



# Minto Mahogany Stage 2

## Transportation Impact Study



## **Minto Mahogany Stage 2**

### **Transportation Impact Study**

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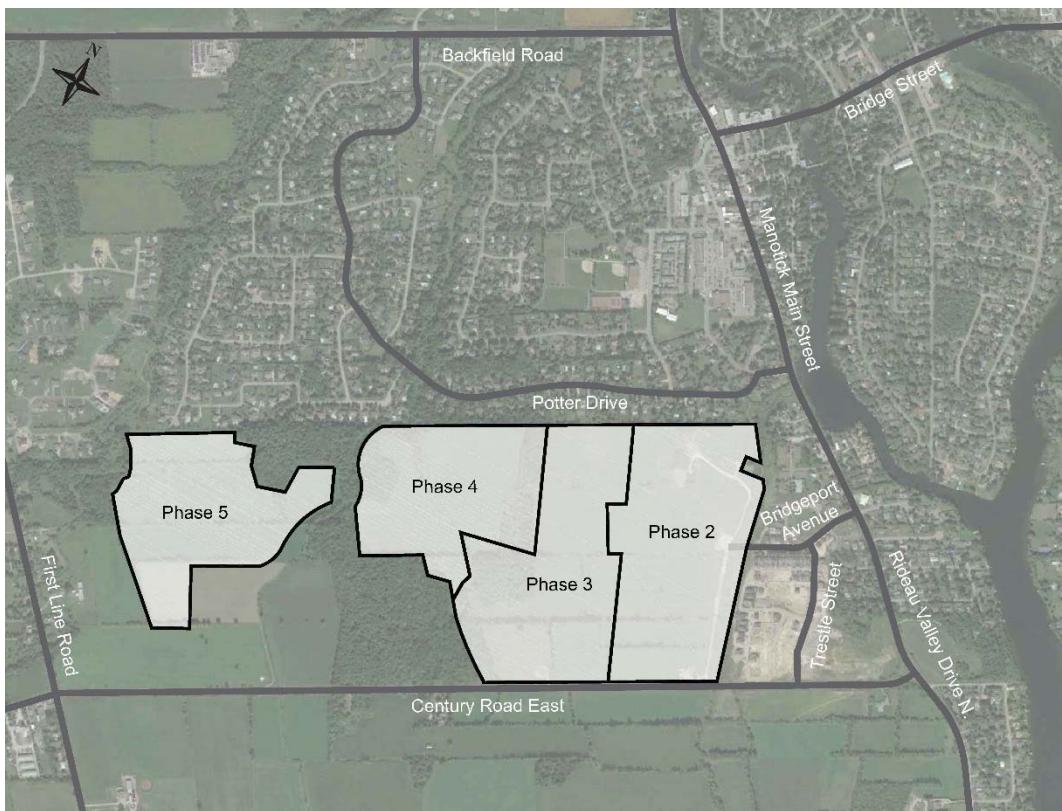
# Transportation Impact Study

## 1. INTRODUCTION

This study has been prepared in support of a Draft Plan of Subdivision application for Stage 2 of the Mahogany Subdivision by Minto Developments Inc. A Transportation Impact Study is required to satisfy the site plan application. The Stage 2 residential development will consist of 4 Phases: Phase 2 with 99 townhomes and 347 single family homes, Phase 3 with 93 townhomes and 224 single family homes, Phase 4 with 167 single family homes, and Phase 5 with 54 townhomes and 205 single family homes. In total, Stage 2 will include 246 townhomes and 943 single family homes. Phase 1 was previously approved and nearing completion. The proposed site is located north of Century Road, between First Line Road and Rideau Valley Drive North. It is acknowledged that the projected unit numbers may vary slightly as each phase comes online, the total unit count for the Mahogany Community is capped at 1,400 units and will not increase beyond this limit.

Figure 1 illustrates the local context of the site and Figure 2 illustrates the proposed Site Plan.

Figure 1: Local Context





#### legend

Single Family (Low Density)	Park	Phase 1 Boundary	Phase 5 Boundary
Single Family (Moderate Density)	School	Phase 2 Boundary	Phase 5 Boundary
Mixed Residential (3-Storey Townhomes & Bungalow Townhome)	SWM	Phase 3 Boundary	Phase 4 Boundary

#### All Phases Unit Summary

Phase 1	211
Phase 2	446
Phase 3	317
Phase 4	167
Phase 5	259
Total	1400

#### Density

Phases 1 - 5 (u/ha)

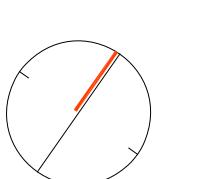
Single Family Low Density  
Single Family Moderate Density  
Mixed Residential

7.40 u/ha  
13.98 u/ha  
27.33 u/ha

#### Product Distribution

Phases 1- 5 (%)

Single Family Low Density 3.29%  
Single Family Moderate Density 79.14%  
Mixed Residential 17.57%



scale | 1:3000



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**Concept Plan**  
Phase 2+  
date | 19 may 2017

## 2. EXISTING CONDITIONS

### 2.1. STUDY AREA ROAD NETWORK

**Manotick Main Street (Rideau Valley Drive)** is a north-south arterial roadway with a two-lane cross-section within the study area. It extends from the south at Roger Stevens Dr through to Prince of Wales Dr where it continues as Jockvale Road. Manotick Main St is urbanized through Manotick to approximately 85m north of Eastman Ave where it transitions into a rural cross-section. The shoulders are generally paved along the rural section, with gravel shoulders generally being provided south of Bridgeport Ave. The posted speed limit is 40 km/h within Manotick and 60 km/h south of Eastman Ave.

**Bridgeport Avenue** is a two-lane, east-west urban collector with an unposted speed of 50 km/h. The road extends from Manotick Main St to Mahogany Creek.

**Century Road** is a two-lane, east-west rural collector with a posted speed of 60 km/h east of Trestle St and 80 km/h to the west. The road extends from Rideau Valley Dr/Manotick Main St to Second Line Rd. Gravel shoulders are provided on either side of the road.

**Trestle Street** is a north-south urban collector roadway with a two-lane cross-section within the study area. It extends from Century Rd northward to Bridgeport Ave. The unposted speed is 50 km/h.

**Bridge Street** is an east-west arterial roadway with a two-lane urban cross-section within the study area. It extends from Manotick Main St to River Rd where it continues as Mitch Owens Road. The posted speed is 40 km/h.

**First Line Road** is a two-lane, north-south rural collector with a posted speed limit of 80 km/h. The road extends from Roger Stevens Road through to Backfield Road and gravel shoulders are provided in both sides of the road.

### 2.2. PEDESTRIAN/CYCLING NETWORK

Sidewalk facilities are provided along both sides of Manotick Main St between Bridge St and Currier St, and a sidewalk on the eastside continues south to approximately 40m north of Eastman Ave. Bridgeport Ave has sidewalks on both sides of the roadway, except for a small link on the south side between Moretto Crt and Trestle St. Bicycle facilities are currently provided in the form of a multi-use pathway (MUP) along Mahogany Creek between Potter Dr and Century Rd and bicycle lanes along Bridge St.

Per the City's Cycling Plan, Manotick Main St is classified as a "Spine Route" and Potter Dr and Century Rd are classified as "Local Routes".

### 2.3. TRANSIT NETWORK

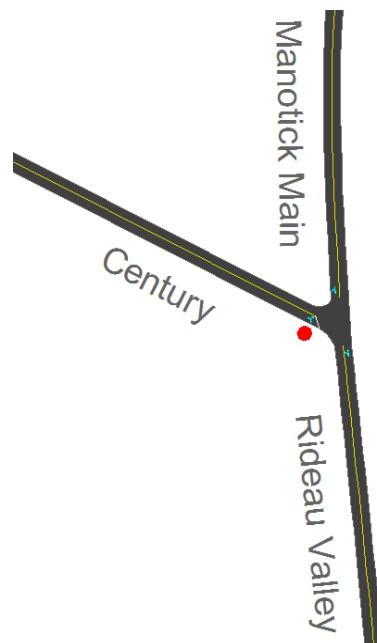
Transit service within the vicinity of the site is currently provided by OC Transpo Peak Route #99 which provides peak hour service in the morning and afternoon. Bus stops for Route #99 closest to the development are located along Manotick Main St at Century Rd, approximately 1 kilometer east from the proposed development access on Century Rd.

Peak Route #186 and Local Route #305 are located approximately 2 kilometers north of the development which provides access to multiple along the Transitway.

## 2.4. EXISTING STUDY AREA INTERSECTIONS

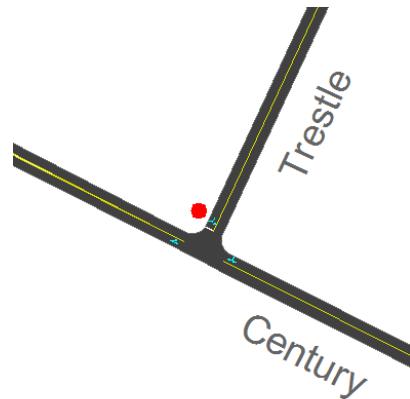
### Century Road/Manotick Main Street/Rideau Valley Drive

The Century Rd/Manotick Main St/Rideau Valley Dr intersection is an unsignalized 'T' intersection with a minor STOP-control on the Century Rd. A single lane approach is provided for each leg of this intersection with all movements permitted.



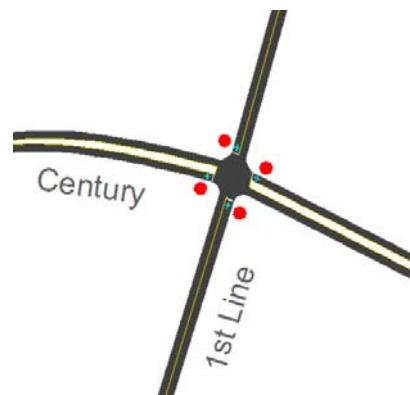
### Century Road/Trestle Street

The Century Rd/Trestle St intersection is an unsignalized 'T' intersection with STOP-control on the minor approach only. A single lane approach is provided for each leg of this intersection with all movements permitted.



### Century Road/First Line Road

The Century Rd/First Line Rd intersection is an unsignalized four-legged intersection with all-way STOP-control. A single lane approach is provided for each leg of this intersection with all movements permitted. Exponential stop bars are provided along both approaches of Century Rd.



# PARSONS

## Manotick Main Street/Bridgeport Avenue/Antochi Lane

The Manotick Main St/Bridgeport Ave/Antochi Ln intersection is an unsignalized four-legged intersection with STOP-control on both minor approaches. A single lane approach is provided for each leg of this intersection with all movements permitted. Perpendicular parking stalls are provided for Ottawa Fire Station 94 on the northeast quadrant of the intersection, outside of the paved shoulder.



## Manotick Main Street/Bridge Street/Maple Avenue

The Manotick Main St/Bridge St/Maple Ave is a signalized four-legged intersection. The northbound approach consists of a through lane and a right-turn lane. The northbound left turn is restricted, except for buses. The southbound approach consists of a left-turn lane and a shared through/right-turn lane. The eastbound approach consists of a shared through/right-turn lane and a left-turn lane. The westbound approach consists of a right-turn lane, a through lane and a left-turn lane.

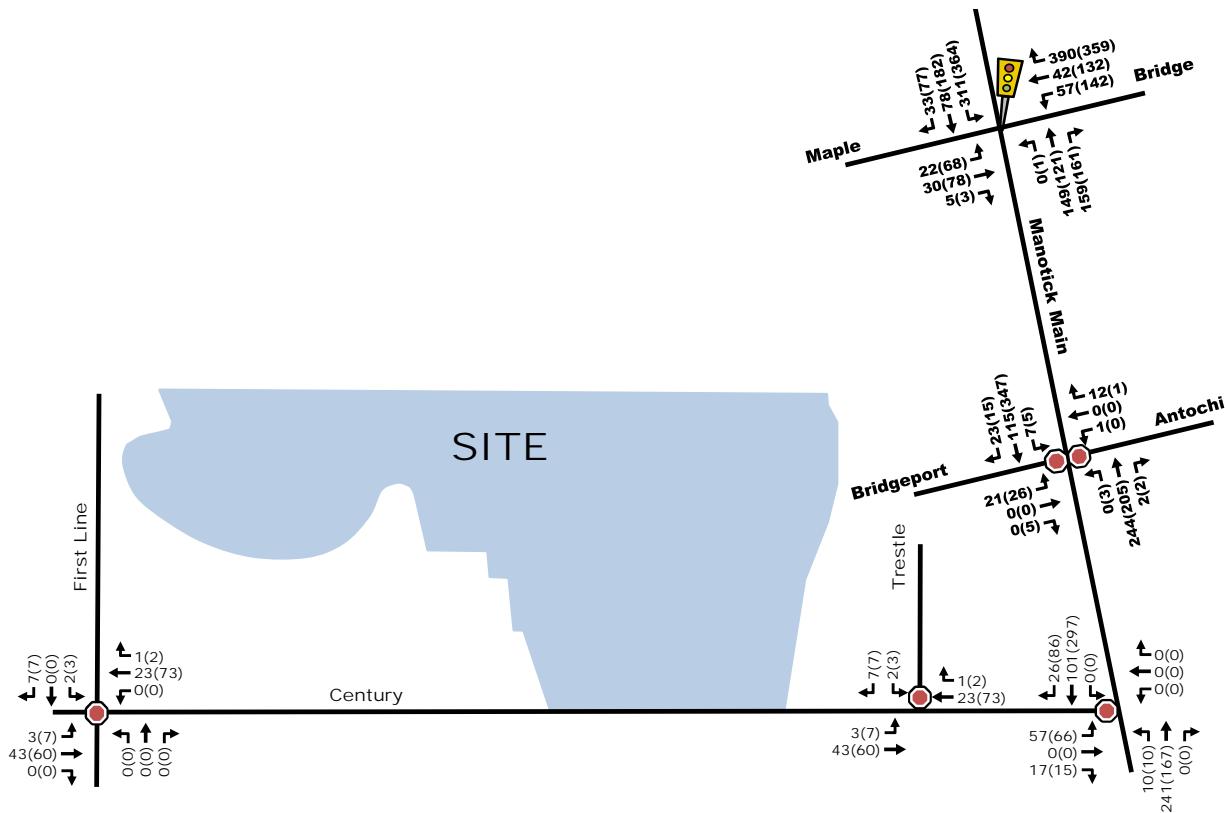


## 2.5. EXISTING INTERSECTION OPERATIONS

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Illustrated as Figure 3, are the most recent weekday morning and afternoon peak hour traffic volumes obtained from the City of Ottawa. Peak hour traffic volumes are included as Appendix A.

Figure 3: Existing Peak Hour Traffic Volumes



The following Table 1 provides a summary of existing traffic operations at study area intersections based on the SYNCHRO (V9) traffic analysis software. The subject intersection was assessed in terms of the volume-to-capacity (v/c) ratio and the corresponding Level of Service (LoS) for the critical movement(s). The subject intersections ‘as a whole’ were assessed based on a weighted v/c ratio. The SYNCHRO model output of existing conditions is provided within Appendix B.

Table 1: Existing Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Manotick Main/Century (unsignalized)	B(B)	11.2(13.4)	EBL(EBL)	2.0(1.8)	-	-
Century/Trestle (unsignalized)	A(A)	8.7(9.1)	SBR(SBR)	1.3(0.9)	-	-
First Line/Century (unsignalized)	A(A)	7.2(7.4)	EBT(WBT)	7.1(7.4)	-	-
Manotick Main/Bridgeport (unsignalized)	B(B)	12.4(14.5)	EBL(EBL)	1.1(0.9)	-	-
Manotick Main /Bridge	A(A)	0.50(0.54)	WBR(SBL)	13.7(20.3)	A(A)	0.45(0.46)

Notes:

- Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.

As shown in Table 1, the signalized Manotick Main/Bridge study area intersection ‘as a whole’ is currently operating at an excellent LoS ‘A’ during both peak hours, with respect to the City of Ottawa operating standards of LoS ‘D’ or better ( $v/c \leq 0.90$ ).

Regarding ‘critical movements’ at study area intersections, they are currently operating at an acceptable LoS ‘B’ or better during peak hours.

## 2.6. EXISTING ROAD SAFETY CONDITIONS

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Collision history for study area roads (2013 to 2015, inclusive) was obtained from the City of Ottawa and most collisions (87%) involved only property damage, indicating low impact speeds, and the remaining 13% involved personal injuries. No incidents were identified as “non-reportable”, indicating the total damage to a vehicle was less than \$1,000.

The primary causes of collisions cited by police include; rear end (26%), turning movement (26%), angle (24%), single vehicle (Other) (13%), sideswipe (5%), and approaching and single vehicle (unattended) (3%) type collisions.

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

- 0.95/MEV at the Manotick Main St and Bridge St intersection.
- 0.25/MEV along Manotick Main St between Bridge and Johnston Clapp Ln.
- 0.25/MEV along Manotick Main St between Johnston Clapp Ln and Mill St.
- 0.24/MEV at the Manotick Main St and Tighe St intersection.
- 0.27/MEV along Manotick Main St between Tighe St and O’Grady St.
- 0.13/MEV at the Manotick Main St and O’Grady St intersection.
- 0.14/MEV along Manotick Main St between Beaverwood Rd and Currier St.
- 0.14/MEV at the Manotick Main St and Currier St intersection.
- 0.45/MEV along Manotick Main St between Currier St and Eastman Ave.
- 0.16/MEV at the Manotick Main St and Island View Dr intersection.
- 0.16/MEV at the Manotick Main St and Century Rd intersection.

Based on the available data, there does not appear to be any prevailing safety issues. The roadways within the study area are noted as being suburban in nature through Manotick (Manotick Main St) or relatively straight and level rural roads (Century Rd), resulting in good sight-lines/visibility and vehicle traction. The source collision data as provided by the City of Ottawa and related analysis is provided as Appendix C.

## 3. DEMAND FORECASTING

### 3.1. PLANNED STUDY AREA TRANSPORTATION NETWORK CHANGES

#### 3.1.1. MANOTICK SECONDARY PLAN

Approved in 2016, the Manotick Secondary Plan outlines the vision for Manotick, to maintain the village atmosphere, historic beginnings, and integration of residential and pedestrian-oriented nature of the area. The planning for the Mahogany development was included in the Secondary Plan, including recommendations for the land use and transportation network.

While the land use is in concert with the Secondary Plan, the transportation recommendations to be considered for the Mahogany development include:

- A pathway along Mahogany Creek, connecting to Potter Dr (existing).
- Potential cycling route along Manotick Main St and Century Rd.
- Proposed sidewalk/path along both sides of Bridgeport Ave and connections to Century Rd.
  - Potential combination with cycling connectivity.
- Proposed sidewalk along the north side of Century Rd.

- Proposed sidewalk connection to Potter Dr (adjacent to Wilson Cowan Drain) and Garrison Dr (adjacent to Mud Creek).
- Consideration of a roundabout at Manotick Main St/Bridgeport Ave, including a gateway feature for Manotick.

### 3.1.2. MANOTICK MAIN PEDESTRIAN CROSSOVER

In August 2016, a pedestrian crossover was installed on Manotick Main Street at Tighe Street. Pedestrians can safely cross the street at the push of the button, which activates flashing beacons ensuring cars yield to pedestrians. There are currently no other planned crossovers for this area.

## 3.2. OTHER AREA DEVELOPMENT

### 3.2.1. MAHOGANY PHASE 1 (MINTO)

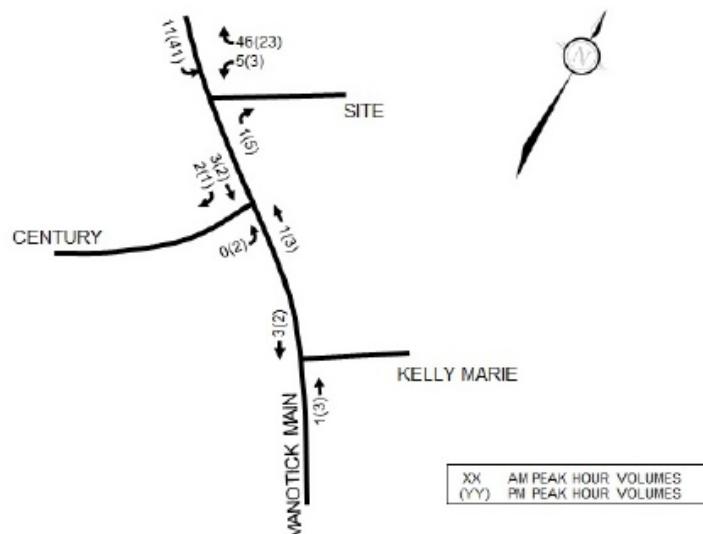
Phase 1 of the Mahogany subdivision is currently undergoing of the final phase of construction, with Phase 1C, located between Manotick Main St and Trestle St, north of Century Rd. Phase 1C will include 57 units, for a total of 221 residential units in all of Phase 1. As part of Phase 1C, a sidewalk will be extended along Century Rd from Manotick Main St to Trestle Rd. The build-out of this Phase will be completed in 2019.

### 3.2.2. 5741, 5731, AND 5721 MANOTICK MAIN STREET (REGIONAL)

Regional has submitted a Draft Plan of Subdivision and Zoning By-law Amendment for an 82-unit development within the lands encompassing 5741, 5731, and 5721 Manotick Main St. The development site access will be located north of the Century Rd intersection to Manotick Main St and provide a multi-use pathway connection to Kelly Marie Dr. No auxiliary lanes are proposed for the development and the site access will be a minor stop-control.

The trip generation from this site, illustrated in Figure 4, will be explicitly included in the background traffic growth, as referenced from the *Revised Access Memorandum*, dated February 15, 2017.

Figure 4: 5741, 5731, and 5721 Projected Site-Generated Traffic



### 3.3. BACKGROUND TRAFFIC GROWTH

The background traffic along Manotick Main Street is expected to increase at a constant rate. The anticipated development of the Manotick community will be captured by subsequent transportation impact assessments to determine when various improvements are triggered. Due to the opening of the Vimy Memorial Bridge, a 1% traffic growth rate per annum was assumed for the 2027 and 2032 Horizon years. First Line Road and Century Road were assumed to have 0% growth and any future traffic growth along the road corridor will be generated by the development of the adjacent community.

The projected background traffic volumes for the horizon years is illustrated as Figure 5 for 2027 and Figure 6 for 2032.

Figure 5: Projected 2027 Baseline Traffic Volumes

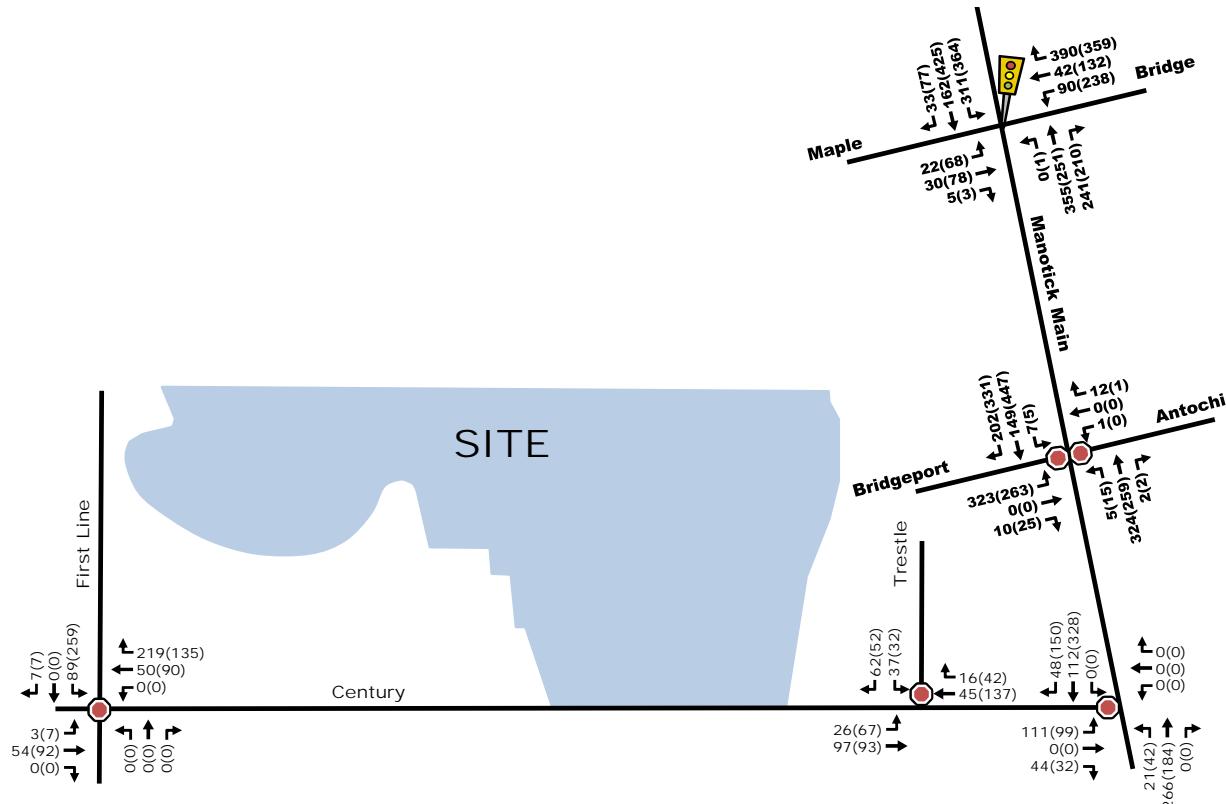
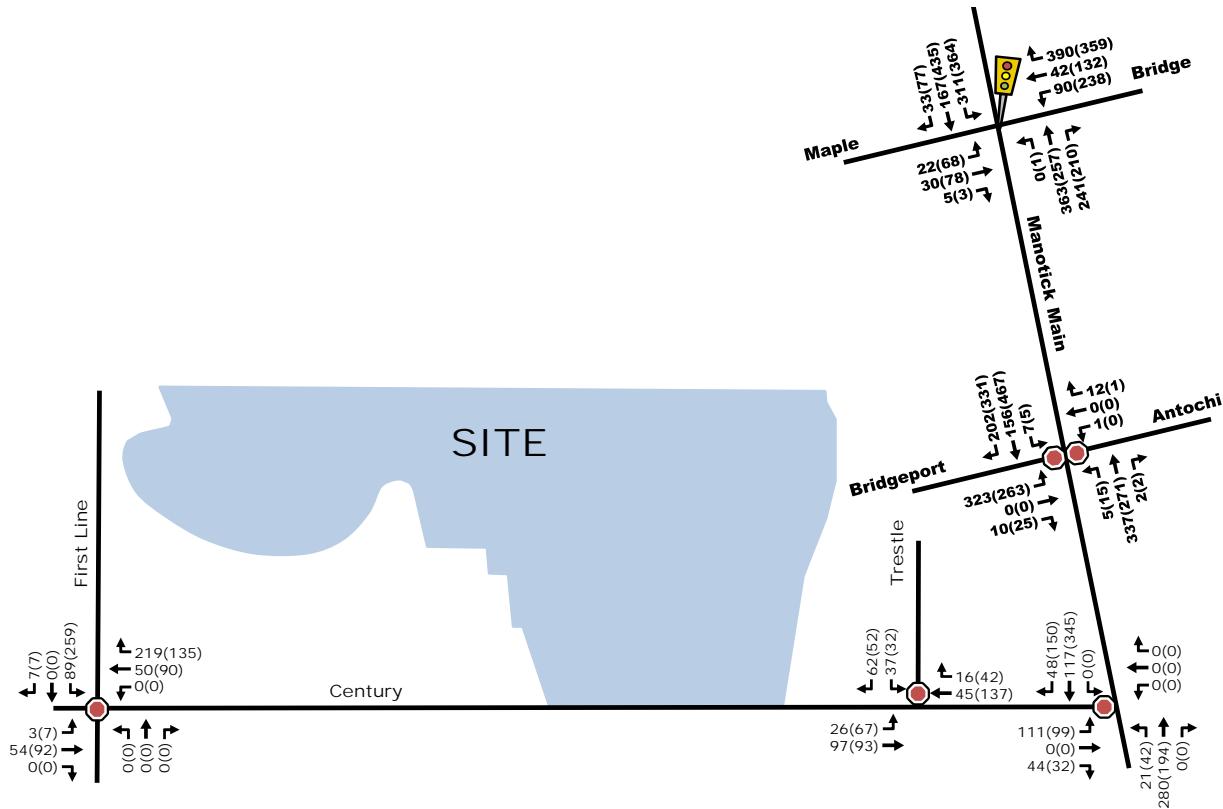


Figure 6: Projected 2032 Baseline Traffic Volumes



The following Table 2 and Table 3 provide a summary of the projected background traffic operations for both the 2027 and 2032 horizon years at study area intersections based on the SYNCHRO (V9) traffic analysis software. The subject intersections were assessed in terms of the volume-to-capacity (v/c) ratio and the corresponding Level of Service (LoS) for the critical movement(s). The subject intersections 'as a whole' were assessed based on a weighted v/c ratio. The SYNCHRO model output of background conditions is provided within Appendix D.

