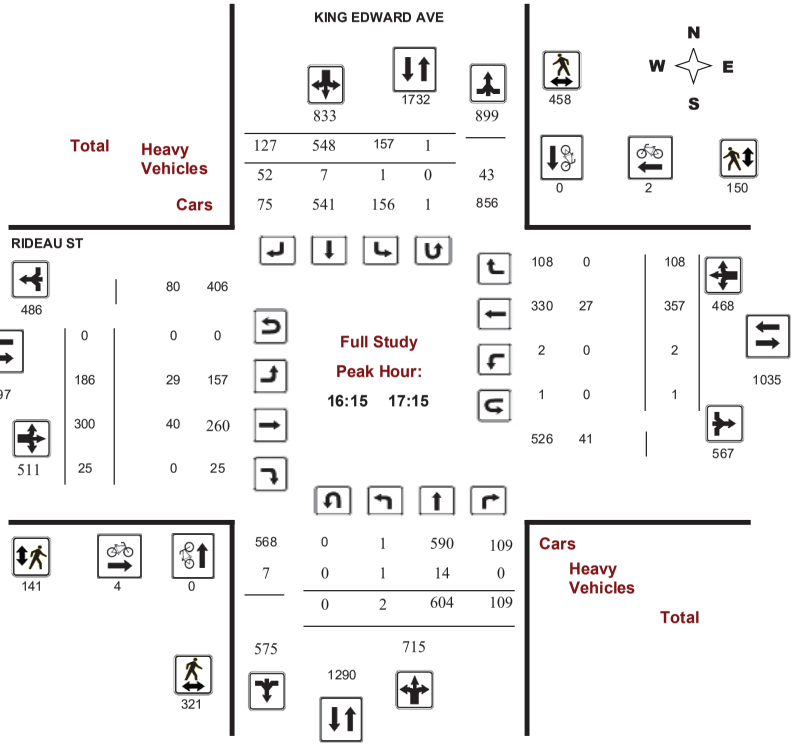
Turning Movement Count - Study Results

KING EDWARD AVE @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39318

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

Full Study Peak Hour Diagram



5470795 - TUE JAN 14, 2020 - 8HRS - LORETTA

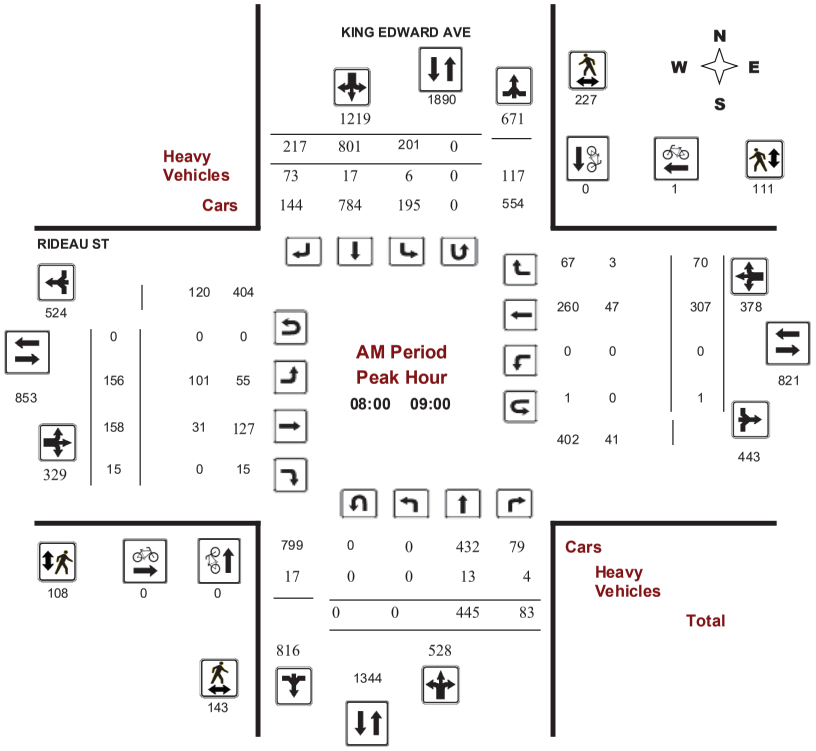
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

KING EDWARD AVE @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39318

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



Comments 5470795 - TUE JAN 14, 2020 - 8HRS - LORETTA

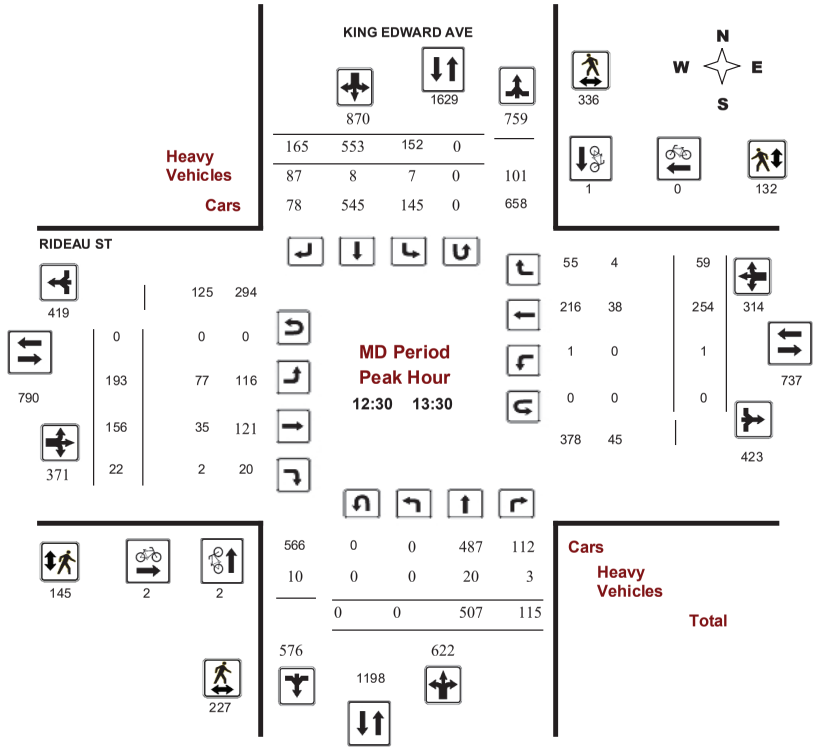
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

KING EDWARD AVE @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39318

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



Comments 5470795 - TUE JAN 14, 2020 - 8HRS - LORETTA

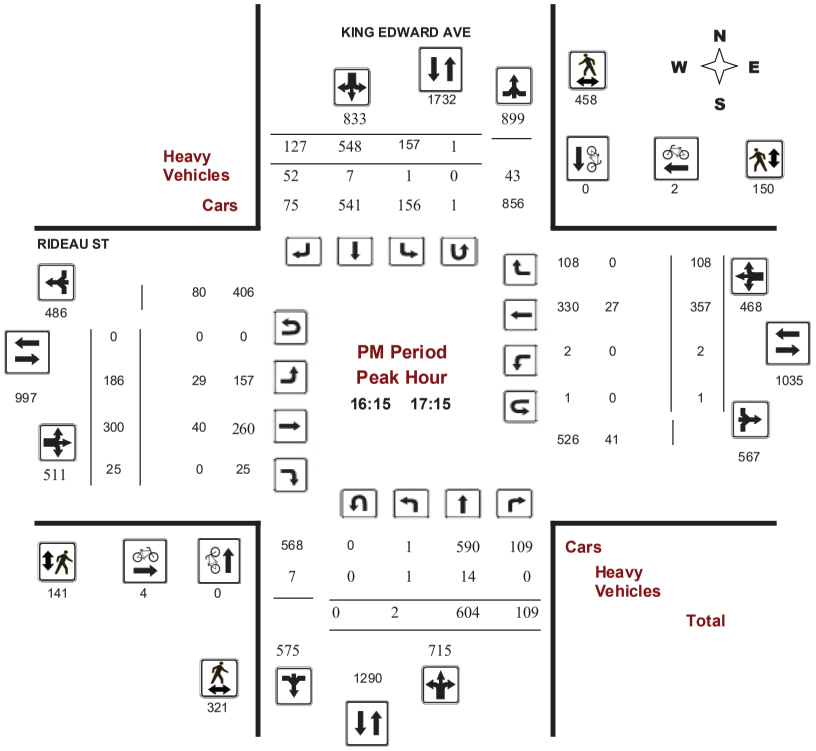
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

KING EDWARD AVE @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39318

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



Comments 5470795 - TUE JAN 14, 2020 - 8HRS - LORETTA

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KING EDWARD AVE @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39318

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

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, January 14, 2020

Total Observed U-Turns

Northbound: 0 Southbound: 2

Eastbound: 0 Westbound: 3

AADT Factor 1.10

	KING EDWARD AVE								RIDEAU ST									
	Northbound				Southbound				Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	0	351	67	**418**	235	768	204	**1207**	**1625**	155	140	21	**316**	0	207	58	**265**	**581**	**2206**
08:00 09:00	0	445	83	**528**	201	801	217	**1219**	**1747**	156	158	15	**329**	0	307	70	**377**	**706**	**2453**
09:00 10:00	0	365	102	**467**	198	767	185	**1150**	**1617**	175	170	19	**364**	2	212	66	**280**	**644**	**2261**
11:30 12:30	1	425	100	**526**	152	453	153	**758**	**1284**	183	159	33	**375**	0	261	74	**335**	**710**	**1994**
12:30 13:30	0	507	115	**622**	152	553	165	**870**	**1492**	193	156	22	**371**	1	254	59	**314**	**685**	**2177**
15:00 16:00	0	607	110	**717**	147	454	140	**741**	**1458**	209	243	22	**474**	1	322	91	**414**	**888**	**2346**
16:00 17:00	1	624	107	**732**	159	483	127	**769**	**1501**	198	297	24	**519**	0	370	111	**481**	**1000**	**2501**
17:00 18:00	1	658	109	**768**	146	506	162	**814**	**1582**	204	275	19	**498**	2	309	91	**402**	**900**	**2482**
Sub Total	3	3982	793	**4778**	1390	4785	1353	**7528**	**12306**	1473	1598	175	**3246**	6	2242	620	**2868**	**6114**	**18420**
U Turns	0			**0**	2			**2**	**2**	**0**			**0**	3			**3**	**3**	**5**
Total	3	3982	793	**4778**	1392	4785	1353	**7530**	**12308**	1473	1598	175	**3246**	9	2242	620	**2871**	**6117**	**18425**
EQ 12Hr	4	5535	1102	**6641**	1935	6651	1881	**10467**	**17108**	2047	2221	243	**4511**	13	3116	862	**3991**	**8502**	**25610**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	4	6089	1212	**7305**	2128	7316	2069	**11513**	**18818**	2252	2443	267	**4962**	14	3428	948	**4390**	**9352**	**28170**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**1.10**					
AVG 24Hr	5	7977	1588	**9570**	2788	9584	2710	**15082**	**24652**	2950	3200	350	**6500**	18	4491	1242	**5751**	**12251**	**36903**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KING EDWARD AVE @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39318

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

Full Study 15 Minute Increments

		KING EDWARD AVE									RIDEAU ST									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	79	12	91	59	198	49	306	**397**	38	29	6	73	0	36	16	52	**125**	**522**
07:15	07:30	0	92	17	109	54	179	50	283	**392**	41	33	4	78	0	45	10	55	**133**	**525**
07:30	07:45	0	75	20	95	66	186	49	301	**396**	38	40	6	84	0	64	15	79	**163**	**559**
07:45	08:00	0	105	18	123	56	205	56	317	**440**	38	38	5	81	0	62	17	79	**160**	**600**
08:00	08:15	0	103	17	120	49	214	51	314	**434**	41	36	7	84	0	81	15	96	**180**	**614**
08:15	08:30	0	103	15	118	55	217	51	323	**441**	33	37	5	75	0	81	18	99	**174**	**615**
08:30	08:45	0	117	24	141	54	168	63	285	**426**	32	40	2	74	1	72	22	95	**169**	**595**
08:45	09:00	0	122	27	149	43	202	52	297	**446**	50	45	1	96	0	73	15	88	**184**	**630**
09:00	09:15	0	107	26	133	54	197	38	289	**422**	41	34	6	81	1	60	17	78	**159**	**581**
09:15	09:30	0	78	26	104	50	184	45	279	**383**	42	46	5	93	2	61	13	76	**169**	**552**
09:30	09:45	0	77	30	107	49	202	55	306	**413**	50	42	2	94	0	47	22	69	**163**	**576**
09:45	10:00	0	103	20	123	45	184	47	276	**399**	42	48	6	96	0	44	14	58	**154**	**553**
11:30	11:45	0	120	24	144	44	99	35	178	**322**	44	41	6	91	0	73	22	95	**186**	**508**
11:45	12:00	1	112	27	140	41	106	40	187	**327**	38	36	6	80	0	61	16	77	**157**	**484**
12:00	12:15	0	102	25	127	34	111	38	183	**310**	50	43	12	105	0	65	20	85	**190**	**500**
12:15	12:30	0	91	24	115	33	137	40	210	**325**	51	39	9	99	0	62	16	78	**177**	**502**
12:30	12:45	0	135	24	159	38	173	43	254	**413**	51	30	4	85	1	55	10	66	**151**	**564**
12:45	13:00	0	135	18	153	32	152	43	227	**380**	50	38	9	97	0	64	12	76	**173**	**553**
13:00	13:15	0	125	38	163	40	118	45	203	**366**	50	34	4	88	0	61	20	81	**169**	**535**
13:15	13:30	0	112	35	147	42	110	34	186	**333**	42	54	5	101	0	74	17	91	**192**	**525**
15:00	15:15	0	146	33	179	40	111	42	193	**372**	54	54	2	110	0	78	23	101	**211**	**583**
15:15	15:30	0	135	27	162	39	113	40	192	**354**	50	65	6	121	0	68	24	92	**213**	**567**
15:30	15:45	0	165	24	189	36	108	25	169	**358**	53	54	8	115	1	81	22	104	**219**	**577**
15:45	16:00	0	161	26	187	32	122	33	187	**374**	52	70	6	128	0	95	22	117	**245**	**619**
16:00	16:15	0	185	29	214	40	100	36	176	**390**	49	64	4	117	0	91	24	115	**232**	**622**
16:15	16:30	0	134	17	151	37	111	36	184	**335**	62	81	4	147	0	102	31	133	**280**	**615**
16:30	16:45	1	154	31	186	41	121	28	190	**376**	46	73	12	131	0	83	27	110	**241**	**617**
16:45	17:00	0	151	30	181	41	151	27	219	**400**	41	79	4	124	1	94	29	124	**248**	**648**
17:00	17:15	1	165	31	197	39	165	36	240	**437**	37	67	5	109	2	78	21	101	**210**	**647**
17:15	17:30	0	147	22	169	32	116	37	185	**354**	49	67	3	119	0	78	23	101	**220**	**574**
17:30	17:45	0	163	31	194	43	100	49	192	**386**	62	69	5	136	0	83	25	108	**244**	**630**
17:45	18:00	0	183	25	208	34	125	40	199	**407**	56	72	6	134	0	70	22	92	**226**	**633**
Total:		3	3982	793	4778	1392	4785	1353	7530	**12308**	1473	1598	175	3246	9	2242	620	2871	**12308**	**18,425**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KING EDWARD AVE @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39318

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

Full Study Cyclist Volume

Time Period		KING EDWARD AVE Northbound	KING EDWARD AVE Southbound	KING EDWARD AVE Street Total	RIDEAU ST Eastbound	RIDEAU ST Westbound	RIDEAU ST Street Total	Grand Total
07:00	07:15	0	0	**0**	0	1	**1**	**1**
07:15	07:30	0	1	**1**	0	1	**1**	**2**
07:30	07:45	1	0	**1**	1	1	**2**	**3**
07:45	08:00	1	0	**1**	0	2	**2**	**3**
08:00	08:15	0	0	**0**	0	0	**0**	**0**
08:15	08:30	0	0	**0**	0	0	**0**	**0**
08:30	08:45	0	0	**0**	0	1	**1**	**1**
08:45	09:00	0	0	**0**	0	0	**0**	**0**
09:00	09:15	0	0	**0**	0	1	**1**	**1**
09:15	09:30	0	0	**0**	0	0	**0**	**0**
09:30	09:45	0	0	**0**	0	0	**0**	**0**
09:45	10:00	0	0	**0**	0	0	**0**	**0**
11:30	11:45	1	0	**1**	1	0	**1**	**2**
11:45	12:00	0	0	**0**	1	1	**2**	**2**
12:00	12:15	1	0	**1**	0	0	**0**	**1**
12:15	12:30	0	1	**1**	0	1	**1**	**2**
12:30	12:45	1	0	**1**	0	0	**0**	**1**
12:45	13:00	0	0	**0**	1	0	**1**	**1**
13:00	13:15	1	0	**1**	0	0	**0**	**1**
13:15	13:30	0	1	**1**	1	0	**1**	**2**
15:00	15:15	0	0	**0**	1	0	**1**	**1**
15:15	15:30	0	0	**0**	1	0	**1**	**1**
15:30	15:45	0	0	**0**	0	0	**0**	**0**
15:45	16:00	0	0	**0**	0	0	**0**	**0**
16:00	16:15	0	1	**1**	1	0	**1**	**2**
16:15	16:30	0	0	**0**	1	2	**3**	**3**
16:30	16:45	0	0	**0**	1	0	**1**	**1**
16:45	17:00	0	0	**0**	1	0	**1**	**1**
17:00	17:15	0	0	**0**	1	0	**1**	**1**
17:15	17:30	0	0	**0**	2	1	**3**	**3**
17:30	17:45	1	1	**2**	0	0	**0**	**2**
17:45	18:00	1	2	**3**	2	0	**2**	**5**
Total		8	7	**15**	16	12	**28**	**43**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KING EDWARD AVE @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39318

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

Full Study Pedestrian Volume

Time Period		KING EDWARD AVE NB Approach (E or W Crossing)	KING EDWARD AVE SB Approach (E or W Crossing)	KING EDWARD AVE Total	RIDEAU ST EB Approach (N or S Crossing)	RIDEAU ST WB Approach (N or S Crossing)	RIDEAU ST Total	Grand Total
07:00	07:15	10	36	**46**	16	5	**21**	**67**
07:15	07:30	13	33	**46**	7	6	**13**	**59**
07:30	07:45	31	61	**92**	19	10	**29**	**121**
07:45	08:00	47	62	**109**	15	15	**30**	**139**
08:00	08:15	33	69	**102**	27	39	**66**	**168**
08:15	08:30	36	70	**106**	33	25	**58**	**164**
08:30	08:45	41	47	**88**	28	25	**53**	**141**
08:45	09:00	33	41	**74**	20	22	**42**	**116**
09:00	09:15	34	58	**92**	14	18	**32**	**124**
09:15	09:30	37	56	**93**	21	22	**43**	**136**
09:30	09:45	36	61	**97**	42	38	**80**	**177**
09:45	10:00	43	58	**101**	33	30	**63**	**164**
11:30	11:45	51	71	**122**	33	24	**57**	**179**
11:45	12:00	64	71	**135**	29	24	**53**	**188**
12:00	12:15	61	77	**138**	35	28	**63**	**201**
12:15	12:30	67	73	**140**	31	28	**59**	**199**
12:30	12:45	72	94	**166**	52	42	**94**	**260**
12:45	13:00	44	100	**144**	43	42	**85**	**229**
13:00	13:15	42	75	**117**	23	28	**51**	**168**
13:15	13:30	69	67	**136**	27	20	**47**	**183**
15:00	15:15	60	99	**159**	23	22	**45**	**204**
15:15	15:30	63	93	**156**	24	23	**47**	**203**
15:30	15:45	81	104	**185**	41	43	**84**	**269**
15:45	16:00	67	124	**191**	30	35	**65**	**256**
16:00	16:15	73	134	**207**	30	40	**70**	**277**
16:15	16:30	92	109	**201**	30	39	**69**	**270**
16:30	16:45	71	108	**179**	38	25	**63**	**242**
16:45	17:00	64	102	**166**	33	30	**63**	**229**
17:00	17:15	94	139	**233**	40	56	**96**	**329**
17:15	17:30	83	144	**227**	42	43	**85**	**312**
17:30	17:45	92	120	**212**	36	39	**75**	**287**
17:45	18:00	89	110	**199**	44	29	**73**	**272**
Total		1793	2666	**4459**	959	915	**1874**	**6333**

5470795 - TUE JAN 14, 2020 - 8HRS - LORETTA

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KING EDWARD AVE @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39318

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

Full Study Heavy Vehicles

		KING EDWARD AVE									RIDEAU ST									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	6	1	**7**	1	3	14	**18**	**25**	24	8	0	**32**	0	9	5	**14**	**46**	**71**
07:15	07:30	0	2	0	**2**	1	3	19	**23**	**25**	27	5	0	**32**	0	15	2	**17**	**49**	**74**
07:30	07:45	0	4	0	**4**	0	7	14	**21**	**25**	20	10	0	**30**	0	10	1	**11**	**41**	**66**
07:45	08:00	0	3	1	**4**	1	2	16	**19**	**23**	22	5	0	**27**	0	8	3	**11**	**38**	**61**
08:00	08:15	0	6	1	**7**	1	5	17	**23**	**30**	28	9	0	**37**	0	12	0	**12**	**49**	**79**
08:15	08:30	0	2	0	**2**	2	5	17	**24**	**26**	17	7	0	**24**	0	13	1	**14**	**38**	**64**
08:30	08:45	0	3	2	**5**	2	1	16	**19**	**24**	21	5	0	**26**	0	11	1	**12**	**38**	**62**
08:45	09:00	0	2	1	**3**	1	6	23	**30**	**33**	35	10	0	**45**	0	11	1	**12**	**57**	**90**
09:00	09:15	0	1	0	**1**	2	3	26	**31**	**32**	30	5	0	**35**	0	14	1	**15**	**50**	**82**
09:15	09:30	0	7	0	**7**	5	1	27	**33**	**40**	27	11	0	**38**	0	8	1	**9**	**47**	**87**
09:30	09:45	0	5	0	**5**	1	7	28	**36**	**41**	28	10	0	**38**	0	8	5	**13**	**51**	**92**
09:45	10:00	0	3	1	**4**	2	3	22	**27**	**31**	23	8	1	**32**	0	8	0	**8**	**40**	**71**
11:30	11:45	0	3	0	**3**	2	5	18	**25**	**28**	21	8	0	**29**	0	12	1	**13**	**42**	**70**
11:45	12:00	0	2	1	**3**	0	2	20	**22**	**25**	23	7	0	**30**	0	7	1	**8**	**38**	**63**
12:00	12:15	0	3	1	**4**	3	2	25	**30**	**34**	25	12	1	**38**	0	12	2	**14**	**52**	**86**
12:15	12:30	0	4	1	**5**	2	2	25	**29**	**34**	18	7	0	**25**	0	5	0	**5**	**30**	**64**
12:30	12:45	0	4	1	**5**	0	2	22	**24**	**29**	25	9	0	**34**	0	7	1	**8**	**42**	**71**
12:45	13:00	0	8	1	**9**	1	4	23	**28**	**37**	18	9	0	**27**	0	14	1	**15**	**42**	**79**
13:00	13:15	0	5	1	**6**	4	0	23	**27**	**33**	15	3	1	**19**	0	7	1	**8**	**27**	**60**
13:15	13:30	0	3	0	**3**	2	2	19	**23**	**26**	19	14	1	**34**	0	10	1	**11**	**45**	**71**
15:00	15:15	0	1	3	**4**	2	5	18	**25**	**29**	20	12	0	**32**	0	9	0	**9**	**41**	**70**
15:15	15:30	0	1	0	**1**	1	2	21	**24**	**25**	11	9	0	**20**	0	9	0	**9**	**29**	**54**
15:30	15:45	0	5	0	**5**	2	1	14	**17**	**22**	13	7	0	**20**	0	9	0	**9**	**29**	**51**
15:45	16:00	0	5	0	**5**	1	3	13	**17**	**22**	12	11	0	**23**	0	8	0	**8**	**31**	**53**
16:00	16:15	0	5	0	**5**	0	4	19	**23**	**28**	7	6	0	**13**	0	8	1	**9**	**22**	**50**
16:15	16:30	0	2	0	**2**	0	2	16	**18**	**20**	12	10	0	**22**	0	8	0	**8**	**30**	**50**
16:30	16:45	1	6	0	**7**	0	1	10	**11**	**18**	5	11	0	**16**	0	8	0	**8**	**24**	**42**
16:45	17:00	0	1	0	**1**	1	2	15	**18**	**19**	6	10	0	**16**	0	5	0	**5**	**21**	**40**
17:00	17:15	0	5	0	**5**	0	2	11	**13**	**18**	6	9	0	**15**	0	6	0	**6**	**21**	**39**
17:15	17:30	0	4	0	**4**	0	0	15	**15**	**19**	6	6	0	**12**	0	4	1	**5**	**17**	**36**
17:30	17:45	0	2	0	**2**	0	2	17	**19**	**21**	14	10	1	**25**	0	5	1	**6**	**31**	**52**
17:45	18:00	0	1	0	**1**	0	0	13	**13**	**14**	8	7	0	**15**	0	5	0	**5**	**20**	**34**
Total:	None	1	114	16	**131**	40	89	596	**725**	**856**	586	270	5	**861**	0	285	32	**317**	**1178**	**2,034**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KING EDWARD AVE @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39318

