

Transportation Impact Assessment

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Introduction

The purpose of this report is to assess the transportation impact of a proposed commercial development located at 5646 and 5650 Manotick Main Street in Manotick, Ontario. The project site is shown on **Figure 1**.



Figure 1: Project Location

The format of this report is consistent with the City of Ottawa's Transportation Impact Assessment (TIA) Guidelines (2017).

1 Screening

1.1 Summary of Development

Table 1 presents a description of the proposed development. A detailed layout is included in **Appendix B**.

Table 1: Description of Proposed Development

Municipal Address	5646 and 5650 Manotick Main Street, Manotick, Ontario K4M 1B3
Description of Location	West side of Manotick Main Street, north side of Mahogany Harbour Lane
Land Use Classification	Rural Commercial 1 with exception 152r
Development Size (units)	n/a
Development Size (m ²)	223 m ² building and a 5-stall self-service car wash (replaces an existing 135 m ² store, 2-stall car wash and apartment unit)
Number of Accesses and Locations	1 proposed access on Manotick Main Street (replaces an existing access)
Phase of Development	Single phase
Buildout Year	2023

1.2 Trip Generation Triggers

A TIA is warranted if the proposed development is anticipated to generate a significant number of person-trips that may affect the performance of the transportation network. **Table 2** presents the trip generation triggers.

Table 2: Trip Generation Triggers

Land Use Type	Minimum Development Size	Proposed Development Size
Single-family homes	40 units	–
Townhomes or apartments	90 units	–
Office	3,500 m ²	–
Industrial	5,000 m ²	–
Fast-food restaurant or coffee shop	100 m ²	223 m ²
Destination retail	1,000 m ²	–
Gas station or convenience market	75 m ²	–

The proposed land uses exceed the trip generation threshold for a fast-food restaurant development. Therefore, a TIA is **warranted** based on trip generation.

1.3 Location Triggers

A TIA may be warranted based on location. **Table 3** presents the location triggers.

Table 3: Location Triggers

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

Based on the information above, a TIA is **warranted** based on location.

1.4 Safety Triggers

A TIA may be warranted based on safety. **Table 4** presents the safety triggers.

Table 4: Safety Triggers

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

Based on the information above, a TIA is **warranted** based on safety.

1.5 Summary

A TIA is warranted if any of the justifications in **Table 5** are met.

Table 5: Summary of TIA Triggers

Trigger Category	Yes/No
Does the development satisfy one of the trip generation triggers?	Yes
Does the development satisfy one of the location triggers?	Yes
Does the development satisfy one of the safety triggers?	Yes

Based on the information above, a TIA is **warranted**.

2 Scoping

2.1 Existing and Planned Conditions

2.1.1 Proposed Development

The project consists of the removal of an existing 135 m² store, car wash and apartment unit, the construction of a 1-storey drive-through coffee shop with an area of 223.2 m² (2402.5 sq. ft.), a 5-stall self-service car wash, and the redevelopment of the existing parking space into a fully paved parking lot with a capacity of 23 spaces (18 for the coffee shop, 5 for the car wash). A site plan is provided in **Appendix B**.

The estimated year of occupancy is 2023. The project site will be accessed via Manotick Main Street through a single access.

2.1.2 Existing Conditions

2.1.2.1 Roadways

Manotick Main Street is a rural 2-lane undivided arterial roadway in a mixed residential and commercial setting. The posted speed limit near the project site is 60 km/h. Manotick Main Street is one of Manotick's main arterial roadways. It becomes Rideau Valley Drive beyond Bankfield Road and connects to Prince of Wales Drive to the north, and it becomes Rideau Valley Drive North beyond Century Road East and connects to Rogers Stevens Drive to the south.

Two streets are located immediately adjacent to the project site on the south side: **Mahogany Harbour Lane** and **Firefly Lane**. Both streets connect to Manotick Main Street, spaced at 20 m from each other, are Stop-controlled and are dead-end streets serving a small number of houses. As is the case on streets in Ontario where there is no posted speed limit, the speed limit on these two streets is 50 km/h. It is noted that Mahogany Harbour Lane is a private street.

There are two notable intersections near the project site. The intersection with Bridgeport Avenue / Antochi Lane is approximately 200 m south of the project site and is two-way Stop-controlled. The intersection with Eastman Avenue, approximately 250 m north of the project site, is also Stop-controlled on the minor approach and a left-turn lane is provided on Manotick Main Street in the northbound direction.

- **Antochi Lane** is a two-lane dead-end local road while **Bridgeport Avenue** is a 2-lane local road serving the newly developed Mahogany Community. The unposted speed limit on both roads is 50 km/h. In contrast to most roadways in the area, Bridgeport Avenue has a curb and a sidewalk on both sides.
- **Eastman Avenue** is a collector road with a posted 40 km/h speed limit that serves an existing residential community and connects to the Manotick Mews commercial plaza.

Further south, Manotick Main Street also intersects with Orchard Hollow Drive, Island View Drive, Artemis Circle, and Century Road. All these intersections are Stop-controlled on the side streets and have no traffic control on Manotick Main Street.

- **Orchard Hollow Drive** is a 2-lane dead-end local residential road approximately 330 m south of the project site, with an unposted speed limit of 50 km/h.
- **Island View Drive** is a 2-lane local residential crescent intersecting with Manotick Main Street at two points. The nearest intersection is approximately 400 m south of the project site and the unposted speed limit is 50 km/h.
- **Artemis Circle** is a 2-lane local residential road approximately 600 m south of the project site, with an unposted speed limit of 50 km/h.
- **Century Road East** is a 2-lane undivided collector road approximately 750 m south of the project site with a posted speed limit of 80 km/h. The Manotick Main Street / Century Road East intersection is flared in the southbound direction to accommodate right-turn traffic.

2.1.2.2 Public Transportation

Figure 2 illustrates the available bus stops near the project site. These stops are served by OC Transpo bus Route 299, a “Connexion” route which only operates during weekday peak hours in the northbound direction during the morning peak, and the southbound direction during the afternoon peak.

Local bus Route 176 also services the Manotick area. The route connects Beaverwood Road, approximately 900 m north of the project site, to Barrhaven Centre. This route also only operates during weekday peak hours.



Figure 2: Transit Stop Locations

2.1.2.3 Active Transportation Network

There are currently no sidewalks or cycling facilities near the project site. The shoulders on Manotick Main Street alternate between paved and gravel in an apparently random manner.

Sidewalks are provided on both sides of Bridgeport Avenue south of the project site.

There is an existing multi-use path along Mahogany Creek west of the project site providing a connection from Eastman Avenue to Bridgeport Avenue and to Century Road. However, this path does not connect to Mahogany Harbour Lane and does not improve access to the project site in any way.

No sidewalks or cycling facilities are provided on any of the other roads near the project site.

2.1.2.4 Existing Traffic Volumes

Traffic count reports were acquired from the City of Ottawa for the following intersections:

- Manotick Main Street / Eastman Avenue (October 10, 2019)
- Manotick Main Street / Bridgeport Avenue / Antochi Lane (October 1, 2019)
- Manotick Main Street / Century Road East (July 17, 2019)
- Manotick Main Street / Century Road East (November 8, 2022)

The traffic counts at Century Road East were compared. The traffic count conducted on July 17, 2019 was observed to have slightly higher volumes than the one conducted on November 8, 2022. Considering that

the former preceded the COVID-19 pandemic, it was determined that it was a more reliable source of data and was therefore selected for analysis.

Additionally, a traffic count was conducted by BTE at the intersection of Manotick Main Street / Mahogany Harbour Lane / Firefly Lane on February 2, 2023.

Figure 3 and **Figure 4** present the existing morning and afternoon traffic volumes in the vicinity of the project site. Traffic count reports are provided in **Appendix C**.