Table 2: Projected Background 2027 Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Manotick Main/Century (unsignalized)	B(B)	11.5(14.0)	EBL(EBL)	0.9(1.9)	-	-
Century/Trestle (unsignalized)	A(A)	8.9(9.3)	SBR(SBR)	0.9(3.7)	-	-
First Line/Century (unsignalized)	A(A)	7.2(7.4)	EBT(WBT)	7.1(7.4)	-	-
Manotick Main/Bridgeport (unsignalized)	C(C)	15.9(25.0)	EBL(EBL)	2.9(4.8)	-	-
Manotick Main /Bridge	A(A)	0.50(0.55)	WBR(SBL)	14.0(20.4)	A(A)	0.45(0.47)

Notes:

- Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.

Table 3: Projected Background 2032 Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Manotick Main/Century (unsignalized)	B(B)	11.7(14.4)	EBL(EBL)	1.9(1.8)	-	-
Century/Trestle (unsignalized)	A(A)	8.9(9.3)	SBR(SBR)	3.7(2.7)	-	-
First Line/Century (unsignalized)	A(A)	7.2(7.4)	EBT(WBT)	7.1(7.4)	-	-
Manotick Main/Bridgeport (unsignalized)	C(D)	16.3(27.0)	EBL(EBL)	2.9(5.0)	-	-
Manotick Main /Bridge	A(A)	0.50(0.55)	WBR(SBL)	14.1(20.4)	A(A)	0.45(0.47)

Notes: • Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.

The background volumes for both the 2027 and 2032 horizons are projected to operate acceptably in both the AM and PM peak hours. It is noted that the build out of Mahogany Phase 1 will have over 60 veh/h making the southbound right-turn movement at Manotick Main St/Bridgeport Ave. While not recommended for the background conditions, additional volume will likely trigger the need for a right-turn lane and this will be carried forward into the future horizons analysis.

### 3.4. SITE TRIP GENERATION

Appropriate trip generation rates for the proposed development of approximate 943 single family homes and 246 residential townhome units were obtained from the 9<sup>th</sup> Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual, which are summarized in Table 4.

As ITE trip generation surveys only record vehicle trips and typically reflect highly suburban locations (with little to no access by travel modes other than private automobiles), adjustment factors appropriate to the more connected suburban study area context were applied to attain estimates of person trips for the proposed development. This approach is considered appropriate within the industry for more urban developments.

Table 4: ITE Trip Generation Rates

Land Use	Data Source	Trip Rates	
		AM Peak	PM Peak
Single Family Homes	ITE 210	T=0.75(du) T=0.70(du)+9.74	T=1.00(du) Ln(T)=0.90Ln(du)+0.51
Townhomes	ITE 230	T=0.44(du) Ln(T)=0.80Ln(du)+0.26	T=0.52(du) Ln(T)=0.82Ln(du)+0.32

Notes: T = Average Vehicle Trip Ends  
du = dwelling units

To convert ITE vehicle trip rates to person trips, an auto occupancy factor and a non-auto trip factor were applied to the ITE vehicle trip rates. Our review of available literature suggests that a combined factor of approximately 1.3 is considered reasonable to account for typical North American auto occupancy values of approximately 1.15 and combined transit and non-motorized modal shares of less than 10%. As such, the person trip generation for the proposed site is summarized by phase in Table 5.

Table 5: Modified Person Trip Generation

Land Use	Units	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Single Family Homes (Phase 2)	347	101	227	328	276	143	419
Townhomes (Phase 2)	99	11	56	67	52	26	78
Single Family Homes (Phase 3)	224	67	150	217	186	96	282
Townhomes (Phase 3)	93	10	53	63	49	25	74
Single Family Homes (Phase 4)	167	51	114	165	143	74	217
Single Family Homes (Phase 5)	205	61	138	199	172	89	261
Townhomes (Phase 5)	54	6	35	41	31	16	47
<b>Total Person Trips</b>		<b>307</b>	<b>773</b>	<b>1,080</b>	<b>909</b>	<b>469</b>	<b>1,378</b>

*Note: 1.3 factor to account for typical North American auto occupancy values of approximately 1.15 and combined transit and non-motorized modal shares of less than 10%*

The person trips for each phase shown in Table 5 for the proposed site were then reduced by modal share values (Table 6, Table 7, Table 8, and Table 9), with the total site-generated vehicle traffic summarized in Table 10.

Table 6: Phase 2 Modal Site Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	70%	79	199	278	231	120	351
Auto Passenger	15%	17	44	61	50	25	75
Transit	5%	5	13	18	15	8	23
Non-motorized	10%	11	27	38	32	16	48
Total Person Trips	100%	112	283	395	328	169	497
<b>Total 'New' Auto Trips</b>		<b>79</b>	<b>199</b>	<b>278</b>	<b>231</b>	<b>120</b>	<b>351</b>

Table 7: Phase 3 Modal Site Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	70%	54	143	197	166	86	252
Auto Passenger	15%	13	31	44	36	19	55
Transit	5%	3	9	12	11	5	16
Non-motorized	10%	7	20	27	22	11	33
Total Person Trips	100%	77	203	280	235	121	356
<b>Total 'New' Auto Trips</b>		<b>54</b>	<b>143</b>	<b>197</b>	<b>166</b>	<b>86</b>	<b>252</b>

Table 8: Phase 4 Modal Site Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	70%	36	80	116	101	52	153
Auto Passenger	15%	8	18	26	21	12	33
Transit	5%	2	5	7	7	3	10
Non-motorized	10%	5	11	16	14	7	21
Total Person Trips	100%	51	114	165	143	74	217
<b>Total 'New' Auto Trips</b>		<b>36</b>	<b>80</b>	<b>116</b>	<b>101</b>	<b>52</b>	<b>153</b>

Table 9: Phase 5 Modal Site Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	70%	48	122	170	143	75	218
Auto Passenger	15%	10	27	37	31	17	48
Transit	5%	3	8	11	9	4	13
Non-motorized	10%	6	16	22	20	9	29
Total Person Trips	100%	67	173	240	203	105	308
<b>Total 'New' Auto Trips</b>		<b>48</b>	<b>122</b>	<b>170</b>	<b>143</b>	<b>75</b>	<b>218</b>

Table 10: Total Site Vehicle Trip Generation

Phase	AM Peak (veh/h)			PM Peak (veh/h)		
	In	Out	Total	In	Out	Total
Phase 2	79	199	278	231	120	351
Phase 3	54	143	197	166	86	252
Phase 4	36	80	116	101	52	153
Phase 5	48	122	170	143	75	218
<b>Total 'New' Auto Trips</b>	<b>217</b>	<b>544</b>	<b>761</b>	<b>641</b>	<b>333</b>	<b>974</b>

As shown in Table 10, the resulting number of potential 'new' two-way vehicle trips for the proposed development is approximately 761 and 974 veh/h during the weekday morning and afternoon peak hours, respectively.

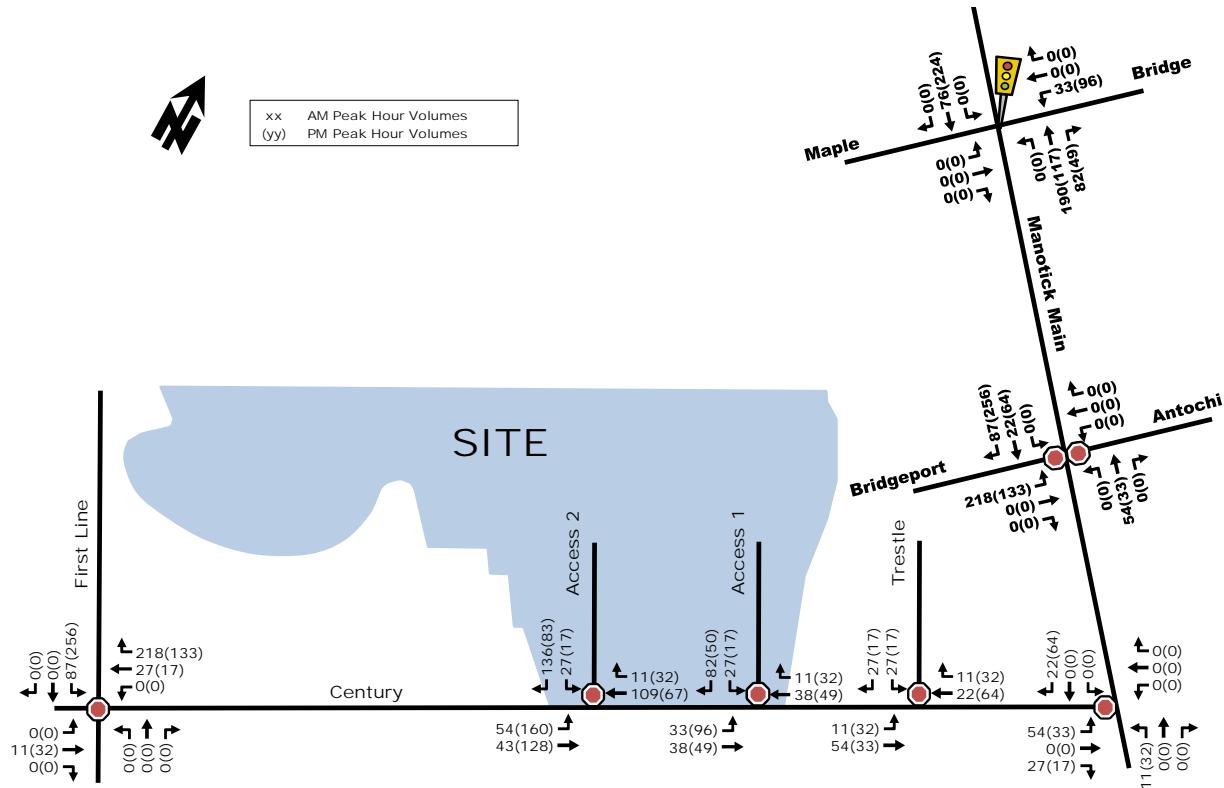
### 3.5. VEHICLE TRAFFIC DISTRIBUTION AND ASSIGNMENT

Traffic distribution was based on the different types of land uses, existing volume splits at study area intersections and our knowledge of the surrounding area. The resultant distribution is outlined as follows.

- 5% to/from the south via Rideau Valley Dr
  - 35% to/from the north via Manotick Main St
  - 15% to/from the east via Manotick Main St and Bridge St
  - 45% to/from the west via Century Rd and First Line Rd
- 100%

Based on these distributions, 'new' site-generated trips were assigned to study area intersections, which are illustrated as Figure 7.

Figure 7: 'New' Site Generated Traffic Volumes



## 4. FUTURE TRAFFIC OPERATIONS

### 4.1. PROJECTED 2027 CONDITIONS AT FULL SITE DEVELOPMENT

The total projected 2027 volumes associated with the proposed development were derived by superimposing 'new' site-generated traffic volumes (Figure 7) onto projected 2027 background traffic volumes (Figure 5). The resulting total projected 2027 volumes are illustrated as Figure 8.

The following Table 11 provides a projected performance summary for study area intersections, based on total projected 2032 traffic volumes. The detailed SYNCHRO model output of projected conditions is provided within Appendix E.

Figure 8: Total Projected 2027 Peak Hour Traffic Volumes

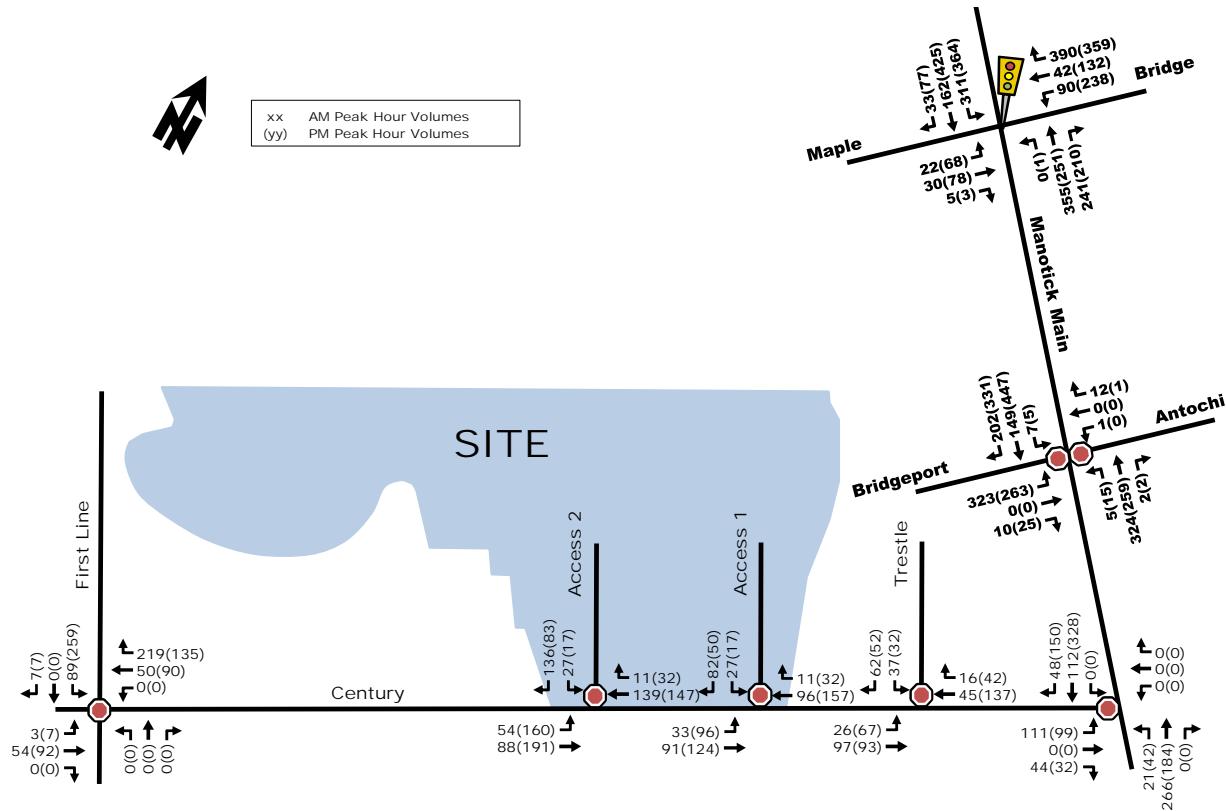


Table 11: Projected 2027 Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Manotick Main/Century (unsignalized)	B(C)	13.0(17.4)	EB(EB)	3.7(3.3)	-	-
Century/Trestle (unsignalized)	A(B)	9.8(11.0)	SB(SB)	4.2(3.7)	-	-
First Line/Century (unsignalized)	A(B)	8.5(10.9)	SB(SB)	8.3(10.0)	-	-
Manotick Main/Bridgeport (unsignalized)	F(F)	75.0(225.6)	EB(EB)	24.4(48.5)	-	-
Manotick Main /Bridge	B(B)	0.65(0.69)	NBT(WBL)	20.7(25.5)	A(B)	0.52(0.66)
Century Rd/Access 1 (unsignalized)	A(B)	9.8(10.6)	SB(SB)	3.8(3.1)	-	-
Century Rd/Access 2 (unsignalized)	B(B)	10.4(11.1)	SB(SB)	4.7(4.1)	-	-

Notes:

- Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.

As shown in Table 11, with the full build-out of Stage 2+, the Manotick Main/Bridgeport intersection is projected to operate above capacity (LoS 'F') during the morning and afternoon peak hour. All other study area intersections 'as a whole' are projected to operate at an acceptable LoS 'C' or better during peak hours.

Regarding the 'critical movements' at study area intersections, the eastbound movement (left) at the Manotick Main St/Bridgeport Ave intersection is projected to operate above capacity (LoS 'F') during the morning and afternoon peak hour. All other critical movements are projected to operate at an acceptable LoS 'C' or better during the morning and afternoon peak hours with respect to the City of Ottawa operating standards of LoS 'D' or better ( $v/c \leq 0.90$ ).

The projected traffic volumes at the Manotick Main St/Bridgeport Ave intersection do not trigger a signal warrant, however, operationally, the eastbound approach would benefit from a higher order control at the intersection. A signal is recommended and Table 12 summarizes the projected operations of the Manotick Main St/Bridgeport Ave intersection. The intersection is anticipated to operate ‘as a whole’ with a LoS ‘B’ or better during both peak hours and the eastbound approach with a LoS ‘C’ or better.

Table 12: Projected 2027 Performance (Mitigated) at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Manotick Main/Bridgeport	C(B)	0.73(0.62)	EB(EB)	13.6(10.8)	A(B)	0.57(0.61)

Notes: • Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.

The roundabout screening tool identifies a 44m requirement for a typical single lane urban roundabout, and the diagonal distances between the property quadrants are approximately 41m (Mahogany park to Fire Station No. 94) and 47m (private residential, northwest to southeast quadrants). The additional space requirements between the park and Fire Station No. 94 would impact the Station on-street parking, landscaping, street lighting, hydro poles, and the existing park space. Therefore, a roundabout intersection was not considered as an option for the high order control intersection control at Manotick Main St/Bridgeport Ave.

## 4.2. PROJECTED 2032 CONDITIONS AT FIVE YEARS BEYOND SITE BUILD-OUT

The total projected 2032 volumes associated with the proposed development were derived by superimposing ‘new’ site-generated traffic volumes (Figure 7) onto projected 2032 background traffic volumes (Figure 6). The resulting total projected 2032 volumes are illustrated as Figure 9.

The following Table 13 provides a projected performance summary for study area intersections, based on total projected 2032 traffic volumes (5-years beyond full site build-out). The detailed SYNCHRO model output of projected conditions is provided within Appendix E.

The Manotick Main St/Bridgeport Ave intersection signalization has been carried forward from the 2027 horizon, including the southbound right-turn lane. No other study area improvements are included in this horizon.

Figure 9: Total Projected 2032 Peak Hour Traffic Volumes

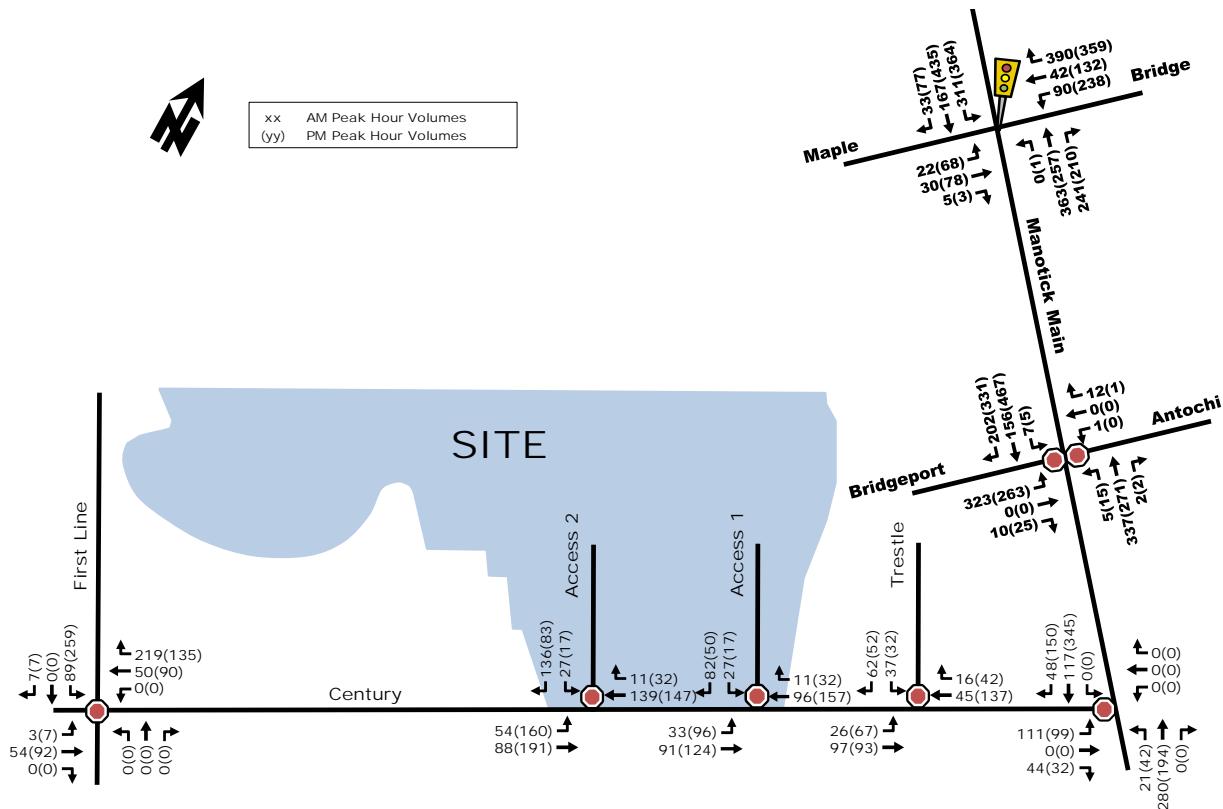


Table 13: Projected 2032 Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement		Intersection			
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Manotick Main/Century (unsignalized)	A(C)	13.2(18.1)	EB(EB)	3.6(3.3)	-	-
Century/Trestle (unsignalized)	A(B)	9.8(11.0)	SB(SB)	4.2(3.7)	-	-
First Line/Century (unsignalized)	A(B)	8.5(10.9)	SB(SB)	8.3(10.0)	-	-
Manotick Main/Bridgeport	B(B)	0.66(0.63)	EB(EB)	11.3(10.9)	A(B)	0.60(0.62)
Manotick Main /Bridge	B(B)	0.66(0.70)	NBT(WBL)	20.8(25.6)	A(B)	0.52(0.66)
Century Rd/Access 1 (unsignalized)	A(B)	9.8(10.6)	SB(SB)	3.8(3.1)	-	-
Century Rd/Access 2 (unsignalized)	B(B)	10.4(11.1)	SB(SB)	4.7(4.1)	-	-

Notes: • Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.

As shown in Table 13, with the continued 1% traffic growth along Manotick Main Street, the study area intersections 'as a whole' are projected to operate at an acceptable LoS 'C' or better during peak hours. The 'critical movements' are projected to operate at an acceptable LoS 'C' or better during the morning and afternoon peak hours with respect to the City of Ottawa operating standards of LoS 'D' or better ( $v/c \leq 0.90$ ).

#### 4.3. NEIGHBOURHOOD/MANOTICK IMPACTS

Based on the location of the proposed development, connections to the adjacent road network, and origin-destination demands of the area, it is anticipated that the majority of the site-generated traffic will utilize Century Rd and First Line

Rd. Inevitably, travel demand will utilize the Bridge St crossing to travel north and east. The opening of the Vimy Memorial Crossing has reduced the demand on Bridge St (approximately 25% from 2010 to 2015), and subsequently the Manotick Main St/Bridge St intersection, providing additional capacity for the Mahogany development to gradually build out.