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

Full Study 15 Minute U-Turn Total

		KING EDWARD AVE		RIDEAU ST		
Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	**0**
07:15	07:30	0	0	0	0	**0**
07:30	07:45	0	0	0	0	**0**
07:45	08:00	0	0	0	0	**0**
08:00	08:15	0	0	0	0	**0**
08:15	08:30	0	0	0	0	**0**
08:30	08:45	0	0	0	1	**1**
08:45	09:00	0	0	0	0	**0**
09:00	09:15	0	0	0	0	**0**
09:15	09:30	0	0	0	1	**1**
09:30	09:45	0	0	0	0	**0**
09:45	10:00	0	0	0	0	**0**
11:30	11:45	0	0	0	0	**0**
11:45	12:00	0	0	0	0	**0**
12:00	12:15	0	0	0	0	**0**
12:15	12:30	0	0	0	0	**0**
12:30	12:45	0	0	0	0	**0**
12:45	13:00	0	0	0	0	**0**
13:00	13:15	0	0	0	0	**0**
13:15	13:30	0	0	0	0	**0**
15:00	15:15	0	0	0	0	**0**
15:15	15:30	0	0	0	0	**0**
15:30	15:45	0	0	0	0	**0**
15:45	16:00	0	0	0	0	**0**
16:00	16:15	0	0	0	0	**0**
16:15	16:30	0	0	0	0	**0**
16:30	16:45	0	0	0	0	**0**
16:45	17:00	0	0	0	1	**1**
17:00	17:15	0	1	0	0	**1**
17:15	17:30	0	0	0	0	**0**
17:30	17:45	0	0	0	0	**0**
17:45	18:00	0	1	0	0	**1**
Total		0	2	0	3	**5**

Transportation Services - Traffic Services

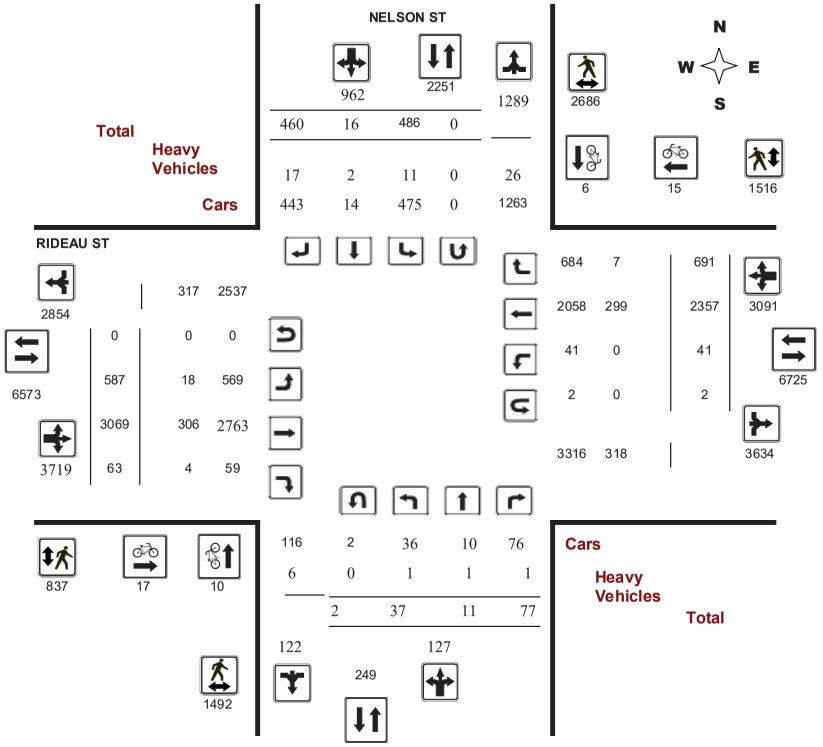
Turning Movement Count - Study Results

NELSON ST @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39319

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

Full Study Diagram



5470796 - TUE JAN 14, 2020 - 8HRS - LORETTA

Transportation Services - Traffic Services

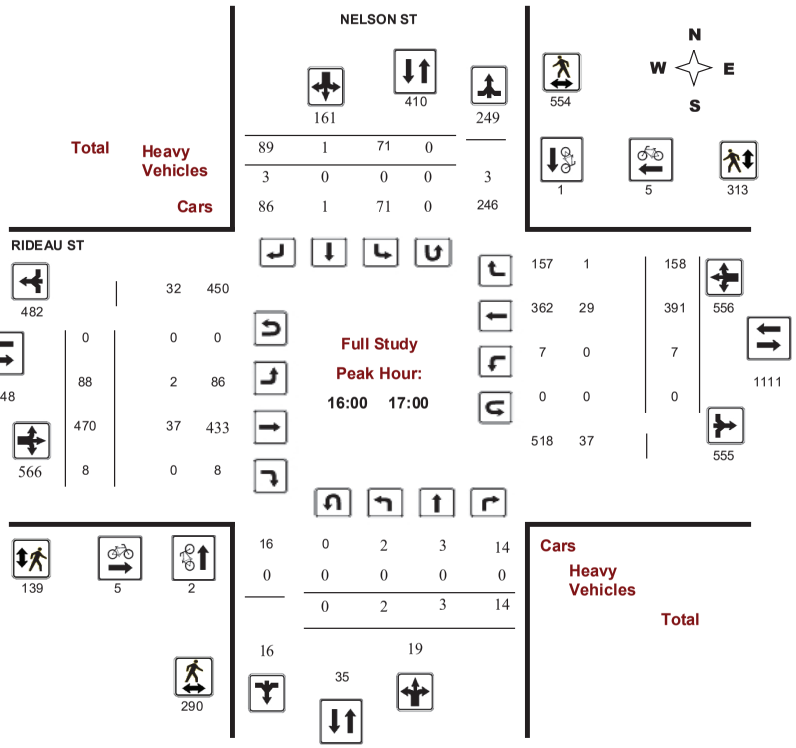
Turning Movement Count - Study Results

NELSON ST @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39319

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

Full Study Peak Hour Diagram



5470796 - TUE JAN 14, 2020 - 8HRS - LORETTA

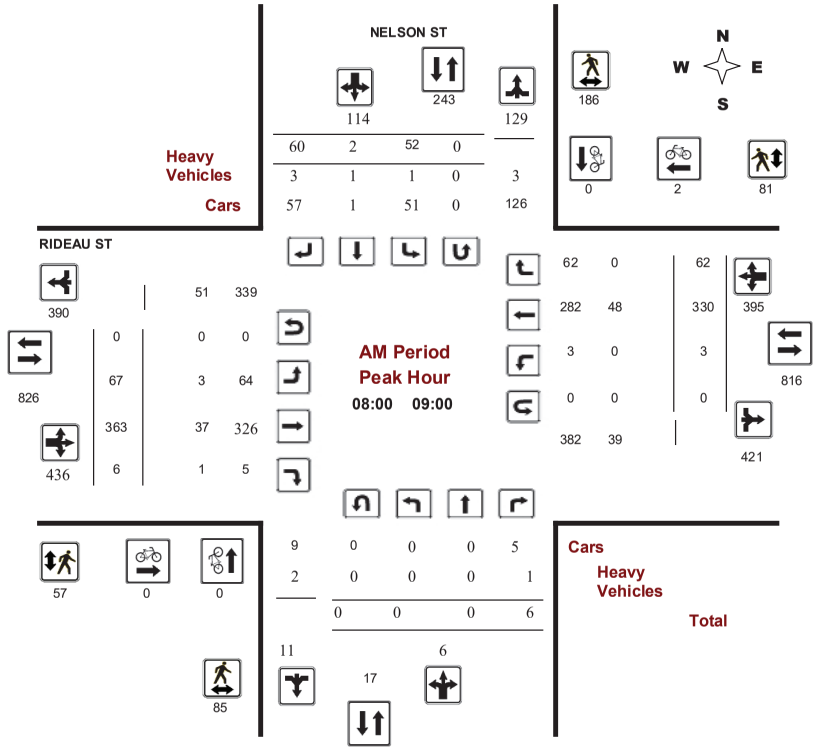
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

NELSON ST @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39319

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



Comments 5470796 - TUE JAN 14, 2020 - 8HRS - LORETTA

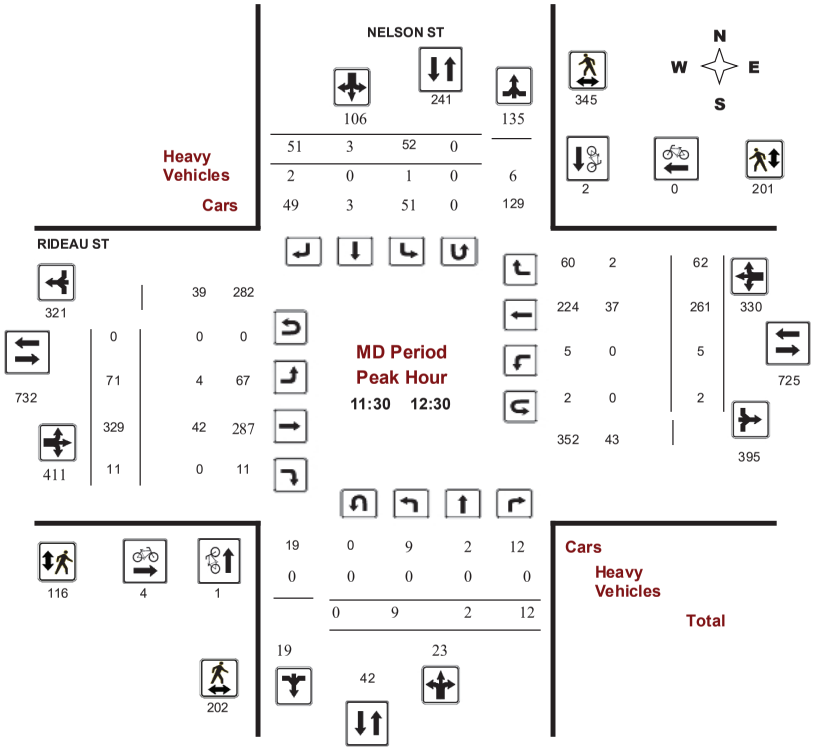
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

NELSON ST @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39319

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



Comments 5470796 - TUE JAN 14, 2020 - 8HRS - LORETTA

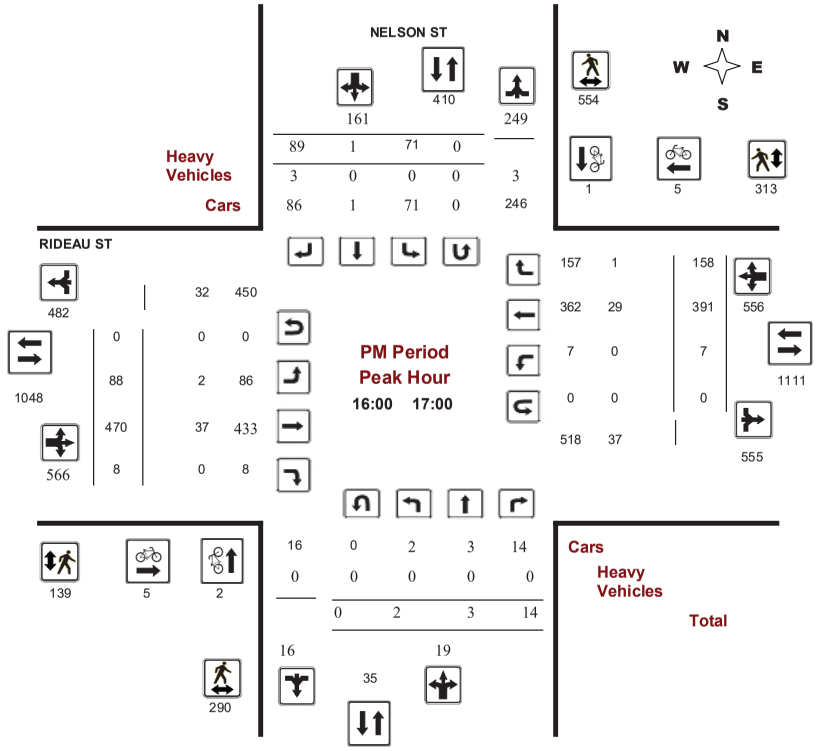
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

NELSON ST @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39319

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



Comments 5470796 - TUE JAN 14, 2020 - 8HRS - LORETTA

Transportation Services - Traffic Services

Turning Movement Count - Study Results

NELSON ST @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39319

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

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, January 14, 2020

Total Observed U-Turns

Northbound: 2 Southbound: 0

Eastbound: 0 Westbound: 2

AADT Factor 1.10

	NELSON ST								RIDEAU ST									
	Northbound				Southbound				Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	0	0	4	**4**	34	1	32	**67**	**71**	74	348	4	**426**	1	248	41	**290**	**716**	**787**
08:00 09:00	0	0	6	**6**	52	2	60	**114**	**120**	67	363	6	**436**	3	330	62	**395**	**831**	**951**
09:00 10:00	7	0	6	**13**	35	2	43	**80**	**93**	58	366	9	**433**	4	221	46	**271**	**704**	**797**
11:30 12:30	9	2	12	**23**	52	3	51	**106**	**129**	71	329	11	**411**	5	261	62	**328**	**739**	**868**
12:30 13:30	9	0	13	**22**	49	4	45	**98**	**120**	59	336	10	**405**	10	254	59	**323**	**728**	**848**
15:00 16:00	8	3	12	**23**	115	1	73	**189**	**212**	96	400	11	**507**	3	337	146	**486**	**993**	**1205**
16:00 17:00	2	3	14	**19**	71	1	89	**161**	**180**	88	470	8	**566**	7	391	158	**556**	**1122**	**1302**
17:00 18:00	2	3	10	**15**	78	2	67	**147**	**162**	74	457	4	**535**	8	315	117	**440**	**975**	**1137**
Sub Total	37	11	77	**125**	486	16	460	**962**	**1087**	587	3069	63	**3719**	41	2357	691	**3089**	**6808**	**7895**
U Turns	2			**2**	0			**0**	**2**	**0**			**0**	2			**2**	**2**	**4**
Total	39	11	77	**127**	486	16	460	**962**	**1089**	587	3069	63	**3719**	43	2357	691	**3091**	**6810**	**7899**
EQ 12Hr	54	15	107	**176**	676	22	639	**1337**	**1513**	816	4266	88	**5170**	60	3276	960	**4296**	**9466**	**10979**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	59	16	118	**193**	744	24	703	**1471**	**1664**	898	4693	97	**5688**	66	3604	1056	**4726**	**10414**	**12078**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**1.10**					
AVG 24Hr	77	21	155	**253**	975	31	921	**1927**	**2180**	1176	6148	127	**7451**	86	4721	1383	**6190**	**13641**	**15821**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

NELSON ST @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39319

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

Full Study 15 Minute Increments

		NELSON ST									RIDEAU ST									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	0	1	1	6	0	3	9	**10**	14	85	0	99	0	49	7	56	**155**	**165**
07:15	07:30	0	0	2	2	11	0	6	17	**19**	19	84	2	105	0	53	10	63	**168**	**187**
07:30	07:45	0	0	1	1	8	0	9	17	**18**	24	87	1	112	1	72	14	87	**199**	**217**
07:45	08:00	0	0	0	0	9	1	14	24	**24**	17	92	1	110	0	74	10	84	**194**	**218**
08:00	08:15	0	0	1	1	10	0	17	27	**28**	19	78	2	99	1	82	15	98	**197**	**225**
08:15	08:30	0	0	3	3	13	0	15	28	**31**	17	85	1	103	2	80	15	97	**200**	**231**
08:30	08:45	0	0	0	0	17	0	16	33	**33**	14	99	2	115	0	81	17	98	**213**	**246**
08:45	09:00	0	0	2	2	12	2	12	26	**28**	17	101	1	119	0	87	15	102	**221**	**249**
09:00	09:15	1	0	0	1	8	0	14	22	**23**	13	85	3	101	0	61	13	74	**175**	**198**
09:15	09:30	1	0	1	2	13	0	5	18	**20**	19	91	2	112	1	66	19	86	**198**	**218**
09:30	09:45	5	0	3	8	7	1	13	21	**29**	17	83	4	104	3	44	5	52	**156**	**185**
09:45	10:00	2	0	2	4	7	1	11	19	**23**	9	107	0	116	0	50	9	59	**175**	**198**
11:30	11:45	1	0	3	4	14	0	12	26	**30**	18	93	3	114	1	79	20	100	**214**	**244**
11:45	12:00	3	0	0	3	8	1	16	25	**28**	18	80	1	99	0	47	19	66	**165**	**193**
12:00	12:15	4	1	5	10	9	1	13	23	**33**	19	81	5	105	4	72	11	87	**192**	**225**
12:15	12:30	1	1	4	6	21	1	10	32	**38**	16	75	2	93	2	63	12	77	**170**	**208**
12:30	12:45	3	0	2	5	11	3	12	26	**31**	9	79	2	90	3	50	15	68	**158**	**189**
12:45	13:00	2	0	6	8	12	0	10	22	**30**	16	71	2	89	2	73	15	90	**179**	**209**
13:00	13:15	2	0	1	3	7	1	13	21	**24**	16	85	5	106	2	56	15	73	**179**	**203**
13:15	13:30	2	0	4	6	19	0	10	29	**35**	18	101	1	120	3	75	14	92	**212**	**247**
15:00	15:15	2	0	3	5	24	0	20	44	**49**	24	95	4	123	0	82	34	116	**239**	**288**
15:15	15:30	2	3	4	9	31	0	13	44	**53**	25	112	3	140	2	79	46	127	**267**	**320**
15:30	15:45	2	0	1	3	34	0	22	56	**59**	21	91	1	113	0	77	35	112	**225**	**284**
15:45	16:00	2	0	4	6	26	1	18	45	**51**	26	102	3	131	1	99	31	131	**262**	**313**
16:00	16:15	1	0	7	8	15	0	29	44	**52**	28	101	0	129	0	91	52	143	**272**	**324**
16:15	16:30	1	1	0	2	15	1	25	41	**43**	28	111	1	140	0	106	43	149	**289**	**332**
16:30	16:45	0	2	4	6	25	0	15	40	**46**	19	120	5	144	3	95	32	130	**274**	**320**
16:45	17:00	0	0	3	3	16	0	20	36	**39**	13	138	2	153	4	99	31	134	**287**	**326**
17:00	17:15	0	0	3	3	23	1	25	49	**52**	14	117	1	132	4	72	33	109	**241**	**293**
17:15	17:30	2	3	5	10	23	1	17	41	**51**	20	105	2	127	2	82	27	111	**238**	**289**
17:30	17:45	0	0	2	2	13	0	11	24	**26**	23	115	0	138	1	87	35	123	**261**	**287**
17:45	18:00	0	0	0	0	19	0	14	33	**33**	17	120	1	138	1	74	22	97	**235**	**268**
Total:		39	11	77	127	486	16	460	962	**1089**	587	3069	63	3719	43	2357	691	3091	**1089**	**7,899**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

NELSON ST @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39319

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

Full Study Cyclist Volume

		NELSON ST			RIDEAU ST			
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	**0**	0	2	**2**	**2**
07:15	07:30	0	0	**0**	0	1	**1**	**1**
07:30	07:45	1	0	**1**	1	1	**2**	**3**
07:45	08:00	0	0	**0**	1	2	**3**	**3**
08:00	08:15	0	0	**0**	0	0	**0**	**0**
08:15	08:30	0	0	**0**	0	0	**0**	**0**
08:30	08:45	0	0	**0**	0	2	**2**	**2**
08:45	09:00	0	0	**0**	0	0	**0**	**0**
09:00	09:15	0	1	**1**	0	0	**0**	**1**
09:15	09:30	0	0	**0**	0	0	**0**	**0**
09:30	09:45	0	0	**0**	0	0	**0**	**0**
09:45	10:00	1	0	**1**	0	0	**0**	**1**
11:30	11:45	0	0	**0**	1	0	**1**	**1**
11:45	12:00	0	1	**1**	2	0	**2**	**3**
12:00	12:15	1	0	**1**	1	0	**1**	**2**
12:15	12:30	0	1	**1**	0	0	**0**	**1**
12:30	12:45	0	1	**1**	0	0	**0**	**1**
12:45	13:00	0	0	**0**	0	1	**1**	**1**
13:00	13:15	0	0	**0**	0	0	**0**	**0**
13:15	13:30	0	0	**0**	0	0	**0**	**0**
15:00	15:15	1	0	**1**	0	0	**0**	**1**
15:15	15:30	0	0	**0**	2	0	**2**	**2**
15:30	15:45	1	1	**2**	0	0	**0**	**2**
15:45	16:00	1	0	**1**	0	0	**0**	**1**
16:00	16:15	0	0	**0**	1	2	**3**	**3**
16:15	16:30	0	0	**0**	1	1	**2**	**2**
16:30	16:45	1	0	**1**	1	2	**3**	**4**
16:45	17:00	1	1	**2**	2	0	**2**	**4**
17:00	17:15	0	0	**0**	1	0	**1**	**1**
17:15	17:30	0	0	**0**	2	0	**2**	**2**
17:30	17:45	1	0	**1**	0	1	**1**	**2**
17:45	18:00	1	0	**1**	1	0	**1**	**2**
Total		10	6	**16**	17	15	**32**	**48**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

NELSON ST @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39319

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

Full Study Pedestrian Volume

Time Period	NELSON ST NB Approach (E or W Crossing)	NELSON ST SB Approach (E or W Crossing)	NELSON ST Total	RIDEAU ST EB Approach (N or S Crossing)	RIDEAU ST WB Approach (N or S Crossing)	RIDEAU ST Total	Grand Total
07:00 07:15	10	31	**41**	4	4	**8**	**49**
07:15 07:30	7	30	**37**	4	9	**13**	**50**
07:30 07:45	18	40	**58**	8	19	**27**	**85**
07:45 08:00	30	47	**77**	8	11	**19**	**96**
08:00 08:15	16	47	**63**	15	16	**31**	**94**
08:15 08:30	20	52	**72**	15	18	**33**	**105**
08:30 08:45	23	43	**66**	12	17	**29**	**95**
08:45 09:00	26	44	**70**	15	30	**45**	**115**
09:00 09:15	25	51	**76**	19	26	**45**	**121**
09:15 09:30	34	46	**80**	5	19	**24**	**104**
09:30 09:45	23	56	**79**	11	24	**35**	**114**
09:45 10:00	32	45	**77**	11	26	**37**	**114**
11:30 11:45	51	75	**126**	38	45	**83**	**209**
11:45 12:00	57	75	**132**	18	58	**76**	**208**
12:00 12:15	44	87	**131**	28	46	**74**	**205**
12:15 12:30	50	108	**158**	32	52	**84**	**242**
12:30 12:45	49	94	**143**	51	41	**92**	**235**
12:45 13:00	43	87	**130**	39	54	**93**	**223**
13:00 13:15	49	82	**131**	34	54	**88**	**219**
13:15 13:30	39	67	**106**	26	52	**78**	**184**
15:00 15:15	58	94	**152**	29	67	**96**	**248**
15:15 15:30	62	108	**170**	39	78	**117**	**287**
15:30 15:45	67	124	**191**	37	53	**90**	**281**
15:45 16:00	76	100	**176**	28	81	**109**	**285**
16:00 16:15	70	126	**196**	23	73	**96**	**292**
16:15 16:30	70	161	**231**	40	75	**115**	**346**
16:30 16:45	71	130	**201**	31	81	**112**	**313**
16:45 17:00	79	137	**216**	45	84	**129**	**345**
17:00 17:15	81	138	**219**	34	80	**114**	**333**
17:15 17:30	68	114	**182**	44	72	**116**	**298**
17:30 17:45	90	130	**220**	50	84	**134**	**354**
17:45 18:00	54	117	**171**	44	67	**111**	**282**
Total	1492	2686	**4178**	837	1516	**2353**	**6531**