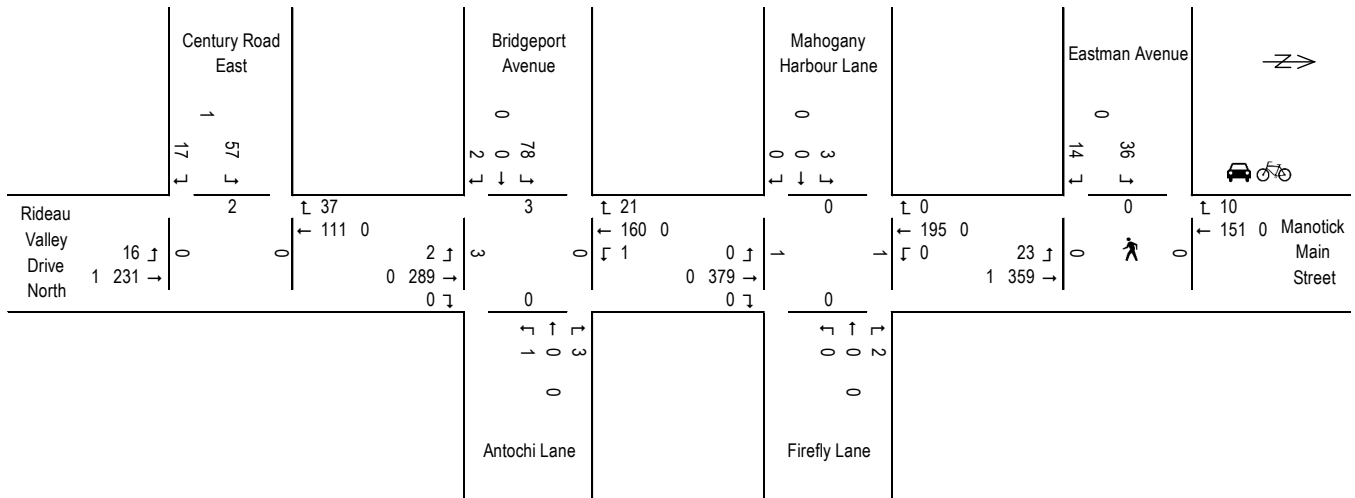


Figure 3: Existing Traffic Volumes, Morning Peak Hour

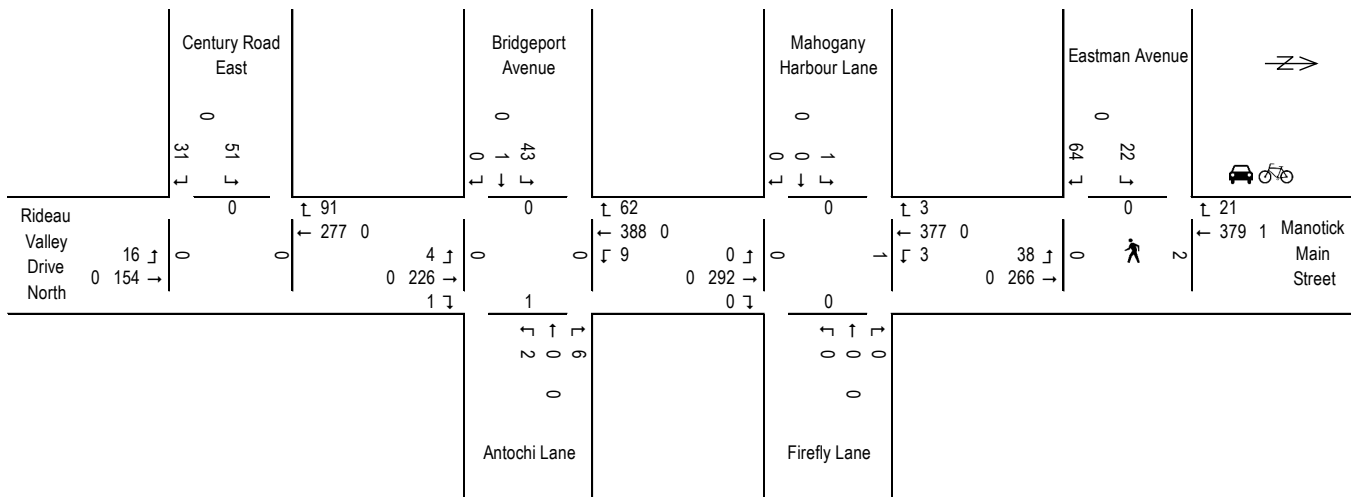


Figure 4: Existing Traffic Volumes, Afternoon Peak Hour

2.1.2.5 Collision History

Collision data for Manotick Main Street between Eastman Avenue and Century Road East have been acquired from the City of Ottawa for the 5-year period between 2016 and 2020. A detailed collision history report is available in **Appendix D**.

A total of 7 collisions have been reported during that period, including 3 intersection collisions at Manotick Main Street / Bridgeport Avenue / Antochi Lane, 2 collisions at Manotick Main Street / Island View Drive (north) and 2 non-intersection collisions on Manotick Main Street. Three collisions involved non-fatal injuries and 4 involved property damages only.

Three (3) collisions involved only one vehicle, 2 collisions were rear-end, 1 was a turning collision and 1 was an angle collision.

Five (5) collisions occurred during daytime on dry road with clear weather, 1 occurred during daytime on packed snow while snowing, and 1 occurred during nighttime on loose snow while snowing.

Due to the low number of collisions and the lack of any discernable pattern, it is concluded that there is currently no significant safety issue near the project site.

2.1.3 Planned Conditions

2.1.3.1 Background Developments

According to the City of Ottawa's Development Application Search tool, two developments are planned north of the project site: a 3-storey mixed-used office building at 5514 Manotick Main Street with two retail units and two office tenants, and a residential low rise rental apartment building with 21 residential units at 5497 Manotick Main Street. Both projects, approximately 1 km north of the project site, are not expected to have a significant impact on traffic near the project site.

The Manotick Secondary Plan identifies the development in 5 phases of the Mahogany Community, a residential community north of Century Road East extending from Manotick Main Street to First Line Road and accessed primarily by Bridgeport Avenue. Phase 1 has recently been completed and Phase 2 is under development. This development is expected to have a significant impact on the intersection of Manotick Main Street / Bridgeport Avenue / Antochi Lane and on traffic near the project site.

2.1.3.2 Roadways

The Manotick Secondary Plan identifies the following potential improvements near the project site:

- Construction of a roundabout at the intersection of Manotick Main Street / Bridgeport Avenue / Antochi Lane, planned for 2024; and
- Extension of Bridgeport Avenue to First Line Road as part of the Mahogany Community development to minimize the site traffic impact on Manotick Main Street.

2.1.3.3 Public Transportation

The 2013 Transportation Master Plan and the Manotick Secondary Plan do not identify any planned changes to public transportation in Manotick.

2.1.3.4 Active Transportation

The Manotick Secondary Plan proposes the implementation of sidewalks on Manotick Main Street, Eastman Avenue and Century Road East.

Road resurfacing, including paved shoulders, is planned in the near-term on Manotick Main Street from Bridgeport Avenue to north of Eastman Avenue.

Manotick Main Street, Eastman Avenue and Century Road East are expected to become cycling routes in the future. According to the 2013 Cycling Plan, Manotick Main Street is identified as a spine route while Eastman Avenue and Century Road East are identified as local routes in the “Ultimate Cycling Network”. However, other than the near-term paved shoulders on Manotick Main Street, no specific features (i.e., painted lanes, separate path) or timing are proposed.

2.2 Study Area and Time Period

2.2.1 Study Area

For the purpose of this analysis, the study area includes the project site driveway as well as the following intersections:

- Manotick Main Street / Eastman Avenue
- Manotick Main Street / Mahogany Harbour Lane
- Manotick Main Street / Bridgeport Avenue / Antochi Lane
- Manotick Main Street / Century Road

2.2.2 Time Periods

The proposed development is expected to be in operation during extended business hours. The critical peak periods are expected to be the weekday morning and afternoon peak hours.

2.2.3 Horizon Year

The project is anticipated to be completed by the end of 2023. Therefore, the year 2028 (5 years after buildout) has been considered in the analysis.

2.3 Exemption Review

Table 6 presents the elements of the TIA Guidelines that can be exempted from the analysis.

Table 6: Possible TIA Exemptions

Element	Exemption	Exempt?
4.1.2 Circulation and Access	Only required for site plans	No
4.1.3 New Street Networks	Only required for plans of subdivision	Yes
4.2.1 Parking Supply	Only required for site plans	No
4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Yes
4.5 Transportation Demand Management	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Yes
4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Yes
4.8 Network Concept	Only required when the proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by established zoning	Yes

3 Forecasting

3.1 Development-Generated Travel Demand

3.1.1 Trip Generation and Mode Shares

According to the site plan, the proposed development will consist of a 223.2 m² (2,402.5 sq. ft.) drive-through restaurant and a 5-stall self-service car wash. It is assumed that the restaurant will be a coffee/donut shop.

According to the Institute of Transportation Engineers' (ITE) Trip Generation Manual, 11th Edition, a coffee/donut shop with drive a through window (ITE code 937) is expected to generate 85.88 and 38.99 vehicular trips per 1000 sq. ft., i.e., 206 and 94 vehicular trips, during the morning and the afternoon peak hours, respectively. According to the same source, a self-service car wash (ITE code 947) is expected to generate 0 and 5.54 vehicular trips per stall, i.e., 0 and 28 vehicular trips, during the morning and the afternoon peak hours, respectively. The total trips expected for the proposed development will be 206 during the morning peak hour and 121 during the afternoon peak hour, as shown in **Table 7**.

Table 7: Trip Generation

Land Use (ITE Code)	Unit	Qty	Morning Peak Hour		Afternoon Peak Hour	
			Trip Rate	Trips	Trip Rate	Trips
Coffee/Donut Shop with Drive-Through Window (937)	1000 sq. ft.	2.40	85.88	206	38.99	94
Self-Service Car Wash (947)	stall	5	0	0	5.54	28
Total Vehicular Trips			206		121	

Assuming a 10% non-auto mode share and an average vehicle occupancy of 1.15, these trips will amount to 263 and 155 person trips during the morning and the afternoon peak hours, respectively.

The information contained in the 2011 TRANS O-D Survey Report for the Rural Southwest district (provided in **Appendix E**) has been used to determine the modal distribution for the morning and the afternoon peak periods, shown in **Table 8**.

Table 8: Trip Mode Distribution

Mode	Morning Peak Hour		Afternoon Peak Hour	
	Distribution	Trips	Distribution	Trips
All Modes	100%	263	100%	155
Auto Driver	78%	206	73%	114
Auto Passenger	14%	36	18%	28
Transit User	6%	15	5%	8
Cyclist	1%	2	1%	1
Pedestrian	2%	5	3%	4

It is assumed that 50% of the auto driver trips will be pass-by trips, i.e., trips already travelling on Manotick Main Street or part of the trips to be generated by Phases 2 to 5 of the Mahogany Community. The resulting numbers of net generated trips and pass-by trips for each peak hour are presented in **Table 9**. The proportions of entering and exiting trips are based on the ITE Trip Generation Manual.

Table 9: Vehicular Trip Directional Distribution

Type of Trip	Morning Peak Hour			Afternoon Peak Hour		
	Total	In	Out	Total	In	Out
Net Generated Trips	102	51%	49%	56	51%	49%
Pass-by Trips	104	52	52	58	29	29

3.1.2 Trip Distribution and Assignment

The rural southwest district covers a large area with various residential communities and farmland. It is expected that most of the vehicular trips generated by the project site will be local trips and that the trip assignment would be reflective of existing traffic patterns.

Figure 5 presents the number of auto trips generated by the proposed development during the morning and the afternoon peak hours.