Within the Mahogany development, additional traffic will utilize Bridgeport Ave and Trestle St to access the site. While the two-way volume will be approximately 10 cars a minute, the community perception may be that it is becoming unsafe. During construction, a monitoring program is recommended for community concerns along the existing portion of Bridgeport Ave to implement remedial passive traffic calming measures, similar to the recommendations for Stage 2+.

With respect to construction traffic for the development, truck routing should be directed to First Line Rd and Century Rd to access the site, avoiding the commercial core and residential areas of Manotick.

## 5. TRANSPORTATION DEMAND MANAGEMENT

Depending on the nature of a development, Transportation Demand Management (TDM) strategies have the potential to be an integral part of a planned development to address and support the City's policies regarding TDM. Several other TDM measures could also be considered, including:

- Improving the quality and safety of pedestrian facilities, such as enhanced sidewalks/lighting.
- Promote transit passes and park & ride options within Manotick and to the Riverview Station.
- Promote appropriate car sharing programs/facilities to reduce auto ownership and attract residents who do not own a vehicle.

TDM strategies are important in encouraging active modes of transportation to/from the site, further lessening the reliance on the private automobile.

## 6. SITE PLAN REVIEW

This section provides an overview of site access, parking requirements, pedestrian circulation and transit accessibility. The proposed Site Plan was previously illustrated as Figure 2.

### Site Access

Access to the Mahogany Stage 2+ will be provided through two new site accesses along Century Rd and the existing Bridgeport Ave intersection on Manotick Main St. The intersections along Century Rd will be stop-controlled along the side streets. No auxiliary lanes are recommended for these additional access locations.

To accommodate the full build-out of Stage 2+, the Manotick Main St/Bridgeport Ave intersection is recommended to be signalized and a southbound right-turn lane provided. The unconstrained storage length for the southbound right-turn lane is approximately 58m, but consideration will need to be given to the adjacent residential driveways along Manotick Main St as the first driveway is approximately 20m north of Bridgeport Ave. No other auxiliary lanes are recommended for the intersection.

### Internal Road Network

The internal road network for Mahogany is developed upon a frame work of 22.0m collector roads and 18.0m local roadways.

The collector roads include Bridgeport Ave, and Access 1 and Access 2, south of Bridgeport Ave. The right-of-way should be able to include 3.3m travel lanes to facilitate transit vehicles, sidewalks on both sides or combination of multi-use pathway and sidewalk, dedicated bike lanes or on-street parking, and the utility/boulevard spacing for lighting and trees. The intersection of Bridgeport Ave/Access 1 is proposed to be a roundabout, facilitating efficient access, calming traffic adjacent to the school site, and providing protected crossing locations for pedestrians and cyclists.

Given the City's recently approved 18.0m cross-section standard, these roadways will match the City typical with on-street parking and a single sidewalk, with the potential combination of a multi-use pathway on adjacent park, stormwater management pond or school lands.

#### Transit

While not currently provided, the opportunity for transit service along Bridgeport Ave can be facilitated with the 22.0m cross-section. Stops should be located on the far side of the intersections and the loop may be facilitated on along Access #1 during Phase 2, and ultimately along Access #2 on Phase 3 proceeds.

#### Pedestrian

The pedestrian network will likely include a sidewalk on the local roads and sidewalks on both sides of the collector roads within the development. External connections are planned to Potter Dr, Garrison Dr, and Century Rd. The use of multi-use pathways within the development may also consolidate the active mode facilities and allow for greater connectivity.

#### Cycling

The cycling network within Mahogany will be facilitated along the collector road network, and multi-use-pathways at the stormwater management ponds and Mahogany Creek. Should a multi-use pathway be provided along the north side of Bridgeport Ave, between Mahogany Creek and Access 2, a potential cycling loop is feasible with connections to Potter Dr.

#### Parking

On-street parking is accommodated along the propose local street network and the potential to be included along the collector roads. If dedicated bike lanes are required, the on-street parking will have to be removed from these roadways. In addition, and transit service provided to the development will limit the areas where parking can be accommodated along the collector roads.

#### Traffic Calming

The implementation of passive traffic calming measures are currently being incorporated into new subdivisions with the goal of reducing potential reconstruction costs soon after a new development roads are completed. The nature of these calming measures should primarily be limited to horizontal features. Within the subject lands, curb narrowings should be provided at the local road intersections with Bridgeport Ave, Access #1 and Access #2. The intersection of Bridgeport Ave/Access #2 is recommended to include a full intersection narrowing to compliment the roundabout proposed at Bridgeport Ave/Access #1. On-street parking planned for the development (as discussed above) will also provide additional side friction along the local roads to calm traffic.

## 7. FINDINGS AND RECOMMENDATIONS

Minto Mahogany, located north of Century Rd, between First Line Rd and Manotick Main St, is a residential development that will consist of 943 single family homes and 246 townhomes, for a total of 1,189 units. It was determined that the proposed development will generate 757 new vehicle trips in the morning peak hour and 966 vehicle trips in the afternoon peak hour.

Based on the foregoing analysis of the proposed development, the following transportation related conclusions are offered.

### **Existing Conditions**

- The signalized study area intersection adjacent to the site is currently operating 'as a whole' with an overall LoS 'A' or better during the weekday morning and afternoon peak hours.
- Regarding 'critical movements' at the study area intersection, they are noted as operating at an acceptable LoS 'C' or better during the peak hours.

# PARSONS

- Based on the available data, there does not appear to be any safety issues at the signalized study area intersections adjacent to the proposed site.

## Projected Conditions

- The background growth rate along Manotick Main St was assumed to be 1% per annum for the 2027 and 2032 horizon years. No background growth was assumed for Century Rd and First Line Rd.
- The proposed development is projected to generate ‘new’ two-way vehicle volumes of approximately 757 and 966 veh/h during the weekday morning and afternoon peak hours, respectively.
- At full occupancy (year 2027), the Manotick Main St/Bridgeport Ave intersection eastbound approached is projected to operate at a LoS ‘F’ during both peak hours. It is recommended that the intersection be signalized upon full build-out and a southbound right-turn lane be provided with a maximum storage length of 58m.
- The remaining study area intersections ‘as a whole’ are projected to operate at an acceptable LoS ‘C’ or better and the ‘critical movements’ are projected to operate at acceptable levels of service during both peak hours.
- At 5-years beyond site build-out, study area intersections ‘as a whole’ are projected to operate at an acceptable LoS ‘C’ or better.

## Site Plan

- The internal road network provides a high level of connectivity within the development and to the adjacent road network.
- The local roads are sufficiently wide (18.0m) to permit the construction of sidewalks on one side of the roadway. The internal collector roads are sufficiently wide to permit the construction of sidewalks along both sides of the road, or potentially the combination of a sidewalk and multi-use pathway.
- A multi-use pathway is recommended along the north side of Bridgeport Ave, between Mahogany Creek and Access 2, to facilitate a cycling loop including Potter Dr, Mahogany Creek, Bridgeport Ave and Access 2/Wilson Cowen Drain.
- Curb narrowings are recommended on the local road approaches to the internal collectors (Bridgeport Ave, Access 1 and Access 2, south of Bridgeport Ave) and a full intersection narrowing is recommended for the intersection of Bridgeport Ave/Access 2.

Based on the foregoing, the proposed Minto Mahogany Stage 2+ residential development is recommended from a transportation perspective.

Prepared By:



Andrew Harte, P.Eng.  
Transportation Engineer

Reviewed By:

A handwritten signature of Christopher Gordon.

Christopher Gordon, P.Eng.  
Senior Project Manager

## **Appendix A**

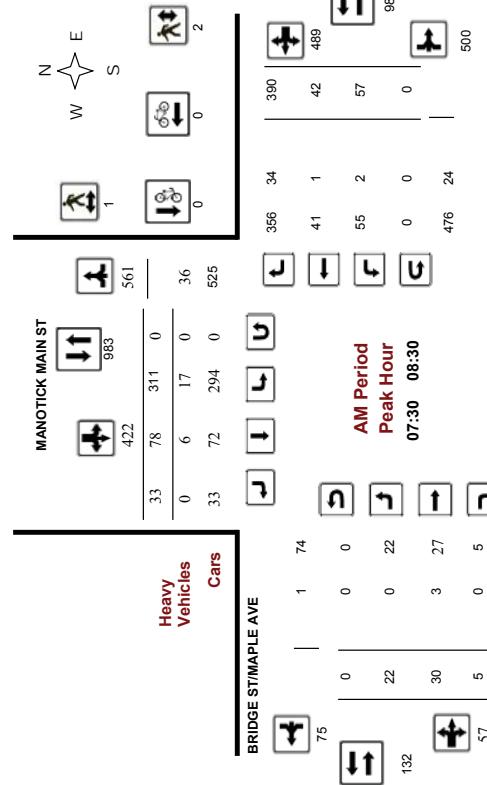
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**Ottawa** Public Works - Traffic Services

Turning Movement Count - Peak Hour Diagram  
BRIDGE ST/MAPLE AVE @ MANOTICK MAIN ST

Survey Date: Tuesday, March 08, 2016  
Start Time: 07:00

WO No: 35737  
Device: Movision

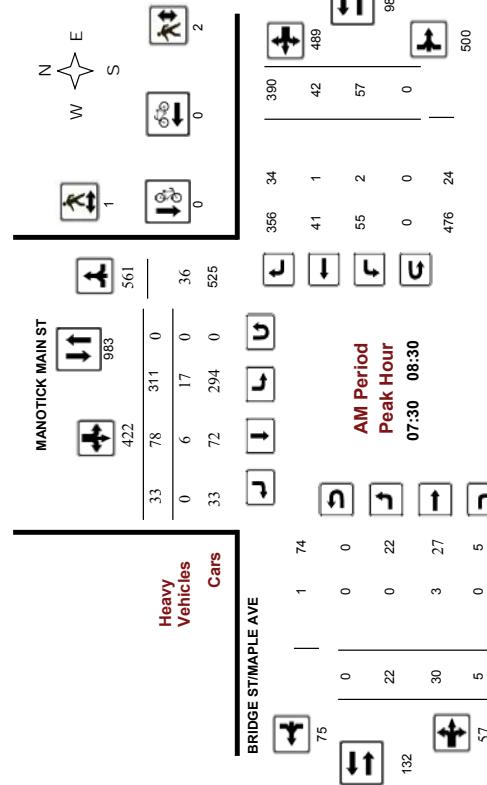


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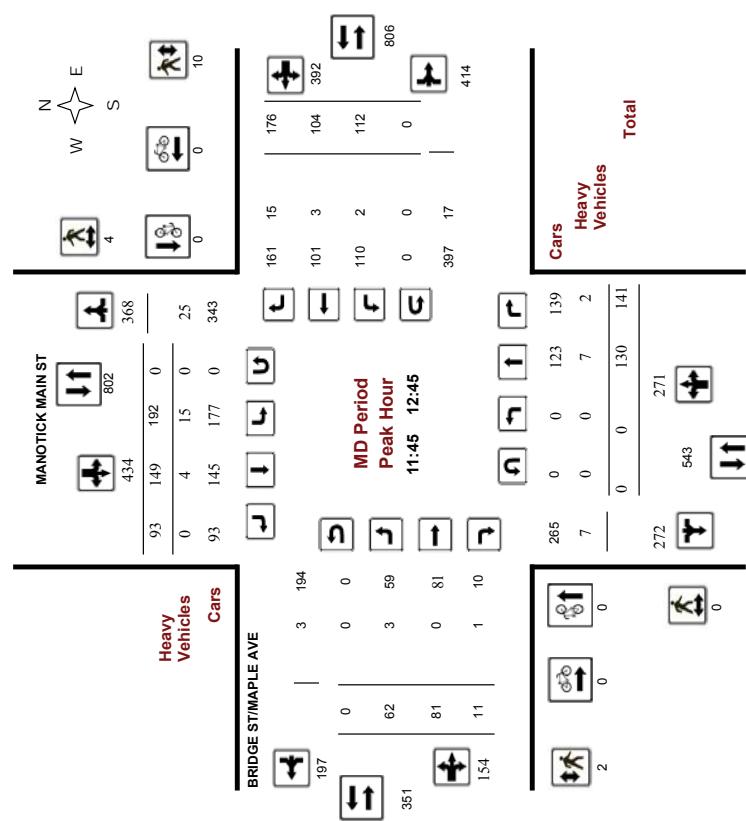
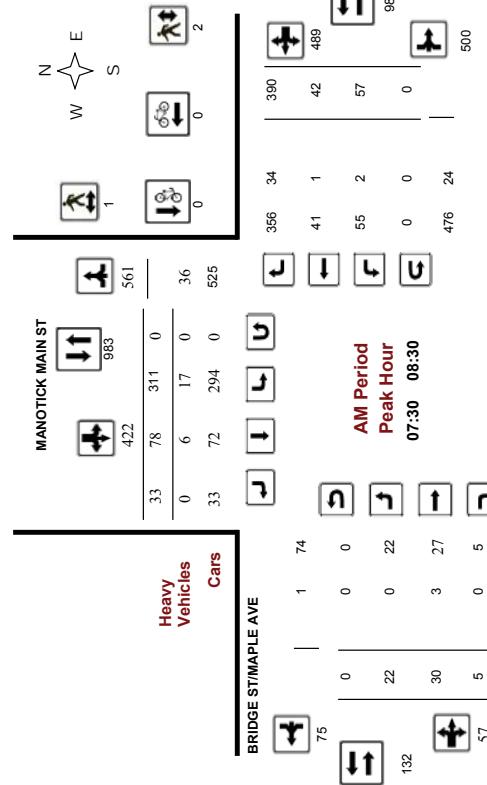


**Ottawa** Public Works - Traffic Services

Turning Movement Count - Peak Hour Diagram  
BRIDGE ST/MAPLE AVE @ MANOTICK MAIN ST

Survey Date: Tuesday, March 08, 2016  
Start Time: 07:00

WO No: 35737  
Device: Movision



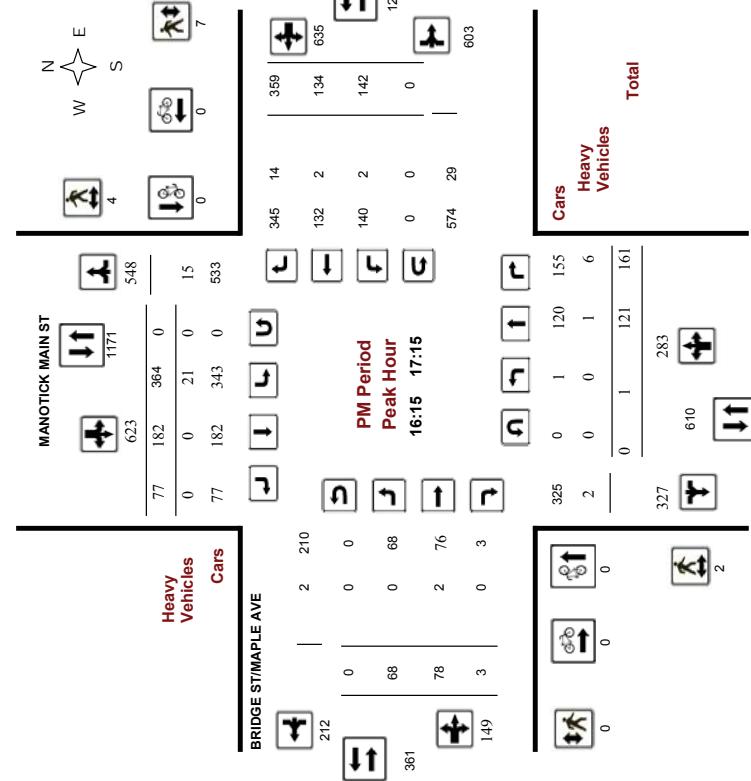
**Ottawa** Public Works - Traffic Services

Turning Movement Count - Peak Hour Diagram

**BRIDGE ST/MAPLE AVE @ MANOTICK MAIN ST**

Survey Date: Tuesday, March 08, 2016  
Start Time: 07:00

WO No.: 35737  
Device: Midvision



Comments



Public Works - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order  
35737

		BRIDGE ST/MAPLE AVE @ MANOTICK MAIN ST							
		MANOTICK MAIN ST			BRIDGE ST/MAPLE AVE				
Time Period	Northbound	Streetbound		Street Total	Eastbound		Westbound	Street Total	Grand Total
		07:00	08:00	2	2	0		0	
08:00	08:00	0	0	0	0	0	0	0	0
08:00	10:00	0	0	0	0	0	0	0	0
11:30	12:30	0	0	0	0	0	0	0	0
12:30	13:30	0	0	0	0	0	0	0	0
15:00	16:00	0	1	1	0	0	0	0	1
16:00	17:00	0	0	0	0	0	0	0	0
17:00	18:00	0	0	0	0	0	0	0	0
Total .....	0	0	3	3	0	0	0	0	3

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.  
2016-Jul-06



## Public Works - Traffic Services

W.O.  
35737

## Turning Movement Count - Heavy Vehicle Report

Work Order  
35737

## Public Works - Traffic Services

## Turning Movement Count - Pedestrian Volume Report

## BRIDGE ST/MAPLE AVE @ MANOTICK MAIN ST

Survey Date: Tuesday, March 08, 2016

## MANOTICK MAIN ST

BRIDGE ST/MAPLE AVE															
Southbound					Westbound										
Time Period	LT	ST	N	RT	LT	ST	S	STR	LT	RT	STR	WT	ST	RT	Grand Total
07:00	08:00	1	1	3	5	17	0	2	19	24	1	33	38	46	70
08:00	09:00	0	6	5	11	22	7	2	31	42	0	3	4	1	37
09:00	10:00	0	4	3	7	21	3	4	28	35	4	8	4	3	25
11:30	12:30	0	7	2	9	14	4	2	20	29	4	0	1	5	2
12:30	13:30	0	6	3	9	19	10	3	32	41	0	0	0	4	1
15:00	16:00	0	2	4	6	29	0	3	32	38	1	1	0	2	22
16:00	17:00	0	1	6	7	28	1	1	30	37	0	1	1	3	18
17:00	18:00	0	0	1	1	8	1	1	10	11	1	2	1	4	1
<b>Sub Total</b>	<b>1</b>	<b>27</b>	<b>27</b>	<b>55</b>	<b>158</b>	<b>26</b>	<b>18</b>	<b>202</b>	<b>257</b>	<b>11</b>	<b>18</b>	<b>2</b>	<b>31</b>	<b>24</b>	<b>17</b>
<b>U-Turns (Heavy Vehicles)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total</b>	<b>1</b>	<b>27</b>	<b>27</b>	<b>0</b>	<b>158</b>	<b>26</b>	<b>18</b>	<b>202</b>	<b>257</b>	<b>11</b>	<b>18</b>	<b>2</b>	<b>31</b>	<b>24</b>	<b>17</b>
<b>Heavy Vehicles</b>	<b>1</b>	<b>27</b>	<b>27</b>	<b>0</b>	<b>158</b>	<b>26</b>	<b>18</b>	<b>202</b>	<b>257</b>	<b>11</b>	<b>18</b>	<b>2</b>	<b>31</b>	<b>24</b>	<b>17</b>
<b>Sub Total</b>	<b>1</b>	<b>27</b>	<b>27</b>	<b>0</b>	<b>158</b>	<b>26</b>	<b>18</b>	<b>202</b>	<b>257</b>	<b>11</b>	<b>18</b>	<b>2</b>	<b>31</b>	<b>24</b>	<b>17</b>
<b>208</b>	<b>239</b>	<b>496</b>													

Heavy Vehicles are vehicles having one rear axle with four or more wheels, or having two or more rear axles. These vehicles include most O.C. Transpo, school and inter-city buses. Further, they ARE included in the Turning Movement Count Summary.

BRIDGE ST/MAPLE AVE @ MANOTICK MAIN ST															Start Time:	
Count Date: Tuesday, March 08, 2016															07:00	
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
07:00	07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	08:45	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:45	09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	09:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
09:00	09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45	10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	15:30	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
15:30	16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	18:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<b>Total .....</b>	<b>7</b>	<b>22</b>	<b>29</b>	<b>7</b>	<b>7</b>	<b>23</b>	<b>7</b>	<b>7</b>	<b>59</b>	<b>59</b>	<b>59</b>	<b>59</b>	<b>59</b>	<b>59</b>	<b>59</b>	<b>59</b>

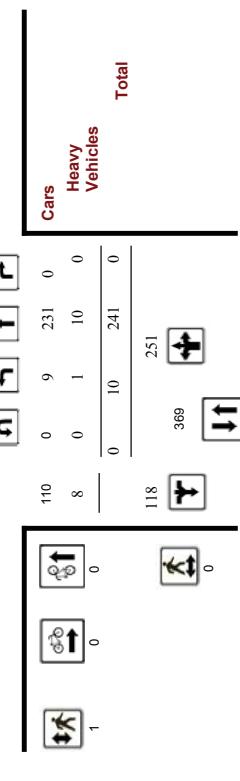
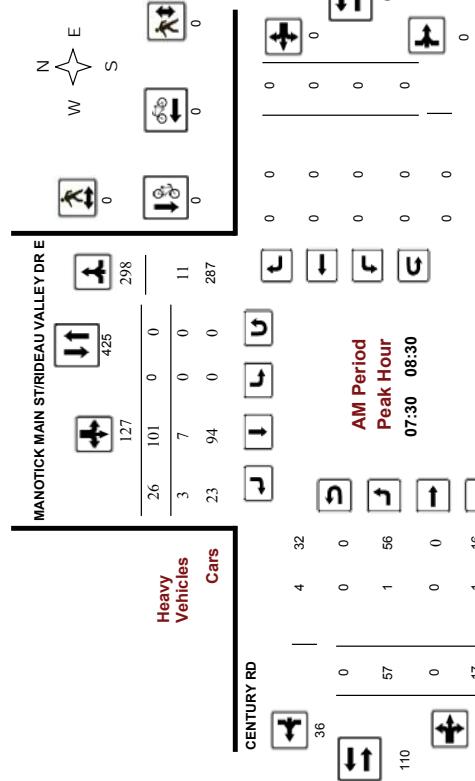
Comment:

**Ottawa** Public Works - Traffic Services

Turning Movement Count - Peak Hour Diagram  
MANOTICK MAIN ST/RIDEAU VALLEY DR E @ CENTURY

Survey Date: Thursday, May 09, 2013  
Start Time: 07:00

WO No: 31209  
Device:



Comments

2016-Jul-06

Page 1 of 3

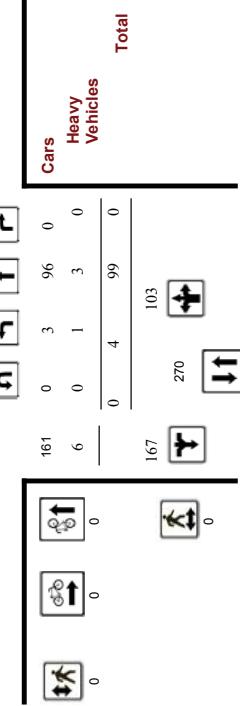
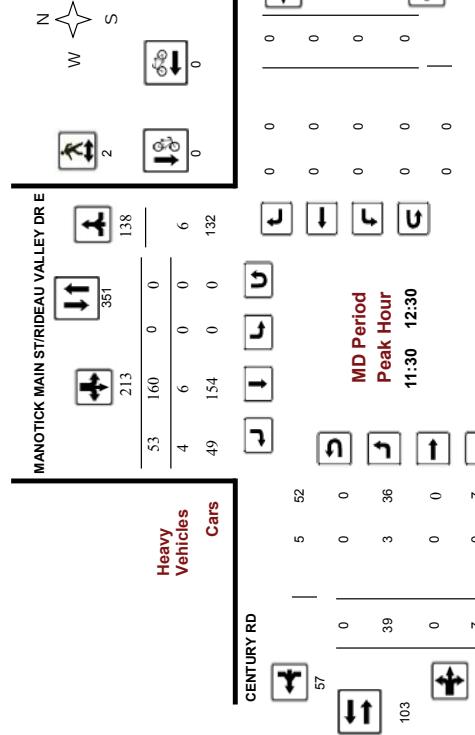
**Ottawa**

Public Works - Traffic Services

Turning Movement Count - Peak Hour Diagram  
MANOTICK MAIN ST/RIDEAU VALLEY DR E @ CENTURY

Survey Date: Thursday, May 09, 2013  
Start Time: 07:00

WO No: 31209  
Device:



Comments

Page 2 of 3



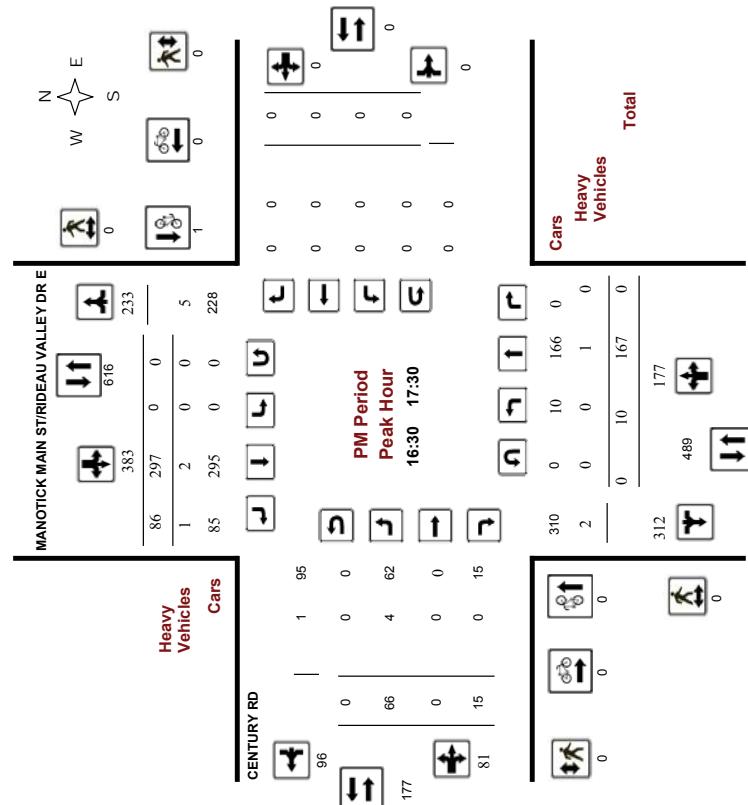
## Public Works - Traffic Services

### Turning Movement Count - Peak Hour Diagram

#### MANOTICK MAIN ST/RIDEAU VALLEY DR E @ CENTURY

Survey Date: Thursday, May 09, 2013  
Start Time: 07:00

WO No: 31209  
Device:



Comments

## Public Works - Traffic Services

### Turning Movement Count - Cyclist Volume Report

#### MANOTICK MAIN ST/RIDEAU VALLEY DR E @ CENTURY

Count Date: Thursday, May 09, 2013  
Start Time: 07:00

WO No: 31209  
Device:

Time Period	Street Total		Street Total	Grand Total
	Northbound	Southbound		
07:00 - 08:00	0	0	0	0
08:00 - 09:00	0	0	1	1
09:00 - 10:00	0	0	0	0
11:30 - 12:30	0	0	0	0
12:30 - 13:30	0	0	0	0
15:00 - 16:00	0	2	0	2
16:00 - 17:00	0	1	1	1
17:00 - 18:00	0	0	0	0
Total .....	0	3	3	4

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.  
2016-Jul-06



## Public Works - Traffic Services

**W.O.**  
31209

### Turning Movement Count - Heavy Vehicle Report



## Public Works - Traffic Services

**Work Order**  
31209

### Turning Movement Count - Pedestrian Volume Report

MANOTICK MAIN ST/RIDEAU VALLEY DRE @ CENTURY													
CENTURY RD													
MANOTICK MAIN ST/RIDEAU VALLEY DRE							Westbound						
Northbound							Eastbound	L	S	T	R	W	STR
Time Period	LT	ST	RT	TOT	N	LT	RT	TOT	S	STR	LT	ST	RT
07:00	08:00	1	7	0	8	0	7	3	10	18	2	0	1
08:00	09:00	2	9	0	11	0	8	3	11	22	2	0	4
09:00	10:00	0	2	0	2	0	8	1	9	11	1	0	1
11:30	12:30	1	3	0	4	0	6	4	10	14	3	0	3
12:30	13:30	0	2	0	2	0	8	1	9	11	3	0	4
15:00	16:00	0	1	0	2	5	7	8	6	0	1	7	0
16:00	17:00	0	4	0	4	0	2	2	4	8	4	0	4
17:00	18:00	0	0	0	0	0	2	4	6	6	1	0	1
<b>Sub Total</b>							<b>23</b>	<b>66</b>	<b>98</b>	<b>22</b>	<b>0</b>	<b>5</b>	<b>27</b>
<b>U-Turns (Heavy Vehicles)</b>							<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total</b>							<b>4</b>	<b>28</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>43</b>	<b>23</b>
Heavy Vehicles are vehicles having one rear axle with four or more wheels, or having two or more rear axles. These vehicles include most O.C. Transpo, school and inter-city buses. Further, they ARE included in the Turning Movement Count Summary.													
MANOTICK MAIN ST/RIDEAU VALLEY DRE @ CENTURY													
Count Date: Thursday, May 09, 2013													
Time Period NB Approach SB Approach Total EB Approach (N or S Crossing) WB Approach (N or S Crossing) Total Grand Total													
07:00	07:15	1	0	0	0	0	0	1	0	0	1	1	2
07:15	07:30	0	0	0	0	0	0	0	0	0	0	0	0
07:30	07:45	0	0	0	0	0	0	0	0	0	0	1	1
07:45	08:00	0	0	0	0	0	0	0	0	0	0	0	0
07:00	08:00	1	0	1	1	1	1	1	1	1	2	3	3
Start Time: 07:00													
Comment:													

**Intersection:** Manotick Main & Bridgeport

Date: Thursday, Jul 14, 2016

Time: 7:00AM - 9:00AM

Time	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
7:00AM - 7:15AM	1					7	4					12	13
7:30AM - 7:45AM		1				3	1					5	5
7:45AM - 8:00AM			1			2	6					8	8
8:00AM - 8:15AM				2								12	12
8:15AM - 8:30AM				4								8	8
8:30AM - 8:45AM				6								8	8
8:45AM - 9:00AM					3							79	79
2 Hour Total	1	0	0	0	43	34	0	1	0	0	0	0	79

North Leg: Trestle  
West and East Leg: Century

Intersection: Manolick Main & Bridgeport

Date: Thursday, Jul 14, 2016

Time: 4:00PM to 6:00PM

Time	NBL	NBT	NBR	SBL	SBT	SR	EBL	EBT	EBR	WB	WBT	WB	15-Minute Total
4:00PM - 4:15PM						1	3	2	8				4
4:15PM - 4:30PM							2						10
4:30PM - 4:45PM	1						3	12	2				18
4:45PM - 5:00PM	0						7		3				10
5:00PM - 5:15PM							3	6					9
5:15PM - 5:30PM	2						3						5
5:30PM - 5:45PM							4	2					4
5:45PM - 6:00PM							4						6
2 Hour Total	3	0	0	0	0	27	31	0	5	0	0	0	63

## **Appendix B**

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AM Existing 1: Rideau Valley/Maniotick Main & Century							AM Existing 2: Century & Trestle						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	Movement	EBL	EBR	WBT	WBR	SBL	SBR
Lane Configurations	Y			A	B		Lane Configurations		A	B	C	D	E
Traffic Volume (veh/h)	57	17	10	241	101	26	Traffic Volume (veh/h)	3	43	23	1	2	7
Future Volume (Veh/h)	57	17	10	241	101	26	Future Volume (Veh/h)	3	43	23	1	2	7
Sign Control	Stop			Free	Free		Sign Control	Free	Free	Stop			
Grade	0%			0%	0%		Grade						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	60	18	11	254	106	27	Hourly flow rate (vph)	3	45	24	1	2	7
Pedestrians							Pedestrians						
Lane Width (m)							Lane Width (m)						
Walking Speed (m/s)							Walking Speed (m/s)						
Percent Blockage							Percent Blockage						
Right turn lane (veh)							Right turn lane (veh)						
Median type							Median type						
Median storage (veh)							Median storage (veh)						
Upstream signal (m)							Upstream signal (m)						
pX, platoon unblocked							pX, platoon unblocked						
vc, conflicting volume							vc, conflicting volume						
vC1, stage 1 conf vol							vC1, stage 1 conf vol						
vC2, stage 2 conf vol							vC2, stage 2 conf vol						
vCu, unblocked vol							vCu, unblocked vol						
IC, single (s)							IC, single (s)						
IC, 2 stage (s)							IC, 2 stage (s)						
IF (s)							IF (s)						
p0 queue free %							p0 queue free %						
cM capacity (veh/h)							cM capacity (veh/h)						
Direction Lane #	EB1	EB2	NB1	NB2	SB1	SB2	Direction Lane #	EB1	EB2	WB1	WB2	SB1	SB2
Volume Total	78	265	133				Volume Total	48	25	9			
Volume Left	60	11	0				Volume Left	3	0	2			
Volume Right	18	0	27				Volume Right		1	7			
cSH	658	1452	1700				cSH	0	1700	978			
Volume to Capacity	0.12	0.01	0.08				Volume to Capacity	0.00	0.01	0.01			
Queue Length 95th (m)	3.0	0.2	0.0				Queue Length 95th (m)	0.1	0.0	0.2			
Control Delay (s)	11.2	0.4	0.0				Control Delay (s)	0.5	0.0	8.7			
Lane LOS	B	A					Lane LOS	A					
Approach Delay (s)	11.2	0.4	0.0				Approach Delay (s)	0.5	0.0	8.7			
Approach LOS	B	A					Approach LOS	A					
Intersection Summary							Intersection Summary						
Average Delay	2.0						Average Delay	1.3					
Intersection Capacity Utilization	33.0%						Intersection Capacity Utilization	15.0%					
Analysis Period (min)	15						Analysis Period (min)	15					

AM Existing 1: Rideau Valley/Maniotick Main & Century							AM Existing 2: Century & Trestle						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	Movement	EBL	EBR	WBT	WBR	SBL	SBR
Lane Configurations	Y			A	B		Lane Configurations		A	B	C	D	E
Traffic Volume (veh/h)	57	17	10	241	101	26	Traffic Volume (veh/h)	3	43	23	1	2	7
Future Volume (Veh/h)	57	17	10	241	101	26	Future Volume (Veh/h)	3	43	23	1	2	7
Sign Control	Stop			Free	Free		Sign Control	Free	Free	Stop			
Grade	0%			0%	0%		Grade						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	60	18	11	254	106	27	Hourly flow rate (vph)	3	45	24	1	2	7
Pedestrians							Pedestrians						
Lane Width (m)							Lane Width (m)						
Walking Speed (m/s)							Walking Speed (m/s)						
Percent Blockage							Percent Blockage						
Right turn lane (veh)							Right turn lane (veh)						
Median type							Median type						
Median storage (veh)							Median storage (veh)						
Upstream signal (m)							Upstream signal (m)						
pX, platoon unblocked							pX, platoon unblocked						
vc, conflicting volume							vc, conflicting volume						
vC1, stage 1 conf vol							vC1, stage 1 conf vol						
vC2, stage 2 conf vol							vC2, stage 2 conf vol						
vCu, unblocked vol							vCu, unblocked vol						
IC, single (s)							IC, single (s)						
IC, 2 stage (s)							IC, 2 stage (s)						
IF (s)							IF (s)						
p0 queue free %							p0 queue free %						
cM capacity (veh/h)							cM capacity (veh/h)						
Direction Lane #	EB1	EB2	NB1	NB2	SB1	SB2	Direction Lane #	EB1	EB2	WB1	WB2	SB1	SB2
Volume Total	78	265	133				Volume Total	48	25	9			
Volume Left	60	11	0				Volume Left	3	0	2			
Volume Right	18	0	27				Volume Right		1	7			
cSH	658	1452	1700				cSH	0	1700	978			
Volume to Capacity	0.12	0.01	0.08				Volume to Capacity	0.00	0.01	0.01			
Queue Length 95th (m)	3.0	0.2	0.0				Queue Length 95th (m)	0.1	0.0	0.2			
Control Delay (s)	11.2	0.4	0.0				Control Delay (s)	0.5	0.0	8.7			
Lane LOS	B	A					Lane LOS	A					
Approach Delay (s)	11.2	0.4	0.0				Approach Delay (s)	0.5	0.0	8.7			
Approach LOS	B	A					Approach LOS	A					
Intersection Summary							Intersection Summary						
Average Delay	2.0						Average Delay	1.3					
Intersection Capacity Utilization	33.0%						Intersection Capacity Utilization	15.0%					
Analysis Period (min)	15						Analysis Period (min)	15					

AM Existing 3: 1st Line & Century							AM Existing 4: Manotick Main & Bridgeport/Antiochi								
Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	NBL	NBT	NBR	SBT	SBL	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	0	0	0	0	0	0	0	0	0
Traffic Volume (vph)	3	43	0	0	23	1	0	0	2	0	0	12	0	244	2
Future Volume (vph)	3	43	0	0	23	1	0	0	2	0	0	12	0	244	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0%	Free	0%	0%	0%
Hourly flow rate (vph)	3	45	0	0	24	1	0	0	2	0	0	257	2	7	115
Direction, Lane #	EB1	WB1	NB1	SB1											23
Volume Total (vph)	48	25	0	9											23
Volume Left (vph)	3	0	0	2											23
Volume Right (vph)	0	1	0	7											23
Hadj (s)	0.05	0.01	0.00	-0.39											23
Departure Headway (s)	4.0	4.0	4.1	3.7											23
Degree Utilization x	0.05	0.03	0.00	0.01											23
Capacity (veh/h)	893	897	877	938											23
Control Delay (s)	7.2	7.1	7.1	6.7											23
Approach Delay (s)	7.2	7.1	0.0	6.7											23
Approach LOS	A	A	A	A											23
Intersection Summary							7.1								23
Delay															23
Level of Service															23
Intersection Capacity Utilization															23
Analysis Period (min)															23
															23

AM Existing 3: 1st Line & Century							AM Existing 4: Manotick Main & Bridgeport/Antiochi								
Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	NBL	NBT	NBR	SBT	SBL	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	0	0	0	0	0	0	0	0	0
Traffic Volume (vph)	3	43	0	0	23	1	0	0	2	0	0	12	0	244	2
Future Volume (vph)	3	43	0	0	23	1	0	0	2	0	0	12	0	244	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0%	Free	0%	0%	0%
Hourly flow rate (vph)	3	45	0	0	24	1	0	0	2	0	0	257	2	7	121
Direction, Lane #	EB1	WB1	NB1	SB1											24
Volume Total (vph)	48	25	0	9											24
Volume Left (vph)	3	0	0	2											24
Volume Right (vph)	0	1	0	7											24
Hadj (s)	0.05	0.01	0.00	-0.39											24
Departure Headway (s)	4.0	4.0	4.1	3.7											24
Degree Utilization x	0.05	0.03	0.00	0.01											24
Capacity (veh/h)	893	897	877	938											24
Control Delay (s)	7.2	7.1	7.1	6.7											24
Approach Delay (s)	7.2	7.1	0.0	6.7											24
Approach LOS	A	A	A	A											24
Intersection Summary							7.1								24
Delay															24
Level of Service															24
Intersection Capacity Utilization															24
Analysis Period (min)															24
															24

AM Existing 5: Manotick Main & Maple/Bridge												PM Existing 1: Rideau Valley/Manotick Main & Century														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Movement	EBL	EBT	EBR	NBL	NBT	SBT	SBR						
Lane Configurations	22	30	5	57	42	390	0	149	159	311	78	33	Lane Configurations	22	30	5	57	42	390	0	149	159	311	78	33	
Traffic Volume (vph)	22	30	5	57	42	390	0	149	159	311	78	33	Traffic Volume (veh/h)	66	15	10	167	297	86							
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	Future Volume (vph)	66	15	10	167	297	86							
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	Sign Control	Stop	Free	Free	Stop	Free	Free	Free						
Lane Util Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	Grade	0%	0%	0%	0%	0%	0%	0%						
Fpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95					
Fpb, bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	Hourly flow rate (vph)	69	16	11	176	313	91							
Fit	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	Pedestrians													
FitProtected	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	Lane Width (m)													
Satd. Flow (prot)	1695	1748	1695	1784	1508	1784	1492	1693	1704	1784	1492	1693	Walking Speed (m/s)													
FIT Permitted	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	Percent Blockage													
Satd. Flow (perm)	1695	1748	1695	1784	1508	1784	1492	1693	1704	1784	1492	1693	Right turn lane (veh)													
Peak-hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	Median type													
Adj. Flow (vph)	23	32	5	60	44	411	0	157	167	327	82	35	Median storage (veh)													
RTOR Reduction (vph)	0	4	0	0	0	260	0	0	0	86	0	10	Upstream signal (m)													
Lane Group Flow (vph)	23	33	0	60	44	151	0	157	81	327	107	0	px, platoon unblocked													
Confli. Peds. (#/hr)	1												vc, conflicting volume													
Turn Type	Split	NA	Split	NA	pmt+ov	NA	pmt+ov	NA	pmt+pt	NA			vc1, stage 1 conf vol													
Protected Phases	4	4	8	8	2	8	2	8	1	6			vc2, stage 2 conf vol													
Permitted Phases													vCu, unblocked vol													
Actualized Green G (\$)	9.4	9.4	12.2	12.2	28.5	27.4	39.6	50.0	50.0	52.3			cC, single (\$)													
Effective Green g (\$)	11.6	11.6	14.4	14.4	33.1	29.7	44.0	52.3	52.3	52.3			fC, 2 stage (\$)													
Actuated g/C Ratio	0.13	0.13	0.16	0.16	0.37	0.33	0.49	0.58	0.58	0.61			IF (\$)													
Clearance Time (s)	6.2	6.2	6.2	6.2	6.3	6.3	6.3	6.3	6.3	6.3			pl queue free %													
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			CM capacity (veh/h)													
Lane Grp Cap (vph)	217	224	270	284	552	586	726	710	986	956	187	404	Direction, Lane #	EB1	NB1	SB1										
v/s Ratio Ptot	0.01	0.02	0.04	0.02	0.06	0.09	0.02	0.09	0.06	0.04	0.017		Volume Total	85	187	404										
v/s Ratio Perm													Volume Left	69	11	0										
v/C Ratio	0.11	0.15	0.22	0.15	0.27	0.27	0.11	0.46	0.11	0.11	0.17		Volume Right	16	0	91										
Uniform Delay d1	34.8	34.9	33.1	32.7	20.1	22.3	12.6	10.2	8.5	5.15	1155	1700	cSH													
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	Volume to Capacity	0.16	0.01	0.24										
Incremental Delay, d2	0.2	0.3	0.4	0.3	0.3	0.3	0.2	0.1	0.5	0.0	4.5	0.2	Queue Length 95th (m)													
Delay (s)	35.0	35.3	33.5	33.0	33.0	30.4	22.5	12.6	8.6	13.4	0.6	0.0	Control Delay (\$)													
Level of Service	C	D	C	C	C	C	B	B	A	B	A	B	Lane LOS	B	A											
Approach Delay (\$)	35.1		23.0		17.4		10.1						Approach Delay (s)	13.4	0.6	0.0										
Approach LOS	D	C	C	B	B	B	B	B	B	B	B	B	Approach LOS	B	B	B										
Intersection Summary													Average Delay													
HCM 2000 Control Delay													Intersection Capacity Utilization													
HCM 2000 Volume to Capacity ratio													Analysis Period (min)													
Actuated Cycle Length (s)	0.41													1.8												
Intersection Capacity Utilization	90.3													33.5%												
Analysis Period (min)	65.6%													ICU Level of Service												
c Critical Lane Group														15												

06/27/2017												06/27/2017														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Movement	EBL	EBT	EBR	NBL	NBT	SBT	SBR						
Lane Configurations	22	30	5	57	42	390	0	149	159	311	78	33	Lane Configurations	66	15	10	167	297	86							
Future Volume (vph)	22	30	5	57	42	390	0	149	159	311	78	33	Traffic Volume (vph/h)	66	15	10	167	297	86							
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	Future Volume (vph)	66	15	10	167	297	86							
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	Sign Control	Stop	Free	Free	Stop	Free	Free	Free						
Lane Util Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	Grade	0%	0%	0%	0%	0%	0%	0%						
Fpb, pedit/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95						
Fpb, bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	Hourly flow rate (vph)	69	16	11	176	313	91							
Fit	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	Pedestrians													
FitProtected	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	Lane Width (m)													
Satd. Flow (prot)	1695	1748	1695	1784	1508	1784	1492	1693	1704	1784	1492	1693	Walking Speed (m/s)													
Satd. Flow (perm)	1695	1748	1695	1784	1508	1784	1492	1693	1704	1784	1492	1693	Right turn lane (veh)													
Peak-hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	Median type													
Adj. Flow (vph)	23	32	5	60	44	411	0	157	167	327	82	35	Median storage (veh)													
RTOR Reduction (vph)	0	4	0	0	0	260	0	0	0	86	0	10	Upstream signal (m)													
Lane Group Flow (vph)	23	33	0	60	44	151	0	157	81	327	107	0	px, platoon unblocked													
Confli. Peds. (#/hr)	1																									

PM Existing 2: Century & Trestle							PM Existing 3: 1st Line & Century											
Movement	EBL	EBT	WBT	WBR	SBL	SBR	Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations							Lane Configurations											
Traffic Volume (veh/h)	7	60	73	2	3	7	Sign Control											
Future Volume (Veh/h)	7	60	73	2	3	7	Traffic Volume (vph)	7	60	0	0	73	2	0	0	3	0	
Sign Control	Free	Free	Stop				Future Volume (vph)	7	60	0	0	73	2	0	0	3	0	
Grade	0%	0%	0%	0%	0%		Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95		Hourly flow rate (vph)	7	63	0	0	77	2	0	0	3	0	
Hourly flow rate (vph)	7	63	77	2	3	7	Direction Lane #	EB1	WB1	NB1	SB1							
Pedestrians							Volume Total (vph)	70	79	0	10							
Lane Width (m)							Volume Left (vph)	7	0	0	3							
Walking Speed (m/s)							Volume Right (vph)	0										
Percent Blockage							Head (s)	0.05	0.02	0.00	-0.33							
Right turn flare (veh)							Departure Headway (s)	4.0	4.0	4.2	3.9							
Median type	None	None	None				Degree Utilization, x	0.08	0.09	0.00	0.01							
Median storage (veh)							Capacity (veh/h)	878	889	826	888							
Upstream signal (m)							Control Delay (s)	7.4	7.4	7.2	6.9							
pX, platoon unblocked							Approach Delay (s)	7.4	7.4	0.0	6.9							
vc, conflicting volume							Approach LOS	A	A	A	A							
vC1, stage 1 conf vol							Intersection Summary											
vC2, stage 2 conf vol							Delay									7.4		
vCu, unblocked vol							Level of Service										A	
IC, single (s)	4.8						Intersection Capacity Utilization										A	
IC, 2 stage (s)							Analysis Period (min)										15	
IF (s)	2.9						Avg. Delay											
p0 queue free %	99						Intersection Capacity Utilization										19.5%	
cM capacity (veh/h)	1162						Analysis Period (min)											
Direction Lane #	EB1	WB1	SB1				Avg. Delay											
Volume Total	70	79	10				Intersection Capacity Utilization											
Volume Left	7	0	3				Analysis Period (min)											
Volume Right	0	2	7				Avg. Delay											
cSH	1162	1700	891				Intersection Capacity Utilization											
Volume to Capacity	0.01	0.05	0.01				Analysis Period (min)											
Queue Length 50th (m)	0.1	0.0	0.3				Avg. Delay											
Control Delay (s)	0.9	0.0	9.1				Intersection Capacity Utilization											
Lane LOS	A	A	A				Analysis Period (min)											
Approach Delay (s)	0.9	0.0	9.1				Avg. Delay											
Approach LOS			A				Intersection Capacity Utilization											
Intersection Summary							Avg. Delay											
Average Delay							Intersection Capacity Utilization											
Intersection Capacity Utilization							Analysis Period (min)											
Analysis Period (min)							Avg. Delay											

PM Existing 2: Century & Trestle							PM Existing 3: 1st Line & Century											
Movement	EBL	EBT	WBT	WBR	SBL	SBR	Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations							Lane Configurations											
Traffic Volume (veh/h)	7	60	73	2	3	7	Sign Control											
Future Volume (Veh/h)	7	60	73	2	3	7	Traffic Volume (vph)	7	60	0	0	73	2	0	0	3	0	
Sign Control	Free	Free	Stop				Future Volume (vph)	7	60	0	0	73	2	0	0	3	0	
Grade	0%	0%	0%	0%	0%		Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95		Hourly flow rate (vph)	7	63	0	0	77	2	0	0	3	0	
Hourly flow rate (vph)	7	63	77	2	3	7	Direction Lane #	EB1	WB1	NB1	SB1							
Pedestrians							Volume Total (vph)	70	79	0	10							
Lane Width (m)							Volume Left (vph)	7	0	0	3							
Walking Speed (m/s)							Volume Right (vph)	0										
Percent Blockage							Head (s)	0.05	0.02	0.00	-0.33							
Right turn flare (veh)							Departure Headway (s)	4.0	4.0	4.2	3.9							
Median type	None	None	None				Degree Utilization, x	0.08	0.09	0.00	0.01							
Median storage (veh)							Capacity (veh/h)	878	889	826	888							
Upstream signal (m)							Control Delay (s)	7.4	7.4	7.2	6.9							
pX, platoon unblocked							Approach Delay (s)	7.4	7.4	0.0	6.9							
vc, conflicting volume							Approach LOS	A	A	A	A							
vC1, stage 1 conf vol							Intersection Summary											
vC2, stage 2 conf vol							Delay									7.4		
vCu, unblocked vol							Level of Service										A	
IC, single (s)	4.8						Intersection Capacity Utilization										A	
IC, 2 stage (s)							Analysis Period (min)										15	
IF (s)	2.9						Avg. Delay											
p0 queue free %	99						Intersection Capacity Utilization											
cM capacity (veh/h)	1162						Analysis Period (min)											
Direction Lane #	EB1	WB1	SB1				Avg. Delay											
Volume Total	70	79	10				Intersection Capacity Utilization											
Volume Left	7	0	3				Analysis Period (min)											
Volume Right	0	2	7				Avg. Delay											
cSH	1162	1700	891				Intersection Capacity Utilization											
Volume to Capacity	0.01	0.05	0.01				Analysis Period (min)											
Queue Length 50th (m)	0.1	0.0	0.3				Avg. Delay											
Control Delay (s)	0.9	0.0	9.1				Intersection Capacity Utilization											
Lane LOS	A	A	A				Analysis Period (min)											
Approach Delay (s)	0.9	0.0	9.1				Avg. Delay											
Approach LOS			A				Intersection Capacity Utilization											
Intersection Summary							Avg. Delay											
Average Delay							Intersection Capacity Utilization											
Intersection Capacity Utilization							Analysis Period (min)											
Analysis Period (min)							Avg. Delay											