5470796 - TUE JAN 14, 2020 - 8HRS - LORETTA

Transportation Services - Traffic Services

Turning Movement Count - Study Results

NELSON ST @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39319

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

Full Study Heavy Vehicles

		NELSON ST									RIDEAU ST									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	0	0	**0**	2	0	0	**2**	**2**	0	8	0	**8**	0	17	0	**17**	**25**	**27**
07:15	07:30	0	0	0	**0**	0	0	0	**0**	**0**	0	5	0	**5**	0	14	1	**15**	**20**	**20**
07:30	07:45	0	0	0	**0**	0	0	0	**0**	**0**	0	10	0	**10**	0	11	1	**12**	**22**	**22**
07:45	08:00	0	0	0	**0**	0	0	1	**1**	**1**	0	6	0	**6**	0	10	0	**10**	**16**	**17**
08:00	08:15	0	0	1	**1**	0	0	0	**0**	**1**	1	11	1	**13**	0	12	0	**12**	**25**	**26**
08:15	08:30	0	0	0	**0**	0	0	2	**2**	**2**	0	10	0	**10**	0	11	0	**11**	**21**	**23**
08:30	08:45	0	0	0	**0**	0	0	1	**1**	**1**	2	4	0	**6**	0	11	0	**11**	**17**	**18**
08:45	09:00	0	0	0	**0**	1	1	0	**2**	**2**	0	12	0	**12**	0	14	0	**14**	**26**	**28**
09:00	09:15	0	0	0	**0**	1	0	0	**1**	**1**	0	7	0	**7**	0	12	0	**12**	**19**	**20**
09:15	09:30	0	0	0	**0**	0	0	1	**1**	**1**	1	17	0	**18**	0	9	0	**9**	**27**	**28**
09:30	09:45	0	0	0	**0**	0	0	0	**0**	**0**	0	8	1	**9**	0	11	0	**11**	**20**	**20**
09:45	10:00	0	0	0	**0**	1	1	0	**2**	**2**	0	11	0	**11**	0	8	0	**8**	**19**	**21**
11:30	11:45	0	0	0	**0**	0	0	0	**0**	**0**	0	11	0	**11**	0	13	0	**13**	**24**	**24**
11:45	12:00	0	0	0	**0**	0	0	0	**0**	**0**	2	7	0	**9**	0	6	1	**7**	**16**	**16**
12:00	12:15	0	0	0	**0**	0	0	2	**2**	**2**	2	15	0	**17**	0	13	1	**14**	**31**	**33**
12:15	12:30	0	0	0	**0**	1	0	0	**1**	**1**	0	9	0	**9**	0	5	0	**5**	**14**	**15**
12:30	12:45	1	0	0	**1**	0	0	1	**1**	**2**	0	10	1	**11**	0	8	0	**8**	**19**	**21**
12:45	13:00	0	0	0	**0**	1	0	2	**3**	**3**	1	12	0	**13**	0	14	0	**14**	**27**	**30**
13:00	13:15	0	0	0	**0**	0	0	1	**1**	**1**	0	6	0	**6**	0	7	1	**8**	**14**	**15**
13:15	13:30	0	0	0	**0**	0	0	0	**0**	**0**	1	16	0	**17**	0	8	0	**8**	**25**	**25**
15:00	15:15	0	0	0	**0**	0	0	2	**2**	**2**	1	14	1	**16**	0	6	1	**7**	**23**	**25**
15:15	15:30	0	1	0	**1**	2	0	0	**2**	**3**	0	11	0	**11**	0	10	0	**10**	**21**	**24**
15:30	15:45	0	0	0	**0**	0	0	0	**0**	**0**	1	9	0	**10**	0	11	0	**11**	**21**	**21**
15:45	16:00	0	0	0	**0**	1	0	0	**1**	**1**	2	10	0	**12**	0	6	0	**6**	**18**	**19**
16:00	16:15	0	0	0	**0**	0	0	1	**1**	**1**	0	7	0	**7**	0	9	1	**10**	**17**	**18**
16:15	16:30	0	0	0	**0**	0	0	1	**1**	**1**	1	8	0	**9**	0	7	0	**7**	**16**	**17**
16:30	16:45	0	0	0	**0**	0	0	1	**1**	**1**	0	11	0	**11**	0	7	0	**7**	**18**	**19**
16:45	17:00	0	0	0	**0**	0	0	0	**0**	**0**	1	11	0	**12**	0	6	0	**6**	**18**	**18**
17:00	17:15	0	0	0	**0**	0	0	0	**0**	**0**	0	10	0	**10**	0	6	0	**6**	**16**	**16**
17:15	17:30	0	0	0	**0**	0	0	1	**1**	**1**	1	4	0	**5**	0	7	0	**7**	**12**	**13**
17:30	17:45	0	0	0	**0**	0	0	0	**0**	**0**	1	9	0	**10**	0	5	0	**5**	**15**	**15**
17:45	18:00	0	0	0	**0**	1	0	0	**1**	**1**	0	7	0	**7**	0	5	0	**5**	**12**	**13**
Total:	None	1	1	1	**3**	11	2	17	**30**	**33**	18	306	4	**328**	0	299	7	**306**	**634**	**667**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

NELSON ST @ RIDEAU ST

Survey Date: Tuesday, January 14, 2020 **WO No:** 39319

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

Full Study 15 Minute U-Turn Total

Time Period		NELSON ST Northbound U-Turn Total	NELSON ST Southbound U-Turn Total	RIDEAU ST Eastbound U-Turn Total	RIDEAU ST Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	**0**
07:15	07:30	0	0	0	0	**0**
07:30	07:45	0	0	0	0	**0**
07:45	08:00	0	0	0	0	**0**
08:00	08:15	0	0	0	0	**0**
08:15	08:30	0	0	0	0	**0**
08:30	08:45	0	0	0	0	**0**
08:45	09:00	0	0	0	0	**0**
09:00	09:15	1	0	0	0	**1**
09:15	09:30	0	0	0	0	**0**
09:30	09:45	0	0	0	0	**0**
09:45	10:00	1	0	0	0	**1**
11:30	11:45	0	0	0	0	**0**
11:45	12:00	0	0	0	0	**0**
12:00	12:15	0	0	0	1	**1**
12:15	12:30	0	0	0	1	**1**
12:30	12:45	0	0	0	0	**0**
12:45	13:00	0	0	0	0	**0**
13:00	13:15	0	0	0	0	**0**
13:15	13:30	0	0	0	0	**0**
15:00	15:15	0	0	0	0	**0**
15:15	15:30	0	0	0	0	**0**
15:30	15:45	0	0	0	0	**0**
15:45	16:00	0	0	0	0	**0**
16:00	16:15	0	0	0	0	**0**
16:15	16:30	0	0	0	0	**0**
16:30	16:45	0	0	0	0	**0**
16:45	17:00	0	0	0	0	**0**
17:00	17:15	0	0	0	0	**0**
17:15	17:30	0	0	0	0	**0**
17:30	17:45	0	0	0	0	**0**
17:45	18:00	0	0	0	0	**0**
Total		2	0	0	2	**4**

Transportation Services - Traffic Services

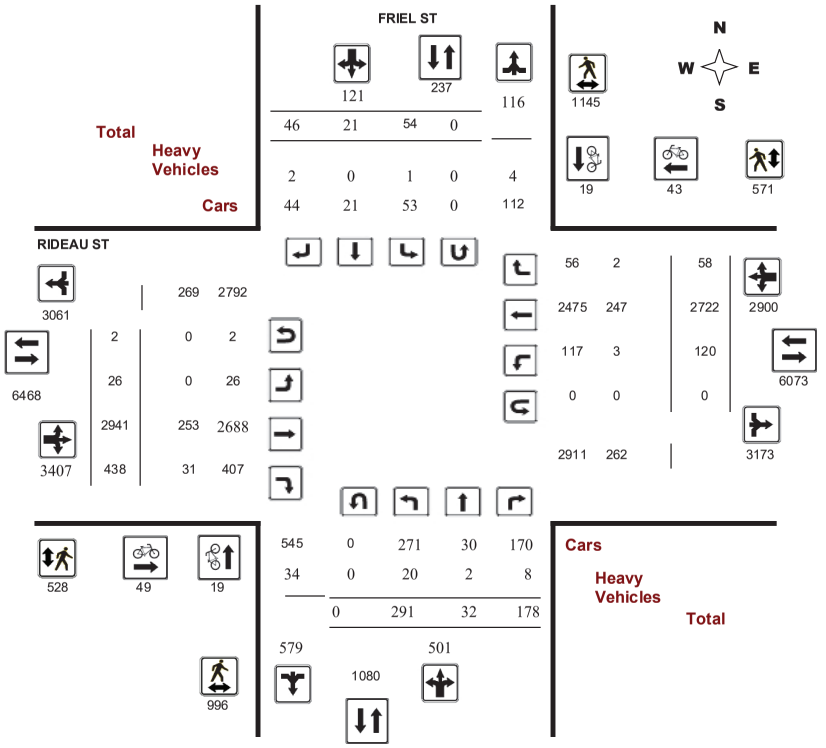
Turning Movement Count - Study Results

FRIEL ST @ RIDEAU ST

Survey Date: Tuesday, May 09, 2017 **WO No:** 37008

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

Full Study Diagram



Transportation Services - Traffic Services

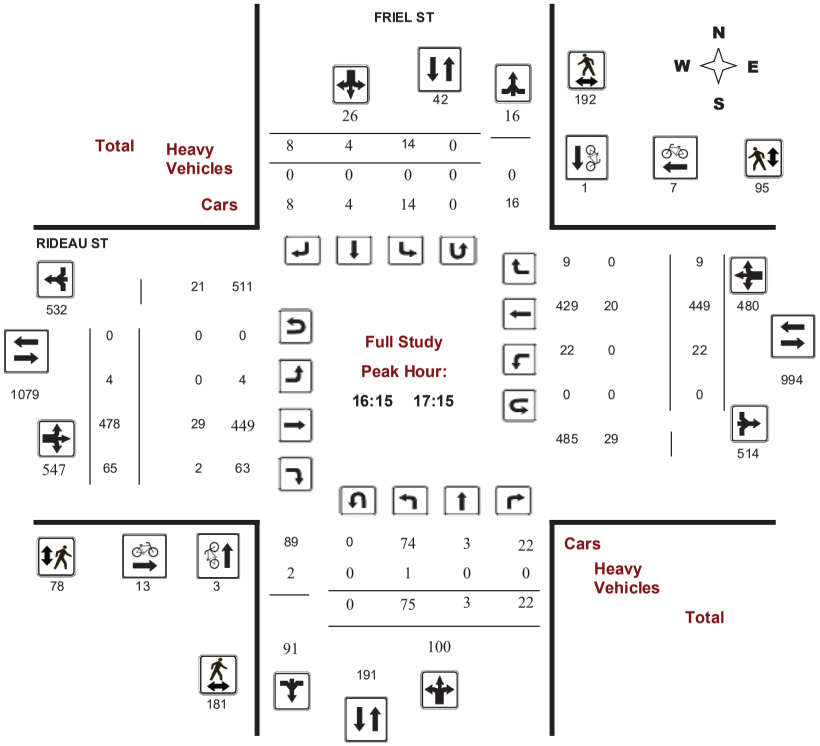
Turning Movement Count - Study Results

FRIEL ST @ RIDEAU ST

Survey Date: Tuesday, May 09, 2017 **WO No:** 37008

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

Full Study Peak Hour Diagram



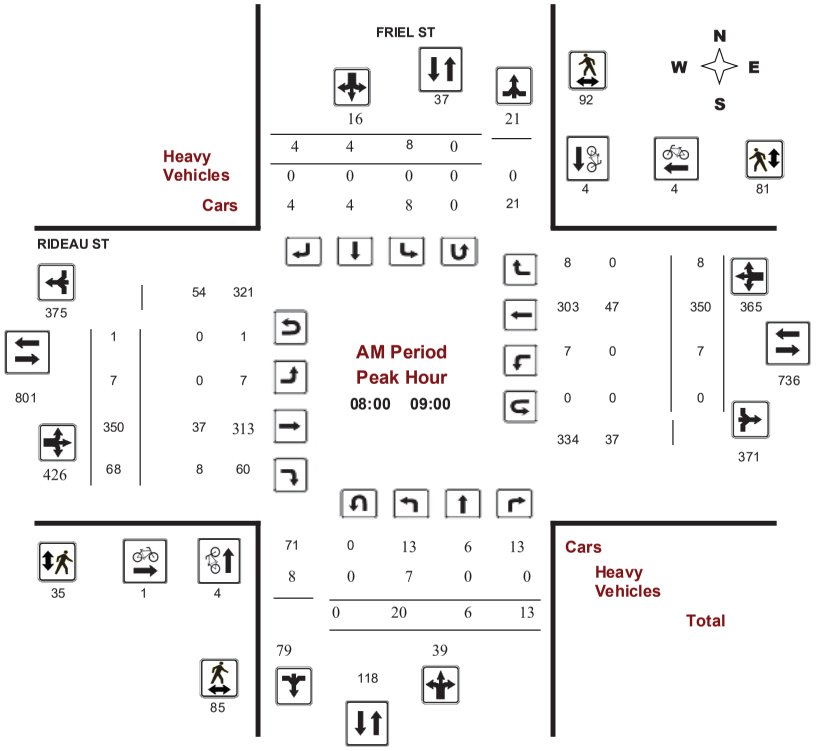
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

FRIEL ST @ RIDEAU ST

Survey Date: Tuesday, May 09, 2017 **WO No:** 37008

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



Comments

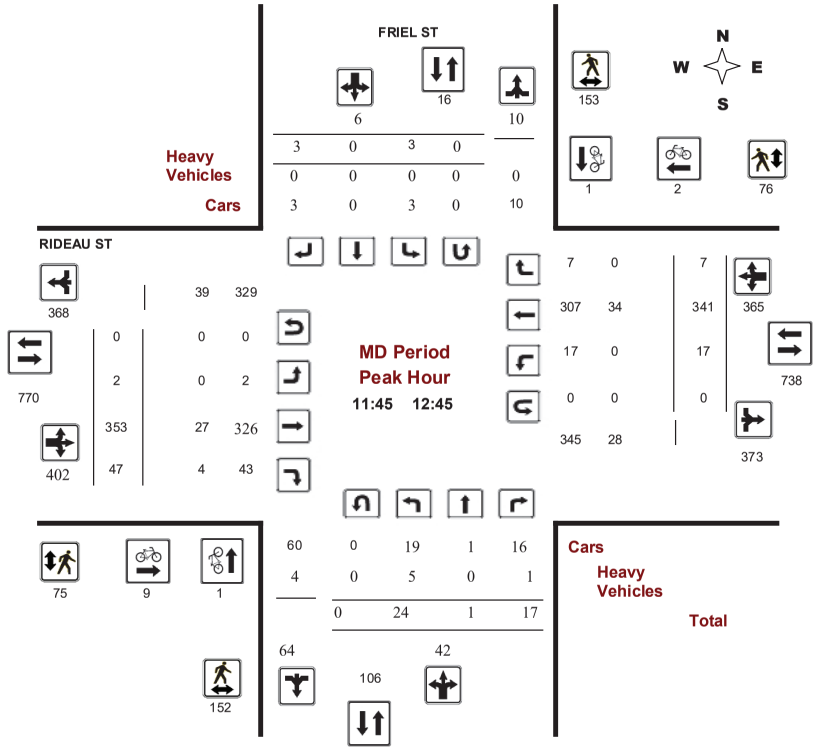
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

FRIEL ST @ RIDEAU ST

Survey Date: Tuesday, May 09, 2017 **WO No:** 37008

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



Comments

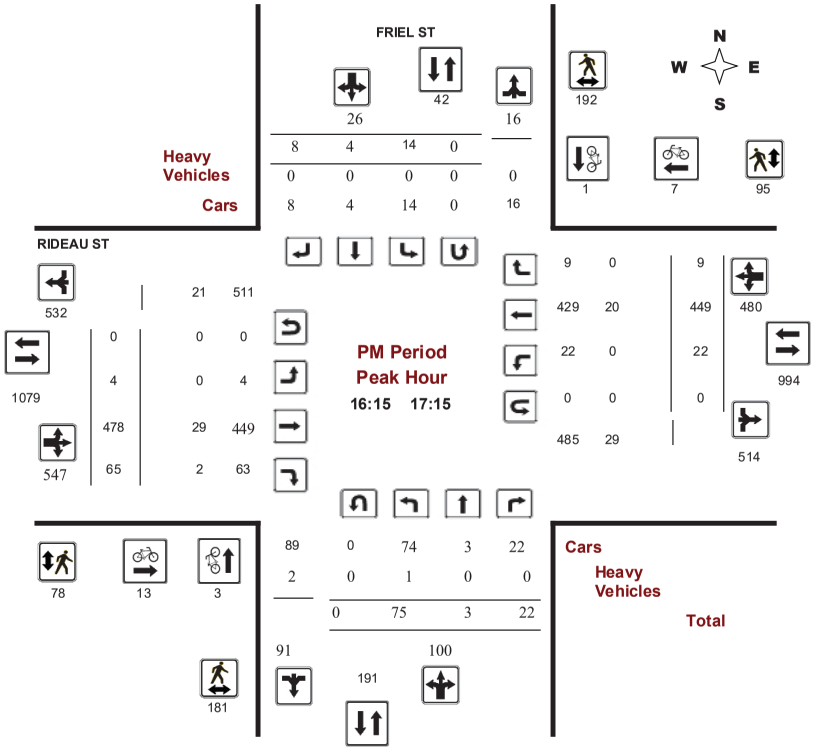
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

FRIEL ST @ RIDEAU ST

Survey Date: Tuesday, May 09, 2017 **WO No:** 37008

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



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

FRIEL ST @ RIDEAU ST

Survey Date: Tuesday, May 09, 2017 **WO No:** 37008

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

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, May 09, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 2 Westbound: 0

AADT Factor .90

	FRIEL ST								RIDEAU ST									
	Northbound				Southbound				Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	9	3	11	**23**	6	2	4	**12**	**35**	5	283	46	**334**	7	258	8	**273**	**607**	**642**
08:00 09:00	20	6	13	**39**	8	4	4	**16**	**55**	7	350	68	**425**	7	350	8	**365**	**790**	**845**
09:00 10:00	22	0	21	**43**	2	0	2	**4**	**47**	0	304	43	**347**	17	285	12	**314**	**661**	**708**
11:30 12:30	21	1	20	**42**	6	0	5	**11**	**53**	1	349	46	**396**	16	335	6	**357**	**753**	**806**
12:30 13:30	19	2	25	**46**	3	2	6	**11**	**57**	3	336	43	**382**	12	332	5	**349**	**731**	**788**
15:00 16:00	61	7	35	**103**	8	5	8	**21**	**124**	6	426	69	**501**	15	360	2	**377**	**878**	**1002**
16:00 17:00	84	5	21	**110**	14	5	7	**26**	**136**	1	478	60	**539**	26	430	10	**466**	**1005**	**1141**
17:00 18:00	55	8	32	**95**	7	3	10	**20**	**115**	3	415	63	**481**	20	372	7	**399**	**880**	**995**
Sub Total	291	32	178	**501**	54	21	46	**121**	**622**	26	2941	438	**3405**	120	2722	58	**2900**	**6305**	**6927**
U Turns	0			**0**	0			**0**	**0**	**2**			**2**	0			**0**	**2**	**2**
Total	291	32	178	**501**	54	21	46	**121**	**622**	28	2941	438	**3407**	120	2722	58	**2900**	**6307**	**6929**
EQ 12Hr	404	44	247	**695**	75	29	64	**168**	**863**	39	4088	609	**4736**	167	3784	81	**4032**	**8768**	**9631**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	364	40	222	**626**	68	26	58	**152**	**778**	35	3679	548	**4262**	150	3406	73	**3629**	**7891**	**8669**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	477	52	291	**820**	89	34	76	**199**	**1019**	46	4819	718	**5583**	196	4462	96	**4754**	**10337**	**11356**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

FRIEL ST @ RIDEAU ST

Survey Date: Tuesday, May 09, 2017 **WO No:** 37008

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

Full Study 15 Minute Increments

		FRIEL ST									RIDEAU ST									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	1	2	1	4	0	0	0	0	**4**	3	73	7	83	1	52	0	53	**136**	**140**
07:15	07:30	1	0	3	4	0	0	1	1	**5**	0	75	10	85	1	70	2	73	**158**	**163**
07:30	07:45	3	0	5	8	4	0	2	6	**14**	1	75	13	89	2	64	1	67	**156**	**170**
07:45	08:00	4	1	2	7	2	2	1	5	**12**	1	60	16	77	3	72	5	80	**157**	**169**
08:00	08:15	4	2	7	13	2	3	3	8	**21**	1	91	17	109	1	94	2	97	**206**	**227**
08:15	08:30	6	4	1	11	4	0	1	5	**16**	3	84	21	108	1	83	3	87	**195**	**211**
08:30	08:45	5	0	1	6	0	1	0	1	**7**	1	81	16	98	1	91	2	94	**192**	**199**
08:45	09:00	5	0	4	9	2	0	0	2	**11**	3	94	14	111	4	82	1	87	**198**	**209**
09:00	09:15	8	0	8	16	0	0	0	0	**16**	0	86	10	96	8	73	5	86	**182**	**198**
09:15	09:30	5	0	3	8	1	0	1	2	**10**	0	82	9	91	1	76	3	80	**171**	**181**
09:30	09:45	4	0	4	8	0	0	0	0	**8**	0	65	14	79	6	59	1	66	**145**	**153**
09:45	10:00	5	0	6	11	1	0	1	2	**13**	0	71	10	81	2	77	3	82	**163**	**176**
11:30	11:45	4	0	10	14	3	0	4	7	**21**	1	74	14	89	3	77	2	82	**171**	**192**
11:45	12:00	5	0	8	13	1	0	1	2	**15**	0	109	12	121	4	98	2	104	**225**	**240**
12:00	12:15	6	1	0	7	2	0	0	2	**9**	0	84	11	95	3	83	1	87	**182**	**191**
12:15	12:30	6	0	2	8	0	0	0	0	**8**	0	82	9	91	6	77	1	84	**175**	**183**
12:30	12:45	7	0	7	14	0	0	2	2	**16**	2	78	15	95	4	83	3	90	**185**	**201**
12:45	13:00	5	0	6	11	0	0	1	1	**12**	0	86	13	99	1	89	0	90	**189**	**201**
13:00	13:15	3	1	4	8	2	1	3	6	**14**	1	105	10	116	3	83	1	87	**203**	**217**
13:15	13:30	4	1	8	13	1	1	0	2	**15**	1	67	5	73	4	77	1	82	**155**	**170**
15:00	15:15	14	0	10	24	2	0	1	3	**27**	1	103	13	117	4	86	0	90	**207**	**234**
15:15	15:30	13	0	9	22	2	4	1	7	**29**	2	107	15	124	1	96	1	98	**222**	**251**
15:30	15:45	21	4	11	36	2	0	1	3	**39**	1	113	16	130	3	94	0	97	**227**	**266**
15:45	16:00	13	3	5	21	2	1	5	8	**29**	2	103	25	130	7	84	1	92	**222**	**251**
16:00	16:15	24	3	4	31	1	2	2	5	**36**	0	113	13	126	7	90	3	100	**226**	**262**
16:15	16:30	26	1	5	32	3	1	2	6	**38**	0	121	12	133	6	105	1	112	**245**	**283**
16:30	16:45	18	0	4	22	4	2	3	9	**31**	0	118	21	139	8	108	2	118	**257**	**288**
16:45	17:00	16	1	8	25	6	0	0	6	**31**	1	126	14	141	5	127	4	136	**277**	**308**
17:00	17:15	15	1	5	21	1	1	3	5	**26**	3	113	18	134	3	109	2	114	**248**	**274**
17:15	17:30	10	4	14	28	3	0	3	6	**34**	0	98	19	117	7	100	0	107	**224**	**258**
17:30	17:45	17	1	7	25	2	1	1	4	**29**	0	112	11	123	3	81	3	87	**210**	**239**
17:45	18:00	13	2	6	21	1	1	3	5	**26**	0	92	15	107	7	82	2	91	**198**	**224**
Total:		291	32	178	501	54	21	46	121	**622**	28	2941	438	3407	120	2722	58	2900	**622**	**6,929**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