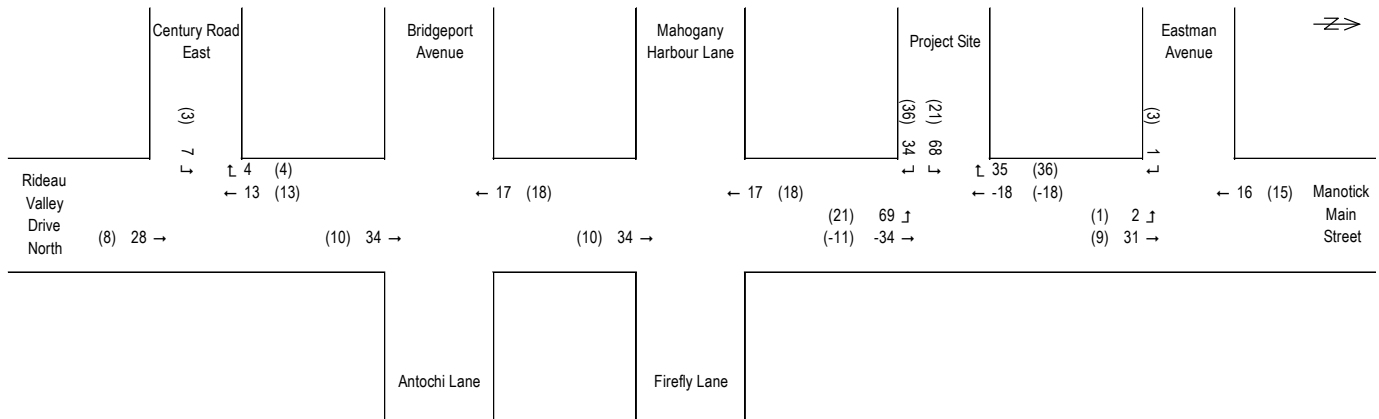


Figure 5: Trip Assignment, Morning (Afternoon) Peak Hour

The transit trips (23 and 11 trips during the morning and the afternoon peak hour, respectively) are expected to access the project site via the nearby bus stops. The cycling and walking trips (10 and 8 trips, respectively) are expected to travel along Manotick Main Street. In both cases, these trips are not expected to have a significant impact on the transportation system.

3.2 Background Network Travel Demand

3.2.1 Transportation Network Plans

As indicated in Section 2.1.3, potential changes to the roadway near the project site include the extension of Bridgeport Avenue to First Line Road. The construction of a single lane roundabout at the intersection of Manotick Main Street / Bridgeport Avenue / Antochi Lane is planned for construction in 2024. Road resurfacing, including paved shoulders, is planned in the near-term on Manotick Main Street from Bridgeport Avenue to north of Eastman Avenue.

No public transportation facilities are planned near the project site.

Sidewalks are planned on Manotick Main Street, Eastman Avenue and Century Road East. These roadways are also planned to become cycling routes in the future, but no specific design or schedule are currently proposed beyond the near-term paved shoulders on Manotick Main Street.

3.2.2 Background Growth

A comparison of the TRANS regional model for the 2011 AM base scenario and the 2031 AM affordable network (provided in **Appendix F**) identified an annual growth rate of 0.2% on Manotick Main Street near the project site. Considering that the TRANS regional model is not meant to accurately represent local traffic and that local developments like the Mahogany Community are not included in the model and are addressed separately, this growth rate is interpreted as not significant and has been rounded to 0%.

A comparison of the 2019 traffic counts provided by the City of Ottawa with the 2023 traffic count conducted by BTE indicate that the volumes do not vary consistently on Manotick Main Street, the latter being 5% higher than the former during the morning peak hour but 10% *lower* during the afternoon peak hour.

However, considering that traffic volumes on Manotick Main Street are expected not to vary significantly between Eastman Avenue and Bridgeport Avenue and between Bridgeport Avenue and Century Road East, a balancing has been performed to ensure volume consistency through the corridor. For each peak hour, the intersection with the greatest volumes was used as a reference for traffic balancing.

3.2.3 Other Developments

According to the Minto Mahogany Stage 2 Transportation Impact Study report (2017), Phases 2 to 5 of the Mahogany Community are expected to be completed in 2027. Therefore, the 2028 horizon is expected to include the trip generation of the fully completed development. **Figure 6** presents the anticipated trips from the development.

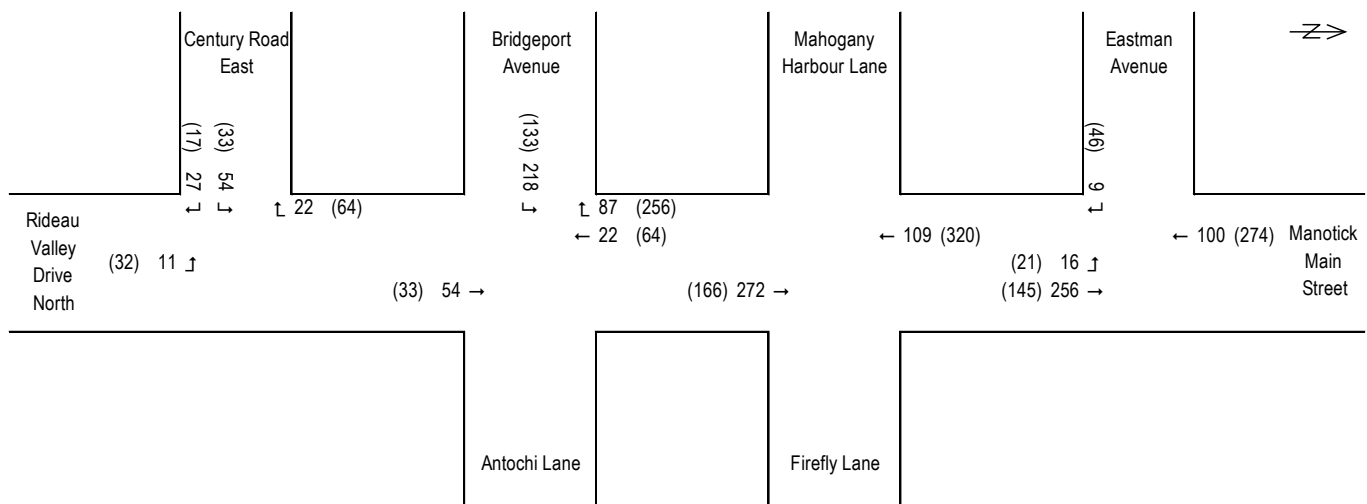


Figure 6: Mahogany Community Phases 2-5 Trip Generation, Morning (Afternoon) Peak Hour

Figure 7 presents the background traffic volumes for the 2028 horizon year, including the balanced traffic counts and the anticipated traffic from the Mahogany Community.

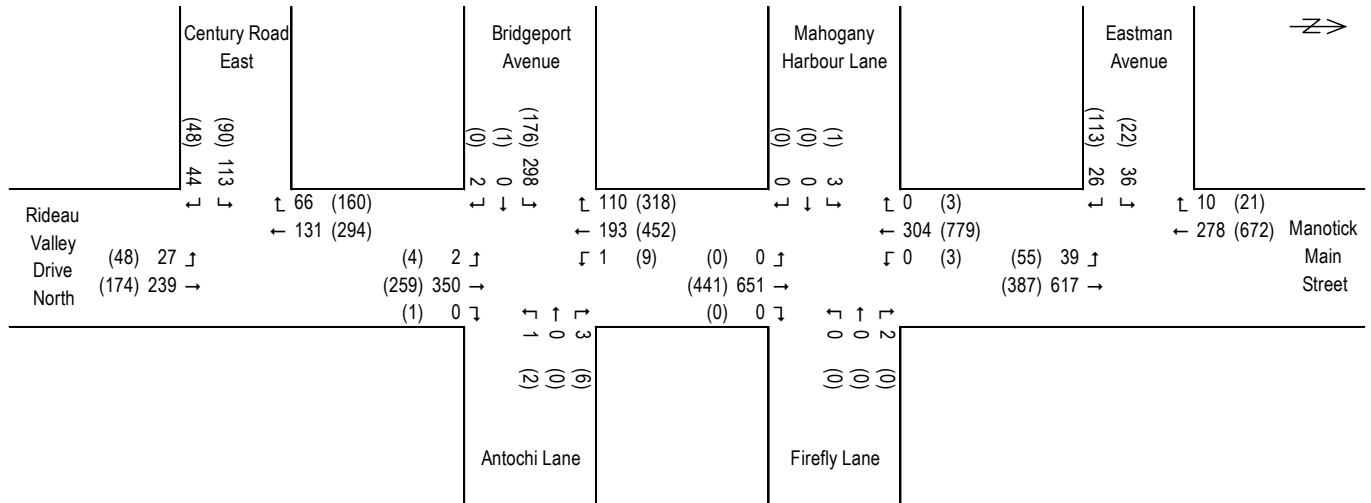


Figure 7: 2028 Background Traffic Volumes, Morning (Afternoon) Peak Hour

3.3 Demand Rationalization

Figure 8 shows the total traffic volumes anticipated for the 2028 horizon year, based on the traffic background and trip generation discussed above.

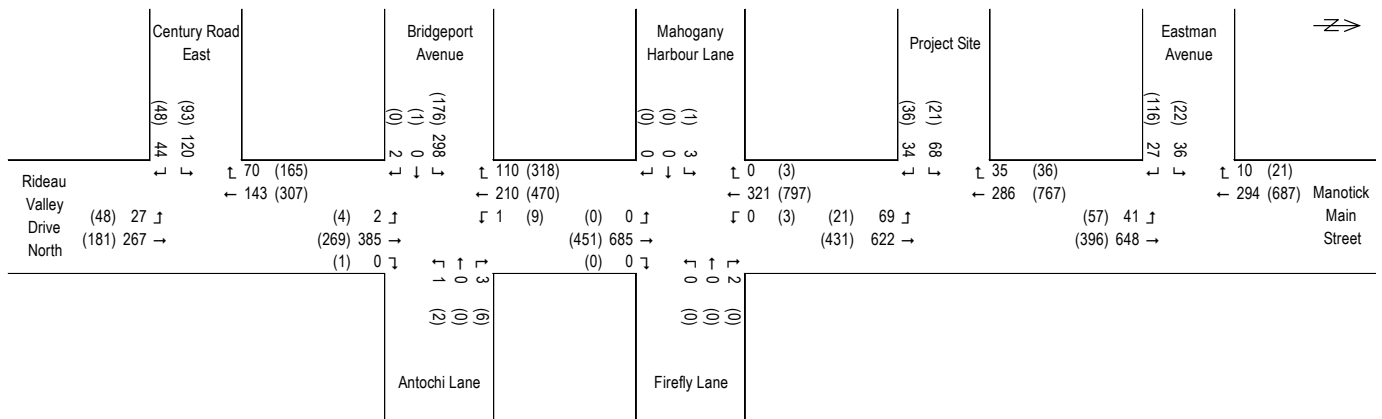


Figure 8: Total 2028 Traffic Volumes, Morning (Afternoon) Peak Hour

The proposed development is in a rural area where driving is usually the most convenient way to travel. Some changes to the transportation system may encourage alternative modes of transportation, including better (more frequent, all-day) bus service, as well as adding sidewalks and cycling lanes. However, such improvements are not expected to have a major impact on the mode distribution as presented in **Table 8**. Consequently, the demand projection for 2028 is considered reasonable for the purpose of the impact assessment.