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PM Existing 4: Manotick Main & Bridgeport/Antioch									
06/27/2017									
Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	SBL
Lane Configurations	4♦	4♦	4♦	4♦	4♦	4♦	4♦	4♦	4♦
Traffic Volume (veh/h)	26	0	5	0	0	1	3	205	2
Future Volume (Veh/h)	26	0	5	0	0	1	3	347	15
Sign Control	Stop			Stop			Free		
Grade	0%		0%		0%		0%		0%
Park Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	27	0	5	0	0	1	3	216	2
Pedestrians									
Lane Width (m)									
Walking Speed (m/s)									
Percent Blockage									
Right turn lane (veh)									
Median type									
Median storage (veh)									
Upstream signal (m)									
pX, platoon unblocked									
vc, conflicting volume									
vc1, stage 1 conf vol									
vc2, stage 2 conf vol									
vc4, unblocked vol									
IC, single (s)	7.3	6.5	6.4	7.1	6.5	6.2	4.8	4.1	
IC, 2 stage (s)									
IF (s)	3.7	4.0	3.5	3.5	4.0	3.3	2.9	2.2	
p0 queue free %	93	100	99	100	100	100	100	100	
cM capacity (veh/h)	384	408	639	401	404	823	869	1352	
Direction Lane #	EB1	WB1	NB1	SB1					
Volume Total	32	1	221	386					
Volume Left	27	0	3	5					
Volume Right	5	1	2	16					
cSH	409	823	869	1352					
Volume to Capacity	0.08	0.00	0.00	0.00					
Queue Length 5th (m)	1.9	0.0	0.1	0.1					
Control Delay (s)	14.5	9.4	0.2	0.1					
Lane LOS	B	A	A	A					
Approach Delay (s)	14.5	9.4	0.2	0.1					
Approach LOS	B	A	A	A					
Intersection Summary									
Average Delay	0.9								
Intersection Capacity Utilization	38.4%								
Analysis Period (min)	15								

PM Existing 5: Manotick Main & Maple/Bridge									
06/27/2017									
Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	SBL
Lane Configurations	4♦	4♦	4♦	4♦	4♦	4♦	4♦	4♦	4♦
Traffic Volume (vph)	26	0	5	0	0	1	3	205	2
Future Volume (Veh/h)	26	0	5	0	0	1	3	347	15
Sign Control	Stop			Stop			Free		
Grade	0%		0%		0%		0%		0%
Park Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	27	0	5	0	0	1	3	216	2
Pedestrians									
Lane Width (m)									
Walking Speed (m/s)									
Percent Blockage									
Right turn lane (veh)									
Median type									
Median storage (veh)									
Upstream signal (m)									
pX, platoon unblocked									
vc, conflicting volume									
vc1, stage 1 conf vol									
vc2, stage 2 conf vol									
vc4, unblocked vol									
IC, single (s)	7.3	6.5	6.4	7.1	6.5	6.2	4.8	4.1	
IC, 2 stage (s)									
IF (s)	3.7	4.0	3.5	3.5	4.0	3.3	2.9	2.2	
p0 queue free %	93	100	99	100	100	100	100	100	
cM capacity (veh/h)	384	408	639	401	404	823	869	1352	
Direction Lane #	EB1	WB1	NB1	SB1					
Volume Total	32	1	221	386					
Volume Left	27	0	3	5					
Volume Right	5	1	2	16					
cSH	409	823	869	1352					
Volume to Capacity	0.08	0.00	0.00	0.00					
Queue Length 5th (m)	1.9	0.0	0.1	0.1					
Control Delay (s)	14.5	9.4	0.2	0.1					
Lane LOS	B	A	A	A					
Approach Delay (s)	14.5	9.4	0.2	0.1					
Approach LOS	B	A	A	A					
Intersection Summary									
Average Delay	0.9								
Intersection Capacity Utilization	38.4%								
Analysis Period (min)	15								

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Parsons

## **Appendix C**

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MANOTICK MAIN ST. TO CLAPP LANE									
Total Area		Classification of Accident		Turning Movement		Sideways		Angle	
		Rear End	Movement	Sideways	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other
P.D. only	10	8	2	0	1	0	3	2	0
Non-fatal injury	0	2	0	0	0	0	0	0	5
Total	10	10	2	0	1	0	5	2	0
#1 or 26%									38
BRIDGE ST./MANOTICK MAIN ST									
Years	Total #	24 Hr AADT	Days	Collisions/MEV	Years	Total #	24 Hr AADT	Days	Collisions/MEV
2013-2015	20	19,135	1095	0.95	2013-2015	1	7,200	1,095	0.13
CENTURY RD./MANOTICK MAIN ST									
Total Area		Classification of Accident		Turning Movement		Sideways		Angle	
		Rear End	Movement	Sideways	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other
P.D. only	7	7	2	2	0	1	0	0	19
Non-fatal injury	0	0	0	0	0	0	0	0	1
Non-reportable	0	0	0	0	0	0	0	0	0
Total	7	7	2	2	0	1	0	0	20
35%									
Years	Total #	24 Hr AADT	Days	Collisions/MEV	Years	Total #	24 Hr AADT	Days	Collisions/MEV
2013-2015	1	5,671	1095	0.16	2013-2015	1	6,360	1,095	0.14
MANOTICK MAIN ST. BRIDGE ST. TO CLAPP LANE									
Total Area		Classification of Accident		Turning Movement		Sideways		Angle	
		Rear End	Movement	Sideways	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other
P.D. only	0	0	0	0	0	1	0	0	1
Non-fatal injury	0	0	0	0	0	0	0	0	0
Non-reportable	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	1
0%									
Years	Total #	24 Hr AADT	Days	Collisions/MEV	Years	Total #	24 Hr AADT	Days	Collisions/MEV
2013-2015	2	2,454	1095	0.25	2013-2015	2	6,100	1,095	0.45
MANOTICK MAIN ST. O'GRADY ST. TO TIGHE ST									
Total Area		Classification of Accident		Turning Movement		Sideways		Angle	
		Rear End	Movement	Sideways	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other
P.D. only	0	0	0	1	0	1	0	0	2
Non-fatal injury	0	0	0	0	0	0	0	0	0
Non-reportable	0	0	0	0	0	0	0	0	2
Total	0	0	0	1	0	1	0	0	2
0%									
Years	Total #	24 Hr AADT	Days	Collisions/MEV	Years	Total #	24 Hr AADT	Days	Collisions/MEV
2013-2015	2	6,800	1095	0.27	2013-2015	1	6,500	1,095	0.14
CURRIER ST./MANOTICK MAIN ST									
Total Area		Classification of Accident		Turning Movement		Sideways		Angle	
		Rear End	Movement	Sideways	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other
P.D. only	0	0	0	1	0	0	0	1	1
Non-fatal injury	0	0	0	0	0	0	0	0	0
Non-reportable	0	0	0	0	0	0	0	0	2
Total	0	0	0	1	0	0	0	1	2
0%									
Years	Total #	24 Hr AADT	Days	Collisions/MEV	Years	Total #	24 Hr AADT	Days	Collisions/MEV
2013-2015	2	7,600	1095	0.24	2013-2015	1	6,500	1,095	0.14

MANOTICK MAIN ST./O'GRADY ST									
Total Area		Classification of Accident		Turning Movement		Sideways		Angle	
		Rear End	Movement	Sideways	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other
P.D. only	10	8	2	0	1	0	3	2	0
Non-fatal injury	0	2	0	0	0	0	0	0	5
Total	10	10	2	0	1	0	5	2	0
#1 or 26%									38
BRIDGE ST./MANOTICK MAIN ST									
Years	Total #	24 Hr AADT	Days	Collisions/MEV	Years	Total #	24 Hr AADT	Days	Collisions/MEV
2013-2015	2	19,135	1095	0.95	2013-2015	1	7,200	1,095	0.13
MANOTICK MAIN ST./BEAVERWOOD RD TO MILL ST									
Total Area		Classification of Accident		Turning Movement		Sideways		Angle	
		Rear End	Movement	Sideways	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other
P.D. only	7	7	2	2	0	1	0	0	19
Non-fatal injury	0	0	0	0	0	0	0	0	1
Non-reportable	0	0	0	0	0	0	0	0	0
Total	7	7	2	2	0	1	0	0	20
35%									
Years	Total #	24 Hr AADT	Days	Collisions/MEV	Years	Total #	24 Hr AADT	Days	Collisions/MEV
2013-2015	2	7,360	1,095	0.25	2013-2015	2	6,360	1,095	0.14
MANOTICK MAIN ST. BEAVERWOOD RD TO CURRIER ST									
Total Area		Classification of Accident		Turning Movement		Sideways		Angle	
		Rear End	Movement	Sideways	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other
P.D. only	0	0	0	0	0	0	0	0	1
Non-fatal injury	0	0	0	0	0	0	0	0	0
Non-reportable	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1
0%									
Years	Total #	24 Hr AADT	Days	Collisions/MEV	Years	Total #	24 Hr AADT	Days	Collisions/MEV
2013-2015	1	6,360	1,095	0.14	2013-2015	1	6,360	1,095	0.14
MANOTICK MAIN ST. CURRIER ST. TO EASTMAN AVE									
Total Area		Classification of Accident		Turning Movement		Sideways		Angle	
		Rear End	Movement	Sideways	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other
P.D. only	0	0	0	0	0	0	0	0	1
Non-fatal injury	0	0	0	0	0	0	0	0	0
Non-reportable	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1
0%									
Years	Total #	24 Hr AADT	Days	Collisions/MEV	Years	Total #	24 Hr AADT	Days	Collisions/MEV
2013-2015	3	7,360	1,095	0.45	2013-2015	3	6,100	1,095	0.45
CURRIER ST./MANOTICK MAIN ST									
Total Area		Classification of Accident		Turning Movement		Sideways		Angle	
		Rear End	Movement	Sideways	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other
P.D. only	0	0	0	1	0	0	0	1	1
Non-fatal injury	0	0	0	0	0	0	0	0	0
Non-reportable	0	0	0	0	0	0	0	0	2
Total	0	0	0	1	0	0	0	1	2
0%									
Years	Total #	24 Hr AADT	Days	Collisions/MEV	Years	Total #	24 Hr AADT	Days	Collisions/MEV
2013-2015	2	7,600	1,095	0.24	2013-2015	1	6,500	1,095	0.14

**ISLAND VIEW DR N/MANOTICK MAIN ST**

## **Appendix D**

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Background 2027 PM 1: Rideau Valley/Maniotick Main & Century						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		A	B		
Traffic Volume (veh/h)	57	17	10	266	112	26
Future Volume (Veh/h)	57	17	10	266	112	26
Sign Control	Stop		Free	Free		
Grade	0%		0%	0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	60	18	11	280	118	27
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn lane (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vc, conflicting volume						
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol						
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	90	98	99			
cM capacity (veh/h)	575	918	1437			
Direction Lane #	EB1	NB1	SB1			
Volume Total	78	291	145			
Volume Left	60	11	0			
Volume Right	18	0	27			
cSH	629	1437	1700			
Volume to Capacity	0.12	0.01	0.09			
Queue Length 95th (m)	3.2	0.2	0.0			
Control Delay (s)	11.5	0.4	0.0			
Lane LOS	B	A				
Approach Delay (s)	11.5	0.4	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		1.9				
Intersection Capacity Utilization		34.4%				
Analysis Period (min)		15				

Background 2027 PM 2: Century & Trestle						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		A	B		
Traffic Volume (veh/h)	57	17	10	266	112	26
Future Volume (Veh/h)	57	17	10	266	112	26
Sign Control	Stop		Free	Free		
Grade	0%		0%	0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	60	18	11	280	118	27
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn lane (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vc, conflicting volume						
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol						
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	90	98	99			
cM capacity (veh/h)	575	918	1437			
Direction Lane #	EB1	NB1	SB1			
Volume Total	78	291	145			
Volume Left	60	11	0			
Volume Right	18	0	27			
cSH	629	1437	1700			
Volume to Capacity	0.12	0.01	0.09			
Queue Length 95th (m)	3.2	0.2	0.0			
Control Delay (s)	11.5	0.4	0.0			
Lane LOS	B	A				
Approach Delay (s)	11.5	0.4	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		1.9				
Intersection Capacity Utilization		34.4%				
Analysis Period (min)		15				

Background 2027 PM 3: 1st Line & Century							Background 2027 PM 4: Manotick Main & Bridgeport/Antiochi								
Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	0	0	0	0	0	0	0	0	
Traffic Volume (vph)	3	43	0	0	23	1	0	0	2	0	0	0	12	5	
Future Volume (vph)	3	43	0	0	23	1	0	0	2	0	0	0	270	2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	3	45	0	0	24	1	0	0	2	0	0	0	284	2	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									7	134	
Volume Total (vph)	48	25	0	9										121	
Volume Left (vph)	3	0	0	2											
Volume Right (vph)	0	1	0	7											
Hadj (s)	0.05	0.01	0.00	-0.39											
Departure Headway (s)	4.0	4.0	4.1	3.7											
Degree Utilization x	0.05	0.03	0.00	0.01											
Capacity (veh/h)	893	897	877	938											
Control Delay (s)	7.2	7.1	7.1	6.7											
Approach Delay (s)	7.2	7.1	0.0	6.7											
Approach LOS	A	A	A	A											
Intersection Summary							7.1								
Delay															
Level of Service							A								
Intersection Capacity Utilization							15.0%								
Analysis Period (min)							15								

Background 2027 PM 4: Manotick Main & Bridgeport/Antiochi							Background 2027 PM 5: 1st Line & Century								
Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	0	0	0	0	0	0	0	0	
Traffic Volume (vph)	3	43	0	0	23	1	0	0	2	0	0	0	12	5	
Future Volume (vph)	3	43	0	0	23	1	0	0	2	0	0	0	270	2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	3	45	0	0	24	1	0	0	2	0	0	0	284	2	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1											
Volume Total (vph)	48	25	0	9											
Volume Left (vph)	3	0	0	2											
Volume Right (vph)	0	1	0	7											
Hadj (s)	0.05	0.01	0.00	-0.39											
Departure Headway (s)	4.0	4.0	4.1	3.7											
Degree Utilization x	0.05	0.03	0.00	0.01											
Capacity (veh/h)	893	897	877	938											
Control Delay (s)	7.2	7.1	7.1	6.7											
Approach Delay (s)	7.2	7.1	0.0	6.7											
Approach LOS	A	A	A	A											
Intersection Summary							7.1								
Delay															
Level of Service							A								
Intersection Capacity Utilization							15.0%								
Analysis Period (min)							15								

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Background 2027 PM 1: Rideau Valley/Manotick Main & Century						
Movement	EBL	EPR	NBL	NBT	RT	
Lane Configurations	2	2	2	2	184	
Traffic Volume (veh/h)	66	15	10	184		
Future Volume (Veh/h)	66	15	10	184		
Sign Control	Stop			Free		
Grade	0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95		
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right Turn Flare (veh)						
Median type					None	
Median storage (veh)						
Upstream Signal (m)						
pX platoon unlocked						
VC conflicting volume						
VC1 stage 1 cont vol						
VC2 stage 2 cont vol						
VC3 Unlocked vol						
IC, single (S)						
IC, 2-stage (S)						
IF (S)	3.5	3.3	2.2			
PO queue free %	85	98	99			
clm capacity (veh/h)	455	658	1124			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume, Total	85	205	436			
Volume, Left	69	11	0			
Volume, Right	16	0	91			
cSH	483	1124	1700			
Volume to Capacity	0.18	0.01	0.26			
Queue Length 95th (m)	4.8	0.2	0.0			
Control Delay (s)	14.0	0.5	0.0			
Lane LOS	B	A				
Approach Delay (s)	14.0	0.5	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay				1.8		
Inter-section Capacity Utilization				35.2%		
Analysis Period (min)				15		

Parsons  
Synchro 9 Report  
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Background 2027 PM 2: Century & Trestle						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	4	4	4	4	4	4
Traffic Volume (veh/h)	35	60	73	10	15	35
Future Volume (Veh/h)	35	60	73	10	15	35
Sign Control	Free	Free	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	37	63	77	11	16	37
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None	None	None	None	None	None
Median storage (veh)						
Upstream signal (m)						
pX_platoon unblocked						
vc_conflicting volume	88		220	82		
vc1, stage 1 conf vol						
vc2, stage 2 conf vol			220	82		
vcUnlocked conf vol	88					
IC, single (s)	4.8		6.6	6.4		
IC, 2 stage (s)						
IF (s)	2.9		3.7	3.5		
p0 queue free %	97		98	96		
cM capacity (veh/h)	1152		711	935		
Direction Lane #	EB1	WB1	SB1	EB1	WB1	SB1
Volume Total	100	88	53			
Volume Left	37	0	16			
Volume Right	0	11	37			
cSH	1152	1700	853			
Volume to Capacity	0.03	0.05	0.06			
Queue Length 50th (m)	0.8	0.0	1.5			
Control Delay (s)	3.2	0.0	9.5			
Lane LOS	A	A	A			
Approach Delay (s)	3.2	0.0	9.5			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay		3.4				
Intersection Capacity Utilization		22.0%				
Analysis Period (min)		15				

Background 2027 PM 3: 1st Line & Century						
Movement	EBL	EBT	WBT	WBL	NBT	SBL
Lane Configurations	4	4	4	4	4	4
Traffic Volume (veh/h)	35	60	73	10	15	35
Future Volume (Veh/h)	35	60	73	10	15	35
Sign Control	Free	Free	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	37	63	77	11	16	37
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None	None	None	None	None	None
Median storage (veh)						
Upstream signal (m)						
pX_platoon unblocked						
vc_conflicting volume	88		220	82		
vc1, stage 1 conf vol						
vc2, stage 2 conf vol			220	82		
vcUnlocked conf vol	88					
IC, single (s)	4.8		6.6	6.4		
IC, 2 stage (s)						
IF (s)	2.9		3.7	3.5		
p0 queue free %	97		98	96		
cM capacity (veh/h)	1152		711	935		
Direction Lane #	EB1	WB1	SB1	EB1	WB1	SB1
Volume Total	100	88	53			
Volume Left	37	0	16			
Volume Right	0	11	37			
cSH	1152	1700	853			
Volume to Capacity	0.03	0.05	0.06			
Queue Length 50th (m)	0.8	0.0	1.5			
Control Delay (s)	3.2	0.0	9.5			
Lane LOS	A	A	A			
Approach Delay (s)	3.2	0.0	9.5			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay		3.4				
Intersection Capacity Utilization		22.0%				
Analysis Period (min)		15				

**Background 2027 PM  
4: Manotick Main & Bridgeport/Antioch**

06/21/2017

Movement	EBL	EBT	EBC	EBR	EBL	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4♦	4♦	4♦	4♦	1	15	226	2	5	383	75	4♦	4♦	4♦
Traffic Volume (veh/h)	130	0	25	0	0	1	15	226	2	5	383	75		
Future Volume (Veh/h)	130	0	25	0	0	1	15	226	2	5	383	75		
Sign Control	Stop					Stop				Free				
Grade	0%				0%			0%		0%		0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Hourly flow rate (vph)	137	0	26	0	0	1	16	238	2	5	403	79		
Pedestrians														
Lane Width (m)														
Walking Speed (m/s)														
Percent Blockage														
Right turn lane (veh)														
Median type														
Median storage (veh)														
Upstream signal (m)														
pX, platoon unblocked														
vc, conflicting volume														
vc1, stage 1 conf vol														
vc2, stage 2 conf vol														
vc4, unblocked vol														
IC, single (s)	7.3	6.5	6.4	7.1	6.5	6.2	4.8		4.1					
IC, 2 stage (s)														
IF (s)	3.7	4.0	3.5	3.5	4.0	3.3	2.9		2.2					
p0 queue free %	56	100	96	100	100	98		100						
cM capacity (veh/h)	315	343	583	307	326	800	788		1327					
Direction Lane #	EB1	WB1	NB1	SB1										
Volume Total	163	1	256	487										
Volume Left	137	0	16	5										
Volume Right	26	1	2	79										
cSH	340	800	788	1327										
Volume to Capacity	0.48	0.00	0.02	0.00										
Queue Length 5th (m)	18.9	0.0	0.5	0.1										
Control Delay (s)	25.0	9.5	0.8	0.1										
Lane LOS	C	A	A	A										
Approach Delay (s)	25.0	9.5	0.8	0.1										
Approach LOS	C	A	A	A										
Intersection Summary														
Average Delay	4.8													
Intersection Capacity Utilization	50.2%													
Analysis Period (min)	15													

**Background 2027 PM  
5: Manotick Main & Maple/Bridge**

06/21/2017

Movement	EBL	EBT	EBC	EBR	EBL	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4♦	4♦	4♦	4♦	1	15	226	2	5	383	75	4♦	4♦	4♦
Traffic Volume (vph)	130	0	25	0	0	1	15	226	2	5	383	75		
Future Volume (vph)	130	0	25	0	0	1	15	226	2	5	383	75		
Sign Control	Stop					Stop				Free				
Grade	0%				0%			0%		0%		0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Hourly flow rate (vph)	137	0	26	0	0	1	16	238	2	5	403	79		
Pedestrians														
Lane Width (m)														
Walking Speed (m/s)														
Percent Blockage														
Right turn lane (veh)														
Median type														
Median storage (veh)														
Upstream signal (m)														
pX, platoon unblocked														
vc, conflicting volume														
vc1, stage 1 conf vol														
vc2, stage 2 conf vol														
vc4, unblocked vol														
IC, single (s)	7.3	6.5	6.4	7.1	6.5	6.2	4.8		4.1					
IC, 2 stage (s)														
IF (s)	3.7	4.0	3.5	3.5	4.0	3.3	2.9		2.2					
p0 queue free %	56	100	96	100	100	98		100						
cM capacity (veh/h)	315	343	583	307	326	800	788		1327					
Direction Lane #	EB1	WB1	NB1	SB1										
Volume Total	163	1	256	487										
Volume Left	137	0	16	5										
Volume Right	26	1	2	79										
cSH	340	800	788	1327										
Volume to Capacity	0.48	0.00	0.02	0.00										
Queue Length 5th (m)	18.9	0.0	0.5	0.1										
Control Delay (s)	25.0	9.5	0.8	0.1										
Lane LOS	C	A	A	A										
Approach Delay (s)	25.0	9.5	0.8	0.1										
Approach LOS	C	A	A	A										
Intersection Summary														
Average Delay	4.8													
Intersection Capacity Utilization	50.2%													
Analysis Period (min)	15													

**Intersection Summary**

06/21/2017

Average Delay	4.8													
Intersection Capacity Utilization	50.2%													
Analysis Period (min)	15													
HCM 2000 Control Delay														
HCM 2000 Volume to Capacity ratio														
Actuated Cycle Length (s)														
Intersection Capacity Utilization														
Analysis Period (min)														
c Critical Lane Group														

**Background 2027 PM  
4: Manotick Main & Bridgeport/Antioch**

06/21/2017

Movement	EBL	EBT	EBC	EBR	EBL	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4♦	4♦	4♦	4♦	1	15	226	2	5	383	75	4♦	4♦	4♦
Traffic Volume (vph)	130	0	25	0	0	1	15	226	2	5	383	75		
Future Volume (vph)	130	0	25	0	0	1	15	226	2	5	383	75		
Sign Control	Stop					Stop				Free				
Grade	0%				0%			0%		0%		0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Hourly flow rate (vph)	137	0	26	0	0	1	16	238	2	5	403	79		
Pedestrians														
Lane Width (m)														
Walking Speed (m/s)														
Percent Blockage														
Right turn lane (veh)														
Median type														
Median storage (veh)														
Upstream signal (m)														
pX, platoon unblocked														
vc, conflicting volume														
vc1, stage 1 conf vol														
vc2, stage 2 conf vol														
vc4, unblocked vol														
IC, single (s)	7.3	6.5	6.4	7.1	6.5	6.2	4.8		4.1					
IC, 2 stage (s)														
IF (s)	3.7	4.0	3.5	3.5	4.0	3.3	2.9		2.2					
p0 queue free %	56	100	96	100	100	98		100						
cM capacity (veh/h)	315	343	583	307	326	800	788		1327					
Direction Lane #	EB1	WB1</td												

Background 2032 AM 1: Rideau Valley/Maniotick Main & Century						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		A	B		
Traffic Volume (veh/h)	57	17	10	280	117	26
Future Volume (Veh/h)	57	17	10	280	117	26
Sign Control	Stop		Free	Free		
Grade	0%		0%	0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	60	18	11	295	123	27
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn lane (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vc, conflicting volume						
vc1, stage 1 conf vol						
vc2, stage 2 conf vol						
vcu, unblocked vol						
IC, single (s)						
IC, 2 stage (s)						
IF (s)						
p0 queue free %						
cM capacity (veh/h)						
Direction Lane #	EB1	NB1	SB1			
Volume Total	78	306	150			
Volume Left	60	11	0			
Volume Right	18	0	27			
cSH	615	1431	1700			
Volume to Capacity	0.13	0.01	0.09			
Queue Length 95th (m)	3.3	0.2	0.0			
Control Delay (s)	11.7	0.3	0.0			
Lane LOS	B	A				
Approach Delay (s)	11.7	0.3	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay	1.9					
Intersection Capacity Utilization	35.2%					
Analysis Period (min)	15					

Background 2032 AM 2: Century & Trestle						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		A	B		
Traffic Volume (veh/h)	57	17	10	280	117	26
Future Volume (Veh/h)	57	17	10	280	117	26
Sign Control	Stop		Free	Free		
Grade	0%		0%	0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	60	18	11	295	123	27
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn lane (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vc, conflicting volume						
vc1, stage 1 conf vol						
vc2, stage 2 conf vol						
vcu, unblocked vol						
IC, single (s)						
IC, 2 stage (s)						
IF (s)						
p0 queue free %						
cM capacity (veh/h)						
Direction Lane #	EB1	NB1	SB1			
Volume Total	61	29	48			
Volume Left	16	0	11			
Volume Right	0	5	37			
cSH	1218	1700	963			
Volume to Capacity	0.01	0.02	0.05			
Queue Length 95th (m)	0.3	0.0	1.2			
Control Delay (s)	2.2	0.0	8.9			
Lane LOS	A					
Approach Delay (s)	2.2	0.0	8.9			
Approach LOS	B					
Intersection Summary						
Average Delay	4.1					
Intersection Capacity Utilization	19.9%					
Analysis Period (min)	15					