FRIEL ST @ RIDEAU ST

Survey Date: Tuesday, May 09, 2017 **WO No:** 37008

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

Full Study Cyclist Volume

Time Period		FRIEL ST Northbound	FRIEL ST Southbound	FRIEL ST Street Total	RIDEAU ST Eastbound	RIDEAU ST Westbound	RIDEAU ST Street Total	Grand Total
07:00	07:15	0	0	**0**	1	0	**1**	**1**
07:15	07:30	0	0	**0**	1	1	**2**	**2**
07:30	07:45	2	2	**4**	0	4	**4**	**8**
07:45	08:00	2	0	**2**	0	2	**2**	**4**
08:00	08:15	2	2	**4**	0	2	**2**	**6**
08:15	08:30	0	1	**1**	0	0	**0**	**1**
08:30	08:45	1	0	**1**	0	2	**2**	**3**
08:45	09:00	1	1	**2**	1	0	**1**	**3**
09:00	09:15	1	1	**2**	1	2	**3**	**5**
09:15	09:30	1	1	**2**	0	1	**1**	**3**
09:30	09:45	0	1	**1**	2	0	**2**	**3**
09:45	10:00	0	0	**0**	0	0	**0**	**0**
11:30	11:45	0	1	**1**	1	1	**2**	**3**
11:45	12:00	1	0	**1**	2	0	**2**	**3**
12:00	12:15	0	0	**0**	2	1	**3**	**3**
12:15	12:30	0	0	**0**	5	1	**6**	**6**
12:30	12:45	0	1	**1**	0	0	**0**	**1**
12:45	13:00	0	1	**1**	4	2	**6**	**7**
13:00	13:15	1	0	**1**	1	2	**3**	**4**
13:15	13:30	0	0	**0**	2	1	**3**	**3**
15:00	15:15	0	1	**1**	0	1	**1**	**2**
15:15	15:30	1	0	**1**	3	2	**5**	**6**
15:30	15:45	0	2	**2**	1	2	**3**	**5**
15:45	16:00	0	1	**1**	1	3	**4**	**5**
16:00	16:15	2	0	**2**	2	3	**5**	**7**
16:15	16:30	0	0	**0**	5	2	**7**	**7**
16:30	16:45	0	0	**0**	1	0	**1**	**1**
16:45	17:00	2	1	**3**	2	0	**2**	**5**
17:00	17:15	1	0	**1**	5	5	**10**	**11**
17:15	17:30	0	1	**1**	1	2	**3**	**4**
17:30	17:45	1	1	**2**	2	1	**3**	**5**
17:45	18:00	0	0	**0**	3	0	**3**	**3**
Total		19	19	**38**	49	43	**92**	**130**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

FRIEL ST @ RIDEAU ST

Survey Date: Tuesday, May 09, 2017 **WO No:** 37008

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

Full Study Pedestrian Volume

Time Period		FRIEL ST NB Approach (E or W Crossing)	FRIEL ST SB Approach (E or W Crossing)	FRIEL ST Total	RIDEAU ST EB Approach (N or S Crossing)	RIDEAU ST WB Approach (N or S Crossing)	RIDEAU ST Total	Grand Total
07:00	07:15	7	7	**14**	0	6	**6**	**20**
07:15	07:30	7	19	**26**	5	13	**18**	**44**
07:30	07:45	13	13	**26**	11	11	**22**	**48**
07:45	08:00	19	17	**36**	13	15	**28**	**64**
08:00	08:15	19	18	**37**	1	24	**25**	**62**
08:15	08:30	19	24	**43**	13	16	**29**	**72**
08:30	08:45	25	26	**51**	10	16	**26**	**77**
08:45	09:00	22	24	**46**	11	25	**36**	**82**
09:00	09:15	17	29	**46**	8	17	**25**	**71**
09:15	09:30	23	30	**53**	5	17	**22**	**75**
09:30	09:45	15	29	**44**	12	8	**20**	**64**
09:45	10:00	18	21	**39**	29	9	**38**	**77**
11:30	11:45	23	29	**52**	19	7	**26**	**78**
11:45	12:00	35	34	**69**	22	19	**41**	**110**
12:00	12:15	29	40	**69**	18	19	**37**	**106**
12:15	12:30	44	37	**81**	20	15	**35**	**116**
12:30	12:45	44	42	**86**	15	23	**38**	**124**
12:45	13:00	42	36	**78**	35	12	**47**	**125**
13:00	13:15	34	29	**63**	10	12	**22**	**85**
13:15	13:30	29	40	**69**	14	13	**27**	**96**
15:00	15:15	34	55	**89**	24	14	**38**	**127**
15:15	15:30	35	34	**69**	18	23	**41**	**110**
15:30	15:45	39	60	**99**	25	40	**65**	**164**
15:45	16:00	52	38	**90**	17	22	**39**	**129**
16:00	16:15	38	57	**95**	13	20	**33**	**128**
16:15	16:30	47	34	**81**	22	28	**50**	**131**
16:30	16:45	40	52	**92**	12	20	**32**	**124**
16:45	17:00	47	54	**101**	23	16	**39**	**140**
17:00	17:15	47	52	**99**	21	31	**52**	**151**
17:15	17:30	43	60	**103**	30	24	**54**	**157**
17:30	17:45	38	55	**93**	26	15	**41**	**134**
17:45	18:00	52	50	**102**	26	21	**47**	**149**
Total	.....	996	1145	**2141**	528	571	**1099**	**3240**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

FRIEL ST @ RIDEAU ST

Survey Date: Tuesday, May 09, 2017 **WO No:** 37008

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

Full Study Heavy Vehicles

		FRIEL ST									RIDEAU ST									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	0	0	**0**	0	0	0	**0**	**0**	0	12	1	**13**	0	8	0	**8**	**21**	**21**
07:15	07:30	0	0	1	**1**	0	0	0	**0**	**1**	0	10	2	**12**	0	7	0	**7**	**19**	**20**
07:30	07:45	0	0	0	**0**	0	0	0	**0**	**0**	0	7	3	**10**	0	12	0	**12**	**22**	**22**
07:45	08:00	1	0	0	**1**	0	0	1	**1**	**2**	0	8	1	**9**	0	11	1	**12**	**21**	**23**
08:00	08:15	1	0	0	**1**	0	0	0	**0**	**1**	0	13	2	**15**	0	9	0	**9**	**24**	**25**
08:15	08:30	2	0	0	**2**	0	0	0	**0**	**2**	0	8	2	**10**	0	11	0	**11**	**21**	**23**
08:30	08:45	3	0	0	**3**	0	0	0	**0**	**3**	0	6	1	**7**	0	13	0	**13**	**20**	**23**
08:45	09:00	1	0	0	**1**	0	0	0	**0**	**1**	0	10	3	**13**	0	14	0	**14**	**27**	**28**
09:00	09:15	1	0	0	**1**	0	0	0	**0**	**1**	0	8	3	**11**	1	10	0	**11**	**22**	**23**
09:15	09:30	2	0	0	**2**	0	0	0	**0**	**2**	0	7	3	**10**	0	9	0	**9**	**19**	**21**
09:30	09:45	2	0	0	**2**	0	0	0	**0**	**2**	0	8	1	**9**	0	8	0	**8**	**17**	**19**
09:45	10:00	1	0	0	**1**	0	0	0	**0**	**1**	0	9	1	**10**	0	8	0	**8**	**18**	**19**
11:30	11:45	0	0	1	**1**	0	0	0	**0**	**1**	0	8	1	**9**	0	4	0	**4**	**13**	**14**
11:45	12:00	1	0	0	**1**	0	0	0	**0**	**1**	0	6	1	**7**	0	9	0	**9**	**16**	**17**
12:00	12:15	2	0	0	**2**	0	0	0	**0**	**2**	0	9	2	**11**	0	11	0	**11**	**22**	**24**
12:15	12:30	2	0	0	**2**	0	0	0	**0**	**2**	0	5	0	**5**	0	4	0	**4**	**9**	**11**
12:30	12:45	0	0	1	**1**	0	0	0	**0**	**1**	0	7	1	**8**	0	10	0	**10**	**18**	**19**
12:45	13:00	0	0	0	**0**	0	0	0	**0**	**0**	0	8	1	**9**	0	4	0	**4**	**13**	**13**
13:00	13:15	0	0	0	**0**	0	0	0	**0**	**0**	0	6	0	**6**	0	7	0	**7**	**13**	**13**
13:15	13:30	0	0	0	**0**	0	0	0	**0**	**0**	0	7	0	**7**	0	9	0	**9**	**16**	**16**
15:00	15:15	0	0	2	**2**	1	0	0	**1**	**3**	0	6	0	**6**	1	4	0	**5**	**11**	**14**
15:15	15:30	0	0	1	**1**	0	0	0	**0**	**1**	0	4	0	**4**	0	8	0	**8**	**12**	**13**
15:30	15:45	0	0	0	**0**	0	0	0	**0**	**0**	0	8	0	**8**	0	5	0	**5**	**13**	**13**
15:45	16:00	0	0	1	**1**	0	0	0	**0**	**1**	0	7	0	**7**	1	12	0	**13**	**20**	**21**
16:00	16:15	0	2	1	**3**	0	0	1	**1**	**4**	0	9	0	**9**	0	4	1	**5**	**14**	**18**
16:15	16:30	1	0	0	**1**	0	0	0	**0**	**1**	0	10	1	**11**	0	4	0	**4**	**15**	**16**
16:30	16:45	0	0	0	**0**	0	0	0	**0**	**0**	0	7	1	**8**	0	6	0	**6**	**14**	**14**
16:45	17:00	0	0	0	**0**	0	0	0	**0**	**0**	0	5	0	**5**	0	4	0	**4**	**9**	**9**
17:00	17:15	0	0	0	**0**	0	0	0	**0**	**0**	0	7	0	**7**	0	6	0	**6**	**13**	**13**
17:15	17:30	0	0	0	**0**	0	0	0	**0**	**0**	0	8	0	**8**	0	5	0	**5**	**13**	**13**
17:30	17:45	0	0	0	**0**	0	0	0	**0**	**0**	0	11	0	**11**	0	5	0	**5**	**16**	**16**
17:45	18:00	0	0	0	**0**	0	0	0	**0**	**0**	0	9	0	**9**	0	6	0	**6**	**15**	**15**
Total:	None	20	2	8	**30**	1	0	2	**3**	**33**	0	253	31	**284**	3	247	2	**252**	**536**	**569**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

FRIEL ST @ RIDEAU ST

Survey Date: Tuesday, May 09, 2017 **WO No:** 37008

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

Full Study 15 Minute U-Turn Total

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

Appendix C

Synchro Intersection Worksheets – Existing Conditions

Lane Group	EBR	WBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	43	15	107	490	1210
Future Volume (vph)	43	15	107	490	1210
Lane Group Flow (vph)	48	17	119	568	1395
Turn Type	Free	Perm	pm+pt	NA	NA
Protected Phases			8	2	6
Permitted Phases	Free	8	2		
Detector Phase		8	8	2	6
Switch Phase					
Minimum Initial (s)		10.0	10.0	10.0	10.0
Minimum Split (s)		39.8	39.8	32.0	32.0
Total Split (s)		39.8	39.8	80.2	80.2
Total Split (%)		33.2%	33.2%	66.8%	66.8%
Maximum Green (s)		33.0	33.0	74.2	74.2
Yellow Time (s)		3.3	3.3	3.0	3.0
All-Red Time (s)		3.5	3.5	3.0	3.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0
Total Lost Time (s)		6.8	6.8	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Vehicle Extension (s)		3.0	3.0	3.0	3.0
Recall Mode		None	None	C-Max	C-Max
Walk Time (s)		25.0	25.0	18.0	18.0
Flash Dont Walk (s)		8.0	8.0	8.0	8.0
Pedestrian Calls (#/hr)		95	95	40	102
Act Effct Green (s)	120.0	33.0	106.4	74.2	74.2
Actuated g/C Ratio	1.00	0.28	0.89	0.62	0.62
v/c Ratio	0.03	0.03	0.19	0.19	0.48
Control Delay	0.0	0.1	1.4	9.9	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.0	0.1	1.4	9.9	13.0
LOS	A	A	A	A	B
Approach Delay				8.5	13.0
Approach LOS				A	B
Queue Length 50th (m)	0.0	0.0	0.2	19.4	60.6
Queue Length 95th (m)	0.0	0.0	0.4	25.1	71.4
Internal Link Dist (m)				218.1	130.8
Turn Bay Length (m)			85.0		
Base Capacity (vph)	1491	576	613	2918	2907
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.19	0.19	0.48

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 95 (79%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 75

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.48
Intersection Signal Delay: 11.2 — Intersection LOS: B
Intersection Capacity Utilization 59.0% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: King Edward & York

Lane Group	EBL	EBT	WBT	NBT	NBR	SBL	SBT	SBR	Ø1	Ø2	Ø3	Ø5
Lane Configurations												
Traffic Volume (vph)	156	158	307	445	83	201	801	217				
Future Volume (vph)	156	158	307	445	83	201	801	217				
Lane Group Flow (vph)	173	193	419	494	92	223	890	241				
Turn Type	Prot	NA	NA	NA	custom	custom	NA	custom				
Protected Phases	11	1 2	5 6	3 4		13	7 8	11	1	2	3	5
Permitted Phases					4	8		8				
Detector Phase	11	1 2	5 6	3 4	4	13	7 8	11				
Switch Phase												
Minimum Initial (s)	5.0				10.0	5.0		5.0	1.0	10.0	1.0	1.0
Minimum Split (s)	11.2				23.7	9.5		11.2	5.0	29.8	5.0	5.0
Total Split (s)	30.0				24.0	14.0		30.0	5.0	62.0	5.0	5.0
Total Split (%)	27.3%				21.8%	12.7%		27.3%	5%	56%	5%	5%
Maximum Green (s)	23.8				17.3	9.5		23.8	3.0	55.2	3.0	3.0
Yellow Time (s)	3.3				3.0	3.5		3.3	2.0	3.3	2.0	2.0
All-Red Time (s)	2.9				3.7	1.0		2.9	0.0	3.5	0.0	0.0
Lost Time Adjust (s)	0.0				0.0	0.0		0.0				
Total Lost Time (s)	6.2				6.7	4.5		6.2				
Lead/Lag					Lag				Lead	Lag	Lead	Lead
Lead-Lag Optimize?					Yes				Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0				3.0	3.0		3.0	3.0	3.0	3.0	3.0
Recall Mode	Max				Max	Max		Max	Max	C-Max	Max	Max
Walk Time (s)					2.0				3.0	2.0	3.0	3.0
Flash Dont Walk (s)					15.0				0.0	21.0	0.0	0.0
Pedestrian Calls (#/hr)					111				143	143	111	227
Act Effct Green (s)	23.8	65.0	35.0	27.0	17.3	33.5	41.0	55.6				
Actuated g/C Ratio	0.22	0.59	0.32	0.25	0.16	0.30	0.37	0.51				
v/c Ratio	0.48	0.10	0.45	0.61	0.28	0.84	0.72	0.36				
Control Delay	43.0	9.1	31.8	40.5	2.2	68.5	33.6	12.6				
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total Delay	43.0	9.1	31.8	40.5	2.2	68.5	33.6	12.6				
LOS	D	A	C	D	A	E	C	B				
Approach Delay		25.2	31.8	34.5			35.6					
Approach LOS		C	C	C			D					
Queue Length 50th (m)	32.7	8.1	37.5	49.6	0.0	38.4	85.2	22.6				
Queue Length 95th (m)	53.9	13.1	52.2	66.9	0.0	#78.0	108.1	35.8				
Internal Link Dist (m)		125.5	140.5	133.0			218.1					
Turn Bay Length (m)	65.0				20.0	105.0						
Base Capacity (vph)	358	1848	922	813	326	264	1235	665				
Starvation Cap Reductn	0	0	0	0	0	0	0	0				
Spillback Cap Reductn	0	0	0	0	0	0	0	0				
Storage Cap Reductn	0	0	0	0	0	0	0	0				
Reduced v/c Ratio	0.48	0.10	0.45	0.61	0.28	0.84	0.72	0.36				

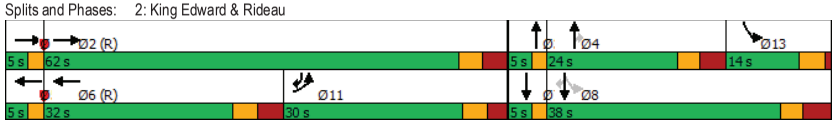
Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 92 (84%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90

Lane Group	Ø6	Ø7	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	6	7	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	10.0	1.0	10.0
Minimum Split (s)	31.8	5.0	25.9
Total Split (s)	32.0	5.0	38.0
Total Split (%)	29%	5%	35%
Maximum Green (s)	25.2	3.0	31.1
Yellow Time (s)	3.3	2.0	3.0
All-Red Time (s)	3.5	0.0	3.9
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	C-Max	Max	Max
Walk Time (s)	2.0	3.0	2.0
Flash Dont Walk (s)	23.0	0.0	17.0
Pedestrian Calls (#/hr)	227	108	108
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 33.4 Intersection LOS: C
Intersection Capacity Utilization 60.4% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: King Edward & Rideau

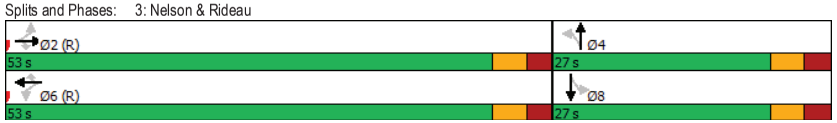


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	67	363	6	3	330	62	0	52	2
Future Volume (vph)	67	363	6	3	330	62	0	52	2
Lane Group Flow (vph)	74	403	7	3	367	69	7	0	127
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2			6		4		8
Permitted Phases	2		2	6		6		8	
Detector Phase	2	2	2	6	6	6	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.8	26.8	26.8	26.8	26.8	26.8	27.0	27.0	27.0
Total Split (s)	53.0	53.0	53.0	53.0	53.0	53.0	27.0	27.0	27.0
Total Split (%)	66.3%	66.3%	66.3%	66.3%	66.3%	66.3%	33.8%	33.8%	33.8%
Maximum Green (s)	47.2	47.2	47.2	47.2	47.2	47.2	21.0	21.0	21.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8	5.8	6.0		6.0
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None
Walk Time (s)	15.0	15.0	15.0	15.0	15.0	15.0	7.0	7.0	7.0
Flash Dont Walk (s)	6.0	6.0	6.0	6.0	6.0	6.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	85	85	85	186	186	186	81	57	57
Act Effct Green (s)	53.8	53.8	53.8	53.8	53.8	53.8	18.8		18.8
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.67	0.67	0.24		0.24
v/c Ratio	0.15	0.34	0.01	0.01	0.31	0.11	0.01		0.38
Control Delay	8.5	9.0	0.0	6.7	7.3	1.9	0.0		16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	8.5	9.0	0.0	6.7	7.3	1.9	0.0		16.2
LOS	A	A	A	A	A	A	A		B
Approach Delay		8.8			6.4				16.2
Approach LOS		A			A				B
Queue Length 50th (m)	4.7	29.7	0.0	0.2	21.1	0.1	0.0		7.1
Queue Length 95th (m)	10.9	47.1	0.0	m0.5	30.6	3.1	0.0		20.9
Internal Link Dist (m)		140.5			117.5		126.5		219.1
Turn Bay Length (m)	40.0		20.0	10.0		20.0			
Base Capacity (vph)	494	1172	832	537	1172	652	556		363
Starvation Cap Reductn	0	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0	0		0
Reduced v/c Ratio	0.15	0.34	0.01	0.01	0.31	0.11	0.01		0.35

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 34 (43%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 55

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.38
Intersection Signal Delay: 8.6 Intersection LOS: A
Intersection Capacity Utilization 60.4% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Nelson & Rideau

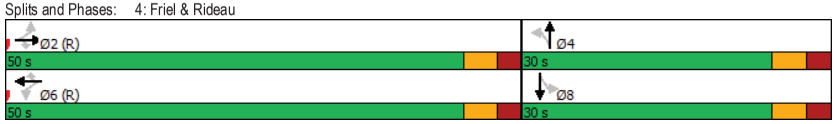


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	8	350	68	7	350	8	20	6	8	4
Future Volume (vph)	8	350	68	7	350	8	20	6	8	4
Lane Group Flow (vph)	0	398	76	0	397	9	0	43	0	17
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2			6			4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.7	25.7	25.7	25.7	25.7	25.7	29.8	29.8	29.8	29.8
Total Split (s)	50.0	50.0	50.0	50.0	50.0	50.0	30.0	30.0	30.0	30.0
Total Split (%)	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	37.5%	37.5%	37.5%	37.5%
Maximum Green (s)	44.3	44.3	44.3	44.3	44.3	44.3	24.2	24.2	24.2	24.2
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0
Total Lost Time (s)		5.7	5.7		5.7	5.7		5.8		5.8
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Walk Time (s)	13.0	13.0	13.0	13.0	13.0	13.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	7.0	7.0	7.0	7.0	7.0	7.0	12.0	12.0	12.0	12.0
Pedestrian Calls (#/hr)	85	85	85	82	82	82	81	81	35	35
Act Effct Green (s)		51.6	51.6		51.6	51.6		21.2		21.2
Actuated g/C Ratio		0.64	0.64		0.64	0.64		0.26		0.26
v/c Ratio		0.36	0.09		0.36	0.01		0.12		0.05
Control Delay		5.1	0.5		10.4	0.0		16.2		17.6
Queue Delay		0.0	0.0		0.0	0.0		0.0		0.0
Total Delay		5.1	0.5		10.4	0.0		16.2		17.6
LOS		A	A		B	A		B		B
Approach Delay		4.3			10.2			16.2		17.6
Approach LOS		A			B			B		B
Queue Length 50th (m)		6.4	0.1		32.1	0.0		3.1		1.4
Queue Length 95th (m)		11.3	0.3		50.9	0.0		10.2		5.7
Internal Link Dist (m)		117.5			103.0			131.9		64.0
Turn Bay Length (m)			20.0			20.0				
Base Capacity (vph)		1113	802		1114	795		417		419
Starvation Cap Reductn		0	0		0	0		0		0
Spillback Cap Reductn		0	0		0	0		0		0
Storage Cap Reductn		0	0		0	0		0		0
Reduced v/c Ratio		0.36	0.09		0.36	0.01		0.10		0.04

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 50 (63%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.36
Intersection Signal Delay: 7.6 Intersection LOS: A
Intersection Capacity Utilization 70.1% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 4: Friel & Rideau



Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	18	8	62	14	5	16	23	26	6	23	2
Future Vol, veh/h	11	18	8	62	14	5	16	23	26	6	23	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	20	9	69	16	6	18	26	29	7	26	2
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.8	7.4	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	25%	30%	77%	19%
Vol Thru, %	35%	49%	17%	74%
Vol Right, %	40%	22%	6%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	65	37	81	31
LT Vol	16	11	62	6
Through Vol	23	18	14	23
RT Vol	26	8	5	2
Lane Flow Rate	72	41	90	34
Geometry Grp	1	1	1	1
Degree of Util (X)	0.08	0.047	0.107	0.04
Departure Headway (Hd)	3.998	4.119	4.268	4.218
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	884	859	833	837
Service Time	2.077	2.192	2.325	2.305
HCM Lane V/C Ratio	0.081	0.048	0.108	0.041
HCM Control Delay	7.4	7.4	7.8	7.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.1	0.4	0.1