4 Analysis

4.1 Development Design

4.1.1 Design for Sustainable Modes

A completed TDM-Supportive Development Design and Infrastructure Checklist is provided in **Appendix G**.

A pedestrian walkway is proposed on the project site on both sides of the driveway, ensuring a connection between the public right-of-way (and future sidewalk) and the restaurants. Crosswalks are provided within the site wherever the pedestrian path conflicts with a vehicular path. Both the walkways and the crosswalks are made of concrete pavers. A bicycle rack is recommended near the main door of the restaurant so that bicycles can be safely secured.

It is recommended to provide tactile warning surface indicators (TWSI) wherever a pedestrian path crosses a vehicular path, per AODA requirement.

4.1.2 Circulation and Access

4.1.2.1 Drive-Throughs

The proposed building is provided with a drive-through lane. A vehicle tracking analysis has been conducted on the site plan (**Appendix H**) to ensure that the drive-through lanes are wide enough to accommodate cars.

4.1.2.2 Delivery

Assuming that deliveries will utilize medium single unit (MSU) trucks, this will be achievable by driving into the car wash area. A three-point turn will then be necessary to exit the project site.

4.1.3 New Street Networks

[Exempt.]

4.2 Parking

4.2.1 Parking Supply

4.2.1.1 Auto Parking

According to the City of Ottawa Zoning By-law, Section 101, the minimum number of required parking spaces for a fast-food restaurant is 10 parking spaces per 100 m² of gross floor area. This rate can be reduced by 20% when a drive-through lane is provided. Since the proposed restaurant will have a gross floor area of 223.2 m², a minimum of 17 parking stalls are required. The proposed development currently meets this requirement with 18 stalls, including one Type B (2.4 m wide) accessible parking stall as prescribed by the City of Ottawa's Accessibility Design Standards.

4.2.1.2 Bicycle Parking

According to the City of Ottawa Zoning By-law, Section 111, the minimum required number of bicycle parking spaces for a full-service restaurant is 1 parking space per 250 m² of gross floor area. The proposed development includes 3 parking spaces near the building entrance.

4.2.2 Spillover Parking

[Exempt.]

4.3 Boundary Street Design

As per Schedule B of the City’s Official Plan, the Manotick area is classified as a “village”. Thus, for the purpose of analysis, Manotick Main Street is considered a “village arterial”.

The target levels of service (LOS) for the various non-auto modes of transportation, as per Exhibit 22 of the City of Ottawa’s 2015 Multi-Modal Level of Service (MMLOS) Guidelines, are documented in **Table 10**.

Table 10: Target Levels of Service for Road Segments

Road Segment	Pedestrian LOS	Bicycle LOS	Transit LOS	Truck LOS
Manotick Main Street	C	C	N/A	D

4.3.1 Mobility

4.3.1.1 Pedestrian Level of Service (PLOS)

For the PLOS analysis, the average daily curb lane traffic volume is approximated as 12,000 (i.e., ten times the average peak hour volume). Also, operating speeds along Manotick Main Street have been assumed to be 10 km/h above the posted speed limit, that is, 70 km/h.

The results of the segment PLOS analysis are summarized in **Table 11**.

Table 11: Pedestrian Level of Service on Boundary Streets

Parameter	Manotick Main Street
Sidewalk Width	2 m paved shoulder
Boulevard Width	N/A
Motor vehicle traffic volume (AADT)	> 3000 veh/d
Presence of on-street parking	No
Operating speed	70 km/h
Pedestrian LOS	F

The absence of a sidewalk, combined with the operating speed and high traffic volumes, automatically results in a PLOS F along Manotick Main Street. The existing conditions therefore do not meet the target level of PLOS C defined by the MMLOS Guidelines.

The target PLOS C could be achieved by reducing the speed limit to 40 km/h and adding a sidewalk (the paved shoulder would then act as a 2 m boulevard). However, this requirement is not triggered by the proposed development.

4.3.1.2 Bicycle Level of Service (BLOS)

Manotick Main Street is expected to have paved shoulders added in the near term. The results of the segment BLOS analysis are summarized in **Table 12**.

Table 12: Bicycle Level of Service on Boundary Streets

Parameter	Manotick Main Street
Segment Facility Type	
Physically Separated Facility	No
Bike Lane Width	2.0 m
Parking Lane	No
Bike Lane Blockage	N/A
Number of Travel Lanes	2
Operating Speed	70 km/h
Segment LOS	E
Unsignalized Crossings	
Unsignalized Crossing along Route	Yes
Median Refuge	No
Number of Travel Lanes on Side Street	2
Operating Speed of Side Street	60 km/h
Unsignalized Crossing LOS	C
Bicycle LOS	E

High operating speeds along a paved bicycle lane result in a BLOS E. The conditions do not meet the target level of BLOS C defined by MMLOS Guidelines. The target BLOS C could be achieved by reducing the speed limit to 50 km/h or less. This requirement is not triggered by the proposed development.

4.3.1.3 Transit Level of Service (TLOS)

[Not Applicable]

4.3.1.4 Truck Level of Service (TkLOS)

The results of the TkLOS analysis are summarized in **Table 13**.

Table 13: Truck Level of Service on Manotick Main Street

Parameter	Manotick Main Street
Curb lane width	3.5 m
Number of travel lanes	1 per direction
Truck LOS	C

The target TkLOS of D is met along Manotick Main Street.

4.3.2 Road Safety

The safety of the boundary roads was reviewed in **Section 2.1.2.5**. It was concluded that the boundary streets demonstrate no discernable pattern that would indicate a deficiency in their design.

4.4 Access Intersections Design

4.4.1 Location and Design of Access

4.4.1.1 Location

The proposed driveway is located 40 m north of Mahogany Harbour Lane and 20 m north of Firefly Lane. This meets the recommended 20 m driveway spacing from the TAC Geometric Design Guide for Canadian Roads.

4.4.1.2 Width

The proposed driveway is 6.8 m wide. This is slightly narrower than what is recommended (7.2 m to 12 m) by the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads. However, as demonstrated in Section 4.1.2 this width is sufficient to accommodate the site circulation.

4.4.1.3 Clear Throat Length

According to the TAC Geometric Design Guide for Canadian Roads, a driveway connecting an arterial roadway to a fast-food restaurant larger than 200 m² should have a throat length of 40 m. According to the site plan, the distance from the driveway corner to the north parking lot access is approximately 7 m and the distance to the drive-through lane is approximately 22 m (see **Appendix H**).

A 40 m long driveway would be difficult to accommodate because such driveway would end beyond the car wash building. However, the throat length could be increased by moving the north parking closer to the north building and having the drive-through traffic circulate through the parking lot. Alternatively, a longer throat length could be achieved by moving the parking lot to the back of the restaurant and the restaurant closer to the roadway.

4.4.2 Intersection Control

A traffic signal warrant analysis has been performed on Manotick Main Street at the intersection with the proposed driveway. The warrant analysis indicates that traffic signals are not warranted at this location (see **Appendix I**).

A left-turn lane warrant analysis has been performed using the MTO warrant methodology and the 2028 total traffic volume projection. The warrant analysis indicates that a northbound left-turn lane is warranted. While the traffic generated by the proposed development is relatively low, the large amount of traffic on Manotick Main Street is what causes the left-turn lane to be warranted.

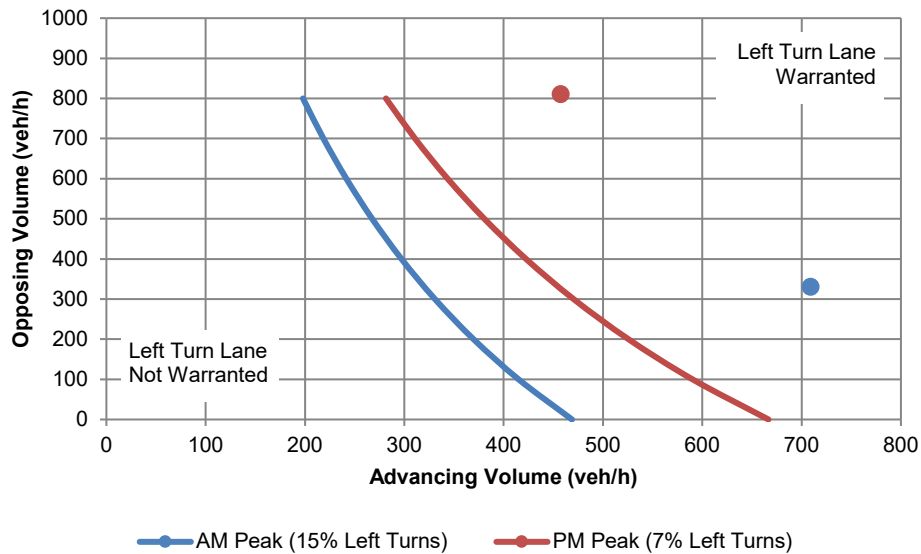


Figure 9: Left-Turn Lane Warrant Chart

A traffic capacity analysis has been performed at this location using Synchro. Three measures of effectiveness are used for comparison: the volume-to-capacity ratio (V/C), the average delay in seconds, and the 95th percentile queue length in metres. The auto LOS at unsignalized intersections is based on the average delay. LOS A is attributed to a delay of 10 seconds or less while LOS F is attributed to a delay of more than 50 seconds. The minimum target within a “village” area is LOS D, i.e., 35 seconds or less.

The results of the analysis are presented in **Table 14**. A detailed report is available in **Appendix J**.

Table 14: Auto Levels of Service at the Proposed Driveway

Impeded Turning Movement	Morning Peak Hour				Afternoon Peak Hour			
	V/C	Delay (s)	Auto LOS	95th Queue (veh)	V/C	Delay (s)	Auto LOS	95th Queue (veh)
EB L/R	0.35	24	C	2	0.21	22	C	1
NB T/L	0.06	8	A	0	0.03	10	A	0
Overall			C				C	

The results indicate that no capacity issues are expected at the proposed driveway, even without the addition of a left-turn lane.

4.5 Transportation Demand Management (TDM)

[Exempt.]

4.6 Neighbourhood Traffic Management

[Exempt.]