Background 2032 AM 3: 1st Line & Century							Background 2032 AM 4: Manotick Main & Bridgeport/Antiochi								
Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	NBL	NBT	NBR	SBT	SBL	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	0	0	0	0	0	0	0	0	
Traffic Volume (vph)	3	43	0	0	23	1	0	0	2	0	0	0	12	5	
Future Volume (vph)	3	43	0	0	23	1	0	0	2	0	0	0	283	2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	3	45	0	0	24	1	0	0	2	0	0	0	298	2	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									7	141	
Volume Total (vph)	48	25	0	9										121	
Volume Left (vph)	3	0	0	2											
Volume Right (vph)	0	0	1	7											
Hadj (s)	0.05	0.01	0.00	-0.39											
Departure Headway (s)	4.0	4.0	4.1	3.7											
Degree Utilization x	0.05	0.03	0.00	0.01											
Capacity (veh/h)	893	897	877	938											
Control Delay (s)	7.2	7.1	7.1	6.7											
Approach Delay (s)	7.2	7.1	0.0	6.7											
Approach LOS	A	A	A	A											
<u>Intersection Summary</u>							7.1								
Delay															
Level of Service							A								
Intersection Capacity Utilization							15.0%								
Analysis Period (min)							15								

Background 2032 AM 4: Manotick Main & Bridgeport/Antiochi							Background 2032 AM 5: 1st Line, 2nd Line & Century								
Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	NBL	NBT	NBR	SBT	SBL	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	0	0	0	0	0	0	0	0	
Traffic Volume (vph)	3	43	0	0	23	1	0	0	2	0	0	0	12	5	
Future Volume (vph)	3	43	0	0	23	1	0	0	2	0	0	0	283	2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	3	45	0	0	24	1	0	0	2	0	0	0	298	2	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1											
Volume Total (vph)	48	25	0	9											
Volume Left (vph)	3	0	0	2											
Volume Right (vph)	0	0	1	7											
Hadj (s)	0.05	0.01	0.00	-0.39											
Departure Headway (s)	4.0	4.0	4.1	3.7											
Degree Utilization x	0.05	0.03	0.00	0.01											
Capacity (veh/h)	893	897	877	938											
Control Delay (s)	7.2	7.1	7.1	6.7											
Approach Delay (s)	7.2	7.1	0.0	6.7											
Approach LOS	A	A	A	A											
<u>Intersection Summary</u>							7.1								
Delay															
Level of Service							A								
Intersection Capacity Utilization							15.0%								
Analysis Period (min)							15								

Background 2032 AM 5: Manotick Main & Maple/Bridge											Background 2032 PM									
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	22	30	5	57	42	390	0	173	159	311	91	33	4	4	4	4	4	4	4	
Traffic Volume (vph)	22	30	5	57	42	390	0	173	159	311	91	33	66	15	10	194	345	86	86	
Future Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	66	15	10	194	345	86	86	
Ideal Flow (vph/h)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	Stop	Free	Free	Free	Free	Free	Free	
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0%	0%	0%	0%	0%	0%	0%	
Lane Util Factor	Fpb, pebfikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Fpb, pebfikes	Fpb, pebfikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Fit	Fit	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
FitProtected	FitProtected	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Satd. Flow (prot)	1695	1748	1695	1784	1508	1784	1492	1693	1713	1784	1492	1713	Right turn late (veh)							
Satd. Flow (perm)	1695	1748	1695	1784	1508	1784	1492	1693	1713	1784	1492	1713	Median type							
Peak-hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	Median storage (veh)							
Adj. Flow (vph)	23	32	5	60	44	411	0	182	167	327	96	35	Upstream signal (m)							
R/TOR Reduction (vph)	0	4	0	0	0	260	0	0	0	86	0	8	PX, platoon unblocked							
Lane Group Flow (vph)	23	33	0	60	44	151	0	182	81	327	123	0	vC, conflicting volume							
Conflicting Ped. (#/hr)	1	Split	NA	Split	NA	pmt+ov	NA	pmt+ov	pmt+ov	pmt+ov	NA	NA	vC1, stage 1 conf vol	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	vCu, unblocked vol	vCu, unblocked vol	
Turn Type	Protected Phases	4	4	8	8	8	2	2	8	1	6	6	vCu, unblocked vol	vCu, unblocked vol	vCu, unblocked vol	vCu, unblocked vol	634	408	454	
Permitted Phases	Actualized Green G (\$)	9.4	9.4	12.2	12.2	28.5	27.4	39.6	50.0	50.0	50.0	50.0	vC, single (\$)	vC, single (\$)	vC, 2 stage (\$)	vC, 2 stage (\$)	6.4	6.2	4.1	
Effective Green g (\$)	11.6	11.6	14.4	14.4	33.1	29.7	44.0	52.3	52.3	52.3	52.3	52.3	If (\$)	If (\$)	If (\$)	If (\$)	3.5	3.3	2.2	
Actualized g/C Ratio	0.13	0.13	0.16	0.16	0.37	0.33	0.49	0.58	0.58	0.58	0.58	0.58	pl queue free %	84	98	99				
Clearance Time (s)	6.2	6.2	6.2	6.2	6.3	6.3	6.3	6.2	6.3	6.3	6.3	6.3	CM capacity (veh/h)	CM capacity (veh/h)	CM capacity (veh/h)	CM capacity (veh/h)	438	643	1107	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	Direction Lane #	Direction Lane #	EB1	EB1	NB1	SB1	SB1	
Lane Grp Cap (vph)	217	224	270	284	552	586	726	689	992	992	992	992	Volume Total	Volume Total	Volume Left	Volume Left	85	215	454	
v/S Ratio Ptot	0.01	0.02	0.04	0.02	0.06	0.10	0.02	0.10	0.07	0.07	0.07	0.07	Volume Right	Volume Right	Volume Right	Volume Right	69	11	0	
v/S Ratio Perm	0.11	0.15	0.22	0.15	0.27	0.31	0.11	0.47	0.12	0.12	0.12	0.12	cSH	cSH	cSH	cSH	16	0	91	
Uniform Delay d1	34.8	34.9	33.1	32.7	20.1	22.6	12.6	10.3	8.6	8.6	8.6	8.6	Volume to Capacity	Volume to Capacity	Volume to Capacity	Volume to Capacity	0.18	0.01	0.27	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	Queue Length 95th (m)	5.0	0.2	0.0				
Incremental Delay, d2	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	Control Delay (\$)	Control Delay (\$)	Control Delay (\$)	Control Delay (\$)	14.4	0.5	0.0	
Delay (s)	35.0	35.3	33.5	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	Lane LOS	Lane LOS	Lane LOS	Lane LOS	B	A	A	
Level of Service	C	D	C	C	C	C	C	C	C	C	C	C	Approach Delay (s)	Approach Delay (s)	Approach Delay (s)	Approach Delay (s)	14.4	0.5	0.0	
Approach LOS	35.1	D	C	C	C	C	C	C	C	C	C	C	Intersection Summary	Intersection Summary	Intersection Summary	Intersection Summary	B	B	B	
Intersection Summary	HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B	Average Delay	1.8	ICU Level of Service	36.2%	ICU Level of Service	A	A	A	Parsons							
HCM 2000 Volume to Capacity ratio	0.42	Sum of lost time (s)	90.3	Analysis Period (min)	15	Analysis Period (min)	15	Analysis Period (min)	15	Analysis Period (min)	15	Analysis Period (min)	Synchro 9 Report							
Actuated Cycle Length (s)	65.6%	ICU Level of Service	C	C Critical Lane Group		C Critical Lane Group		C Critical Lane Group		C Critical Lane Group		C Critical Lane Group								

Background 2032 AM 5: Manotick Main & Maple/Bridge											Background 2032 PM 1: Rideau Valley/Manotick Main & Century								
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	NBL	NBT	SBT	SBR
Lane Configurations	22	30	5	57	42	390	0	173	159	311	91	33	4	4	4	4	4	4	4
Traffic Volume (vph)	22	30	5	57	42	390	0	173	159	311	91	33	66	15	10	194	345	86	86
Future Volume (vph)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	Stop	Free	Free	Free	Free	Free	Free
Ideal Flow (vph/h)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	0%	0%	0%	0%	0%	0%	0%
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0%	0%	0%	0%	0%	0%	0%
Lane Util Factor	Fpb, pebfikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Fpb, pebfikes	Fpb, pebfikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Fit	Fit	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.96	0.96	0.96	0.96	0.96	0.96
FitProtected	FitProtected	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Satd. Flow (prot)	1695	1748	1695	1784	1508	1784	1492	1693	1713	1784	1492	1713	Right turn late (veh)						
Satd. Flow (perm)	1695	1748	1695	1784	1508	1784	1492	1693	1713	1784	1492	1713	Median type						
Peak-hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	32	5	60	44	411	0	182	167	327	96	35	Upstream signal (m)						
R/TOR Reduction (vph)	0	4	0	0	0	260	0	0	0	86	0	8	PX, platoon unblocked						
Lane Group Flow (vph)	23	33	0	60	44	151	0	182	81	327	123	0	vC, conflicting volume						
Conflicting Ped. (#/hr)	1	Split	NA	Split	NA	pmt+ov	NA	pmt+ov	pmt+ov	pmt+ov	NA	NA	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	vCu, unblocked vol	634	408	454
Protected Phases	Actualized Green G (\$)	9.4	9.4	12.2	12.2	28.5	27.4	39.6	50.0	50.0	50.0	50.0	vC, single (\$)	vC, single (\$)	vC, 2 stage (\$)	vC, 2 stage (\$)	6.4	6.2	4.1
Actualized Green g (\$)	11.6	11.6	14.4	14.4	33.1	29.7	44.0	52.3	52.3	52.3	52.3	52.3	If (\$)	If (\$)	If (\$)	If (\$)	3.5	3.3	2.2
Effective Green g (\$)	0.13	0.13	0.16	0.16	0.37	0.33	0.49	0.58	0.58	0.58	0.58	0.58	pl queue free %	84	98	99			
Actualized g/C Ratio	0.62	0.62	0.62	0.62	0.63	0.63	0.63	0.62	0.63	0.63	0.63	0.63	CM capacity (veh/h)	CM capacity (veh/h)	CM capacity (veh/h)	CM capacity (veh/h)	438	643	1107
Clearance Time (s)	6.2	6.2	6.2	6.2	6.3	6.3	6.3	6.2	6.3	6.3	6.3	6.3	Direction Lane #	Direction Lane #	EB1	EB1	NB1	SB1	SB1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	Volume Total	Volume Total	Volume Left	Volume Left	69	11	0
Lane Grp Cap (vph)	217	224	270	284	552	586	726	689	992	992	992	992	Volume Right	Volume Right	Volume Right	Volume Right	16	0	91
v/S Ratio Ptot	0.01	0.02	0.04	0.02	0.06	0.10	0.02	0.10	0.07	0.07	0.07	0.07	cSH	cSH	cSH	cSH	466	1107	1700
v/S Ratio Perm	0.11	0.15	0.22	0.15	0.27	0.31	0.11	0.47</											

**Background 2032 PM  
2: Century & Trestle**

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	4	4	4	4	4	4
Traffic Volume (veh/h)	35	60	73	10	15	35
Future Volume (Veh/h)	35	60	73	10	15	35
Sign Control	Free	Free	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	37	63	77	11	16	37
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None	None	None	None	None	None
Median storage (veh)						
Upstream signal (m)						
pX_platoon unblocked						
vc_conflicting volume	88		220	82		
vc1, stage 1 conf vol						
vc2, stage 2 conf vol						
vcUnlockedConfVol	88		220	82		
IC, single (s)	4.8		6.6	6.4		
IC, 2 stage (s)						
IF (s)	2.9		3.7	3.5		
p0 queue free %	97		98	96		
cM capacity (veh/h)	1152		711	935		
Direction Lane #	EB1	WB1	SB1			
Volume Total	100	88	53			
Volume Left	37	0	16			
Volume Right	0	11	37			
cSH	1152	1700	853			
Volume to Capacity	0.03	0.05	0.06			
Queue Length 50th (m)	0.8	0.0	1.5			
Control Delay (s)	3.2	0.0	9.5			
Lane LOS	A	A	A			
Approach Delay (s)	3.2	0.0	9.5			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay	3.4					
Intersection Capacity Utilization	22.0%					
Analysis Period (min)	15					

**Background 2032 PM  
3: 1st Line & Century**

Movement	EBL	EBT	WBT	WBR	NBL	NBR	NBT	NBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4
Traffic Volume (veh/h)	35	60	73	10	15	35				
Future Volume (Veh/h)	35	60	73	10	15	35				
Sign Control	Free	Free	Stop							
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	37	63	77	11	16	37				
Pedestrians										
Lane Width (m)										
Walking Speed (m/s)										
Percent Blockage										
Right turn flare (veh)										
Median type										
Median storage (veh)										
Upstream signal (m)										
pX_platoon unblocked										
vc_conflicting volume										
vc1, stage 1 conf vol										
vc2, stage 2 conf vol										
vcUnlockedConfVol										
IC, single (s)										
IC, 2 stage (s)										
IF (s)										
p0 queue free %										
cM capacity (veh/h)										
Direction Lane #	EB1	WB1	SB1							
Volume Total	100	88	53							
Volume Left	37	0	16							
Volume Right	0	11	37							
cSH	1152	1700	853							
Volume to Capacity	0.03	0.05	0.06							
Queue Length 50th (m)	0.8	0.0	1.5							
Control Delay (s)	3.2	0.0	9.5							
Lane LOS	A	A	A							
Approach Delay (s)	3.2	0.0	9.5							
Approach LOS	A	A	A							
Intersection Summary										
Average Delay	3.4									
Intersection Capacity Utilization	22.0%									
Analysis Period (min)	15									

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#### Background 2032 PM 4: Manotick Main & Bridgeport/Antioch

Background 2032 PM											
Movement	EBL	EBT	EBC	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations	4♦	0	25	0	0	1	15	238	2	5	403
Future Volume (veh/h)	130	0	25	0	0	1	15	238	2	5	75
Sign Control	Stop				Stop			Free			
Grade	0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	137	0	26	0	0	1	16	251	2	5	424
Pedestrians											
Lane Width (m)											
Walking Speed (m/s)											
Percent Blockage											
Right turn lane (veh)											
Median type											
Median storage (veh)											
Upstream signal (m)											
pX, platoon unblocked											
vc, conflicting volume											
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol											
IC, single (s)	7.3	6.5	6.4	7.1	6.5	6.2	4.8	4.1			
IC, 2 stage (s)											
IF (s)	3.7	4.0	3.5	3.5	4.0	3.3	2.9	2.2			
p0 queue free %	54	100	95	100	100	98	100	100			
cM capacity (veh/h)	298	328	567	291	312	787	772	1312			
Direction Lane #	EB1	WB1	NB1	SB1							
Volume Total	163	1	269	508							
Volume Left	137	0	16	5							
Volume Right	26	1	2	79							
cSH	323	787	772	1312							
Volume to Capacity	0.51	0.00	0.02	0.00							
Queue Length 5th (m)	205	0.0	0.5	0.1							
Control Delay (s)	27.0	9.6	0.8	0.1							
Lane LOS	D	A	A	A							
Approach Delay (s)	27.0	9.6	0.8	0.1							
Approach LOS	D	A									
Intersection Summary											
Average Delay	5.0										
Intersection Capacity Utilization	51.3%										
Analysis Period (min)	15										

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Background 2032 PM  
5: Manotick Main & Maple/Bridge

Movement	EBL	EBT	EBC	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations	4♦	0	25	0	0	1	15	238	2	5	75
Future Volume (veh/h)	130	0	25	0	0	1	15	238	2	5	403
Sign Control	Stop				Stop			Free			
Grade	0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	137	0	26	0	0	1	16	251	2	5	424
Pedestrians											
Lane Width (m)											
Walking Speed (m/s)											
Percent Blockage											
Right turn lane (veh)											
Median type											
Median storage (veh)											
Upstream signal (m)											
pX, platoon unblocked											
vc, conflicting volume											
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol											
IC, single (s)	7.3	6.5	6.4	7.1	6.5	6.2	4.8	4.1			
IC, 2 stage (s)											
IF (s)	3.7	4.0	3.5	3.5	4.0	3.3	2.9	2.2			
p0 queue free %	54	100	95	100	100	98	100	100			
cM capacity (veh/h)	298	328	567	291	312	787	772	1312			
Direction Lane #	EB1	WB1	NB1	SB1							
Volume Total	163	1	269	508							
Volume Left	137	0	16	5							
Volume Right	26	1	2	79							
cSH	323	787	772	1312							
Volume to Capacity	0.51	0.00	0.02	0.00							
Queue Length 5th (m)	205	0.0	0.5	0.1							
Control Delay (s)	27.0	9.6	0.8	0.1							
Lane LOS	D	A	A	A							
Approach Delay (s)	27.0	9.6	0.8	0.1							
Approach LOS	D	A									
Intersection Summary											
Average Delay	5.0										
Intersection Capacity Utilization	51.3%										
Analysis Period (min)	15										

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Background 2032 FM  
5: Manotick Main & Maple/Bridge

Parsons

Synchro 9 Report

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Synchro 9 Report

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## **Appendix E**

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Total 2027 AM 1: Rideau Valley/Maniotick Main & Century						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		A	B	C	D
Traffic Volume (veh/h)	111	44	21	266	112	48
Future Volume (Veh/h)	111	44	21	266	112	48
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	117	46	22	280	118	51
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn lane (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vc, conflicting volume						
vc1, stage 1 conf vol						
vc2, stage 2 conf vol						
vcu, unblocked vol						
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	79	95	98			
cM capacity (veh/h)	545	904	1409			
Direction Lane #	EB1	NB1	SB1			
Volume Total	163	302	169			
Volume Left	117	22	0			
Volume Right	46	0	51			
cSH	614	1409	1700			
Volume to Capacity	0.27	0.02	0.10			
Queue Length 95th (m)	8.1	0.4	0.0			
Control Delay (s)	13.0	0.7	0.0			
Lane LOS	B	A				
Approach Delay (s)	13.0	0.7	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay	3.7					
Intersection Capacity Utilization	44.6%					
Analysis Period (min)	15					

Total 2027 AM 2: Century & Trestle						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		A	B	C	D
Traffic Volume (veh/h)	111	44	21	266	112	48
Future Volume (Veh/h)	111	44	21	266	112	48
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	117	46	22	280	118	51
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn lane (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vc, conflicting volume						
vc1, stage 1 conf vol						
vc2, stage 2 conf vol						
vcu, unblocked vol						
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	79	95	98			
cM capacity (veh/h)	545	904	1409			
Direction Lane #	EB1	NB1	SB1			
Volume Total	129	64	104			
Volume Left	27	0	39			
Volume Right	0	17	65			
cSH	1178	1700	860			
Volume to Capacity	0.02	0.04	0.12			
Queue Length 95th (m)	0.5	0.0	3.1			
Control Delay (s)	1.9	0.0	9.8			
Lane LOS	A					
Approach Delay (s)	1.9	0.0	9.8			
Approach LOS	A					
Intersection Summary						
Average Delay	4.2					
Intersection Capacity Utilization	26.4%					
Analysis Period (min)	15					

Total 2027 AM 3: 1st Line & Century										06/21/2017										
Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	NBL	NBT	NBR	SBT	SBL	SBR	♦	♦	♦	♦	♦
Lane Configurations	♦			♦			Stop	Stop	Stop	0	0	89	0	7	♦	♦	♦	♦	♦	
Sign Control							50	219	0	0	0	0	89	0	7	323	0	10	1	0
Traffic Volume (vph)	3	54	0	0	0	0	50	219	0	0	0	0	89	0	7	323	0	10	1	0
Future Volume (vph)	3	54	0	0	0	0	50	219	0	0	0	0	89	0	7	324	2	7	7	149
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0%	Free				202
Hourly flow rate (vph)	3	57	0	0	53	231	0	0	0	94	0	7	94	0	0	0%	0%	0%	0%	0%
Direction, Lane #	EB1	WB1	NB1	SB1																
Volume Total (vph)	60	284	0	101																
Volume Left (vph)	3	0	0	94																
Volume Right (vph)	0	231	0	7																
Hadj (s)	0.04	-0.45	0.00	0.18																
Departure Headway (s)	4.5	3.8	4.7	4.8																
Degree Utilization x	0.07	0.30	0.00	0.13																
Capacity (veh/h)	773	931	702	698																
Control Delay (s)	7.8	8.4	7.7	8.5																
Approach Delay (s)	7.8	8.4	0.0	8.5																
Approach LOS	A	A	A	A																
Intersection Summary										8.3										
Delay																				
Level of Service										A										
Intersection Capacity Utilization										29.3%										
Analysis Period (min)										15										

Total 2027 AM 4: Manotick Main & Bridgeport/Antiochi										06/21/2017										
Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	NBL	NBT	NBR	SBT	SBL	SBR	♦	♦	♦	♦	♦
Lane Configurations	♦			♦			Stop	Stop	Stop	0	0	89	0	7	♦	♦	♦	♦	♦	
Sign Control							50	219	0	0	0	0	89	0	7	323	0	10	1	0
Traffic Volume (vph)	3	54	0	0	0	0	50	219	0	0	0	0	89	0	7	323	0	10	1	0
Future Volume (vph)	3	54	0	0	0	0	50	219	0	0	0	0	89	0	7	324	2	7	7	149
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0%	Free				202
Hourly flow rate (vph)	3	57	0	0	53	231	0	0	0	94	0	7	94	0	0	0%	0%	0%	0%	0%
Direction, Lane #	EB1	WB1	NB1	SB1																
Volume Total (vph)	60	284	0	101																
Volume Left (vph)	3	0	0	94																
Volume Right (vph)	0	231	0	7																
Hadj (s)	0.04	-0.45	0.00	0.18																
Departure Headway (s)	4.5	3.8	4.7	4.8																
Degree Utilization x	0.07	0.30	0.00	0.13																
Capacity (veh/h)	773	931	702	698																
Control Delay (s)	7.8	8.4	7.7	8.5																
Approach Delay (s)	7.8	8.4	0.0	8.5																
Approach LOS	A	A	A	A																
Intersection Summary										8.3										
Delay																				
Level of Service										A										
Intersection Capacity Utilization										29.3%										
Analysis Period (min)										15										

Total 2027 AM 5: Mandtck Main & Maple/Bridge											
Movement	EBL	EBT	EBC	VBL	VBT	WBL	WBT	NBL	NBT	SBL	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	22	30	5	90	42	390	0	355	241	311	162
Future Volume (vph)	22	30	5	90	42	390	0	355	241	311	162
Ideal Flow (vph/h)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit	1.00	0.98	1.00	1.00	0.95	1.00	1.00	0.85	1.00	0.97	1.00
FitProtected	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1695	1748	1695	1784	1508	1784	1492	1694	1739	1784	1492
Filt Permitted	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1695	1748	1695	1784	1508	1784	1492	496	1739	1784	1492
Peak-hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	32	5	95	44	411	0	374	254	327	171
RTOR Reduction (vph)	0	4	0	0	0	251	0	0	131	0	4
Lane Group Flow (vph)	23	33	0	95	44	160	0	374	123	327	202
Confli. Peds. (#/hr)	1										
Turn Type	Split	NA	Split	NA	pmt+ov	NA	pmt+ov	pmt+pt	NA		
Protected Phases	4	4	8	8	8	2	8	1	6		
Permitted Phases											
Actualized Green G (\$)	9.3	9.3	13.1	13.1	32.4	28.6	41.7	54.2	54.2		
Effective Green g (\$)	11.5	11.5	15.3	15.3	37.0	30.9	46.1	56.5	56.5		
Actualized g/C Ratio	0.12	0.12	0.16	0.16	0.39	0.32	0.48	0.59	0.59		
Clearance Time (s)	6.2	6.2	6.2	6.2	6.3	6.3	6.2	6.3	6.3		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	204	210	272	286	585	578	721	565	1030		
v/s Ratio Prot	0.01	0.02	c0.06	0.02	0.06	c0.21	0.03	c0.13	0.12		
v/s Ratio Perm											
v/C Ratio	0.11	0.16	0.35	0.15	0.27	0.65	0.17	0.58	0.20		
Uniform Delay d1	37.4	37.5	35.6	34.4	19.9	27.5	13.8	12.1	8.9		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	0.2	0.3	0.8	0.3	0.3	2.5	0.1	1.4	0.1		
Delay (s)	37.6	37.9	36.4	34.7	20.2	30.0	14.0	13.5	9.0		
Level of Service	D	D	D	C	C	C	B	B	A		
Approach Delay (s)	37.8	D	D	C	C	24.1	23.5	11.8	B		
Approach LOS											
Intersection Summary											
HCM 2000 Control Delay			20.7			HCM 2000 Level of Service	C				
HCM 2000 Volume to Capacity ratio			0.52								
Actuated Cycle Length (s)			37.5								
Intersection Capacity Utilization			95.3			Sum of lost time (s)	18.0				
Analysis Period (min)			65.6%			ICU Level of Service	C				
c Critical Lane Group			15								