Lane Group	EBR	WBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	76	10	90	850	724	29
Future Volume (vph)	76	10	90	850	724	29
Lane Group Flow (vph)	84	11	100	963	804	32
Turn Type	Free	Perm	pm+pt	NA	NA	Perm
Protected Phases			8	2	6	
Permitted Phases	Free	8	2			6
Detector Phase		8	8	2	6	6
Switch Phase						
Minimum Initial (s)		10.0	10.0	10.0	10.0	10.0
Minimum Split (s)		39.8	39.8	32.0	32.0	32.0
Total Split (s)		39.8	39.8	80.2	80.2	80.2
Total Split (%)		33.2%	33.2%	66.8%	66.8%	66.8%
Maximum Green (s)		33.0	33.0	74.2	74.2	74.2
Yellow Time (s)		3.3	3.3	3.0	3.0	3.0
All-Red Time (s)		3.5	3.5	3.0	3.0	3.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.8	6.8	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Recall Mode		None	None	C-Max	C-Max	C-Max
Walk Time (s)		25.0	25.0	18.0	18.0	18.0
Flash Dont Walk (s)		8.0	8.0	8.0	8.0	8.0
Pedestrian Calls (#/hr)		109	109	52	108	108
Act Effct Green (s)	120.0	33.0	106.4	74.2	74.2	74.2
Actuated g/C Ratio	1.00	0.28	0.89	0.62	0.62	0.62
v/c Ratio	0.06	0.02	0.13	0.33	0.39	0.05
Control Delay	0.1	0.1	0.8	11.3	12.2	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.1	0.1	0.8	11.3	12.2	2.8
LOS	A	A	A	B	B	A
Approach Delay				10.3	11.9	
Approach LOS				B	B	
Queue Length 50th (m)	0.0	0.0	0.2	37.0	46.9	0.0
Queue Length 95th (m)	0.0	0.0	0.4	44.9	59.1	3.5
Internal Link Dist (m)				218.1	130.8	
Turn Bay Length (m)			85.0			30.0
Base Capacity (vph)	1489	445	764	2930	2050	687
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.02	0.13	0.33	0.39	0.05

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 58 (48%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 75

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.39
Intersection Signal Delay: 10.5 — Intersection LOS: B
Intersection Capacity Utilization 59.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: King Edward & York

Lane Group	EBL	EBT	WBT	NBT	NBR	SBL	SBT	SBR	Ø1	Ø2	Ø3	Ø5
Lane Configurations												
Traffic Volume (vph)	186	300	357	604	108	158	548	127				
Future Volume (vph)	186	300	357	604	108	158	548	127				
Lane Group Flow (vph)	207	361	517	671	120	176	609	141				
Turn Type	Prot	NA	NA	NA	custom	custom	NA	custom				
Protected Phases	11	1 2	5 6	3 4		13	7 8	11	1	2	3	5
Permitted Phases					4	8		8				
Detector Phase	11	1 2	5 6	3 4	4	13	7 8	11				
Switch Phase												
Minimum Initial (s)	5.0				10.0	5.0		5.0	1.0	10.0	1.0	1.0
Minimum Split (s)	11.2				23.7	9.5		11.2	5.0	29.8	5.0	5.0
Total Split (s)	27.0				29.0	12.0		27.0	5.0	59.0	5.0	5.0
Total Split (%)	24.5%				26.4%	10.9%		24.5%	5%	54%	5%	5%
Maximum Green (s)	20.8				22.3	7.5		20.8	3.0	52.2	3.0	3.0
Yellow Time (s)	3.3				3.0	3.5		3.3	2.0	3.3	2.0	2.0
All-Red Time (s)	2.9				3.7	1.0		2.9	0.0	3.5	0.0	0.0
Lost Time Adjust (s)	0.0				0.0	0.0		0.0				
Total Lost Time (s)	6.2				6.7	4.5		6.2				
Lead/Lag					Lag				Lead	Lag	Lead	Lead
Lead-Lag Optimize?					Yes				Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0				3.0	3.0		3.0	3.0	3.0	3.0	3.0
Recall Mode	Max				Max	Max		Max	Max	C-Max	Max	Max
Walk Time (s)					2.0				3.0	2.0	3.0	3.0
Flash Dont Walk (s)					15.0				0.0	21.0	0.0	0.0
Pedestrian Calls (#/hr)					150				321	321	150	458
Act Effct Green (s)	20.8	62.0	35.0	32.0	22.3	36.5	44.0	55.6				
Actuated g/C Ratio	0.19	0.56	0.32	0.29	0.20	0.33	0.40	0.51				
v/c Ratio	0.66	0.20	0.58	0.70	0.37	0.83	0.46	0.22				
Control Delay	52.6	11.7	34.5	39.2	3.3	71.5	25.7	11.0				
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total Delay	52.6	11.7	34.5	39.2	3.3	71.5	25.7	11.0				
LOS	D	B	C	D	A	E	C	B				
Approach Delay		26.6	34.5	33.8			32.1					
Approach LOS		C	C	C			C					
Queue Length 50th (m)	41.6	18.2	48.6	67.3	0.0	28.1	49.7	12.3				
Queue Length 95th (m)	66.4	26.0	66.0	87.6	0.0	#61.2	65.4	21.2				
Internal Link Dist (m)		125.5	140.5	133.0			218.1					
Turn Bay Length (m)	65.0				20.0	105.0		95.0				
Base Capacity (vph)	313	1774	890	964	321	212	1326	631				
Starvation Cap Reductn	0	0	0	0	0	0	0	0				
Spillback Cap Reductn	0	0	0	0	0	0	0	0				
Storage Cap Reductn	0	0	0	0	0	0	0	0				
Reduced v/c Ratio	0.66	0.20	0.58	0.70	0.37	0.83	0.46	0.22				

Intersection Summary

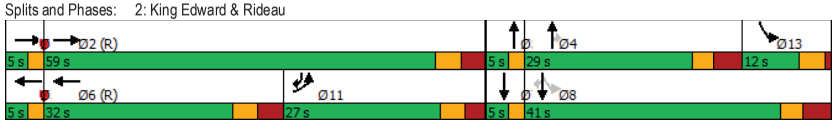
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 92 (84%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90

Lane Group	Ø6	Ø7	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	6	7	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	10.0	1.0	10.0
Minimum Split (s)	31.8	5.0	25.9
Total Split (s)	32.0	5.0	41.0
Total Split (%)	29%	5%	37%
Maximum Green (s)	25.2	3.0	34.1
Yellow Time (s)	3.3	2.0	3.0
All-Red Time (s)	3.5	0.0	3.9
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	C-Max	Max	Max
Walk Time (s)	2.0	3.0	2.0
Flash Dont Walk (s)	23.0	0.0	17.0
Pedestrian Calls (#/hr)	458	141	141
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 31.9 Intersection LOS: C
Intersection Capacity Utilization 67.8% 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: 2: King Edward & Rideau



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	88	470	8	7	391	158	2	3	71	1
Future Volume (vph)	88	470	8	7	391	158	2	3	71	1
Lane Group Flow (vph)	98	522	9	8	434	176	0	21	0	179
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2			6			4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	5	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.8	26.8	26.8	26.8	26.8	26.8	27.0	27.0	27.0	27.0
Total Split (s)	12.0	60.0	60.0	48.0	48.0	48.0	30.0	30.0	30.0	30.0
Total Split (%)	13.3%	66.7%	66.7%	53.3%	53.3%	53.3%	33.3%	33.3%	33.3%	33.3%
Maximum Green (s)	6.2	54.2	54.2	42.2	42.2	42.2	24.0	24.0	24.0	24.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8	5.8		6.0		6.0
Lead/Lag	Lead			Lag	Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes	Yes				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Walk Time (s)		15.0	15.0	15.0	15.0	15.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		6.0	6.0	6.0	6.0	6.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)		290	290	500	500	500	313	313	139	139
Act Effct Green (s)	54.2	54.2	54.2	44.6	44.6	44.6		24.0		24.0
Actuated g/C Ratio	0.60	0.60	0.60	0.50	0.50	0.50		0.27		0.27
v/c Ratio	0.26	0.50	0.02	0.03	0.50	0.56		0.09		0.63
Control Delay	9.5	12.2	0.1	10.3	12.7	9.5		14.6		29.2
Queue Delay	0.0	0.6	0.0	0.0	0.2	0.0		0.0		0.0
Total Delay	9.5	12.8	0.1	10.3	12.9	9.5		14.6		29.2
LOS	A	B	A	B	B	A		B		C
Approach Delay		12.1			11.9			14.6		29.2
Approach LOS		B			B			B		C
Queue Length 50th (m)	6.6	46.9	0.0	0.4	28.8	1.5		0.6		16.6
Queue Length 95th (m)	12.8	70.8	0.0	m1.1	39.8	8.7		6.2		#40.5
Internal Link Dist (m)		140.5			117.5			126.5		218.8
Turn Bay Length (m)	40.0		20.0	10.0		20.0				
Base Capacity (vph)	372	1050	429	303	864	316		245		283
Starvation Cap Reductn	0	220	0	0	73	0		0		0
Spillback Cap Reductn	0	0	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0	0	0		0		0
Reduced v/c Ratio	0.26	0.63	0.02	0.03	0.55	0.56		0.09		0.63

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 52 (58%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.63
Intersection Signal Delay: 14.2 Intersection LOS: B
Intersection Capacity Utilization 69.6% 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.
m Volume for 95th percentile queue is metered by upstream signal.

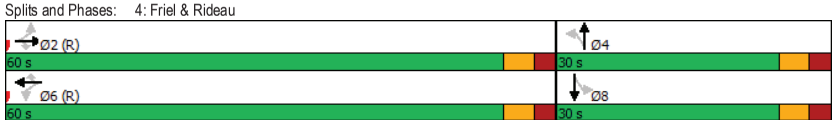
Splits and Phases: 3: Nelson & Rideau

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	4	478	65	22	449	9	75	3	14	4
Future Volume (vph)	4	478	65	22	449	9	75	3	14	4
Lane Group Flow (vph)	0	535	72	0	523	10	0	110	0	29
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2			6			4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.7	25.7	25.7	25.7	25.7	25.7	29.8	29.8	29.8	29.8
Total Split (s)	60.0	60.0	60.0	60.0	60.0	60.0	30.0	30.0	30.0	30.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%
Maximum Green (s)	54.3	54.3	54.3	54.3	54.3	54.3	24.2	24.2	24.2	24.2
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0
Total Lost Time (s)		5.7	5.7		5.7	5.7		5.8		5.8
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Walk Time (s)	13.0	13.0	13.0	13.0	13.0	13.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	7.0	7.0	7.0	7.0	7.0	7.0	12.0	12.0	12.0	12.0
Pedestrian Calls (#/hr)	181	181	181	192	192	192	95	95	78	78
Act Effct Green (s)		57.3	57.3		57.3	57.3		21.2		21.2
Actuated g/C Ratio		0.64	0.64		0.64	0.64		0.24		0.24
v/c Ratio		0.48	0.13		0.49	0.02		0.41		0.10
Control Delay		4.9	0.9		11.5	0.2		28.5		20.2
Queue Delay		0.1	0.0		0.0	0.0		0.0		0.0
Total Delay		5.0	0.9		11.5	0.2		28.5		20.2
LOS		A	A		B	A		C		C
Approach Delay		4.5			11.3			28.5		20.2
Approach LOS		A			B			C		C
Queue Length 50th (m)		15.7	0.2		47.4	0.0		13.2		2.6
Queue Length 95th (m)		23.2	m1.0		72.2	0.3		27.8		9.1
Internal Link Dist (m)		117.5			103.0			131.9		64.0
Turn Bay Length (m)			20.0			20.0				
Base Capacity (vph)		1106	562		1065	535		307		338
Starvation Cap Reductn		53	0		0	0		0		0
Spillback Cap Reductn		0	0		0	0		0		0
Storage Cap Reductn		0	0		0	0		0		0
Reduced v/c Ratio		0.51	0.13		0.49	0.02		0.36		0.09

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 48 (53%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.49
Intersection Signal Delay: 9.8 Intersection LOS: A
Intersection Capacity Utilization 77.3% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Friel & Rideau



Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	8	10	43	0	43	0	98	66	4	19	6
Future Vol, veh/h	4	8	10	43	0	43	0	98	66	4	19	6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	9	11	48	0	48	0	109	73	4	21	7
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.7	8	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	18%	50%	14%
Vol Thru, %	60%	36%	0%	66%
Vol Right, %	40%	45%	50%	21%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	164	22	86	29
LT Vol	0	4	43	4
Through Vol	98	8	0	19
RT Vol	66	10	43	6
Lane Flow Rate	182	24	96	32
Geometry Grp	1	1	1	1
Degree of Util (X)	0.199	0.029	0.109	0.037
Departure Headway (Hd)	3.926	4.257	4.125	4.188
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	904	846	855	841
Service Time	1.993	2.257	2.218	2.284
HCM Lane V/C Ratio	0.201	0.028	0.112	0.038
HCM Control Delay	8	7.4	7.7	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.7	0.1	0.4	0.1

Appendix D

Collision Data

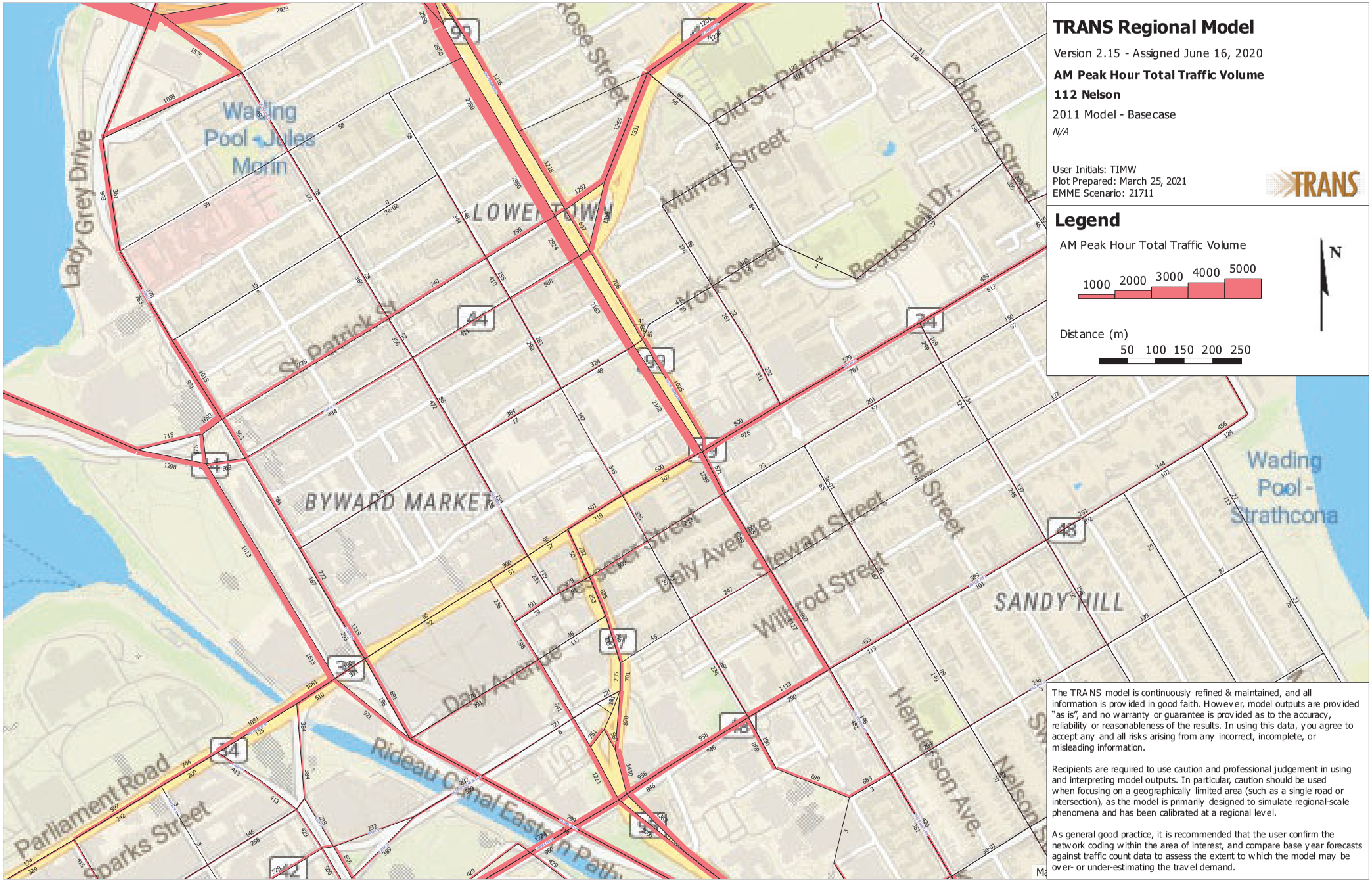
CGH TRANSPORTATION

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Traffic Control Condition	Classification Of Accident	Initial Impact Type	Road Surface Condition
2015-01-16	2015	12:25	KING EDWARD AVE @ YORK ST	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	03 - Loose snow
2015-02-02	2015	8:57	KING EDWARD AVE @ YORK ST	03 - Snow	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	03 - Loose snow
2015-03-21	2015	10:38	KING EDWARD AVE @ YORK ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2015-11-17	2015	8:44	KING EDWARD AVE @ YORK ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2016-02-10	2016	11:19	KING EDWARD AVE @ YORK ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	06 - Ice
2017-02-20	2017	13:15	KING EDWARD AVE @ YORK ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2017-12-28	2017	8:30	KING EDWARD AVE @ YORK ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2018-08-29	2018	16:07	KING EDWARD AVE @ YORK ST (0008244)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2018-09-14	2018	14:40	KING EDWARD AVE @ YORK ST (0008244)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2018-09-18	2018	16:15	KING EDWARD AVE @ YORK ST (0008244)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2018-09-19	2018	14:50	KING EDWARD AVE @ YORK ST (0008244)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	01 - Dry
2019-04-19	2019	22:00	KING EDWARD AVE @ YORK ST (0008244)	02 - Rain	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	05 - Turning movement	02 - Wet
2019-10-10	2019	13:11	KING EDWARD AVE @ YORK ST (0008244)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2019-11-28	2019	16:30	KING EDWARD AVE @ YORK ST (0008244)	01 - Clear	05 - Dusk	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	02 - Wet
2016-06-26	2016	11:00	KING EDWARD AVE NB btwn CLARENCE ST & YORK ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2018-04-27	2018	15:46	KING EDWARD AVE NB btwn CLARENCE ST & YORK ST (__3ZA3WR)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
2018-06-14	2018	15:18	KING EDWARD AVE NB btwn CLARENCE ST & YORK ST (__3ZA3WR)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
2015-02-26	2015	11:41	KING EDWARD AVE NB btwn YORK ST & RIDEAU ST	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	07 - SMV other	01 - Dry
2015-02-11	2015	17:00	KING EDWARD AVE NB btwn YORK ST & RIDEAU ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
2015-09-03	2015	17:56	KING EDWARD AVE NB btwn YORK ST & RIDEAU ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
2016-04-11	2016	6:41	KING EDWARD AVE NB btwn YORK ST & RIDEAU ST	04 - Freezing Rain	01 - Daylight	10 - No control		02 - Non-fatal injury	99 - Other	02 - Wet
2016-12-13	2016	15:03	KING EDWARD AVE NB btwn YORK ST & RIDEAU ST	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	07 - SMV other	02 - Wet
2016-03-30	2016	17:42	KING EDWARD AVE NB btwn YORK ST & RIDEAU ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	04 - Sideswipe	01 - Dry
2016-02-22	2016	13:30	KING EDWARD AVE NB btwn YORK ST & RIDEAU ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	01 - Dry
2016-11-05	2016	15:44	KING EDWARD AVE NB btwn YORK ST & RIDEAU ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2016-12-02	2016	10:37	KING EDWARD AVE NB btwn YORK ST & RIDEAU ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	02 - Wet
2019-07-13	2019	6:54	KING EDWARD AVE NB btwn YORK ST & RIDEAU ST (__3ZA1ZH)	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	07 - SMV other	01 - Dry
2015-08-24	2015	16:11	NELSON ST @ RIDEAU ST	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	01 - Dry
2015-02-21	2015	14:20	NELSON ST @ RIDEAU ST	03 - Snow	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	04 - Slush
2015-03-24	2015	8:05	NELSON ST @ RIDEAU ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2015-12-01	2015	16:31	NELSON ST @ RIDEAU ST	02 - Rain	05 - Dusk	01 - Traffic signal		03 - P.D. only	05 - Turning movement	02 - Wet
2016-04-01	2016	21:47	NELSON ST @ RIDEAU ST	01 - Clear	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	05 - Turning movement	01 - Dry
2016-08-25	2016	16:23	NELSON ST @ RIDEAU ST	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	05 - Turning movement	01 - Dry
2016-03-15	2016	16:55	NELSON ST @ RIDEAU ST	02 - Rain	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	02 - Wet
2016-12-15	2016	16:09	NELSON ST @ RIDEAU ST	01 - Clear	05 - Dusk	01 - Traffic signal		03 - P.D. only	05 - Turning movement	01 - Dry
2017-06-04	2017	16:14	NELSON ST @ RIDEAU ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	01 - Dry
2017-07-27	2017	13:46	NELSON ST @ RIDEAU ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	01 - Dry
2017-07-16	2017	14:30	NELSON ST @ RIDEAU ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2017-10-12	2017	15:38	NELSON ST @ RIDEAU ST	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	01 - Dry
2017-11-15	2017	11:24	NELSON ST @ RIDEAU ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2018-04-03	2018	17:40	NELSON ST @ RIDEAU ST (0007626)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	99 - Other	01 - Dry
2018-05-03	2018	12:30	NELSON ST @ RIDEAU ST (0007626)	02 - Rain	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	02 - Wet
2018-05-20	2018	21:00	NELSON ST @ RIDEAU ST (0007626)	01 - Clear	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	01 - Dry
2018-06-03	2018	17:52	NELSON ST @ RIDEAU ST (0007626)	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	05 - Turning movement	01 - Dry
2018-10-17	2018	11:55	NELSON ST @ RIDEAU ST (0007626)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2019-03-08	2019	16:13	NELSON ST @ RIDEAU ST (0007626)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2019-03-20	2019	15:45	NELSON ST @ RIDEAU ST (0007626)	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	02 - Angle	01 - Dry
2019-04-16	2019	9:15	NELSON ST @ RIDEAU ST (0007626)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2019-04-01	2019	9:16	NELSON ST @ RIDEAU ST (0007626)	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	01 - Dry
2019-06-27	2019	18:00	NELSON ST @ RIDEAU ST (0007626)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2015-02-07	2015	2:42	NELSON ST btwn YORK ST & RIDEAU ST	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	05 - Packed snow
2015-09-11	2015	18:33	NELSON ST btwn YORK ST & RIDEAU ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2015-08-02	2015	11:49	NELSON ST btwn YORK ST & RIDEAU ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2016-01-01	2016	22:35	NELSON ST btwn YORK ST & RIDEAU ST	03 - Snow	07 - Dark	10 - No control		03 - P.D. only	04 - Sideswipe	03 - Loose snow
2016-04-10	2016	13:42	NELSON ST btwn YORK ST & RIDEAU ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2018-07-22	2018	5:30	NELSON ST btwn YORK ST & RIDEAU ST (__3ZA82D)	01 - Clear	03 - Dawn	10 - No control		03 - P.D. only	04 - Sideswipe	01 - Dry
2018-07-23	2018	19:40	NELSON ST btwn YORK ST & RIDEAU ST (__3ZA82D)	02 - Rain	01 - Daylight	10 - No control		03 - P.D. only	04 - Sideswipe	02 - Wet
2019-09-19	2019	15:55	NELSON ST btwn YORK ST & RIDEAU ST (__3ZA82D)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	01 - Dry
2019-11-16	2019	20:49	NELSON ST btwn YORK ST & RIDEAU ST (__3ZA82D)	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	04 - Sideswipe	01 - Dry
2019-12-06	2019	14:35	NELSON ST btwn YORK ST & RIDEAU ST (__3ZA82D)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	01 - Dry
2019-12-19	2019	13:00	NELSON ST btwn YORK ST & RIDEAU ST (__3ZA82D)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	02 - Wet
2015-09-17	2015	17:37	RIDEAU ST btwn KING EDWARD AVE & NELSON ST	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	07 - SMV other	01 - Dry
2015-10-29	2015	17:18	RIDEAU ST btwn KING EDWARD AVE & NELSON ST	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	07 - SMV other	01 - Dry
2015-02-13	2015	12:01	RIDEAU ST btwn KING EDWARD AVE & NELSON ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	01 - Dry
2015-02-01	2015	13:54	RIDEAU ST btwn KING EDWARD AVE & NELSON ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	02 - Wet
2015-02-06	2015	11:20	RIDEAU ST btwn KING EDWARD AVE & NELSON ST	03 - Snow	01 - Daylight	10 - No control		03 - P.D. only	04 - Sideswipe	04 - Slush
2015-08-09	2015	20:15	RIDEAU ST btwn KING EDWARD AVE & NELSON ST	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	05 - Turning movement	01 - Dry
2015-05-02	2015	11:01	RIDEAU ST btwn KING EDWARD AVE & NELSON ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	01 - Dry
2015-03-01	2015	16:45	RIDEAU ST btwn KING EDWARD AVE & NELSON ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	01 - Dry
2015-10-20	2015	15:01	RIDEAU ST btwn KING EDWARD AVE & NELSON ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	01 - Dry
2015-07-29	2015	18:08	RIDEAU ST btwn KING EDWARD AVE & NELSON ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	04 - Sideswipe	01 - Dry
2016-09-13	2016	12:47	RIDEAU ST btwn KING EDWARD AVE & NELSON ST	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	05 - Turning movement	01 - Dry
2016-12-26	2016	12:33	RIDEAU ST btwn KING EDWARD AVE & NELSON ST	04 - Freezing Rain	01 - Daylight	10 - No control		02 - Non-fatal injury	05 - Turning movement	06 - Ice
2016-10-28	2016	18:46	RIDEAU ST btwn KING EDWARD AVE & NELSON ST	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	05 - Turning movement	01 - Dry
2016-07-23	2016	11:00	RIDEAU ST btwn KING EDWARD AVE & NELSON ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
2016-09-16	2016	16:21	RIDEAU ST btwn KING EDWARD AVE & NELSON ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	01 - Dry
2017-06-03	2017	14:30	RIDEAU ST btwn KING EDWARD AVE & NELSON ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	01 - Dry
2017-07-18	2017	21:30	RIDEAU ST btwn KING EDWARD AVE & NELSON ST	01 - Clear	07 - Dark	10 - No control		02 - Non-fatal injury	07 - SMV other	01 - Dry
2018-02-07	2018	19:03	RIDEAU ST btwn KING EDWARD AVE & NELSON ST (__3ZA3VG)	03 - Snow	07 - Dark	10 - No control		03 - P.D. only	04 - Sideswipe	03 - Loose snow
2018-06-17	2018	23:54	RIDEAU ST btwn KING EDWARD AVE & NELSON ST (__3ZA3VG)	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	05 - Turning movement	01 - Dry
2018-07-13	2018	14:30	RIDEAU ST btwn KING EDWARD AVE & NELSON ST (__3ZA3VG)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	01 - Dry
2018-09-17	2018	16:30	RIDEAU ST btwn KING EDWARD AVE & NELSON ST (__3ZA3VG)	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	07 - SMV other	01 - Dry
2018-11-07	2018	12:24	RIDEAU ST btwn KING EDWARD AVE & NELSON ST (__3ZA3VG)	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	99 - Other	01 - Dry
2019-02-10	2019	13:30	RIDEAU ST btwn KING EDWARD AVE & NELSON ST (__3ZA3VG)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	01 - Dry
2019-06-15	2019	10:25	RIDEAU ST btwn KING EDWARD AVE & NELSON ST (__3ZA3VG)	02 - Rain	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	02 - Wet
2019-08-01	2019	9:40	RIDEAU ST btwn KING EDWARD AVE & NELSON ST (__3ZA3VG)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	01 - Dry
2019-09-20	2019	8:40	RIDEAU ST btwn KING EDWARD AVE & NELSON ST (__3ZA3VG)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	01 - Dry
2019-10-03	2019	22:20	RIDEAU ST btwn KING EDWARD AVE & NELSON ST (__3ZA3VG)	02 - Rain	07 - Dark	10 - No control		02 - Non-fatal injury	02 - Angle	02 - Wet
2016-03-04	2016	8:55	RIDEAU ST btwn NELSON ST & FRIEL ST	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	03 - Rear end	02 - Wet
2016-08-08	2016	14:17	RIDEAU ST btwn NELSON ST & FRIEL ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	04 - Sideswipe	01 - Dry
2017-09-14	2017	14:45	RIDEAU ST btwn NELSON ST & FRIEL ST	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	07 - SMV other	01 - Dry
2017-01-09	2017	14:29	RIDEAU ST btwn NELSON ST & FRIEL ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2018-03-02	2018	20:06	RIDEAU ST btwn NELSON ST & FRIEL ST (__3ZA3WJ)	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	99 - Other	03 - Loose snow
2018-03-13	2018	10:03	RIDEAU ST btwn NELSON ST & FRIEL ST (__3ZA3WJ)	03 - Snow	01 - Daylight	10 - No control		03 - P.D. only	05 - Turning movement	02 - Wet
2019-02-04	2019	6:00	RIDEAU ST btwn NELSON ST & FRIEL ST (__3ZA3WJ)	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	05 - Turning movement	03 - Loose snow