4.7 Transit

4.7.1 Route Capacity

As noted in **Section 3.1.1**, the proposed development is expected to generate 15 transit trips in the morning peak hour and 8 in the afternoon peak hour. These transit users are expected to either walk to and from the bus stops near the project site and use Connexion Route 299 or walk to and from Beaverwood Road near Manotick Mews and use Local Route 176.

Both routes currently provide only one bus departure per hour. It is assumed that the number of bus departures can be adjusted as needed to accommodate the demand.

4.7.2 Transit Priority

The transit demand is very low at the project site and there are no signalized intersections (where transit priority measures would be the most efficient) in the immediate vicinity of the project site. Therefore, transit priority measures are not warranted.

4.8 Review of Network Concept

[Exempt.]

4.9 Intersection Design

4.9.1 Intersection Control

A traffic signal warrant analysis has been performed at all the intersections under study, except the intersection at Bridgeport Avenue / Antochi Lane since it will be converted to a roundabout in 2024. The traffic signal warrant analysis reveals that signals are not warranted at any of the intersections (see **Appendix I**).

4.9.2 Intersection Design

For all modes of transportation other than auto, the MMLOS guidelines only applies to signalized intersections. **Section 4.3.1** above presents the levels of service for pedestrians, cyclists, and trucks along Manotick Main Street.

4.9.2.1 Auto Level of Service

A traffic capacity analysis of the intersections under study was performed using Synchro. Three measures of effectiveness are used for comparison: the volume-to-capacity ratio (V/C), the average delay in seconds, and the 95th percentile queue length in metres (or in number of vehicles in the case of a roundabout). The auto LOS at unsignalized intersections is based on the average delay. LOS A is attributed

to a delay of 10 seconds or less while LOS F is attributed to a delay of more than 50 seconds. The minimum target within a “village” area is LOS D, i.e., 35 seconds or less.

The results of the unsignalized intersection analysis are summarized in **Tables 15 to 18**. A detailed report is available in **Appendix J**. By default, the values presented in these tables represent 2028 traffic conditions **with and without** the proposed development. Where there is a difference, the values within square brackets represent the 2028 traffic conditions with the proposed development.

Table 15: Auto Levels of Service at Eastman Avenue

Impeded Turning Movement	Morning Peak Hour				Afternoon Peak Hour			
	V/C	Delay (s)	LOS	95th Queue (veh)	V/C	Delay (s)	LOS	95th Queue (veh)
Eastbound all	0.17 [0.19]	17 [18]	C	1	0.37 [0.39]	20 [21]	C	2
Northbound left	0.03	8	A	0	0.06 [0.07]	9	A	0
Overall			C				C	

Table 16: Auto Levels of Service at Mahogany Harbour Lane / Firefly Lane

Impeded Turning Movement	Morning Peak Hour				Afternoon Peak Hour			
	V/C	Delay (s)	LOS	95th Queue (veh)	V/C	Delay (s)	LOS	95th Queue (veh)
Eastbound all	0.01	21 [22]	C	0	0.01	29 [30]	D	0
Westbound all	0.00	13	B	0	–	–	–	–
Northbound all	0.00	0	A	0	0.00	0	A	0
Southbound all	0.00	0	A	0	0.00	0	A	0
Overall			C				D	

Table 17: Auto Levels of Service at Bridgeport Avenue / Antochi Lane (roundabout)

Impeded Turning Movement	Morning Peak Hour				Afternoon Peak Hour			
	V/C	Delay (s)	LOS	95th Queue (veh)	V/C	Delay (s)	LOS	95th Queue (veh)
Eastbound all	0.36 [0.37]	9	A	2	0.27	9	A	1
Westbound all	0.01	7	A	0	0.01	5	A	0
Northbound all	0.48 [0.52]	12 [13]	B	3	0.30 [0.31]	7	A	1
Southbound all	0.30 [0.31]	7	A	1	0.73 [0.75]	15 [16]	C	7
Overall			B				C	

Table 18: Auto Levels of Service at Century Road East

Impeded Turning Movement	Morning Peak Hour				Afternoon Peak Hour			
	V/C	Delay (s)	LOS	95th Queue (veh)	V/C	Delay (s)	LOS	95th Queue (veh)
Eastbound all	0.25 [0.28]	13	B	1	0.26 [0.28]	14 [15]	B	1
Northbound left	0.02	1	A	0	0.04 [0.05]	2	A	0
Overall			B				B	

The results of the Synchro analysis presented above demonstrate that the unsignalized intersections are expected to operate within capacity during both morning and afternoon peak hours. The proposed development does not have a significant impact on the traffic operations, nor does it trigger any requirement for mitigation measures.

Conclusions

The proposed development, consisting of a 223 m² coffee shop with a drive-through lane, is expected to generate 263 trips in the morning and 155 trips in the afternoon, with about three-quarters of the trips done by automobile drivers, half of them being pass-by trips. The adjacent roadway, Manotick Main Street, is currently moderately busy but is expected to become significantly busier with the development of the nearby Mahogany Community, although no capacity issue is anticipated within the 2028 horizon year. The trips generated by the proposed development are not expected to have a significant impact on traffic operations between Eastman Avenue and Century Road East.

The left-turn lane warrant analysis reveals that a left-turn lane is warranted to accommodate the northbound left-turn movement from Manotick Main Street to the proposed development.

A vehicle tracking analysis confirms that the drive-through lanes are wide enough to accommodate cars. Deliveries to the project site will be possible with light and medium single unit trucks, using the car wash area to perform a 3-point turn.

The number of parking stalls provided on the project site corresponds to the zoning requirement. The provision of one more accessible parking stall (Type B) meets the Accessibility Design Standards.

Both the pedestrian and cyclist levels of service are lower than the target LOS for a village arterial despite the planned addition of paved shoulders. It is recommended that the speed limit be lowered to meet the target LOS of both active transportation modes. Walkways and crosswalks are provided on the project site to accommodate pedestrians and a bicycle rack is provided near the coffee shop entrance to accommodate cyclists. It is recommended to provide tactile warning surface indicators (TWSI) wherever a pedestrian path crosses a vehicular path, per AODA requirement.

Appendix A

TIA Certification



TIA Plan Reports

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

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

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

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
4. I am either a licensed¹ or registered² professional in good standing, whose field of expertise [check appropriate field(s)] is either transportation engineering or transportation planning .

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

City Of Ottawa
Infrastructure Services and Community
Sustainability
Planning and Growth Management
110 Laurier Avenue West, 4th fl.
Ottawa, ON K1P 1J1
Tel. : 613-580-2424
Fax: 613-560-6006


Ville d'Ottawa
Services d'infrastructure et Viabilité des
collectivités
Urbanisme et Gestion de la croissance
110, avenue Laurier Ouest
Ottawa (Ontario) K1P 1J1
Tél. : 613-580-2424
Télécopieur: 613-560-6006



Dated at Ottawa this 19th day of January, 2023.
(City)

Name: Daniel Riendeau
(Please Print)

Professional Title: Transportation Engineer

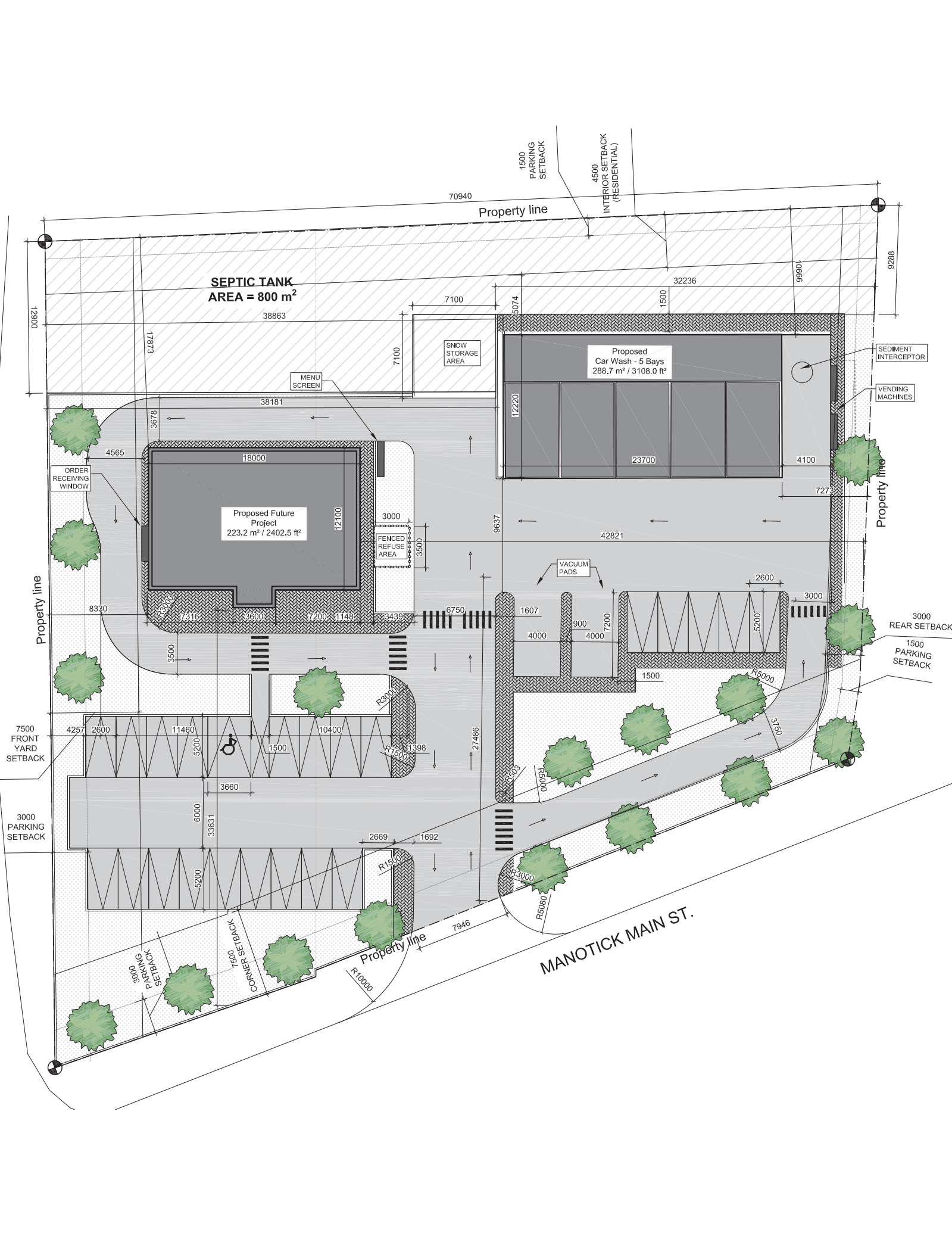

Signature of Individual certifier that s/he meets the above four criteria

Office Contact Information (Please Print)
Address: 100 Craig Henry Drive, Suite 201
City / Postal Code: Ottawa, ON K2G 5W3
Telephone / Extension: 613-228-4813
E-Mail Address: daniel.riendeau@bteng.ca