Total 2027 AM 6: Century & Access 1											
Movement	EBL	EBT	EBC	VBL	VBT	WBL	WBT	NBL	NBT	SBL	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	22	30	5	90	42	390	0	355	241	311	162
Future Volume (vph)	22	30	5	90	42	390	0	355	241	311	162
Ideal Flow (vph/h)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit	1.00	0.98	1.00	1.00	0.95	1.00	1.00	0.85	1.00	0.97	1.00
FitProtected	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1695	1748	1695	1784	1508	1784	1492	1694	1739	1784	1492
Filt Permitted	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1695	1748	1695	1784	1508	1784	1492	496	1739	1784	1492
Peak-hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	32	5	95	44	411	0	374	254	327	171
RTOR Reduction (vph)	0	4	0	0	0	251	0	0	131	0	4
Lane Group Flow (vph)	23	33	0	95	44	160	0	374	123	327	202
Confli. Peds. (#/hr)	1										
Turn Type	Split	NA	Split	NA	pmt+ov	NA	pmt+ov	pmt+pt	NA		
Protected Phases	4	4	8	8	8	2	8	1	6		
Permitted Phases											
Actualized Green G (\$)	9.3	9.3	13.1	13.1	32.4	28.6	41.7	54.2	54.2		
Effective Green g (\$)	11.5	11.5	15.3	15.3	37.0	30.9	46.1	56.5	56.5		
Actualized g/C Ratio	0.12	0.12	0.16	0.16	0.39	0.32	0.48	0.59	0.59		
Clearance Time (s)	6.2	6.2	6.2	6.2	6.3	6.3	6.2	6.3	6.3		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	204	210	272	286	585	578	721	565	1030		
v/s Ratio Prot	0.01	0.02	c0.06	0.02	0.06	c0.21	0.03	c0.13	0.12		
v/s Ratio Perm											
v/C Ratio	0.11	0.16	0.35	0.15	0.27	0.65	0.17	0.58	0.20		
Uniform Delay d1	37.4	37.5	35.6	34.4	19.9	27.5	13.8	12.1	8.9		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	0.2	0.3	0.8	0.3	0.3	2.5	0.1	1.4	0.1		
Delay (s)	37.6	37.9	36.4	34.7	20.2	30.0	14.0	13.5	9.0		
Level of Service	D	D	D	C	C	C	B	B	A		
Approach Delay (s)	37.8	D	D	C	C	24.1	23.5	11.8	B		
Approach LOS											
Intersection Summary											
HCM 2000 Control Delay			20.7			HCM 2000 Level of Service	C				
HCM 2000 Volume to Capacity ratio			0.52								
Actuated Cycle Length (s)			37.5			Sum of lost time (s)	18.0				
Intersection Capacity Utilization			95.3			ICU Level of Service	C				
Analysis Period (min)			65.6%			15					
c Critical Lane Group			15								

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Total 2027 AM 7: Century & Access 2		EBL	EBT	WBT	WBR	SBL	SBR						
Lane Configurations		54	88	139	11	27	136	4	4	4	4	4	4
Traffic Volume (veh/h)		54	88	139	11	27	136						
Future Volume (Veh/h)													
Sign Control		Free	Free	Stop									
Grade		0%	0%	0%	0%								
Peak Hour Factor		0.95	0.95	0.95	0.95								
Hourly flow rate (vph)		57	93	146	12	28	143						
Pedestrians													
Lane Width (m)													
Walking Speed (m/s)													
Percent Blockage													
Right turn lane (veh)													
Median type		None	None										
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vc, conflicting volume													
vc1, stage 1 conf vol													
vc2, stage 2 conf vol													
vcU, unblocked vol		158		359	152								
IC, single (s)		4.1		6.4	6.2								
IC, 2 stage (s)													
IF (s)		2.2		3.5	3.3								
p0 queue free %		96		95	84								
cM capacity (veh/h)		1422		614	894								
Direction Lane #	EB1	WB1	SB1										
Direction	Lane #	EB1	NB1	SB1									
Volume Total		150	158	171									
Volume Left		57	0	28									
Volume Right		0	12	143									
cSH		1422	1700	832									
Volume to Capacity		0.04	0.09	0.21									
Queue Length 95th (m)		1.0	0.0	5.8									
Control Delay (s)		3.1	0.0	10.4									
Lane LOS		A	B										
Approach Delay (s)		3.1	0.0	10.4									
Approach LOS			B										
Intersection Summary													
Average Delay		4.7											
Intersection Capacity Utilization		36.9%											
Analysis Period (min)		15											

Total 2027 PM 1: Ridgeau Valley/Manotick Main & Century		EBL	EBT	WBT	WBR	SBL	SBR						
Movement								Movement					
Lane Configurations								Lane Configurations					
Traffic Volume (veh/h)		54	88	139	11	27	136	Traffic Volume (veh/h)					
Future Volume (Veh/h)		54	88	139	11	27	136	Future Volume (Veh/h)					
Sign Control		Free	Free	Stop				Sign Control					
Grade		0%	0%	0%	0%			Grade					
Peak Hour Factor		0.95	0.95	0.95	0.95			Peak Hour Factor					
Hourly flow rate (vph)		57	93	146	12	28	143	Hourly flow rate (vph)					
Pedestrians								Pedestrians					
Lane Width (m)								Lane Width (m)					
Walking Speed (m/s)								Walking Speed (m/s)					
Percent Blockage								Percent Blockage					
Right turn lane (veh)								Right turn lane (veh)					
Median type		None	None					Median type					
Median storage (veh)								Median storage (veh)					
Upstream signal (m)								Upstream signal (m)					
pX, platoon unblocked								pX, platoon unblocked					
vc, conflicting volume								vc, conflicting volume					
vc1, stage 1 conf vol								vc1, stage 1 conf vol					
vc2, stage 2 conf vol								vc2, stage 2 conf vol					
vcU, unblocked vol		158		359	152			vcU, unblocked vol					
IC, single (s)		4.1		6.4	6.2			IC, single (s)					
IC, 2 stage (s)								IC, 2 stage (s)					
IF (s)		2.2		3.5	3.3			IF (s)					
p0 queue free %		96		95	84			p0 queue free %					
cM capacity (veh/h)		1422		614	894			cM capacity (veh/h)					
Direction Lane #	EB1	WB1	SB1					Direction	Lane #	EB1	NB1	SB1	
Direction	Lane #	EB1	NB1	SB1				Direction	Lane #	EB1	NB1	SB1	
Volume Total		150	158	171				Volume Total		138	238	503	
Volume Left		57	0	28				Volume Left		104	44	0	
Volume Right		0	12	143				Volume Right		34	0	158	
cSH		1422	1700	832				cSH		426	1061	1700	
Volume to Capacity		0.04	0.09	0.21				Volume to Capacity		0.32	0.04	0.30	
Queue Length 95th (m)		1.0	0.0	5.8				Queue Length 95th (m)		10.5	1.0	0.0	
Control Delay (s)		3.1	0.0	10.4				Control Delay (s)		17.4	1.9	0.0	
Lane LOS		A	B					Lane LOS		C	A		
Approach Delay (s)		3.1	0.0	10.4				Approach Delay (s)		17.4	1.9	0.0	
Approach LOS			B					Approach LOS		C			
Intersection Summary								Intersection Summary					
Average Delay		4.7						Average Delay		3.3			
Intersection Capacity Utilization		36.9%						Intersection Capacity Utilization		58.4%			
Analysis Period (min)		15						Analysis Period (min)		15			

Total 2027 PM 2: Century & Trestle						Total 2027 PM 3: 1st Line & Century											
Movement	EBL	EBT	WBT	WBR	SBL	SBR	Movement	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations							Lane Configurations										
Traffic Volume (veh/h)	67	93	137	42	32	52	Sign Control										
Future Volume (Veh/h)	67	93	137	42	32	52	Traffic Volume (vph)										
Sign Control	Free	Free	Stop				Future Volume (vph)	7	92	0	0	90	135	0	0	259	0
Grade	0%	0%	0%	0%	0%		Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95		Hourly flow rate (vph)	7	97	0	0	95	142	0	0	273	0
Hourly flow rate (vph)	71	98	144	44	34		Direction Lane #	EB 1	WB 1	NB 1	SB 1						
Pedestrians							Volume Total (vph)	104	237	0	280						
Lane Width (m)							Volume Left (vph)	7	0	0	273						
Walking Speed (m/s)							Volume Right (vph)	0	142	0							
Percent Blockage							Head (s)	0.05	-0.33	0.00	0.21						
Right turn flare (veh)							Departure Headway (s)	5.0	4.5	5.1	4.9						
Median type	None	None	None				Degree Utilization, x	0.14	0.29	0.00	0.38						
Median storage (veh)							Capacity (veh/h)	668	758	640	692						
Upstream signal (m)							Control Delay (s)	8.8	9.3	8.1	10.9						
pX, platoon unblocked							Approach Delay (s)	8.8	9.3	0.0	10.9						
vc, conflicting volume							Approach LOS	A	A	A	B						
vC1, stage 1 conf vol							Intersection Summary										
vC2, stage 2 conf vol							Delay								10.0		
vCu, unblocked conf vol							Level of Service								A		
IC, single (s)	4.8						Intersection Capacity Utilization								36.0%		
IC, 2 stage (s)							Analysis Period (min)								15		
IF (s)	2.9																
p0 queue free %	93																
cm capacity (veh/h)	1047																
Direction Lane #	EB 1	WB 1	NB 1	SB 1													
Volume Total	169	188	89														
Volume Left	71	0	34														
Volume Right	0	44	55														
cSH	1047	1700	688														
Volume to Capacity	0.07	0.11	0.13														
Queue Length 5th (m)	1.7	0.0	3.4														
Control Delay (s)	4.0	0.0	11.0														
Lane LOS	A	B	B														
Approach Delay (s)	4.0	0.0	11.0														
Approach LOS			B														
Intersection Summary																	
Average Delay			3.7														
Intersection Capacity Utilization			34.6%														
Analysis Period (min)			15														

Total 2027 PM 2: Century & Trestle						Total 2027 PM 3: 1st Line & Century											
Movement	EBL	EBT	WBT	WBR	SBL	SBR	Movement	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations							Lane Configurations										
Traffic Volume (veh/h)	67	93	137	42	32	52	Sign Control										
Future Volume (Veh/h)	67	93	137	42	32	52	Traffic Volume (vph)										
Sign Control	Free	Free	Stop				Future Volume (vph)	7	92	0	0	90	135	0	0	259	0
Grade	0%	0%	0%	0%	0%		Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95		Hourly flow rate (vph)	7	97	0	0	95	142	0	0	273	0
Hourly flow rate (vph)	71	98	144	44	34		Direction Lane #	EB 1	WB 1	NB 1	SB 1						
Pedestrians							Volume Total (vph)	104	237	0	280						
Lane Width (m)							Volume Left (vph)	7	0	0	273						
Walking Speed (m/s)							Volume Right (vph)	0	142	0							
Percent Blockage							Head (s)	0.05	-0.33	0.00	0.21						
Right turn flare (veh)							Departure Headway (s)	5.0	4.5	5.1	4.9						
Median type	None	None	None				Degree Utilization, x	0.14	0.29	0.00	0.38						
Median storage (veh)							Capacity (veh/h)	668	758	640	692						
Upstream signal (m)							Control Delay (s)	8.8	9.3	8.1	10.9						
pX, platoon unblocked							Approach Delay (s)	8.8	9.3	0.0	10.9						
vc, conflicting volume							Approach LOS	A	A	A	B						
vC1, stage 1 conf vol							Intersection Summary										
vC2, stage 2 conf vol							Delay								10.0		
vCu, unblocked conf vol							Level of Service								A		
IC, single (s)	4.8						Intersection Capacity Utilization								36.0%		
IC, 2 stage (s)							Analysis Period (min)								15		
IF (s)	2.9																
p0 queue free %	93																
cm capacity (veh/h)	1047																
Direction Lane #	EB 1	WB 1	NB 1	SB 1													
Volume Total	169	188	89														
Volume Left	71	0	34														
Volume Right	0	44	55														
cSH	1047	1700	688														
Volume to Capacity	0.07	0.11	0.13														
Queue Length 5th (m)	1.7	0.0	3.4														
Control Delay (s)	4.0	0.0	11.0														
Lane LOS	A	B	B														
Approach Delay (s)	4.0	0.0	11.0														
Approach LOS			B														
Intersection Summary																	
Average Delay			3.7														
Intersection Capacity Utilization			34.6%														
Analysis Period (min)			15														

Total 2027 PM  
2: Century & Trestle

Total 2027 PM  
3: 1st Line & Century

06/21/2017

Total 2027 PM  
4: Manotick Main & Bridgeport/Antioch

06/21/2017

Movement	EBL	EBT	EBC	EBR	EBL	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4♦	0	25	0	0	1	15	259	2	5	447	331	4♦	4♦
Future Volume (veh/h)	263	0	25	0	0	1	15	259	2	5	447	331	Free	
Sign Control	Stop					Stop								
Grade	0%			0%			0%		0%		0%			
Park Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Hourly flow rate (vph)	277	0	26	0	0	1	16	273	2	5	471	348		
Pedestrians														
Lane Width (m)														
Walking Speed (m/s)														
Percent Blockage														
Right turn lane (veh)														
Median type														
Median storage (veh)														
Upstream signal (m)														
pX, platoon unblocked														
vc, conflicting volume														
vc1, stage 1 conf vol														
vc2, stage 2 conf vol														
vc4, unblocked vol														
IC, single (s)	962	962	645	987	1135	274	819	275						
IC, 2 stage (s)	7.3	6.5	6.4	7.1	6.5	6.2	4.8	4.1						
IF (s)	3.7	4.0	3.5	3.5	4.0	3.3	2.9	2.2						
p0 queue free %	0	100	94	100	100	97	100	100						
cM capacity (veh/h)	215	248	445	208	196	765	566	1288						
Direction Lane #	EB1	WB1	NB1	SB1										
Volume Total	303	1	291	824										
Volume Left	277	0	16	5										
Volume Right	26	1	2	348										
cSH	225	765	566	1288										
Volume to Capacity	1.35	0.00	0.03	0.00										
Queue Length 5th (m)	126.4	0.0	0.7	0.1										
Control Delay (s)	225.6	9.7	10	0.1										
Lane LOS	F	A	A	A										
Approach Delay (s)	225.6	9.7	1.0	0.1										
Approach LOS	F	A												
Intersection Summary														
Average Delay		48.5												
Intersection Capacity Utilization		78.2%												
Analysis Period (min)		15												

Total 2027 PM  
5: Manotick Main & Maple/Bridge

06/21/2017

Movement	EBL	EBT	EBC	EBR	EBL	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4♦	0	25	0	0	1	15	259	2	5	447	331	4♦	4♦
Future Volume (veh/h)	263	0	25	0	0	1	15	259	2	5	447	331	Free	
Sign Control	Stop					Stop								
Grade	0%			0%			0%		0%		0%			
Park Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Hourly flow rate (vph)	277	0	26	0	0	1	16	273	2	5	471	348		
Pedestrians														
Lane Width (m)														
Walking Speed (m/s)														
Percent Blockage														
Right turn lane (veh)														
Median type														
Median storage (veh)														
Upstream signal (m)														
pX, platoon unblocked														
vc, conflicting volume														
vc1, stage 1 conf vol														
vc2, stage 2 conf vol														
vc4, unblocked vol														
IC, single (s)	962	962	645	987	1135	274	819	275						
IC, 2 stage (s)	7.3	6.5	6.4	7.1	6.5	6.2	4.8	4.1						
IF (s)	3.7	4.0	3.5	3.5	4.0	3.3	2.9	2.2						
p0 queue free %	0	100	94	100	100	97	100	100						
cM capacity (veh/h)	215	248	445	208	196	765	566	1288						
Direction Lane #	EB1	WB1	NB1	SB1										
Volume Total	303	1	291	824										
Volume Left	277	0	16	5										
Volume Right	26	1	2	348										
cSH	225	765	566	1288										
Volume to Capacity	1.35	0.00	0.03	0.00										
Queue Length 5th (m)	126.4	0.0	0.7	0.1										
Control Delay (s)	225.6	9.7	10	0.1										
Lane LOS	F	A	A	A										
Approach Delay (s)	225.6	9.7	1.0	0.1										
Approach LOS	F	A												
Intersection Summary														
Average Delay		48.5												
Intersection Capacity Utilization		78.2%												
Analysis Period (min)		15												

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Movement	EBL	EBT	EBC	EBR	EBL	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4♦	0	25	0	0	1	15	259	2	5	447	331	4♦	4♦
Future Volume (veh/h)	263	0	25	0	0	1	15	259	2	5	447	331	Free	
Sign Control	Stop					Stop								
Grade	0%			0%			0%		0%		0%			
Park Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Hourly flow rate (vph)	277	0	26	0	0	1	16	273	2	5	471	348		
Pedestrians														
Lane Width (m)														
Walking Speed (m/s)														
Percent Blockage														
Right turn lane (veh)														
Median type														
Median storage (veh)														
Upstream signal (m)														
pX, platoon unblocked														
vc, conflicting volume														
vc1, stage 1 conf vol														
vc2, stage 2 conf vol														
vc4, unblocked vol														
IC, single (s)	962	962	645	987	1135	274	819	275						
IC, 2 stage (s)	7.3	6.5	6.4	7.1	6.5	6.2	4.8	4.1						
IF (s)	3.7	4.0	3.5	3.5	4.0	3.3	2.9	2.2						
p0 queue free %	0	100	94	100	100	97	100	100						
cM capacity (veh/h)	215	248	445	208	196	765	566	1288						
Direction Lane #	EB1	WB1	NB1	SB1										
Volume Total	303	1	291	824										
Volume Left	277	0	16	5										
Volume Right	26	1	2	348										
cSH	225	765	566	1288										
Volume to Capacity	1.35	0.00	0.03	0.00										
Queue Length 5th (m)	126.4	0.0	0.7	0.1										
Control Delay (s)	225.6	9.7	10	0.1										
Lane LOS	F	A	A	A										
Approach Delay (s)	225.6	9.7	1.0	0.1										
Approach LOS	F	A												
Intersection Summary														
Average Delay		48.5												
Intersection Capacity Utilization		78.2%												
Analysis Period (min)		15												

Movement	EBL	EBT	EBC	EBR	EBL	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR



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Total 2027 PM 6: Century & Access 1						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↗	↙	↘	↗
Traffic Volume (veh/h)	96	124	157	32	17	50
Future Volume (Veh/h)	96	124	157	32	17	50
Sign Control	Free	Free	Stop			
Grade	0%	0%	0%	0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	
Hourlyflow rate (vph)	101	131	165	34	18	53
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn lane (veh)						
Median type	None	None				
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vc, conflicting volume						
VC1, stage 1 conf vol						
vc2, stage 2 conf vol						
vcU, unblocked vol						
IC, single (s)	199					
IC, 2 stage (s)	4.1					
IF, (s)	2.2					
p0 queue free %	93					
cLM capacity (veh/h)	1373					
Direction, Lane #	EB1	EB2	WB1	SB1		
Volume Total	101	131	199	71		
Volume Left	101	0	0	18		
Volume Right	0	0	34	53		
CSH	1373	1700	1700	717		
Volume to Capacity	0.07	0.08	0.12	0.10		
Queue Length5th (m)	1.8	0.0	0.0	2.5		
Control Delay (s)	7.8	0.0	0.0	10.6		
Lane LOS	A			B		
Approach Delay (s)	3.4	0.0	10.6	B		
Approach LOS						
Intersection Summary						
Average Delay					3.1	
Intersection Capacity Utilization					30.6%	
Analysis Period (min)					15	A

Total 2027 AM - Mitigation 4: Manotick Main & Bridgeport/Antiochi											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	4♦	0	10	1	0	12	5	324	2	7	149
Traffic Volume (vph)	323	0	10	1	0	12	5	324	2	7	202
Future Volume (vph)	323	0	10	1	0	12	5	324	2	7	149
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00			1.00			1.00			1.00	
Fit	1.00			0.87			1.00			1.00	
Fit Protected	0.95			1.00			1.00			1.00	
Satd. Flow (prot)	1465			1555			1764			1781	
Fit Permitted	0.72			0.98			1.00			1.00	
Satd. Flow (perm)	1110			1526			1759			1755	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	340	0	11	1	0	13	5	341	2	7	157
R/TOR Reduction (vph)	0	34	0	0	9	0	0	1	0	0	115
Lane Group Flow (vph)	0	317	0	0	5	0	0	347	0	0	164
Heavy Vehicles (%)	18%	2%	18%	2%	2%	75%	2%	2%	2%	2%	75%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	4		8		2		2		6		6
Permitted Phases	4		8		2		6		6		6
Actuated Green, G (s)	18.8		18.8		22.6		22.6		6		6
Effective Green, g (s)	20.8		20.8		24.6		24.6		18.3		18.3
Actuated g/C Ratio	0.39		0.39		0.46		0.46		0.38		0.38
Clearance Time (s)	6.0		6.0		6.0		6.0		6.0		6.0
Vehicle Extension (s)	3.0		3.0		3.0		3.0		3.0		3.0
Lane Grp Cap (vph)	432		594		810		808		407		391
V/s Ratio Prot	c0.29		0.00		c0.20		0.09		0.11		0.18
V/s Ratio Perm	0.73		0.01		0.43		0.20		0.24		0.40
V/C Ratio	13.9		10.0		9.7		8.6		8.7		9.7
Uniform Delay, d1	1.00		1.00		1.00		1.00		1.00		1.00
Progression Factor	6.4		6.0		1.7		0.6		1.4		0.4
Incremental Delay, d2	20.3		10.0		11.3		9.1		10.1		14.2
Delay (s)	C		A		B		A		B		A
Level of Service	20.3		10.0		11.3		9.7		10.3		14.2
Approach Delay (s)	C		A		B		A		B		8.7
Approach LOS											A
Intersection Summary											
HCM 2000 Control Delay	13.6		HCM 2000 Level of Service	B							
HCM 2000 Volume to Capacity ratio	0.57		Sum of lost time (s)	8.0							
Actuated Cycle Length (s)	53.4		ICU Level of Service	B							
Intersection Capacity Utilization	55.2%										
Analysis Period (min)	15										
C Critical Lane Group											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	4♦	0	10	1	0	12	5	324	2	7	149
Traffic Volume (vph)	323	0	10	1	0	12	5	324	2	7	202
Future Volume (vph)	323	0	10	1	0	12	5	324	2	7	149
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00			1.00			1.00			1.00	
Fit	1.00			0.87			1.00			1.00	
Fit Protected	0.95			1.00			1.00			1.00	
Satd. Flow (prot)	1465			1555			1764			1781	
Fit Permitted	0.72			0.98			1.00			1.00	
Satd. Flow (perm)	1110			1526			1759			1755	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	340	0	11	1	0	13	5	341	2	7	213
R/TOR Reduction (vph)	0	34	0	0	9	0	0	1	0	0	115
Lane Group Flow (vph)	0	317	0	0	5	0	0	347	0	0	164
Heavy Vehicles (%)	18%	2%	18%	2%	2%	75%	2%	2%	2%	2%	75%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	4		8		2		6		6		6
Permitted Phases	4		8		2		6		6		6
Actuated Green, G (s)	18.8		18.8		22.6		22.6		18.3		18.3
Effective Green, g (s)	20.8		20.8		24.6		24.6		20.3		20.3
Actuated g/C Ratio	0.39		0.39		0.46		0.46		0.44		0.44
Clearance Time (s)	6.0		6.0		6.0		6.0		6.0		6.0
Vehicle Extension (s)	3.0		3.0		3.0		3.0		3.0		3.0
Lane Grp Cap (vph)	432		594		810		808		407		391
V/s Ratio Prot	c0.29		0.00		c0.20		0.09		0.11		0.18
V/s Ratio Perm	0.73		0.01		0.43		0.20		0.24		0.40
V/C Ratio	13.9		10.0		9.7		8.6		8.7		9.7
Uniform Delay, d1	1.00		1.00		1.00		1.00		1.00		1.00
Progression Factor	6.4		6.0		1.7		0.6		1.4		0.4
Incremental Delay, d2	20.3		10.0		11.3		9.1		10.1		14.2
Delay (s)	C		A		B		A		B		A
Level of Service	20.3		10.0		11.3		9.7		10.3		14.2
Approach Delay (s)	C		A		B		A		B		8.7
Approach LOS											A
Intersection Summary											
HCM 2000 Control Delay	13.6		HCM 2000 Level of Service	B							
HCM 2000 Volume to Capacity ratio	0.57		Sum of lost time (s)	8.0							
Actuated Cycle Length (s)	53.4		ICU Level of Service	B							
Intersection Capacity Utilization	55.2%										
Analysis Period (min)	15										
C Critical Lane Group											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	4♦	0	10	1	0	12	5	324	2	7	149
Traffic Volume (vph)	323	0	10	1	0	12	5	324	2	7	202
Future Volume (vph)	323	0	10	1	0	12	5	324	2	7	149
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00			1.00			1.00			1.00	
Fit	1.00			0.87			1.00			1.00	
Fit Protected	0.95			1.00			1.00			1.00	
Satd. Flow (prot)	1465			1555			1764			1781	
Fit Permitted	0.72			0.98			1.00			1.00	
Satd. Flow (perm)	1110			1526			1759			1755	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	340	0	11	1	0	13	5	341	2	7	157
R/TOR Reduction (vph)	0	34	0	0	9	0	0	1	0	0	115
Lane Group Flow (vph)	0	317	0	0	5	0	0	347	0	0	164
Heavy Vehicles (%)	18%	2%	18%	2%	2%	75%	2%	2%	2%	2%	75%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	4		8		2		6		6		6
Permitted Phases	4		8		2		6		6		6
Actuated Green, G (s)	18.8		18.8		22.6		22.6		18.3		18.3
Effective Green, g (s)	20.8		20.8		24.6		24.6		20.3		20.3
Actuated g/C Ratio	0.39		0.39		0.46		0.46		0.44		0.44
Clearance Time (s)	6.0		6.0		6.0		6.0		6.0		6.0
Vehicle Extension (s)	3.0		3.0		3.0		3.0		3.0		3.0
Lane Grp Cap (vph)	432		594		810		808		407		391
V/s Ratio Prot	c0.29		0.00		c0.20		0.09		0.11		0.18
V/s Ratio Perm	0.73		0.01		0.43		0.20		0.24		0.40
V/C Ratio	13.9		10.0		9.7		8.6		8.7		9.7
Uniform Delay, d1	1.00		1.00		1.00		1.00		1.00		1.00
Progression Factor	6.4		6.0		1.7		0.6		1.4		0.4
Incremental Delay, d2	20.3		10.0		11.3		9.1		10.1		14.2
Delay (s)	C		A		B		A		B		A
Level of Service	20.3		10.0		11.3		9.7		10.3		14.2
Approach Delay (s)	C		A		B		A		B		8.7
Approach LOS											A
Intersection Summary											
HCM 2000 Control Delay	13.6		HCM 2000 Level of Service	B							
HCM 2000 Volume to Capacity ratio	0.57		Sum of lost time (s)	8.0							
Actuated Cycle Length (s)	53.4		ICU Level of Service	B							
Intersection Capacity Utilization	55.2%										