2019-01-30	2019	21:00	RIDEAU ST btwn NELSON ST & FRIEL ST (__3ZA3WJ)	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	03 - Rear end	02 - Wet
2019-07-28	2019	3:03	RIDEAU ST btwn NELSON ST & FRIEL ST (__3ZA3WJ)	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2019-01-25	2019	22:00	RIDEAU ST btwn NELSON ST & FRIEL ST (__3ZA3WJ)	03 - Snow	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	06 - Ice
2019-05-08	2019	16:00	YORK ST btwn TURN LANE & NELSON ST (__3ZA7AE)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	02 - Angle	01 - Dry

Appendix E

Synchro Intersection Worksheets – 2022 Future Background Conditions



TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

112 Nelson

2011 Model - Basecase

N/A

User Initials: TIMW
Plot Prepared: March 25, 2021
EMME Scenario: 21711

TRANS

Legend

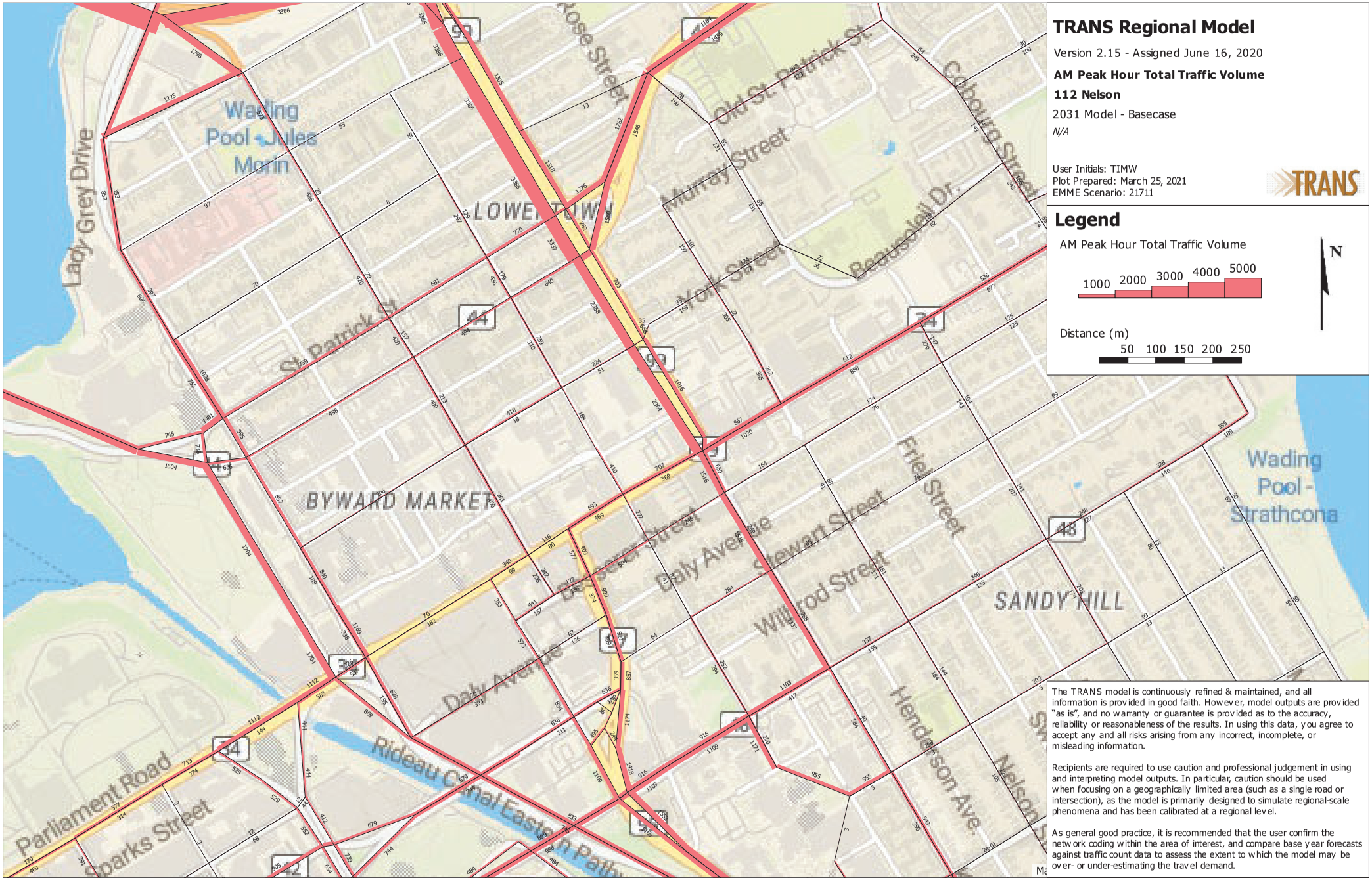
AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

Distance (m)

50 100 150 200 250

N



TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

112 Nelson

2031 Model - Basecase

N/A

User Initials: TIMW
Plot Prepared: March 25, 2021
EMME Scenario: 21711

TRANS

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

Distance (m)

50 100 150 200 250

N

Appendix F

Background Development Volumes

CGH TRANSPORTATION

Figure 8: Total Site-Generated Traffic

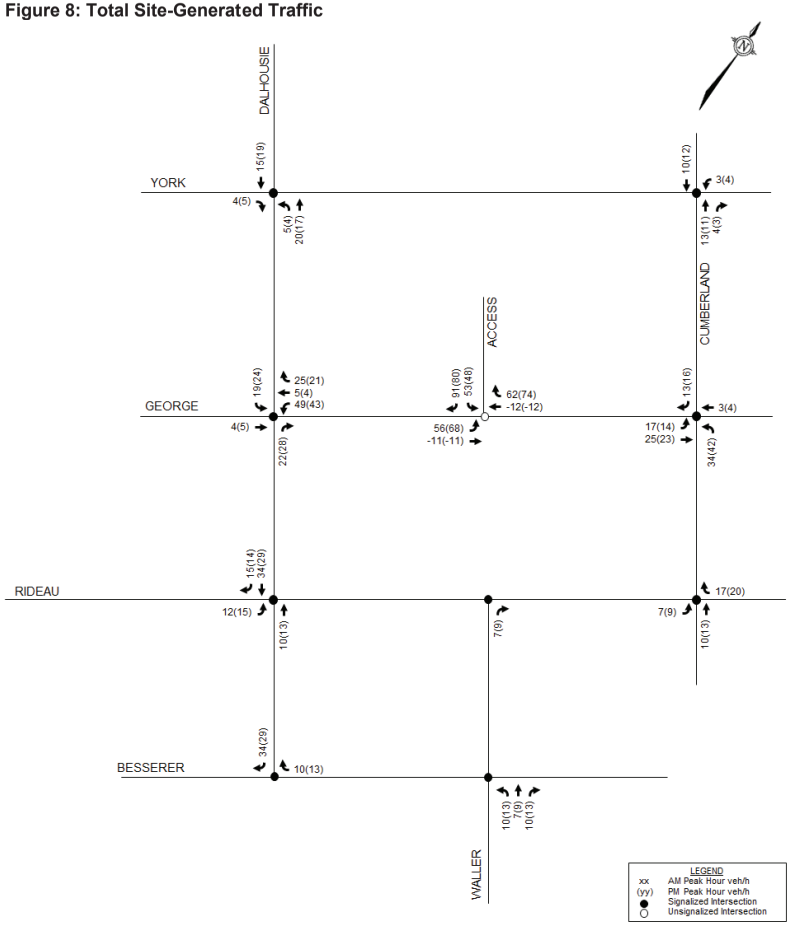
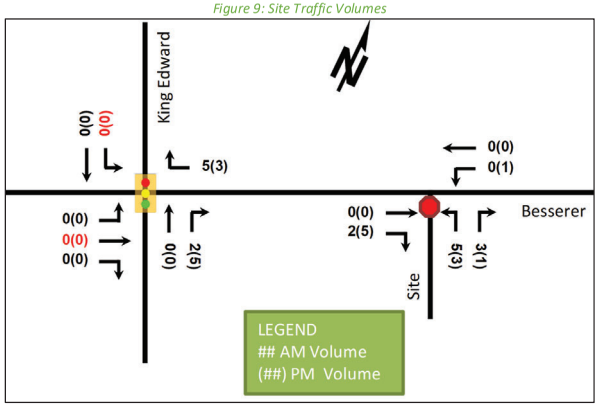


Figure 9: Site Traffic Volumes



Appendix G

Synchro Intersection Worksheets – Future Background 2024 & 2029

CGH TRANSPORTATION

Lane Group	EBR	WBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	47	15	109	495	1213
Future Volume (vph)	47	15	109	495	1213
Lane Group Flow (vph)	47	15	109	517	1260
Turn Type	Free	Perm	pm+pt	NA	NA
Protected Phases			8	2	6
Permitted Phases	Free	8	2		
Detector Phase		8	8	2	6
Switch Phase					
Minimum Initial (s)		10.0	10.0	10.0	10.0
Minimum Split (s)		39.8	39.8	32.0	32.0
Total Split (s)		39.8	39.8	80.2	80.2
Total Split (%)		33.2%	33.2%	66.8%	66.8%
Maximum Green (s)		33.0	33.0	74.2	74.2
Yellow Time (s)		3.3	3.3	3.0	3.0
All-Red Time (s)		3.5	3.5	3.0	3.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0
Total Lost Time (s)		6.8	6.8	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Vehicle Extension (s)		3.0	3.0	3.0	3.0
Recall Mode		None	None	C-Max	C-Max
Walk Time (s)		25.0	25.0	18.0	18.0
Flash Dont Walk (s)		8.0	8.0	8.0	8.0
Pedestrian Calls (#/hr)		95	95	40	102
Act Effct Green (s)	120.0	33.0	106.4	74.2	74.2
Actuated g/C Ratio	1.00	0.28	0.89	0.62	0.62
v/c Ratio	0.03	0.03	0.17	0.18	0.43
Control Delay	0.0	0.1	1.1	9.8	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.0	0.1	1.1	9.8	12.4
LOS	A	A	A	A	B
Approach Delay				8.3	12.4
Approach LOS				A	B
Queue Length 50th (m)	0.0	0.0	0.2	17.5	52.6
Queue Length 95th (m)	0.0	0.0	0.4	22.7	62.4
Internal Link Dist (m)				218.1	130.8
Turn Bay Length (m)			85.0		
Base Capacity (vph)	1491	599	642	2918	2903
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.17	0.18	0.43

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 95 (79%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 75

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.43
Intersection Signal Delay: 10.7 — Intersection LOS: B
Intersection Capacity Utilization 59.0% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: King Edward & York

Lane Group	EBL	EBT	WBT	NBT	NBR	SBL	SBT	SBR	Ø1	Ø2	Ø3	Ø5
Lane Configurations												
Traffic Volume (vph)	156	158	324	452	83	206	821	222				
Future Volume (vph)	156	158	324	452	83	206	821	222				
Lane Group Flow (vph)	156	173	394	452	83	206	821	222				
Turn Type	Prot	NA	NA	NA	custom	custom	NA	custom				
Protected Phases	11	1 2	5 6	3 4		13	7 8	11	1	2	3	5
Permitted Phases					4	8		8				
Detector Phase	11	1 2	5 6	3 4	4	13	7 8	11				
Switch Phase												
Minimum Initial (s)	5.0				10.0	5.0		5.0	1.0	10.0	1.0	1.0
Minimum Split (s)	11.2				23.7	9.5		11.2	5.0	29.8	5.0	5.0
Total Split (s)	30.0				24.0	14.0		30.0	5.0	62.0	5.0	5.0
Total Split (%)	27.3%				21.8%	12.7%		27.3%	5%	56%	5%	5%
Maximum Green (s)	23.8				17.3	9.5		23.8	3.0	55.2	3.0	3.0
Yellow Time (s)	3.3				3.0	3.5		3.3	2.0	3.3	2.0	2.0
All-Red Time (s)	2.9				3.7	1.0		2.9	0.0	3.5	0.0	0.0
Lost Time Adjust (s)	0.0				0.0	0.0		0.0				
Total Lost Time (s)	6.2				6.7	4.5		6.2				
Lead/Lag					Lag				Lead	Lag	Lead	Lead
Lead-Lag Optimize?					Yes				Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0				3.0	3.0		3.0	3.0	3.0	3.0	3.0
Recall Mode	Max				Max	Max		Max	Max	C-Max	Max	Max
Walk Time (s)					2.0				3.0	2.0	3.0	3.0
Flash Dont Walk (s)					15.0				0.0	21.0	0.0	0.0
Pedestrian Calls (#/hr)					111				143	143	111	227
Act Effct Green (s)	23.8	65.0	35.0	27.0	17.3	33.5	41.0	55.6				
Actuated g/C Ratio	0.22	0.59	0.32	0.25	0.16	0.30	0.37	0.51				
v/c Ratio	0.44	0.09	0.43	0.56	0.25	0.74	0.66	0.33				
Control Delay	41.8	9.0	31.3	39.3	1.9	55.3	32.0	12.3				
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total Delay	41.8	9.0	31.3	39.3	1.9	55.3	32.0	12.3				
LOS	D	A	C	D	A	E	C	B				
Approach Delay		24.6	31.3	33.5			32.3					
Approach LOS		C	C	C			C					
Queue Length 50th (m)	29.2	7.2	34.9	44.7	0.0	35.0	76.4	20.6				
Queue Length 95th (m)	49.2	11.8	48.8	61.0	0.0	#63.0	97.7	32.8				
Internal Link Dist (m)		125.5	140.5	133.0			218.1					
Turn Bay Length (m)	65.0				20.0	105.0						
Base Capacity (vph)	358	1849	927	813	326	280	1235	665				
Starvation Cap Reductn	0	0	0	0	0	0	0	0				
Spillback Cap Reductn	0	0	0	0	0	0	0	0				
Storage Cap Reductn	0	0	0	0	0	0	0	0				
Reduced v/c Ratio	0.44	0.09	0.43	0.56	0.25	0.74	0.66	0.33				

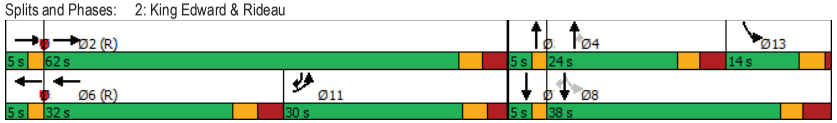
Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 92 (84%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90

Lane Group	Ø6	Ø7	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	6	7	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	10.0	1.0	10.0
Minimum Split (s)	31.8	5.0	25.9
Total Split (s)	32.0	5.0	38.0
Total Split (%)	29%	5%	35%
Maximum Green (s)	25.2	3.0	31.1
Yellow Time (s)	3.3	2.0	3.0
All-Red Time (s)	3.5	0.0	3.9
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	C-Max	Max	Max
Walk Time (s)	2.0	3.0	2.0
Flash Dont Walk (s)	23.0	0.0	17.0
Pedestrian Calls (#/hr)	227	108	108
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 31.4 Intersection LOS: C
Intersection Capacity Utilization 61.3% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: King Edward & Rideau

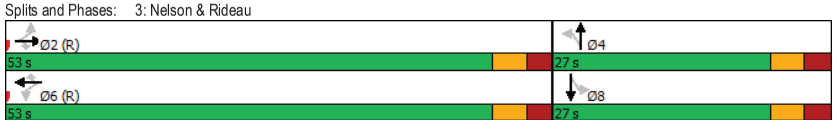


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	67	368	6	3	347	62	0	52	2
Future Volume (vph)	67	368	6	3	347	62	0	52	2
Lane Group Flow (vph)	67	368	6	3	347	62	6	0	114
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2			6		4		8
Permitted Phases	2		2	6		6		8	
Detector Phase	2	2	2	6	6	6	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.8	26.8	26.8	26.8	26.8	26.8	27.0	27.0	27.0
Total Split (s)	53.0	53.0	53.0	53.0	53.0	53.0	27.0	27.0	27.0
Total Split (%)	66.3%	66.3%	66.3%	66.3%	66.3%	66.3%	33.8%	33.8%	33.8%
Maximum Green (s)	47.2	47.2	47.2	47.2	47.2	47.2	21.0	21.0	21.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8	5.8	6.0		6.0
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None
Walk Time (s)	15.0	15.0	15.0	15.0	15.0	15.0	7.0	7.0	7.0
Flash Dont Walk (s)	6.0	6.0	6.0	6.0	6.0	6.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	85	85	85	186	186	186	81	57	57
Act Effct Green (s)	53.8	53.8	53.8	53.8	53.8	53.8	18.8		18.8
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.67	0.67	0.24		0.24
v/c Ratio	0.13	0.31	0.01	0.01	0.30	0.10	0.01		0.35
Control Delay	8.3	8.7	0.0	6.7	7.2	2.0	0.0		15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	8.3	8.7	0.0	6.7	7.2	2.0	0.0		15.9
LOS	A	A	A	A	A	A	A		B
Approach Delay		8.5			6.4				15.9
Approach LOS		A			A				B
Queue Length 50th (m)	4.2	26.4	0.0	0.2	19.5	0.0	0.0		6.3
Queue Length 95th (m)	9.8	42.2	0.0	m0.6	29.0	3.0	0.0		19.3
Internal Link Dist (m)		140.5			117.5		126.5		219.1
Turn Bay Length (m)	40.0		20.0	10.0		20.0			
Base Capacity (vph)	503	1172	832	560	1172	650	575		360
Starvation Cap Reductn	0	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0	0		0
Reduced v/c Ratio	0.13	0.31	0.01	0.01	0.30	0.10	0.01		0.32

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 34 (43%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 55

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.35
Intersection Signal Delay: 8.4 Intersection LOS: A
Intersection Capacity Utilization 60.7% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Nelson & Rideau