Appendix B

Site Plan



Appendix C

Traffic Count Reports

Turning Movement Count - Peak Hour Diagram

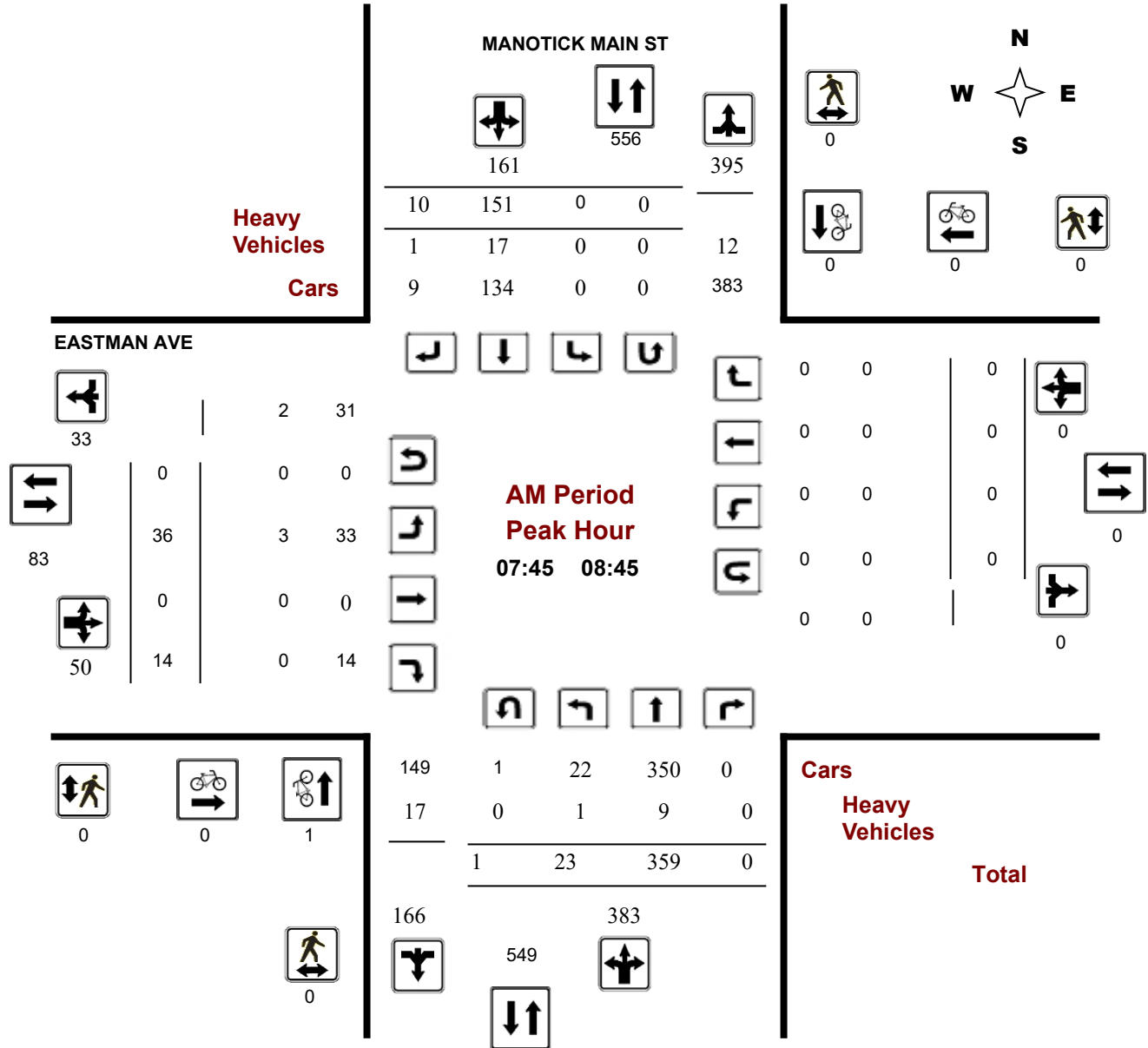
EASTMAN AVE @ MANOTICK MAIN ST

Survey Date: Thursday, October 10, 2019

Start Time: 07:00

WO No: 38854

Device: Miovision





Transportation Services - Traffic Services

Turning Movement Count - Study Results

EASTMAN AVE @ MANOTICK MAIN ST

Survey Date: Thursday, October 10, 2019

WO No: 38854

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Thursday, October 10, 2019

Total Observed U-Turns

AADT Factor

Northbound: 2 Southbound: 3
 Eastbound: 0 Westbound: 0

.90

MANOTICK MAIN ST

EASTMAN AVE

Period	Northbound				Southbound				STR TOT	Eastbound				Westbound				STR TOT	Grand Total
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT		LT	ST	RT	EB TOT	LT	ST	RT	WB TOT		
07:00 08:00	6	306	0	312	0	139	5	144	456	40	0	10	50	0	0	0	0	50	506
08:00 09:00	30	336	0	366	0	147	9	156	522	33	0	15	48	0	0	0	0	48	570
09:00 10:00	29	242	0	271	0	189	13	202	473	22	0	19	41	0	0	0	0	41	514
11:30 12:30	35	215	0	250	0	233	14	247	497	21	0	40	61	0	0	0	0	61	558
12:30 13:30	31	210	0	241	0	230	15	245	486	27	0	47	74	0	0	0	0	74	560
15:00 16:00	43	245	0	288	0	304	24	328	616	11	0	47	58	0	0	0	0	58	674
16:00 17:00	35	272	0	307	0	365	22	387	694	29	0	67	96	0	0	0	0	96	790
17:00 18:00	35	260	0	295	0	372	22	394	689	16	0	43	59	0	0	0	0	59	748
Sub Total	244	2086	0	2330	0	1979	124	2103	4433	199	0	288	487	0	0	0	0	487	4920
U Turns	2				3				5				0				0	0	5
Total	244	2086	0	2332	0	1979	124	2106	4438	199	0	288	487	0	0	0	0	487	4925
EQ 12Hr	339	2900	0	3241	0	2751	172	2927	6169	277	0	400	677	0	0	0	0	677	6846

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

1.39

AVG 12Hr	305	2610	0	2917	0	3243	203	2634	5552	249	0	360	609	0	0	0	0	609	6161
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Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.

.90

AVG 24Hr	400	3419	0	3821	0	4248	266	3451	7273	326	0	472	798	0	0	0	0	798	8071
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Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.

1.31

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



Transportation Services - Traffic Services

Turning Movement Count - Study Results

EASTMAN AVE @ MANOTICK MAIN ST

Survey Date: Thursday, October 10, 2019

WO No: 38854

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

MANOTICK MAIN ST

EASTMAN AVE

Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	1	0	1	0	0	0	1
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	0	0	0	2	0	2	2
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	1	0	1	0	0	0	1
12:30 12:45	0	1	1	0	0	0	1
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	0	0	2	0	2	2
13:15 13:30	0	0	0	0	0	0	0
15:00 15:15	1	0	1	2	0	2	3
15:15 15:30	0	0	0	0	0	0	0
15:30 15:45	0	0	0	0	0	0	0
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	0	0	0	0	0	0	0
16:15 16:30	0	0	0	0	0	0	0
16:30 16:45	0	0	0	0	0	0	0
16:45 17:00	0	0	0	0	0	0	0
17:00 17:15	0	1	1	0	0	0	1
17:15 17:30	1	0	1	1	0	1	2
17:30 17:45	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0
Total	4	2	6	7	0	7	13