## **Appendix F**

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Total 2032 AM 1: Rideau Valley/Maniotick Main & Century						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		A	B	C	D
Traffic Volume (veh/h)	111	44	21	280	117	48
Future Volume (Veh/h)	111	44	21	280	117	48
Sign Control	Stop		Free	Free		
Grade	0%		0%	0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	117	46	22	295	123	51
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn lane (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vc, conflicting volume						
vc1, stage 1 conf vol						
vc2, stage 2 conf vol						
vcu, unblocked vol						
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	78	95	98			
cM capacity (veh/h)	531	898	1403			
Direction Lane #	EB 1	NB 1	SB 1			
Volume Total	163	317	174			
Volume Left	117	22	0			
Volume Right	46	0	51			
cSH	600	1403	1700			
Volume to Capacity	0.27	0.02	0.10			
Queue Length 95th (m)	8.3	0.4	0.0			
Control Delay (s)	13.2	0.7	0.0			
Lane LOS	B	A				
Approach Delay (s)	13.2	0.7	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay	3.6					
Intersection Capacity Utilization	45.7%					
Analysis Period (min)	15					

Total 2032 AM 2: Century & Trestle						
Movement	EBL	EBR	NBL	NBT	WBT	SBL
Lane Configurations	Y		A	B	C	D
Traffic Volume (veh/h)	111	44	21	280	117	48
Future Volume (Veh/h)	111	44	21	280	117	48
Sign Control	Stop		Free	Free		
Grade	0%		0%	0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	117	46	22	295	123	51
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn lane (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vc, conflicting volume						
vc1, stage 1 conf vol						
vc2, stage 2 conf vol						
vcu, unblocked vol						
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	78	95	98			
cM capacity (veh/h)	531	898	1403			
Direction Lane #	EB 1	NB 1	SB 1			
Volume Total	129	64	104			
Volume Left	27	0	39			
Volume Right	0	17	65			
cSH	1178	1700	860			
Volume to Capacity	0.02	0.04	0.12			
Queue Length 95th (m)	0.5	0.0	3.1			
Control Delay (s)	1.9	0.0	9.8			
Lane LOS	A					
Approach Delay (s)	1.9	0.0	9.8			
Approach LOS	B					
Intersection Summary						
Average Delay	3.6					
Intersection Capacity Utilization	45.7%					
Analysis Period (min)	15					

Total 2032 AM 3: 1st Line & Century											06/21/2017													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↙	↘	↖	↗	↙	↘	↖	↗	↙	↘	↖	↗	↙	↘	↖	↗	↙	↘	↖	↗	↙	↘
Sign Control																								
Traffic Volume (vph)	3	54	0	0	50	219	0	0	89	0	7													
Future Volume (vph)	3	54	0	0	50	219	0	0	89	0	7													
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95													
Hourly flowrate (vph)	3	57	0	0	53	231	0	0	94	0	7													
Direction, Lane #	EB1	WB1	NB1	SB1																				
Volume Total (vph)	60	284	0	101																				
Volume Left (vph)	3	0	0	94																				
Volume Right (vph)	0	231	0	7																				
Hadj (s)	0.04	-0.45	0.00	0.18																				
Departure Headway (s)	4.5	3.8	4.7	4.8																				
Degree Utilization x	0.07	0.30	0.00	0.13																				
Capacity (veh/h)	773	931	702	698																				
Control Delay (s)	7.8	8.4	7.7	8.5																				
Approach Delay (s)	7.8	8.4	0.0	8.5																				
Approach LOS	A	A	A	A																				
Intersection Summary											8.3													
Delay												A												
Level of Service												29.3%												
Intersection Capacity Utilization												15												
Analysis Period (min)																								

Total 2032 AM 4: Manotick Main & Bridgeport/Antiochi											06/21/2017													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↙	↘	↖	↗	↙	↘	↖	↗	↙	↘	↖	↗	↙	↘	↖	↗	↙	↘	↖	↗	↙	↘
Sign Control																								
Traffic Volume (vph)	3	54	0	0	50	219	0	0	89	0	7													
Future Volume (vph)	3	54	0	0	50	219	0	0	89	0	7													
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95													
Hourly flowrate (vph)	3	57	0	0	53	231	0	0	94	0	7													
Direction, Lane #	EB1	WB1	NB1	SB1																				
Volume Total (vph)	60	284	0	101																				
Volume Left (vph)	3	0	0	94																				
Volume Right (vph)	0	231	0	7																				
Hadj (s)	0.04	-0.45	0.00	0.18																				
Departure Headway (s)	4.5	3.8	4.7	4.8																				
Degree Utilization x	0.07	0.30	0.00	0.13																				
Capacity (veh/h)	773	931	702	698																				
Control Delay (s)	7.8	8.4	7.7	8.5																				
Approach Delay (s)	7.8	8.4	0.0	8.5																				
Approach LOS	A	A	A	A																				
Intersection Summary											8.3													
Delay												A												
Level of Service												29.3%												
Intersection Capacity Utilization												15												
Analysis Period (min)																								

Total 2032 AM 5: Mandtck Main & Maple/Bridge												
Movement	EBL	EBT	EBC	VBL	VBT	WBL	WBT	NBL	NBT	NBR	SBL	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	22	30	5	90	42	390	0	363	241	311	167	33
Future Volume (vph)	22	30	5	90	42	390	0	363	241	311	167	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit	1.00	0.98	1.00	1.00	0.95	1.00	1.00	0.85	1.00	0.85	1.00	0.98
FitProtected	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1695	1748	1695	1784	1508	1784	1492	1695	1740	1784	1492	1695
FitPermitted	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1695	1748	1695	1784	1508	1784	1492	1695	1740	1784	1492	1695
Peak-hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	32	5	95	44	411	0	382	254	327	176	35
RTOR Reduction (vph)	0	4	0	0	0	252	0	0	131	0	4	0
Lane Group Flow (vph)	23	33	0	95	44	159	0	382	123	327	207	0
Confli. Peds. (#/hr)	1											
Turn Type	Split	NA	Split	NA	pmt+ov	NA	pmt+ov	pmt+pt	NA			
Protected Phases	4	4	8	8	2	8	2	8	1	6		
Permitted Phases												
Actualized Green G(s)	9.3	9.3	13.2	13.2	32.5	28.9	42.1	54.5	54.5			
Effective Green g(s)	11.5	11.5	15.4	15.4	37.1	31.2	46.5	56.8	56.8			
Actualized g/C Ratio	0.12	0.12	0.16	0.16	0.39	0.33	0.49	0.59	0.59			
Clearance Time (s)	6.2	6.2	6.2	6.2	6.3	6.3	6.2	6.3	6.3			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	203	210	272	287	584	581	724	560	1032			
v/s Ratio Ptot	0.01	0.02	c0.06	0.02	0.06	c0.21	0.03	c0.13	0.12			
v/s Ratio Perm												
v/C Ratio	0.11	0.16	0.35	0.15	0.27	0.66	0.17	0.58	0.20			
Uniform Delay d1	37.6	37.7	35.7	34.5	20.1	27.7	13.8	12.2	9.0			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	0.2	0.3	0.8	0.2	0.3	2.7	0.1	1.6	0.1			
Delay (s)	37.8	38.1	36.5	34.8	20.3	30.4	13.9	13.8	9.1			
Level of Service	D	D	D	C	C	C	B	B	A			
Approach Delay (s)	38.0		24.3		23.8		11.9					
Approach LOS	D		C		C		B		A			
Intersection Summary												
HCM 2000 Control Delay			20.8		HCM 2000 Level of Service	C						
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			95.7		Sum of lost time (s)	18.0						
Intersection Capacity Utilization			65.6%		ICU Level of Service	C						
Analysis Period (min)			15									
c Critical Lane Group												

Total 2032 AM 6: Century & Access 1												
Movement	EBL	EBT	EBC	VBL	VBT	WBL	WBT	NBL	NBT	NBR	SBL	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	22	30	5	90	42	390	0	363	241	311	167	33
Future Volume (vph)	22	30	5	90	42	390	0	363	241	311	167	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit	1.00	0.98	1.00	1.00	0.95	1.00	1.00	0.85	1.00	0.85	1.00	0.98
FitProtected	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1695	1748	1695	1784	1508	1784	1492	1695	1740	1784	1492	1695
FitPermitted	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1695	1748	1695	1784	1508	1784	1492	1695	1740	1784	1492	1695
Peak-hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	32	5	95	44	411	0	382	254	327	176	35
RTOR Reduction (vph)	0	4	0	0	0	252	0	0	131	0	4	0
Lane Group Flow (vph)	23	33	0	95	44	159	0	382	123	327	207	0
Confli. Peds. (#/hr)	1											
Turn Type	Split	NA	Split	NA	pmt+ov	NA	pmt+ov	pmt+pt	NA			
Protected Phases	4	4	8	8	2	8	2	6	1	6		
Permitted Phases												
Actualized Green G(s)	9.3	9.3	13.2	13.2	32.5	28.9	42.1	54.5	54.5			
Effective Green g(s)	11.5	11.5	15.4	15.4	37.1	31.2	46.5	56.8	56.8			
Actualized g/C Ratio	0.12	0.12	0.16	0.16	0.39	0.33	0.49	0.59	0.59			
Clearance Time (s)	6.2	6.2	6.2	6.2	6.3	6.3	6.2	6.3	6.3			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	203	210	272	287	584	581	724	560	1032			
v/s Ratio Ptot	0.01	0.02	c0.06	0.02	0.06	c0.21	0.03	c0.13	0.12			
v/s Ratio Perm												
v/C Ratio	0.11	0.16	0.35	0.15	0.27	0.66	0.17	0.58	0.20			
Uniform Delay d1	37.6	37.7	35.7	34.5	20.1	27.7	13.8	12.2	9.0			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	0.2	0.3	0.8	0.2	0.3	2.7	0.1	1.6	0.1			
Delay (s)	37.8	38.1	36.5	34.8	20.3	30.4	13.9	13.8	9.1			
Level of Service	D	D	D	C	C	C	B	B	A			
Approach Delay (s)	38.0		24.3		23.8		11.9					
Approach LOS	D		C		C		B		A			
Intersection Summary												
HCM 2000 Control Delay			20.8		HCM 2000 Level of Service	C						
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			95.7		Sum of lost time (s)	18.0						
Intersection Capacity Utilization			65.6%		ICU Level of Service	C						
Analysis Period (min)			15									
c Critical Lane Group												

A

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Total 2032 AM 7: Century & Access 2		EBL	EBT	WBT	WBR	SBL	SBR						
Lane Configurations		54	88	139	11	27	136	4	4	4	4	4	4
Traffic Volume (veh/h)		54	88	139	11	27	136						
Future Volume (Veh/h)													
Sign Control		Free	Free	Stop									
Grade		0%	0%	0%	0%								
Peak Hour Factor		0.95	0.95	0.95	0.95								
Hourly flow rate (vph)		57	93	146	12	28	143						
Pedestrians													
Lane Width (m)													
Walking Speed (m/s)													
Percent Blockage													
Right turn lane (veh)													
Median type		None	None										
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vc, conflicting volume		158		359	152								
vc1, stage 1 conf vol													
vc2, stage 2 conf vol													
vcU, unblocked vol		158		359	152								
IC, single (s)		4.1		6.4	6.2								
IC, 2 stage (s)													
IF (s)		2.2		3.5	3.3								
p0 queue free %		96		95	84								
cM capacity (veh/h)		1422		614	894								
Direction Lane #	EB1	WB1	SB1										
Direction	Lane #	EB1	WB1	SB1									
Volume Total	150	158	171										
Volume Left	57	0	28										
Volume Right	0	12	143										
cSH	1422	1700	832										
Volume to Capacity	0.04	0.09	0.21										
Queue Length 50th (m)	1.0	0.0	5.8										
Control Delay (s)	3.1	0.0	10.4										
Lane LOS	A	B	B										
Approach Delay (s)	3.1	0.0	10.4										
Approach LOS													
Intersection Summary													
Average Delay	4.7												
Intersection Capacity Utilization	36.9%												
Analysis Period (min)	15												

Total 2032 PM 1: Ridgeau Valley/Manotick Main & Century		EBL	EBT	WBT	WBR	SBL	SBR						
Movement								EBL	EBT	NBL	NBT	SBT	SBR
Lane Configurations								99	32	42	194	345	150
Traffic Volume (veh/h)								99	32	42	194	345	150
Future Volume (Veh/h)								Stop			Free		
Sign Control								Grade		0%	0%	0%	
Grade		0%	0%	0%	0%			Peak Hour Factor		0.95	0.95	0.95	0.95
Peak Hour Factor		0.95	0.95	0.95	0.95			Hourly flow rate (vph)		104	34	204	363
Hourly flow rate (vph)		57	93	146	12	28	143	Pedestrians					
Pedestrians								Lane Width (m)					
Lane Width (m)								Walking Speed (m/s)					
Walking Speed (m/s)								Percent Blockage					
Percent Blockage								Right turn lane (veh)					
Right turn lane (veh)								Median type					
Median type								Median storage (veh)					
Median storage (veh)								Upstream signal (m)					
Upstream signal (m)								pX, platoon unblocked					
pX, platoon unblocked								vc, conflicting volume					
vc, conflicting volume								vc1, stage 1 conf vol					
vc1, stage 1 conf vol								vc2, stage 2 conf vol					
vcU, unblocked vol								vcU, unblocked vol					
vcU, unblocked vol								IC, single (s)					
IC, single (s)								IC, 2 stage (s)					
IC, 2 stage (s)								IF (s)					
IF (s)								p0 queue free %					
p0 queue free %								cM capacity (veh/h)					
cM capacity (veh/h)								Direction Lane #					
Direction Lane #	EB1	WB1	SB1					Direction	Lane #	EB1	NB1	SB1	
Volume Total	150	158	171					Volume Total	138	248	521		
Volume Left	57	0	28					Volume Left	104	44	0		
Volume Right	0	12	143					Volume Right	34	0	158		
cSH	1422	1700	832					cSH	411	1045	1700		
Volume to Capacity	0.04	0.09	0.21					Volume to Capacity	0.34	0.04	0.31		
Queue Length 50th (m)	1.0	0.0	5.8					Queue Length 50th (m)	11.0	1.0	0.0		
Control Delay (s)	3.1	0.0	10.4					Control Delay (s)	18.1	1.9	0.0		
Lane LOS	A	B	B					Lane LOS	C				
Approach Delay (s)	3.1	0.0	10.4					Approach Delay (s)	18.1	1.9	0.0		
Approach LOS								Approach LOS	C				
Intersection Summary								Intersection Summary					
Average Delay	4.7							Average Delay	3.3				
Intersection Capacity Utilization	36.9%							Intersection Capacity Utilization	59.9%				
Analysis Period (min)	15							Analysis Period (min)	15				

Total 2032 PM 2: Century & Trestle							Total 2032 PM 3: 1st Line & Century									
Movement	EBL	EBT	WBT	WBR	SBL	SBR	Movement	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Configurations							Lane Configurations									
Traffic Volume (veh/h)	67	93	137	42	32	52	Sign Control									
Future Volume (Veh/h)	67	93	137	42	32	52	Traffic Volume (vph)									
Sign Control	Free	Free	Stop				Future Volume (vph)	7	92	0	0	90	135	0	259	0
Grade	0%	0%	0%	0%	0%		Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95		Hourly flow rate (vph)	7	97	0	0	95	142	0	273	0
Hourly flow rate (vph)	71	98	144	44	34		Direction Lane #	EB 1	WB 1	NB 1	SB 1					
Pedestrians							Volume Total (vph)	104	237	0	280					
Lane Width (m)							Volume Left (vph)	7	0	0	273					
Walking Speed (m/s)							Volume Right (vph)	0	142	0						
Percent Blockage							Head (s)	0.05	-0.33	0.00	0.21					
Right turn flare (veh)							Departure Headway (s)	5.0	4.5	5.1	4.9					
Median type	None	None					Degree Utilization, x	0.14	0.29	0.00	0.38					
Median storage (veh)							Capacity (veh/h)	668	758	640	692					
Upstream signal (m)							Control Delay (s)	8.8	9.3	8.1	10.9					
pX, platoon unblocked							Approach Delay (s)	8.8	9.3	0.0	10.9					
vc, conflicting volume							Approach LOS	A	A	A	B					
vc1, stage 1 conf vol							Intersection Summary									
vc2, stage 2 conf vol							Delay					10.0				
vc4, unblocked conf vol							Level of Service					A				
IC, single (s)	4.8						Intersection Capacity Utilization					36.0%				
IC, 2 stage (s)							Analysis Period (min)					15				
IF (s)	2.9															
p0 queue free %	93															
cm capacity (veh/h)	1047															
Direction Lane #	EB 1	WB 1	NB 1	SB 1												
Volume Total	169	188	89													
Volume Left	71	0	34													
Volume Right	0	44	55													
cSH	1047	1700	688													
Volume to Capacity	0.07	0.11	0.13													
Queue Length 50th (m)	1.7	0.0	3.4													
Control Delay (s)	4.0	0.0	11.0													
Lane LOS	A	B														
Approach Delay (s)	4.0	0.0	B													
Approach LOS																
Intersection Summary																
Average Delay			3.7													
Intersection Capacity Utilization			34.6%													
Analysis Period (min)			15													

Total 2032 PM 2: Century & Trestle							Total 2032 PM 3: 1st Line & Century									
Movement	EBL	EBT	WBT	WBR	SBL	SBR	Movement	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Configurations							Lane Configurations									
Traffic Volume (veh/h)	67	93	137	42	32	52	Sign Control									
Future Volume (Veh/h)	67	93	137	42	32	52	Traffic Volume (vph)									
Sign Control	Free	Free	Stop				Future Volume (vph)	7	92	0	0	90	135	0	259	0
Grade	0%	0%	0%	0%	0%		Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95		Hourly flow rate (vph)	7	97	0	0	95	142	0	273	0
Hourly flow rate (vph)	71	98	144	44	34		Direction Lane #	EB 1	WB 1	NB 1	SB 1					
Pedestrians							Volume Total (vph)	104	237	0	280					
Lane Width (m)							Volume Left (vph)	7	0	0	273					
Walking Speed (m/s)							Volume Right (vph)	0	142	0						
Percent Blockage							Head (s)	0.05	-0.33	0.00	0.21					
Right turn flare (veh)							Departure Headway (s)	5.0	4.5	5.1	4.9					
Median type	None	None					Degree Utilization, x	0.14	0.29	0.00	0.38					
Median storage (veh)							Capacity (veh/h)	668	758	640	692					
Upstream signal (m)							Control Delay (s)	8.8	9.3	8.1	10.9					
pX, platoon unblocked							Approach Delay (s)	8.8	9.3	0.0	10.9					
vc, conflicting volume							Approach LOS	A	A	A	B					
vc1, stage 1 conf vol							Intersection Summary									
vc2, stage 2 conf vol							Delay					10.0				
vc4, unblocked conf vol							Level of Service					A				
IC, single (s)	4.8						Intersection Capacity Utilization					36.0%				
IC, 2 stage (s)							Analysis Period (min)					15				
IF (s)	2.9															
p0 queue free %	93															
cm capacity (veh/h)	1047															
Direction Lane #	EB 1	WB 1	NB 1	SB 1												
Volume Total	169	188	89													
Volume Left	71	0	34													
Volume Right	0	44	55													
cSH	1047	1700	688													
Volume to Capacity	0.07	0.11	0.13													
Queue Length 50th (m)	1.7	0.0	3.4													
Control Delay (s)	4.0	0.0	11.0													
Lane LOS	A	B														
Approach Delay (s)	4.0	0.0	B													
Approach LOS																
Intersection Summary																
Average Delay			3.7													
Intersection Capacity Utilization			34.6%													
Analysis Period (min)			15													

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Total 2032 PM

3: 1st Line & Century

06/21/2017

Total 2032 PM

2: Century & Trestle

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Total 2032 PM 6: Century & Access 1						Total 2032 PM 7: Century & Access 2							
Movement	EBL	EBT	WBT	WBR	SBL	SBR	Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	96	124	157	32	17	50	Lane Configurations	160	191	147	32	17	83
Traffic Volume (veh/h)	96	124	157	32	17	50	Traffic Volume (veh/h)	160	191	147	32	17	83
Future Volume (Veh/h)	96	Free	Free	Stop			Future Volume (Veh/h)	Free	Free	Stop			
Sign Control							Sign Control						
Grade	0%	0%	0%	0%	0%		Grade						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95		Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	101	131	165	34	18	53	Hourly flow rate (vph)	168	201	155	34	18	87
Pedestrians							Pedestrians						
Lane Width (m)							Lane Width (m)						
Walking Speed (m/s)							Walking Speed (m/s)						
Percent Blockage							Percent Blockage						
Right turn lane (veh)							Right turn lane (veh)						
Median type	None	None	None				Median type	None	None				
Median storage (veh)							Median storage (veh)						
Upstream signal (m)							Upstream signal (m)						
pX, platoon unblocked							pX, platoon unblocked						
vc, conflicting volume	199						vc, conflicting volume	189					
vc1, stage 1 conf vol							vc1, stage 1 conf vol						
vc2, stage 2 conf vol							vc2, stage 2 conf vol						
vcu, unblocked vol	199						vcu, unblocked vol	189					
IC, single (s)	4.1						IC, single (s)	4.1					
IC, 2 stage (s)							IC, 2 stage (s)						
IF (s)	2.2						IF (s)	2.2					
p0 queue free %	93						p0 queue free %	88					
cM capacity (veh/h)	1373						cM capacity (veh/h)	1385					
Direction Lane #	EB1	EB2	WB1	SB1			Direction Lane #	EB1	WB1	SB1			
Volume Total	101	131	199	71			Volume Total	369	189	105			
Volume Left	101	0	0	18			Volume Left	168	0	18			
Volume Right	0	0	34	53			Volume Right	0	34	87			
cSH	1373	1700	717				cSH	1385	1700	696			
Volume to Capacity	0.07	0.08	0.12	0.10			Volume to Capacity	0.12	0.11	0.15			
Queue Length 95th (m)	1.8	0.0	0.0	2.5			Queue Length 95th (m)	3.1	0.0	4.0			
Control Delay (s)	7.8	0.0	0.0	10.6			Control Delay (s)	4.2	0.0	11.1			
Lane LOS	A	B					Lane LOS	A	B				
Approach Delay (s)	3.4	0.0	10.6	B			Approach Delay (s)	4.2	0.0	11.1	B		
Approach LOS							Approach LOS						
Intersection Summary	3.1						Intersection Summary						
Average Delay							Average Delay						
Intersection Capacity Utilization	30.6%						Intersection Capacity Utilization	4.1					
Analysis Period (min)	15						Analysis Period (min)	46.6%					

Total 2032 PM 7: Century & Access 2						06/21/2017							
Movement	EBL	EBT	WBT	WBR	SBL	SBR	Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	96	124	157	32	17	50	Lane Configurations	160	191	147	32	17	83
Traffic Volume (veh/h)	96	124	157	32	17	50	Traffic Volume (veh/h)	160	191	147	32	17	83
Future Volume (Veh/h)	96	Free	Free	Stop			Future Volume (Veh/h)	Free	Free	Stop			
Sign Control							Sign Control						
Grade	0%	0%	0%	0%	0%		Grade						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95		Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	101	131	165	34	18	53	Hourly flow rate (vph)	168	201	155	34	18	87
Pedestrians							Pedestrians						
Lane Width (m)							Lane Width (m)						
Walking Speed (m/s)							Walking Speed (m/s)						
Percent Blockage							Percent Blockage						
Right turn lane (veh)							Right turn lane (veh)						
Median type	None	None	None				Median type	None	None				
Median storage (veh)							Median storage (veh)						
Upstream signal (m)							Upstream signal (m)						
pX, platoon unblocked							pX, platoon unblocked						
vc, conflicting volume	199						vc, conflicting volume	189					
vc1, stage 1 conf vol							vc1, stage 1 conf vol						
vc2, stage 2 conf vol							vc2, stage 2 conf vol						
vcu, unblocked vol	199						vcu, unblocked vol	189					
IC, single (s)	4.1						IC, single (s)	4.1					
IC, 2 stage (s)							IC, 2 stage (s)						
IF (s)	2.2						IF (s)	2.2					
p0 queue free %	93						p0 queue free %	88					
cM capacity (veh/h)	1373						cM capacity (veh/h)	1385					
Direction Lane #	EB1	EB2	WB1	SB1			Direction Lane #	EB1	WB1	SB1			
Volume Total	101	131	199	71			Volume Total	369	189	105			
Volume Left	101	0	0	18			Volume Left	168	0	18			
Volume Right	0	0	34	53			Volume Right	0	34	87			
cSH	1373	1700	717				cSH	1385	1700	696			
Volume to Capacity	0.07	0.08	0.12	0.10			Volume to Capacity	0.12	0.11	0.15			
Queue Length 95th (m)	1.8	0.0	0.0	2.5			Queue Length 95th (m)	3.1	0.0	4.0			
Control Delay (s)	7.8	0.0	0.0	10.6			Control Delay (s)	4.2	0.0	11.1			
Lane LOS	A	B					Lane LOS	A	B				
Approach Delay (s)	3.4	0.0	10.6	B			Approach Delay (s)	4.2	0.0	11.1	B		
Approach LOS							Approach LOS						
Intersection Summary	3.1						Intersection Summary						
Average Delay							Average Delay						
Intersection Capacity Utilization	30.6%						Intersection Capacity Utilization	4.1					
Analysis Period (min)	15						Analysis Period (min)	46.6%					