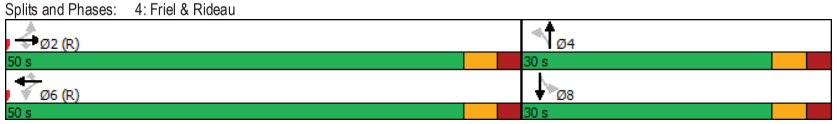


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	8	355	68	7	367	8	20	6	8	4
Future Volume (vph)	8	355	68	7	367	8	20	6	8	4
Lane Group Flow (vph)	0	363	68	0	374	8	0	39	0	16
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2			6			4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.7	25.7	25.7	25.7	25.7	25.7	29.8	29.8	29.8	29.8
Total Split (s)	50.0	50.0	50.0	50.0	50.0	50.0	30.0	30.0	30.0	30.0
Total Split (%)	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	37.5%	37.5%	37.5%	37.5%
Maximum Green (s)	44.3	44.3	44.3	44.3	44.3	44.3	24.2	24.2	24.2	24.2
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0
Total Lost Time (s)		5.7	5.7		5.7	5.7		5.8		5.8
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Walk Time (s)	13.0	13.0	13.0	13.0	13.0	13.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	7.0	7.0	7.0	7.0	7.0	7.0	12.0	12.0	12.0	12.0
Pedestrian Calls (#/hr)	85	85	85	82	82	82	81	81	35	35
Act Effct Green (s)		51.6	51.6		51.6	51.6		21.2		21.2
Actuated g/C Ratio		0.64	0.64		0.64	0.64		0.26		0.26
v/c Ratio		0.33	0.08		0.33	0.01		0.11		0.04
Control Delay		4.8	0.5		10.2	0.0		16.0		17.4
Queue Delay		0.0	0.0		0.0	0.0		0.0		0.0
Total Delay		4.8	0.5		10.2	0.0		16.0		17.4
LOS		A	A		B	A		B		B
Approach Delay		4.1			10.0			16.0		17.4
Approach LOS		A			A			B		B
Queue Length 50th (m)		5.6	0.1		29.7	0.0		2.8		1.3
Queue Length 95th (m)		9.6	0.2		47.3	0.0		9.5		5.5
Internal Link Dist (m)		117.5			103.0			131.9		64.0
Turn Bay Length (m)			20.0			20.0				
Base Capacity (vph)		1114	802		1117	795		417		424
Starvation Cap Reductn		0	0		0	0		0		0
Spillback Cap Reductn		0	0		0	0		0		0
Storage Cap Reductn		0	0		0	0		0		0
Reduced v/c Ratio		0.33	0.08		0.33	0.01		0.09		0.04

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 50 (63%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.33
Intersection Signal Delay: 7.5 Intersection LOS: A
Intersection Capacity Utilization 70.4% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 4: Friel & Rideau



Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	18	8	62	14	5	16	23	26	6	23	2
Future Vol, veh/h	11	18	8	62	14	5	16	23	26	6	23	2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	18	8	62	14	5	16	23	26	6	23	2
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	7.8	7.4	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	25%	30%	77%	19%
Vol Thru, %	35%	49%	17%	74%
Vol Right, %	40%	22%	6%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	65	37	81	31
LT Vol	16	11	62	6
Through Vol	23	18	14	23
RT Vol	26	8	5	2
Lane Flow Rate	65	37	81	31
Geometry Grp	1	1	1	1
Degree of Util (X)	0.072	0.042	0.096	0.036
Departure Headway (Hd)	3.972	4.094	4.247	4.189
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	891	867	839	844
Service Time	2.043	2.158	2.297	2.266
HCM Lane V/C Ratio	0.073	0.043	0.097	0.037
HCM Control Delay	7.4	7.3	7.8	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.3	0.1

Lane Group	EBR	WBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	79	10	93	853	728	30
Future Volume (vph)	79	10	93	853	728	30
Lane Group Flow (vph)	79	10	93	870	728	30
Turn Type	Free	Perm	pm+pt	NA	NA	Perm
Protected Phases			8	2	6	
Permitted Phases	Free	8	2			6
Detector Phase		8	8	2	6	6
Switch Phase						
Minimum Initial (s)		10.0	10.0	10.0	10.0	10.0
Minimum Split (s)		39.8	39.8	32.0	32.0	32.0
Total Split (s)		39.8	39.8	80.2	80.2	80.2
Total Split (%)		33.2%	33.2%	66.8%	66.8%	66.8%
Maximum Green (s)		33.0	33.0	74.2	74.2	74.2
Yellow Time (s)		3.3	3.3	3.0	3.0	3.0
All-Red Time (s)		3.5	3.5	3.0	3.0	3.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.8	6.8	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Recall Mode		None	None	C-Max	C-Max	C-Max
Walk Time (s)		25.0	25.0	18.0	18.0	18.0
Flash Dont Walk (s)		8.0	8.0	8.0	8.0	8.0
Pedestrian Calls (#/hr)		109	109	52	108	108
Act Effct Green (s)	120.0	33.0	106.4	74.2	74.2	74.2
Actuated g/C Ratio	1.00	0.28	0.89	0.62	0.62	0.62
v/c Ratio	0.05	0.02	0.12	0.30	0.36	0.04
Control Delay	0.1	0.1	0.8	11.0	11.8	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.1	0.1	0.8	11.0	11.8	2.6
LOS	A	A	A	B	B	A
Approach Delay				10.0	11.4	
Approach LOS				A	B	
Queue Length 50th (m)	0.0	0.0	0.2	32.6	41.2	0.0
Queue Length 95th (m)	0.0	0.0	0.3	39.9	52.4	3.1
Internal Link Dist (m)				218.1	130.8	
Turn Bay Length (m)			85.0			30.0
Base Capacity (vph)	1489	464	792	2930	2050	687
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.02	0.12	0.30	0.36	0.04

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 58 (48%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 75

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.36
Intersection Signal Delay: 10.1 — Intersection LOS: B
Intersection Capacity Utilization 59.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: King Edward & York

Lane Group	EBL	EBT	WBT	NBT	NBR	SBL	SBT	SBR	Ø1	Ø2	Ø3	Ø5
Lane Configurations												
Traffic Volume (vph)	186	300	377	610	108	163	565	131				
Future Volume (vph)	186	300	377	610	108	163	565	131				
Lane Group Flow (vph)	186	325	485	610	108	163	565	131				
Turn Type	Prot	NA	NA	NA	custom	custom	NA	custom				
Protected Phases	11	1 2	5 6	3 4		13	7 8	11	1	2	3	5
Permitted Phases					4	8		8				
Detector Phase	11	1 2	5 6	3 4	4	13	7 8	11				
Switch Phase												
Minimum Initial (s)	5.0				10.0	5.0		5.0	1.0	10.0	1.0	1.0
Minimum Split (s)	11.2				23.7	9.5		11.2	5.0	29.8	5.0	5.0
Total Split (s)	27.0				29.0	12.0		27.0	5.0	59.0	5.0	5.0
Total Split (%)	24.5%				26.4%	10.9%		24.5%	5%	54%	5%	5%
Maximum Green (s)	20.8				22.3	7.5		20.8	3.0	52.2	3.0	3.0
Yellow Time (s)	3.3				3.0	3.5		3.3	2.0	3.3	2.0	2.0
All-Red Time (s)	2.9				3.7	1.0		2.9	0.0	3.5	0.0	0.0
Lost Time Adjust (s)	0.0				0.0	0.0		0.0				
Total Lost Time (s)	6.2				6.7	4.5		6.2				
Lead/Lag					Lag				Lead	Lag	Lead	Lead
Lead-Lag Optimize?					Yes				Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0				3.0	3.0		3.0	3.0	3.0	3.0	3.0
Recall Mode	Max				Max	Max		Max	Max	C-Max	Max	Max
Walk Time (s)					2.0				3.0	2.0	3.0	3.0
Flash Dont Walk (s)					15.0				0.0	21.0	0.0	0.0
Pedestrian Calls (#/hr)					150				321	321	150	458
Act Effct Green (s)	20.8	62.0	35.0	32.0	22.3	36.5	44.0	55.6				
Actuated g/C Ratio	0.19	0.56	0.32	0.29	0.20	0.33	0.40	0.51				
v/c Ratio	0.59	0.18	0.54	0.63	0.34	0.70	0.43	0.21				
Control Delay	49.6	11.5	33.6	37.4	2.8	54.7	25.1	10.9				
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total Delay	49.6	11.5	33.6	37.4	2.8	54.7	25.1	10.9				
LOS	D	B	C	D	A	D	C	B				
Approach Delay		25.4	33.6	32.2			28.6					
Approach LOS		C	C	C			C					
Queue Length 50th (m)	36.8	16.1	44.9	59.8	0.0	25.8	45.4	11.3				
Queue Length 95th (m)	60.0	23.4	61.3	78.7	0.0	#48.4	60.2	19.8				
Internal Link Dist (m)		125.5	140.5	133.0			218.1					
Turn Bay Length (m)	65.0				20.0	105.0		95.0				
Base Capacity (vph)	313	1774	897	964	321	233	1326	631				
Starvation Cap Reductn	0	0	0	0	0	0	0	0				
Spillback Cap Reductn	0	0	0	0	0	0	0	0				
Storage Cap Reductn	0	0	0	0	0	0	0	0				
Reduced v/c Ratio	0.59	0.18	0.54	0.63	0.34	0.70	0.43	0.21				

Intersection Summary

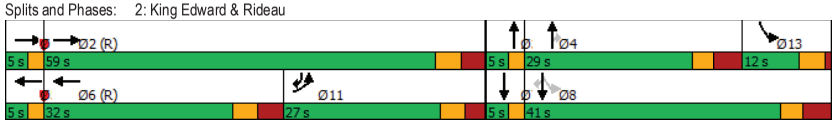
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 92 (84%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90

Lane Group	Ø6	Ø7	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	6	7	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	10.0	1.0	10.0
Minimum Split (s)	31.8	5.0	25.9
Total Split (s)	32.0	5.0	41.0
Total Split (%)	29%	5%	37%
Maximum Green (s)	25.2	3.0	34.1
Yellow Time (s)	3.3	2.0	3.0
All-Red Time (s)	3.5	0.0	3.9
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	C-Max	Max	Max
Walk Time (s)	2.0	3.0	2.0
Flash Dont Walk (s)	23.0	0.0	17.0
Pedestrian Calls (#/hr)	458	141	141
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 29.9 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: 2: King Edward & Rideau

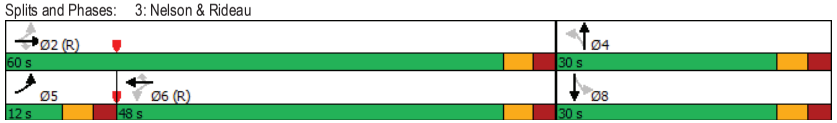


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	88	475	8	7	411	158	2	3	71	1
Future Volume (vph)	88	475	8	7	411	158	2	3	71	1
Lane Group Flow (vph)	88	475	8	7	411	158	0	19	0	161
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2			6			4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	5	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.8	26.8	26.8	26.8	26.8	26.8	27.0	27.0	27.0	27.0
Total Split (s)	12.0	60.0	60.0	48.0	48.0	48.0	30.0	30.0	30.0	30.0
Total Split (%)	13.3%	66.7%	66.7%	53.3%	53.3%	53.3%	33.3%	33.3%	33.3%	33.3%
Maximum Green (s)	6.2	54.2	54.2	42.2	42.2	42.2	24.0	24.0	24.0	24.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8	5.8		6.0		6.0
Lead/Lag	Lead			Lag	Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes	Yes				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Walk Time (s)		15.0	15.0	15.0	15.0	15.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		6.0	6.0	6.0	6.0	6.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)		290	290	500	500	500	313	313	139	139
Act Effct Green (s)	54.2	54.2	54.2	44.6	44.6	44.6		24.0		24.0
Actuated g/C Ratio	0.60	0.60	0.60	0.50	0.50	0.50		0.27		0.27
v/c Ratio	0.23	0.45	0.02	0.02	0.48	0.50		0.08		0.57
Control Delay	9.1	11.5	0.1	10.1	12.4	8.0		15.1		25.6
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0		0.0		0.0
Total Delay	9.1	11.5	0.1	10.1	12.6	8.0		15.1		25.6
LOS	A	B	A	B	B	A		B		C
Approach Delay		11.0			11.3			15.1		25.6
Approach LOS		B			B			B		C
Queue Length 50th (m)	5.9	41.1	0.0	0.4	26.7	1.1		0.6		13.6
Queue Length 95th (m)	11.7	62.5	0.0	m1.0	37.4	7.6		5.9		34.5
Internal Link Dist (m)		140.5			117.5			126.5		218.8
Turn Bay Length (m)	40.0		20.0	10.0		20.0				
Base Capacity (vph)	379	1050	429	310	864	313		250		283
Starvation Cap Reductn	0	0	0	0	76	0		0		0
Spillback Cap Reductn	0	0	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0	0	0		0		0
Reduced v/c Ratio	0.23	0.45	0.02	0.02	0.52	0.50		0.08		0.57

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 52 (58%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 13.0 Intersection LOS: B
Intersection Capacity Utilization 69.8% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Nelson & Rideau

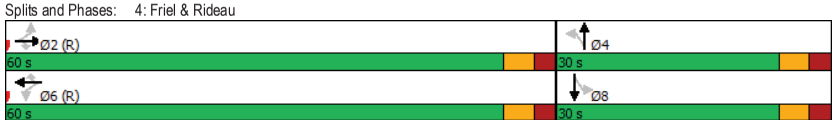


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	4	483	65	22	469	9	75	3	14	4
Future Volume (vph)	4	483	65	22	469	9	75	3	14	4
Lane Group Flow (vph)	0	487	65	0	491	9	0	100	0	26
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2			6			4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.7	25.7	25.7	25.7	25.7	25.7	29.8	29.8	29.8	29.8
Total Split (s)	60.0	60.0	60.0	60.0	60.0	60.0	30.0	30.0	30.0	30.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%
Maximum Green (s)	54.3	54.3	54.3	54.3	54.3	54.3	24.2	24.2	24.2	24.2
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0
Total Lost Time (s)		5.7	5.7		5.7	5.7		5.8		5.8
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Walk Time (s)	13.0	13.0	13.0	13.0	13.0	13.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	7.0	7.0	7.0	7.0	7.0	7.0	12.0	12.0	12.0	12.0
Pedestrian Calls (#/hr)	181	181	181	192	192	192	95	95	78	78
Act Effct Green (s)		57.3	57.3		57.3	57.3		21.2		21.2
Actuated g/C Ratio		0.64	0.64		0.64	0.64		0.24		0.24
v/c Ratio		0.44	0.12		0.46	0.02		0.37		0.09
Control Delay		4.7	0.8		11.0	0.1		27.1		20.1
Queue Delay		0.1	0.0		0.0	0.0		0.0		0.0
Total Delay		4.8	0.8		11.0	0.1		27.1		20.1
LOS		A	A		B	A		C		C
Approach Delay		4.3			10.8			27.1		20.1
Approach LOS		A			B			C		C
Queue Length 50th (m)		13.9	0.1		43.3	0.0		11.7		2.3
Queue Length 95th (m)		21.1	m0.8		66.1	0.1		25.4		8.4
Internal Link Dist (m)		117.5			103.0			131.9		64.0
Turn Bay Length (m)			20.0			20.0				
Base Capacity (vph)		1105	562		1070	535		308		343
Starvation Cap Reductn		88	0		0	0		0		0
Spillback Cap Reductn		0	0		0	0		0		0
Storage Cap Reductn		0	0		0	0		0		0
Reduced v/c Ratio		0.48	0.12		0.46	0.02		0.32		0.08

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 48 (53%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.46
Intersection Signal Delay: 9.3 Intersection LOS: A
Intersection Capacity Utilization 77.6% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Friel & Rideau



Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	8	10	43	0	43	0	98	66	4	19	6
Future Vol, veh/h	4	8	10	43	0	43	0	98	66	4	19	6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	8	10	43	0	43	0	98	66	4	19	6
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	7.6	7.8	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	18%	50%	14%
Vol Thru, %	60%	36%	0%	66%
Vol Right, %	40%	45%	50%	21%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	164	22	86	29
LT Vol	0	4	43	4
Through Vol	98	8	0	19
RT Vol	66	10	43	6
Lane Flow Rate	164	22	86	29
Geometry Grp	1	1	1	1
Degree of Util (X)	0.178	0.025	0.098	0.033
Departure Headway (Hd)	3.902	4.101	4.086	4.152
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	912	858	865	851
Service Time	1.961	2.197	2.166	2.235
HCM Lane V/C Ratio	0.18	0.026	0.099	0.034
HCM Control Delay	7.8	7.3	7.6	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.1	0.3	0.1

Appendix H

MMLOS Analysis

CGH TRANSPORTATION

Multi-Modal Level of Service - Intersections Form

Consultant	**CGH Transportation Inc.**	**Project**	**2020-88**
Scenario	**Existing/Future**	**Date**	**2021-07-07**
Comments			

	INTERSECTIONS	York St at King Edward Ave				Rideau St at King Edward Ave				Rideau St at Nelson St				Rideau St at Friel St			
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	8		3	0 - 2	8	8	6	6	0 - 2	0 - 2	5	5	0 - 2	0 - 2	5	5
	Median	Median > 2.4 m		No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	No left turn / Prohib.		No left turn / Prohib.	Permissive	Protected	No left turn / Prohib.	Protected/ Permissive	No left turn / Prohib.	Protected/ Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
	Conflicting Right Turns	Permissive or yield control		Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Protected/ Permissive	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control
	Right Turns on Red (RToR) ?	RTOR allowed		RTOR allowed	RTOR allowed	RTOR prohibited	RTOR allowed	RTOR prohibited	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	No		No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No
	Right Turn Channel	No Channel		No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel
	Corner Radius	5-10m		10-15m	10-15m	>25m	15-25m	5-10m	10-15m	5-10m	5-10m	5-10m	5-10m	5-10m	5-10m	5-10m	5-10m
	Crosswalk Type	Zebra stripe hi-vis markings		Std transverse markings	Std transverse markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings
	PETSI Score	7		78	85	1	-1	29	33	89	89	41	41	89	89	41	41
	Ped. Exposure to Traffic LoS	F	-	B	B	F	F	F	E	B	B	E	E	B	B	E	E
	Cycle Length																
	Effective Walk Time																
	Average Pedestrian Delay																
	Pedestrian Delay LoS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Level of Service	F	-	B	B	F	F	F	E	B	B	E	E	B	B	E	E
		F				F				E				E			
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach					Mixed Traffic	Mixed Traffic										
	Right Turn Lane Configuration					> 50 m	≤ 50 m										
	Right Turning Speed					≤ 25 km/h	≤ 25 km/h										
	Cyclist relative to RT motorists	-	A	-	-	F	D	-	A	A	A	A	A	A	A	A	A
	Separated or Mixed Traffic	-	-	-	-	**Mixed Traffic**	**Mixed Traffic**	-	-	-	-	-	-	-	-	-	-
	Left Turn Approach		≥ 2 lanes crossed			≥ 2 lanes crossed			One lane crossed	No lane crossed	No lane crossed	One lane crossed	One lane crossed	No lane crossed	No lane crossed	One lane crossed	One lane crossed
	Operating Speed		> 50 to < 60 km/h			> 50 to < 60 km/h			> 50 to < 60 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h
	Left Turning Cyclist	-	F	-	-	F	A	-	E	B	B	E	E	B	B	E	E
	Level of Service	-	F	-	-	F	D	-	E	B	B	E	E	B	B	E	E
		F				F				E				E			
Transit	Average Signal Delay	≤ 10 sec	≤ 20 sec			≤ 40 sec	≤ 40 sec	≤ 40 sec	≤ 20 sec			≤ 20 sec	≤ 20 sec			≤ 10 sec	≤ 20 sec
	Level of Service	B	C	-	-	E	E	E	C	-	-	C	C	-	-	B	C
		C				E				C				C			
Truck	Effective Corner Radius					> 15 m		> 15 m	> 15 m								
	Number of Receiving Lanes on Departure from Intersection					≥ 2		≥ 2	≥ 2								
	Level of Service	-	-	-	-	A	-	A	A	-	-	-	-	-	-	-	-
		-				A				-				-			
Auto	Volume to Capacity Ratio	0.61 - 0.70				0.71 - 0.80				0.61 - 0.70				0.0 - 0.60			
	Level of Service	B				C				B				A			

Multi-Modal Level of Service - Segments Form

Consultant	**CGH Transportation Inc.**	**Project**	**2020-88**
Scenario	**Existing/Future**	**Date**	**7/7/2021**
Comments			

SEGMENTS			Nelson Street		
Pedestrian	Sidewalk Width Boulevard Width	**C**	≥ 2 m < 0.5		
	Avg Daily Curb Lane Traffic Volume		≤ 3000		
	Operating Speed On-Street Parking		> 50 to 60 km/h no		
	Exposure to Traffic PLoS		**C**	-	-
	Effective Sidewalk Width				
	Pedestrian Volume				
	Crowding PLoS		**A**	-	-
	Level of Service		**C**	-	-
Bicycle	Type of Cycling Facility	**D**	Mixed Traffic		
	Number of Travel Lanes		≤ 2 (no centreline)		
	Operating Speed		≥ 50 to 60 km/h		
	# of Lanes & Operating Speed LoS		**D**	-	-
	Bike Lane (+ Parking Lane) Width				
	Bike Lane Width LoS		-	-	-
	Bike Lane Blockages				
	Blockage LoS		-	-	-
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge		
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes		
	Sidestreet Operating Speed		≤ 40 km/h		
	Unsignalized Crossing - Lowest LoS		**A**	-	-
	Level of Service		**D**	-	-
Transit	Facility Type	-			
	Friction or Ratio Transit:Posted Speed				
	Level of Service		-	-	-
Truck	Truck Lane Width	-			
	Travel Lanes per Direction				
	Level of Service		-	-	-

Appendix I

Synchro Intersection Worksheets – Future Total 2024 & 2029

Lane Group	EBR	WBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	47	17	109	495	1214
Future Volume (vph)	47	17	109	495	1214
Lane Group Flow (vph)	47	17	109	517	1261
Turn Type	Free	Perm	pm+pt	NA	NA
Protected Phases			8	2	6
Permitted Phases	Free	8	2		
Detector Phase		8	8	2	6
Switch Phase					
Minimum Initial (s)		10.0	10.0	10.0	10.0
Minimum Split (s)		39.8	39.8	32.0	32.0
Total Split (s)		39.8	39.8	80.2	80.2
Total Split (%)		33.2%	33.2%	66.8%	66.8%
Maximum Green (s)		33.0	33.0	74.2	74.2
Yellow Time (s)		3.3	3.3	3.0	3.0
All-Red Time (s)		3.5	3.5	3.0	3.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0
Total Lost Time (s)		6.8	6.8	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Vehicle Extension (s)		3.0	3.0	3.0	3.0
Recall Mode		None	None	C-Max	C-Max
Walk Time (s)		25.0	25.0	18.0	18.0
Flash Dont Walk (s)		8.0	8.0	8.0	8.0
Pedestrian Calls (#/hr)		112	112	57	102
Act Effct Green (s)	120.0	33.0	106.4	74.2	74.2
Actuated g/C Ratio	1.00	0.28	0.89	0.62	0.62
v/c Ratio	0.03	0.03	0.17	0.18	0.43
Control Delay	0.0	0.1	1.1	9.8	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.0	0.1	1.1	9.8	12.4
LOS	A	A	A	A	B
Approach Delay				8.3	12.4
Approach LOS				A	B
Queue Length 50th (m)	0.0	0.0	0.2	17.5	52.6
Queue Length 95th (m)	0.0	0.0	0.4	22.7	62.4
Internal Link Dist (m)				218.1	130.8
Turn Bay Length (m)			85.0		
Base Capacity (vph)	1491	575	642	2913	2903
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.17	0.18	0.43

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 95 (79%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 75

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.43
Intersection Signal Delay: 10.7 — Intersection LOS: B
Intersection Capacity Utilization 59.4% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: King Edward & York