Turning Movement Count - Peak Hour Diagram

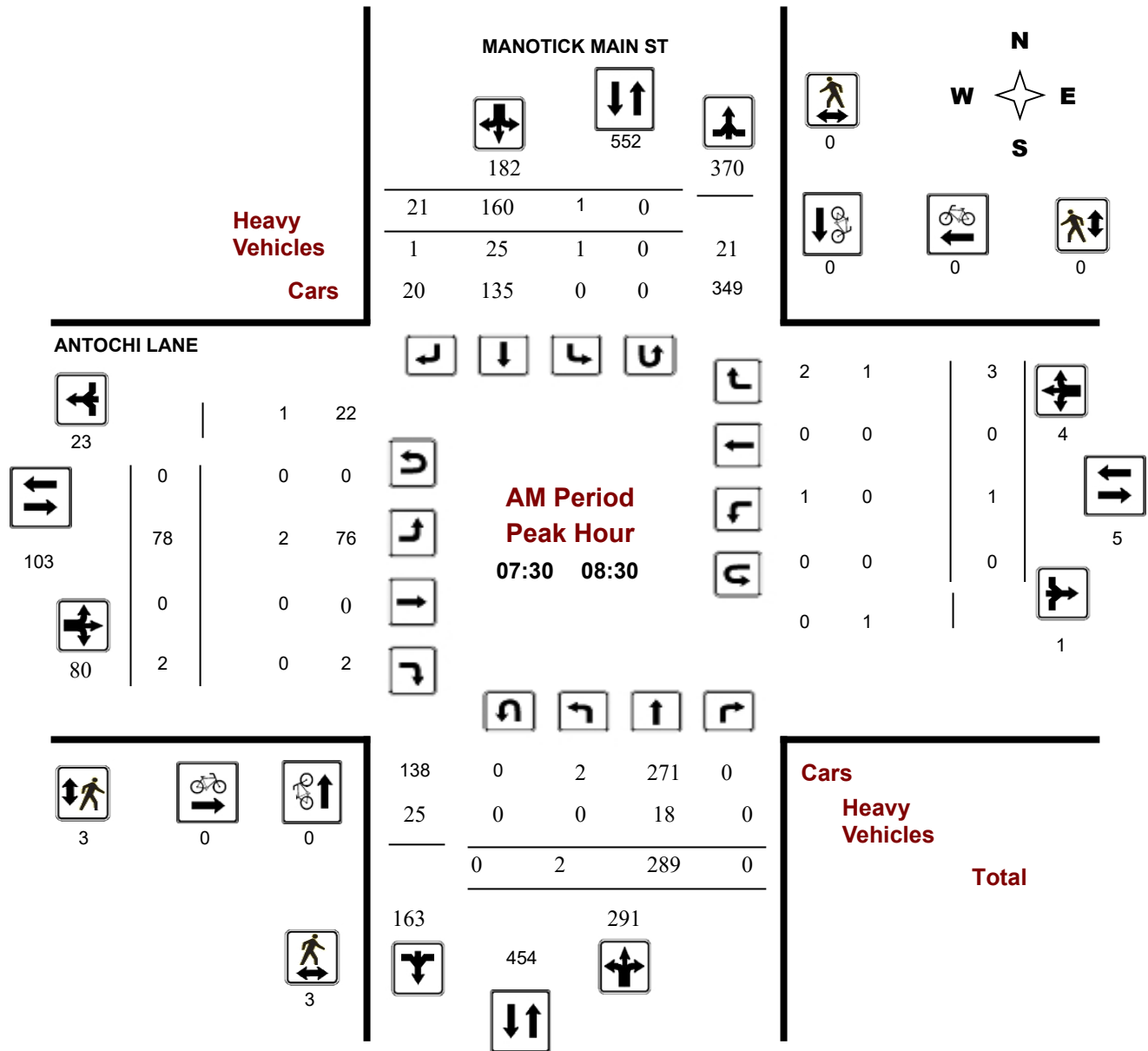
ANTOCHI LANE @ MANOTICK MAIN ST

Survey Date: Tuesday, October 01, 2019

Start Time: 07:00

WO No: 38787

Device: Miovision



Turning Movement Count - Peak Hour Diagram

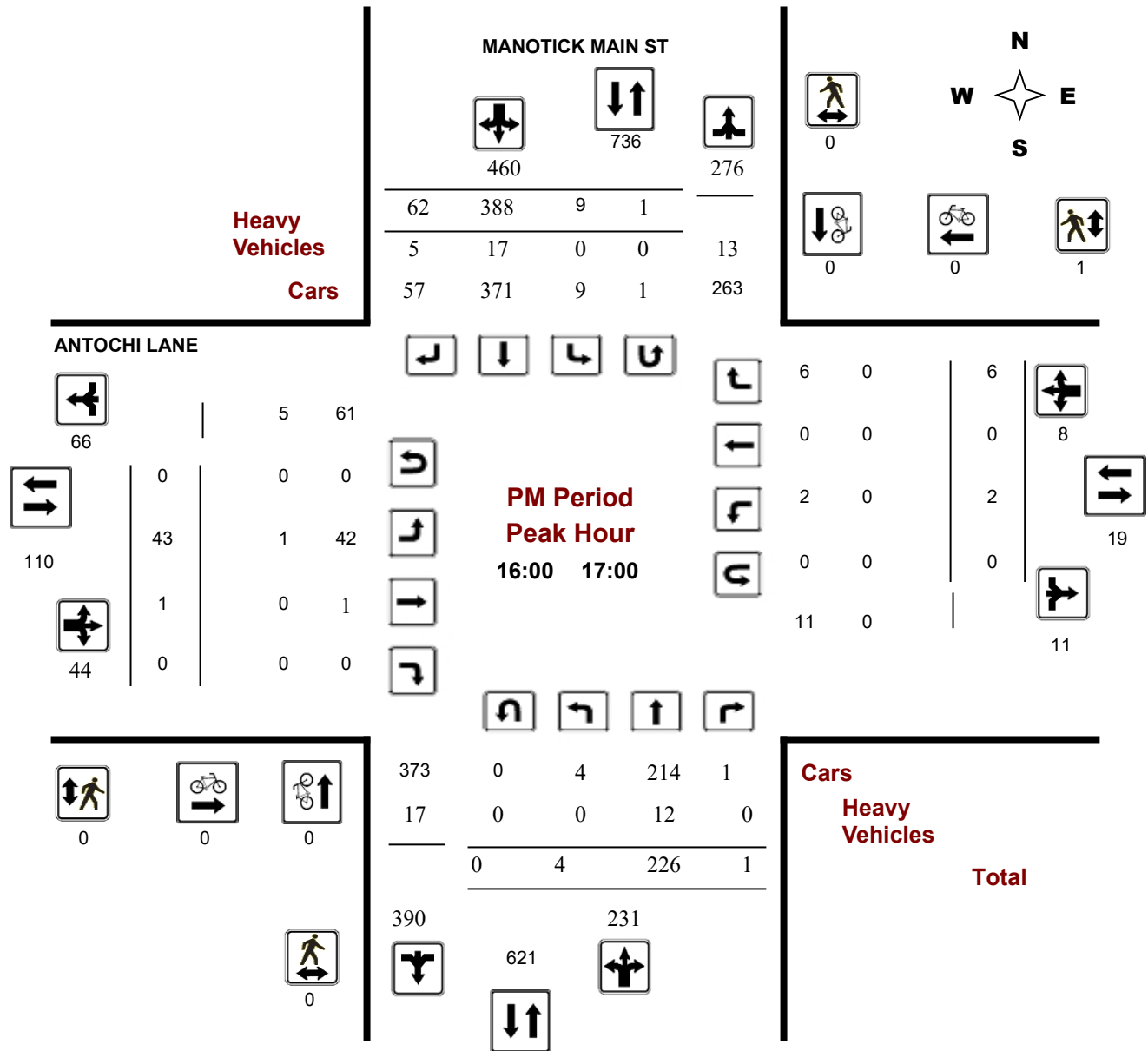
ANTOCHI LANE @ MANOTICK MAIN ST

Survey Date: Tuesday, October 01, 2019

Start Time: 07:00

WO No: 38787

Device: Miovision





Transportation Services - Traffic Services

Turning Movement Count - Study Results

ANTOCHI LANE @ MANOTICK MAIN ST

Survey Date: Tuesday, October 01, 2019

WO No: 38787

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, October 01, 2019

Total Observed U-Turns

AADT Factor

Northbound: 0 Southbound: 1
 Eastbound: 0 Westbound: 0
 .90

MANOTICK MAIN ST

ANTOCHI LANE

Period	Northbound					Southbound					Eastbound					Westbound					Grand Total
	LT	ST	RT	NB TOT	STR TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	STR TOT	LT	ST	RT	WB TOT	STR TOT	
07:00 08:00	3	255	0	258	421	1	142	20	163	388	69	0	1	70	426	1	0	5	6	76	497
08:00 09:00	1	283	0	284	441	1	131	25	157	441	74	0	5	79	441	1	0	5	6	85	526
09:00 10:00	0	209	0	209	395	3	151	32	186	395	50	0	1	51	395	0	0	5	5	56	451
11:30 12:30	3	187	1	191	436	7	217	21	245	436	40	1	2	43	436	1	0	2	3	46	482
12:30 13:30	2	185	1	188	426	1	196	41	238	426	24	0	3	27	426	0	0	4	4	31	457
15:00 16:00	8	183	0	191	525	3	289	42	334	525	36	0	5	41	525	1	0	3	4	45	570
16:00 17:00	4	226	1	231	690	9	388	62	459	690	43	1	0	44	690	2	0	6	8	52	742
17:00 18:00	3	184	2	189	554	8	294	63	365	554	28	0	3	31	554	1	0	3	4	35	589
Sub Total	24	1712	5	1741	3888	33	1808	306	2147	3888	364	2	20	386	3888	7	0	33	40	426	4314
U Turns				0	1				1	1				0					0	0	1
Total	24	1712	5	1741	3889	33	1808	306	2148	3889	364	2	20	386	3889	7	0	33	40	426	4315

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

AVG 12Hr	30	2142	6	2178	4865	41	2963	501	2687	4865	455	3	25	483	4865	9	0	41	50	533	5398
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Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **.90**

AVG 24Hr	39	2806	8	2853	6373	54	3882	656	3520	6373	596	4	33	633	6373	12	0	54	66	698	7071
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Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. **1.31**

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



Transportation Services - Traffic Services

Turning Movement Count - Study Results

ANTOCHI LANE @ MANOTICK MAIN ST

Survey Date: Tuesday, October 01, 2019

WO No: 38787

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

MANOTICK MAIN ST

ANTOCHI LANE

Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	1	1	0	0	0	1
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	0	0	0
15:00 15:15	0	0	0	0	0	0	0
15:15 15:30	0	0	0	0	0	0	0
15:30 15:45	0	0	0	0	0	0	0
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	0	0	0	0	0	0	0
16:15 16:30	0	0	0	0	0	0	0
16:30 16:45	0	0	0	0	0	0	0
16:45 17:00	0	0	0	0	0	0	0
17:00 17:15	0	0	0	0	0	0	0
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0
Total	0	1	1	0	0	0	1