Lane Group	EBL	EBT	WBT	NBT	NBR	SBL	SBT	SBR	Ø1	Ø2	Ø3	Ø5
Lane Configurations												
Traffic Volume (vph)	156	160	334	452	85	207	821	222				
Future Volume (vph)	156	160	334	452	85	207	821	222				
Lane Group Flow (vph)	156	175	404	452	85	207	821	222				
Turn Type	Prot	NA	NA	NA	custom	custom	NA	custom				
Protected Phases	11	1 2	5 6	3 4		13	7 8	11	1	2	3	5
Permitted Phases					4	8		8				
Detector Phase	11	1 2	5 6	3 4	4	13	7 8	11				
Switch Phase												
Minimum Initial (s)	5.0				10.0	5.0		5.0	1.0	10.0	1.0	1.0
Minimum Split (s)	11.2				23.7	9.5		11.2	5.0	29.8	5.0	5.0
Total Split (s)	30.0				24.0	14.0		30.0	5.0	62.0	5.0	5.0
Total Split (%)	27.3%				21.8%	12.7%		27.3%	5%	56%	5%	5%
Maximum Green (s)	23.8				17.3	9.5		23.8	3.0	55.2	3.0	3.0
Yellow Time (s)	3.3				3.0	3.5		3.3	2.0	3.3	2.0	2.0
All-Red Time (s)	2.9				3.7	1.0		2.9	0.0	3.5	0.0	0.0
Lost Time Adjust (s)	0.0				0.0	0.0		0.0				
Total Lost Time (s)	6.2				6.7	4.5		6.2				
Lead/Lag					Lag				Lead	Lag	Lead	Lead
Lead-Lag Optimize?					Yes				Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0				3.0	3.0		3.0	3.0	3.0	3.0	3.0
Recall Mode	Max				Max	Max		Max	Max	C-Max	Max	Max
Walk Time (s)					2.0				3.0	2.0	3.0	3.0
Flash Dont Walk (s)					15.0				0.0	21.0	0.0	0.0
Pedestrian Calls (#/hr)					146				182	182	146	306
Act Effct Green (s)	23.8	65.0	35.0	27.0	17.3	33.5	41.0	55.6				
Actuated g/C Ratio	0.22	0.59	0.32	0.25	0.16	0.30	0.37	0.51				
v/c Ratio	0.44	0.09	0.43	0.56	0.26	0.74	0.66	0.33				
Control Delay	41.8	9.1	31.5	39.3	1.9	55.6	32.0	12.3				
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total Delay	41.8	9.1	31.5	39.3	1.9	55.6	32.0	12.3				
LOS	D	A	C	D	A	E	C	B				
Approach Delay		24.5	31.5	33.4			32.4					
Approach LOS		C	C	C			C					
Queue Length 50th (m)	29.2	7.3	35.9	44.7	0.0	35.3	76.4	20.6				
Queue Length 95th (m)	49.2	12.0	50.1	61.0	0.0	#63.5	97.7	32.8				
Internal Link Dist (m)		125.5	140.5	133.0			218.1					
Turn Bay Length (m)	65.0				20.0	105.0						
Base Capacity (vph)	358	1850	931	813	326	280	1235	665				
Starvation Cap Reductn	0	0	0	0	0	0	0	0				
Spillback Cap Reductn	0	0	0	0	0	0	0	0				
Storage Cap Reductn	0	0	0	0	0	0	0	0				
Reduced v/c Ratio	0.44	0.09	0.43	0.56	0.26	0.74	0.66	0.33				

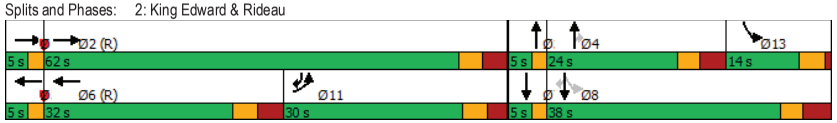
Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 92 (84%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90

Lane Group	Ø6	Ø7	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	6	7	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	10.0	1.0	10.0
Minimum Split (s)	31.8	5.0	25.9
Total Split (s)	32.0	5.0	38.0
Total Split (%)	29%	5%	35%
Maximum Green (s)	25.2	3.0	31.1
Yellow Time (s)	3.3	2.0	3.0
All-Red Time (s)	3.5	0.0	3.9
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	C-Max	Max	Max
Walk Time (s)	2.0	3.0	2.0
Flash Dont Walk (s)	23.0	0.0	17.0
Pedestrian Calls (#/hr)	306	128	128
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 31.4 — Intersection LOS: C
Intersection Capacity Utilization 61.7% — ICU Level of Service B
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: King Edward & Rideau

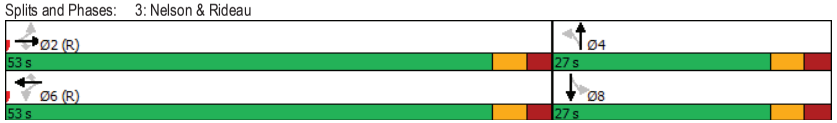


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	72	368	6	3	347	62	0	56	2
Future Volume (vph)	72	368	6	3	347	62	0	56	2
Lane Group Flow (vph)	72	368	6	3	347	62	6	0	128
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2			6		4		8
Permitted Phases	2		2	6		6		8	
Detector Phase	2	2	2	6	6	6	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.8	26.8	26.8	26.8	26.8	26.8	27.0	27.0	27.0
Total Split (s)	53.0	53.0	53.0	53.0	53.0	53.0	27.0	27.0	27.0
Total Split (%)	66.3%	66.3%	66.3%	66.3%	66.3%	66.3%	33.8%	33.8%	33.8%
Maximum Green (s)	47.2	47.2	47.2	47.2	47.2	47.2	21.0	21.0	21.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8	5.8	6.0		6.0
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None
Walk Time (s)	15.0	15.0	15.0	15.0	15.0	15.0	7.0	7.0	7.0
Flash Dont Walk (s)	6.0	6.0	6.0	6.0	6.0	6.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	89	89	89	225	225	225	89	88	88
Act Effct Green (s)	49.4	49.4	49.4	49.4	49.4	49.4	18.8		18.8
Actuated g/C Ratio	0.62	0.62	0.62	0.62	0.62	0.62	0.24		0.24
v/c Ratio	0.16	0.34	0.01	0.01	0.32	0.10	0.01		0.38
Control Delay	8.6	9.2	0.0	6.7	7.7	2.1	0.0		15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	8.6	9.2	0.0	6.7	7.7	2.1	0.0		15.7
LOS	A	A	A	A	A	A	A		B
Approach Delay		9.0			6.9				15.7
Approach LOS		A			A				B
Queue Length 50th (m)	4.5	26.4	0.0	0.2	19.5	0.0	0.0		6.8
Queue Length 95th (m)	10.6	42.2	0.0	m0.6	29.0	3.0	0.0		20.7
Internal Link Dist (m)		140.5			117.5		126.5		49.6
Turn Bay Length (m)	40.0		20.0	10.0		20.0			
Base Capacity (vph)	457	1077	766	509	1077	602	574		368
Starvation Cap Reductn	0	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0	0		0
Reduced v/c Ratio	0.16	0.34	0.01	0.01	0.32	0.10	0.01		0.35

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 34 (43%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 55

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.38
Intersection Signal Delay: 8.9 Intersection LOS: A
Intersection Capacity Utilization 60.9% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Nelson & Rideau

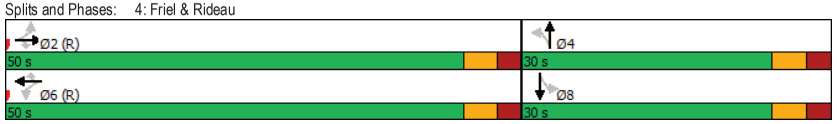


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	8	359	68	7	367	8	20	6	8	4
Future Volume (vph)	8	359	68	7	367	8	20	6	8	4
Lane Group Flow (vph)	0	367	68	0	374	8	0	39	0	16
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2			6			4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.7	25.7	25.7	25.7	25.7	25.7	29.8	29.8	29.8	29.8
Total Split (s)	50.0	50.0	50.0	50.0	50.0	50.0	30.0	30.0	30.0	30.0
Total Split (%)	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	37.5%	37.5%	37.5%	37.5%
Maximum Green (s)	44.3	44.3	44.3	44.3	44.3	44.3	24.2	24.2	24.2	24.2
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0
Total Lost Time (s)		5.7	5.7		5.7	5.7		5.8		5.8
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Walk Time (s)	13.0	13.0	13.0	13.0	13.0	13.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	7.0	7.0	7.0	7.0	7.0	7.0	12.0	12.0	12.0	12.0
Pedestrian Calls (#/hr)	85	85	85	82	82	82	81	81	35	35
Act Effct Green (s)		51.6	51.6		51.6	51.6		21.2		21.2
Actuated g/C Ratio		0.64	0.64		0.64	0.64		0.26		0.26
v/c Ratio		0.33	0.09		0.34	0.01		0.11		0.04
Control Delay		4.9	0.5		10.2	0.0		16.0		17.4
Queue Delay		0.0	0.0		0.0	0.0		0.0		0.0
Total Delay		4.9	0.5		10.2	0.0		16.0		17.4
LOS		A	A		B	A		B		B
Approach Delay		4.2			10.0			16.0		17.4
Approach LOS		A			A			B		B
Queue Length 50th (m)		5.9	0.1		29.7	0.0		2.8		1.3
Queue Length 95th (m)		10.1	0.3		47.3	0.0		9.5		5.5
Internal Link Dist (m)		117.5			103.0			131.9		64.0
Turn Bay Length (m)			20.0			20.0				
Base Capacity (vph)		1113	793		1116	780		415		423
Starvation Cap Reductn		0	0		0	0		0		0
Spillback Cap Reductn		0	0		0	0		0		0
Storage Cap Reductn		0	0		0	0		0		0
Reduced v/c Ratio		0.33	0.09		0.34	0.01		0.09		0.04

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 50 (63%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.34
Intersection Signal Delay: 7.5 Intersection LOS: A
Intersection Capacity Utilization 70.6% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 4: Friel & Rideau



Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	18	8	62	14	5	18	23	26	6	23	2
Future Vol, veh/h	11	18	8	62	14	5	18	23	26	6	23	2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	18	8	62	14	5	18	23	26	6	23	2
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	7.8	7.4	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	27%	30%	77%	19%
Vol Thru, %	34%	49%	17%	74%
Vol Right, %	39%	22%	6%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	67	37	81	31
LT Vol	18	11	62	6
Through Vol	23	18	14	23
RT Vol	26	8	5	2
Lane Flow Rate	67	37	81	31
Geometry Grp	1	1	1	1
Degree of Util (X)	0.074	0.042	0.096	0.036
Departure Headway (Hd)	3.983	4.098	4.25	4.191
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	889	865	838	844
Service Time	2.054	2.162	2.301	2.268
HCM Lane V/C Ratio	0.075	0.043	0.097	0.037
HCM Control Delay	7.4	7.3	7.8	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.3	0.1

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	14	5	65	93	0
Future Vol, veh/h	2	14	5	65	93	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	14	5	65	93	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	168	93	93	0	-	0
Stage 1	93	-	-	-	-	-
Stage 2	75	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	822	964	1501	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	948	-	-	-	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	820	964	1501	-	-	-
Mov Cap-2 Maneuver	820	-	-	-	-	-
Stage 1	928	-	-	-	-	-
Stage 2	948	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1501	-	943	-	-
HCM Lane V/C Ratio	0.003	-	0.017	-	-
HCM Control Delay (s)	7.4	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBR	WBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	79	10	93	854	730	30
Future Volume (vph)	79	10	93	854	730	30
Lane Group Flow (vph)	79	10	93	872	730	30
Turn Type	Free	Perm	pm+pt	NA	NA	Perm
Protected Phases			8	2	6	
Permitted Phases	Free	8	2			6
Detector Phase		8	8	2	6	6
Switch Phase						
Minimum Initial (s)		10.0	10.0	10.0	10.0	10.0
Minimum Split (s)		39.8	39.8	32.0	32.0	32.0
Total Split (s)		39.8	39.8	80.2	80.2	80.2
Total Split (%)		33.2%	33.2%	66.8%	66.8%	66.8%
Maximum Green (s)		33.0	33.0	74.2	74.2	74.2
Yellow Time (s)		3.3	3.3	3.0	3.0	3.0
All-Red Time (s)		3.5	3.5	3.0	3.0	3.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.8	6.8	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Recall Mode		None	None	C-Max	C-Max	C-Max
Walk Time (s)		25.0	25.0	18.0	18.0	18.0
Flash Dont Walk (s)		8.0	8.0	8.0	8.0	8.0
Pedestrian Calls (#/hr)		127	127	70	108	108
Act Effct Green (s)	120.0	33.0	106.4	74.2	74.2	74.2
Actuated g/C Ratio	1.00	0.28	0.89	0.62	0.62	0.62
v/c Ratio	0.05	0.02	0.12	0.30	0.36	0.04
Control Delay	0.1	0.1	0.8	11.0	11.8	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.1	0.1	0.8	11.0	11.8	2.6
LOS	A	A	A	B	B	A
Approach Delay				10.0	11.4	
Approach LOS				A	B	
Queue Length 50th (m)	0.0	0.0	0.2	32.7	41.4	0.0
Queue Length 95th (m)	0.0	0.0	0.3	40.0	52.6	3.1
Internal Link Dist (m)				218.1	130.8	
Turn Bay Length (m)			85.0			30.0
Base Capacity (vph)	1489	464	792	2930	2050	686
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.02	0.12	0.30	0.36	0.04

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 58 (48%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 75

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.36
Intersection Signal Delay: 10.1 — Intersection LOS: B
Intersection Capacity Utilization 59.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: King Edward & York

Lane Group	EBL	EBT	WBT	NBT	NBR	SBL	SBT	SBR	Ø1	Ø2	Ø3	Ø5
Lane Configurations												
Traffic Volume (vph)	186	304	382	611	114	165	565	131				
Future Volume (vph)	186	304	382	611	114	165	565	131				
Lane Group Flow (vph)	186	329	491	611	114	165	565	131				
Turn Type	Prot	NA	NA	NA	custom	custom	NA	custom				
Protected Phases	11	1 2	5 6	3 4		13	7 8	11	1	2	3	5
Permitted Phases					4	8		8				
Detector Phase	11	1 2	5 6	3 4	4	13	7 8	11				
Switch Phase												
Minimum Initial (s)	5.0				10.0	5.0		5.0	1.0	10.0	1.0	1.0
Minimum Split (s)	11.2				23.7	9.5		11.2	5.0	29.8	5.0	5.0
Total Split (s)	27.0				29.0	12.0		27.0	5.0	59.0	5.0	5.0
Total Split (%)	24.5%				26.4%	10.9%		24.5%	5%	54%	5%	5%
Maximum Green (s)	20.8				22.3	7.5		20.8	3.0	52.2	3.0	3.0
Yellow Time (s)	3.3				3.0	3.5		3.3	2.0	3.3	2.0	2.0
All-Red Time (s)	2.9				3.7	1.0		2.9	0.0	3.5	0.0	0.0
Lost Time Adjust (s)	0.0				0.0	0.0		0.0				
Total Lost Time (s)	6.2				6.7	4.5		6.2				
Lead/Lag					Lag				Lead	Lag	Lead	Lead
Lead-Lag Optimize?					Yes				Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0				3.0	3.0		3.0	3.0	3.0	3.0	3.0
Recall Mode	Max				Max	Max		Max	Max	C-Max	Max	Max
Walk Time (s)					2.0				3.0	2.0	3.0	3.0
Flash Dont Walk (s)					15.0				0.0	21.0	0.0	0.0
Pedestrian Calls (#/hr)					186				362	362	186	500
Act Effct Green (s)	20.8	62.0	35.0	32.0	22.3	36.5	44.0	55.6				
Actuated g/C Ratio	0.19	0.56	0.32	0.29	0.20	0.33	0.40	0.51				
v/c Ratio	0.59	0.19	0.55	0.63	0.37	0.71	0.43	0.21				
Control Delay	49.6	11.5	33.7	37.4	3.3	55.5	25.1	11.0				
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total Delay	49.6	11.5	33.7	37.4	3.3	55.5	25.1	11.0				
LOS	D	B	C	D	A	E	C	B				
Approach Delay		25.3	33.7	32.1			28.8					
Approach LOS		C	C	C			C					
Queue Length 50th (m)	36.8	16.3	45.5	60.0	0.0	26.1	45.4	11.3				
Queue Length 95th (m)	60.0	23.6	62.2	78.8	0.0	#49.4	60.2	19.8				
Internal Link Dist (m)		125.5	140.5	133.0			218.1					
Turn Bay Length (m)	65.0				20.0	105.0		95.0				
Base Capacity (vph)	313	1777	897	964	311	233	1326	614				
Starvation Cap Reductn	0	0	0	0	0	0	0	0				
Spillback Cap Reductn	0	0	0	0	0	0	0	0				
Storage Cap Reductn	0	0	0	0	0	0	0	0				
Reduced v/c Ratio	0.59	0.19	0.55	0.63	0.37	0.71	0.43	0.21				

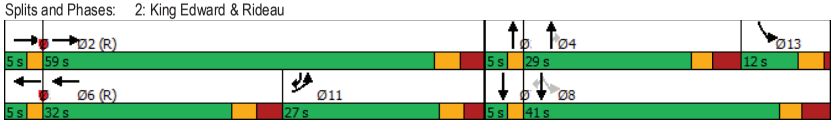
Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 92 (84%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90

Lane Group	Ø6	Ø7	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	6	7	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	10.0	1.0	10.0
Minimum Split (s)	31.8	5.0	25.9
Total Split (s)	32.0	5.0	41.0
Total Split (%)	29%	5%	37%
Maximum Green (s)	25.2	3.0	34.1
Yellow Time (s)	3.3	2.0	3.0
All-Red Time (s)	3.5	0.0	3.9
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0
Recall Mode	C-Max	Max	Max
Walk Time (s)	2.0	3.0	2.0
Flash Dont Walk (s)	23.0	0.0	17.0
Pedestrian Calls (#/hr)	500	162	162
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 29.9 Intersection LOS: C
Intersection Capacity Utilization 69.2% 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: 2: King Edward & Rideau



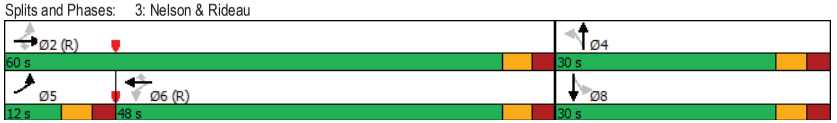
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	101	475	8	7	411	159	2	3	73	1
Future Volume (vph)	101	475	8	7	411	159	2	3	73	1
Lane Group Flow (vph)	101	475	8	7	411	159	0	19	0	169
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2			6			4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	5	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.8	26.8	26.8	26.8	26.8	26.8	27.0	27.0	27.0	27.0
Total Split (s)	12.0	60.0	60.0	48.0	48.0	48.0	30.0	30.0	30.0	30.0
Total Split (%)	13.3%	66.7%	66.7%	53.3%	53.3%	53.3%	33.3%	33.3%	33.3%	33.3%
Maximum Green (s)	6.2	54.2	54.2	42.2	42.2	42.2	24.0	24.0	24.0	24.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8	5.8		6.0		6.0
Lead/Lag	Lead			Lag	Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes	Yes				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Walk Time (s)		15.0	15.0	15.0	15.0	15.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		6.0	6.0	6.0	6.0	6.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)		294	294	500	500	500	322	322	171	171
Act Effct Green (s)	54.2	54.2	54.2	44.6	44.6	44.6		24.0		24.0
Actuated g/C Ratio	0.60	0.60	0.60	0.50	0.50	0.50		0.27		0.27
v/c Ratio	0.27	0.45	0.02	0.02	0.48	0.53		0.08		0.61
Control Delay	9.5	11.5	0.1	10.1	12.4	8.9		15.1		27.8
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0		0.0		0.0
Total Delay	9.5	11.5	0.1	10.1	12.6	8.9		15.1		27.8
LOS	A	B	A	B	B	A		B		C
Approach Delay		11.0			11.6			15.1		27.8
Approach LOS		B			B			B		C
Queue Length 50th (m)	6.8	41.1	0.0	0.4	26.9	1.2		0.6		14.6
Queue Length 95th (m)	13.1	62.5	0.0	m1.0	37.4	7.7		5.9		37.1
Internal Link Dist (m)		140.5			117.5			126.5		49.6
Turn Bay Length (m)	40.0		20.0	10.0		20.0				
Base Capacity (vph)	377	1050	426	309	864	301		247		275
Starvation Cap Reductn	0	0	0	0	76	0		0		0
Spillback Cap Reductn	0	0	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0	0	0		0		0
Reduced v/c Ratio	0.27	0.45	0.02	0.02	0.52	0.53		0.08		0.61

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 52 (58%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 13.4 — Intersection LOS: B
Intersection Capacity Utilization 70.7% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Nelson & Rideau



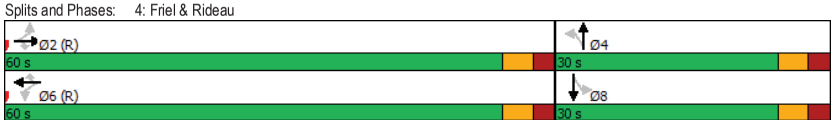
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	4	485	65	22	470	9	75	3	14	4
Future Volume (vph)	4	485	65	22	470	9	75	3	14	4
Lane Group Flow (vph)	0	489	65	0	492	9	0	100	0	26
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2			6			4		8
Permitted Phases	2		2	6		6	4		8	
Detector Phase	2	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.7	25.7	25.7	25.7	25.7	25.7	29.8	29.8	29.8	29.8
Total Split (s)	60.0	60.0	60.0	60.0	60.0	60.0	30.0	30.0	30.0	30.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%
Maximum Green (s)	54.3	54.3	54.3	54.3	54.3	54.3	24.2	24.2	24.2	24.2
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0
Total Lost Time (s)		5.7	5.7		5.7	5.7		5.8		5.8
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Walk Time (s)	13.0	13.0	13.0	13.0	13.0	13.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	7.0	7.0	7.0	7.0	7.0	7.0	12.0	12.0	12.0	12.0
Pedestrian Calls (#/hr)	185	185	185	201	201	201	95	95	82	82
Act Effct Green (s)		57.3	57.3		57.3	57.3		21.2		21.2
Actuated g/C Ratio		0.64	0.64		0.64	0.64		0.24		0.24
v/c Ratio		0.44	0.12		0.46	0.02		0.37		0.09
Control Delay		4.7	0.8		11.0	0.1		27.1		20.1
Queue Delay		0.1	0.0		0.0	0.0		0.0		0.0
Total Delay		4.8	0.8		11.0	0.1		27.1		20.1
LOS		A	A		B	A		C		C
Approach Delay		4.3			10.8			27.1		20.1
Approach LOS		A			B			C		C
Queue Length 50th (m)		14.1	0.1		43.3	0.0		11.7		2.3
Queue Length 95th (m)		21.4	m0.7		66.3	0.1		25.5		8.4
Internal Link Dist (m)		117.5			103.0			131.9		64.0
Turn Bay Length (m)			20.0			20.0				
Base Capacity (vph)		1105	554		1070	516		306		342
Starvation Cap Reductn		88	0		0	0		0		0
Spillback Cap Reductn		0	0		0	0		0		0
Storage Cap Reductn		0	0		0	0		0		0
Reduced v/c Ratio		0.48	0.12		0.46	0.02		0.33		0.08

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 48 (53%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.46
Intersection Signal Delay: 9.3 — Intersection LOS: A
Intersection Capacity Utilization 77.7% — ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Friel & Rideau



Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	8	11	43	0	43	0	98	66	4	19	6
Future Vol, veh/h	4	8	11	43	0	43	0	98	66	4	19	6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	8	11	43	0	43	0	98	66	4	19	6
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	7.6	7.8	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	17%	50%	14%
Vol Thru, %	60%	35%	0%	66%
Vol Right, %	40%	48%	50%	21%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	164	23	86	29
LT Vol	0	4	43	4
Through Vol	98	8	0	19
RT Vol	66	11	43	6
Lane Flow Rate	164	23	86	29
Geometry Grp	1	1	1	1
Degree of Util (X)	0.178	0.026	0.098	0.033
Departure Headway (Hd)	3.902	4.085	4.086	4.152
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	910	861	865	850
Service Time	1.963	2.181	2.167	2.237
HCM Lane V/C Ratio	0.18	0.027	0.099	0.034
HCM Control Delay	7.8	7.3	7.6	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.1	0.3	0.1

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	8	13	164	72	1
Future Vol, veh/h	0	8	13	164	72	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	8	13	164	72	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	263	73	73	0	-	0
Stage 1	73	-	-	-	-	-
Stage 2	190	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	726	989	1527	-	-	-
Stage 1	950	-	-	-	-	-
Stage 2	842	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	719	989	1527	-	-	-
Mov Cap-2 Maneuver	719	-	-	-	-	-
Stage 1	941	-	-	-	-	-
Stage 2	842	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1527	-	989	-	-
HCM Lane V/C Ratio	0.009	-	0.008	-	-
HCM Control Delay (s)	7.4	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Appendix J

TDM Checklist

CGH TRANSPORTATION

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

Legend

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

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

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

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

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

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

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

Legend

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

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

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

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

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