Turning Movement Count - Peak Hour Diagram

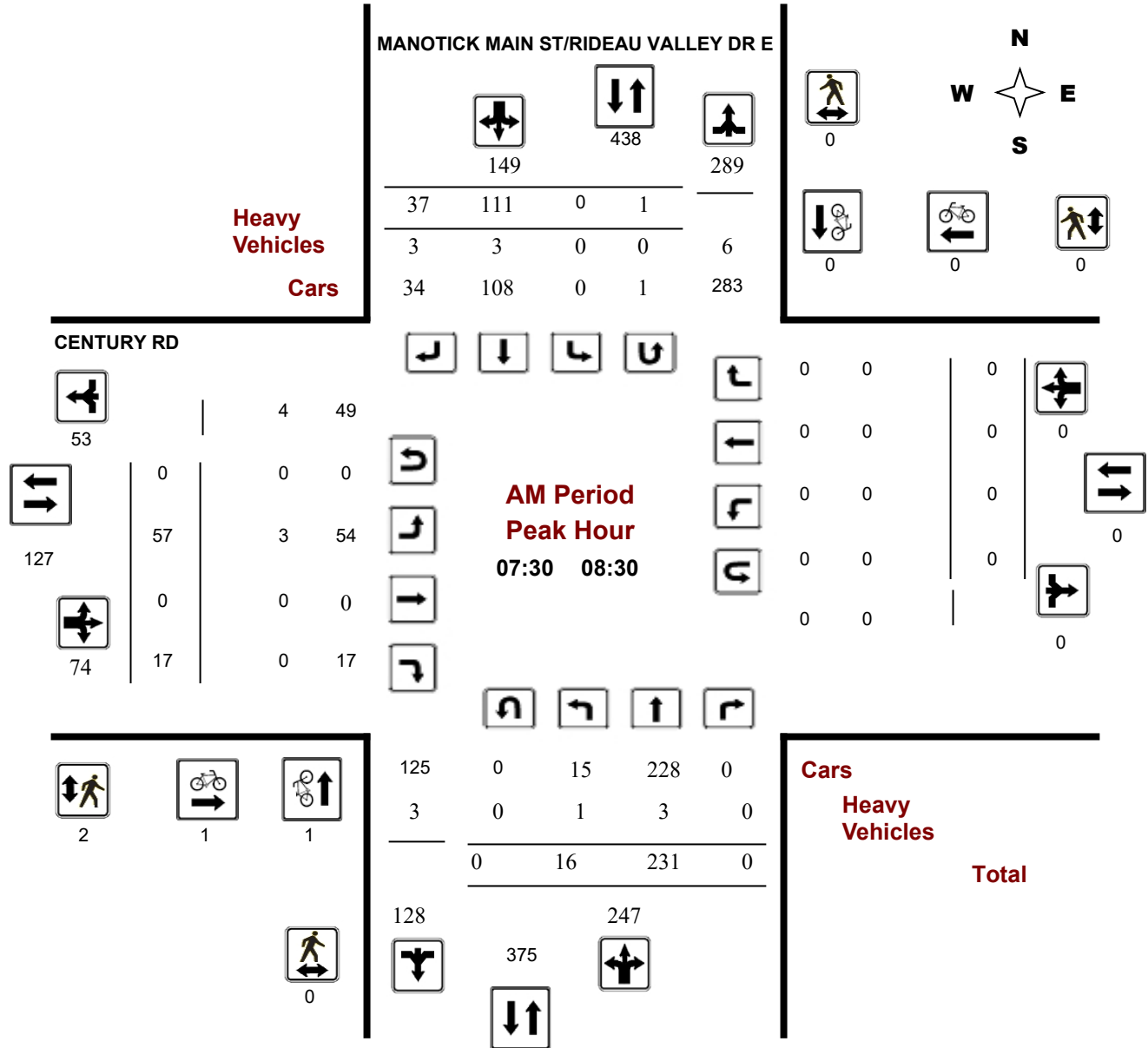
MANOTICK MAIN ST/RIDEAU VALLEY DR E @ CENTURY

Survey Date: Wednesday, July 17, 2019

Start Time: 07:00

WO No: 38698

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

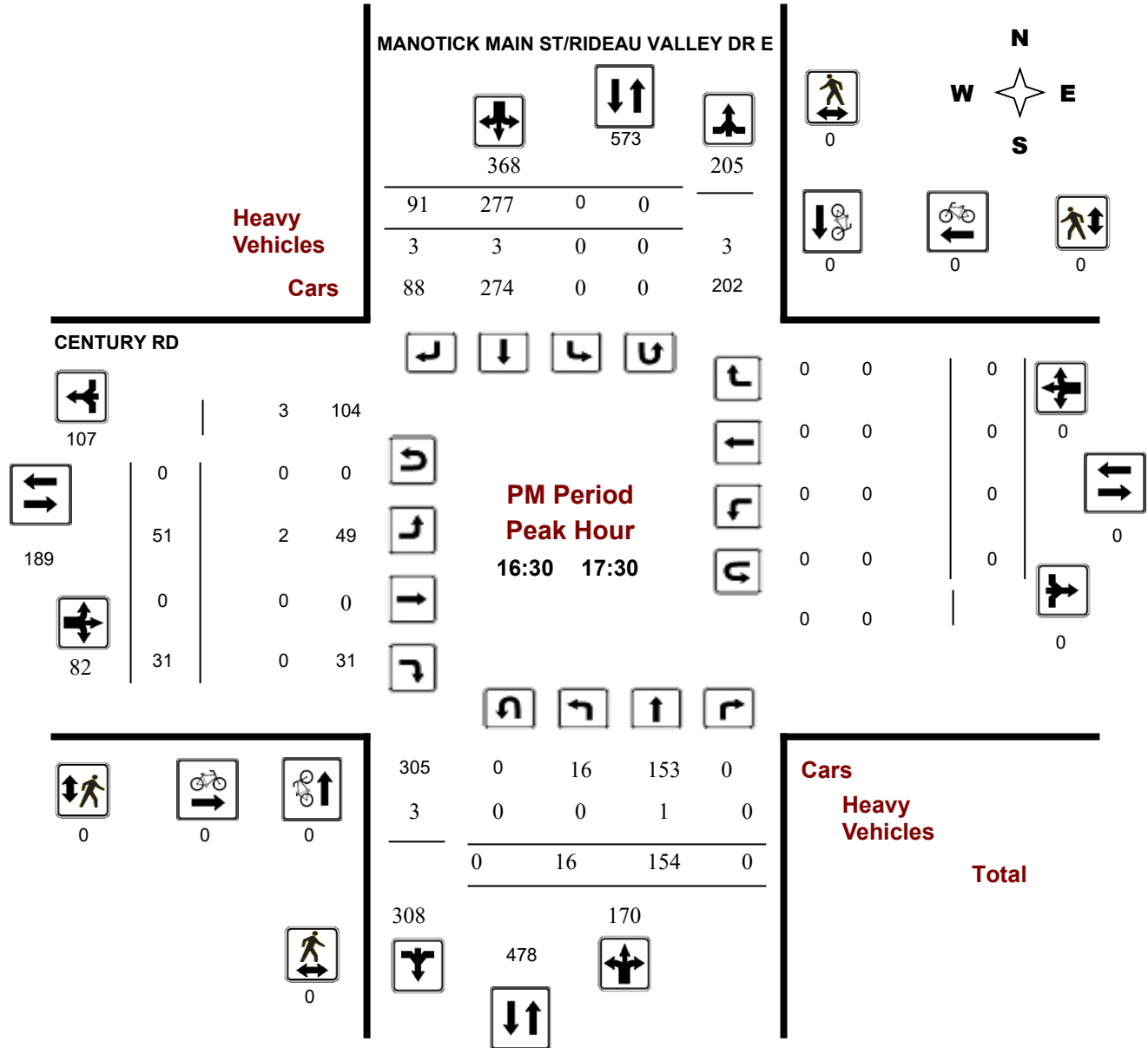
MANOTICK MAIN ST/RIDEAU VALLEY DR E @ CENTURY

Survey Date: Wednesday, July 17, 2019

Start Time: 07:00

WO No: 38698

Device: Miovision





Transportation Services - Traffic Services

Turning Movement Count - Study Results

MANOTICK MAIN ST/RIDEAU VALLEY DR E @ CENTURY

Survey Date: Wednesday, July 17, 2019

WO No: 38698

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, July 17, 2019

Total Observed U-Turns

AADT Factor

Northbound: 0 Southbound: 6
 Eastbound: 0 Westbound: 0

.90

MANOTICK MAIN ST/RIDEAU VALLEY DR E

CENTURY RD

Period	Northbound				Southbound				STR TOT	Eastbound				Westbound				STR TOT	Grand Total
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT		LT	ST	RT	EB TOT	LT	ST	RT	WB TOT		
07:00 08:00	15	189	0	204	0	81	28	109	313	46	0	16	62	0	0	0	0	62	375
08:00 09:00	13	206	0	219	0	115	37	152	371	48	0	17	65	0	0	0	0	65	436
09:00 10:00	11	160	0	171	0	103	42	145	316	43	0	12	55	0	0	0	0	55	371
11:30 12:30	13	140	0	153	0	136	66	202	355	56	0	7	63	0	0	0	0	63	418
12:30 13:30	15	146	0	161	0	167	61	228	389	33	0	29	62	0	0	0	0	62	451
15:00 16:00	19	127	0	146	0	191	72	263	409	46	0	8	54	0	0	0	0	54	463
16:00 17:00	19	133	0	152	0	269	84	353	505	48	0	24	72	0	0	0	0	72	577
17:00 18:00	8	134	0	142	0	244	80	324	466	43	0	18	61	0	0	0	0	61	527
Sub Total	113	1235	0	1348	0	1306	470	1776	3124	363	0	131	494	0	0	0	0	494	3618
U Turns	0				6				6	0				0				0	6
Total	113	1235	0	1348	0	1306	470	1782	3130	363	0	131	494	0	0	0	0	494	3624

EQ 12Hr 157 1717 0 1874 0 1815 653 2477 4351 505 0 182 687 0 0 0 0 0 687 5037

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

1.39

AVG 12Hr 141 1545 0 1687 0 2140 770 2229 3916 454 0 164 618 0 0 0 0 0 618 4533

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

.90

AVG 24Hr 185 2024 0 2210 0 2803 1009 2920 5130 595 0 215 810 0 0 0 0 0 810 5938

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

1.31

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



Transportation Services - Traffic Services

Turning Movement Count - Study Results

MANOTICK MAIN ST/RIDEAU VALLEY DR E @ CENTURY

Survey Date: Wednesday, July 17, 2019

WO No: 38698

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

MANOTICK MAIN ST/RIDEAU VALLEY DR
E

CENTURY RD

Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	1	0	1	0	0	0	1
07:45 08:00	0	0	0	1	0	1	1
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	1	1	0	0	0	1
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	1	1	0	0	0	1
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	0	0	1	0	1	1
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	0	0	0
15:00 15:15	1	0	1	0	0	0	1
15:15 15:30	0	0	0	0	0	0	0
15:30 15:45	0	0	0	0	0	0	0
15:45 16:00	1	0	1	0	0	0	1
16:00 16:15	0	0	0	0	0	0	0
16:15 16:30	0	0	0	0	0	0	0
16:30 16:45	0	0	0	0	0	0	0
16:45 17:00	0	0	0	0	0	0	0
17:00 17:15	0	0	0	0	0	0	0
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	2	2	0	0	0	2
17:45 18:00	0	0	0	0	0	0	0
Total	3	4	7	2	0	2	9



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

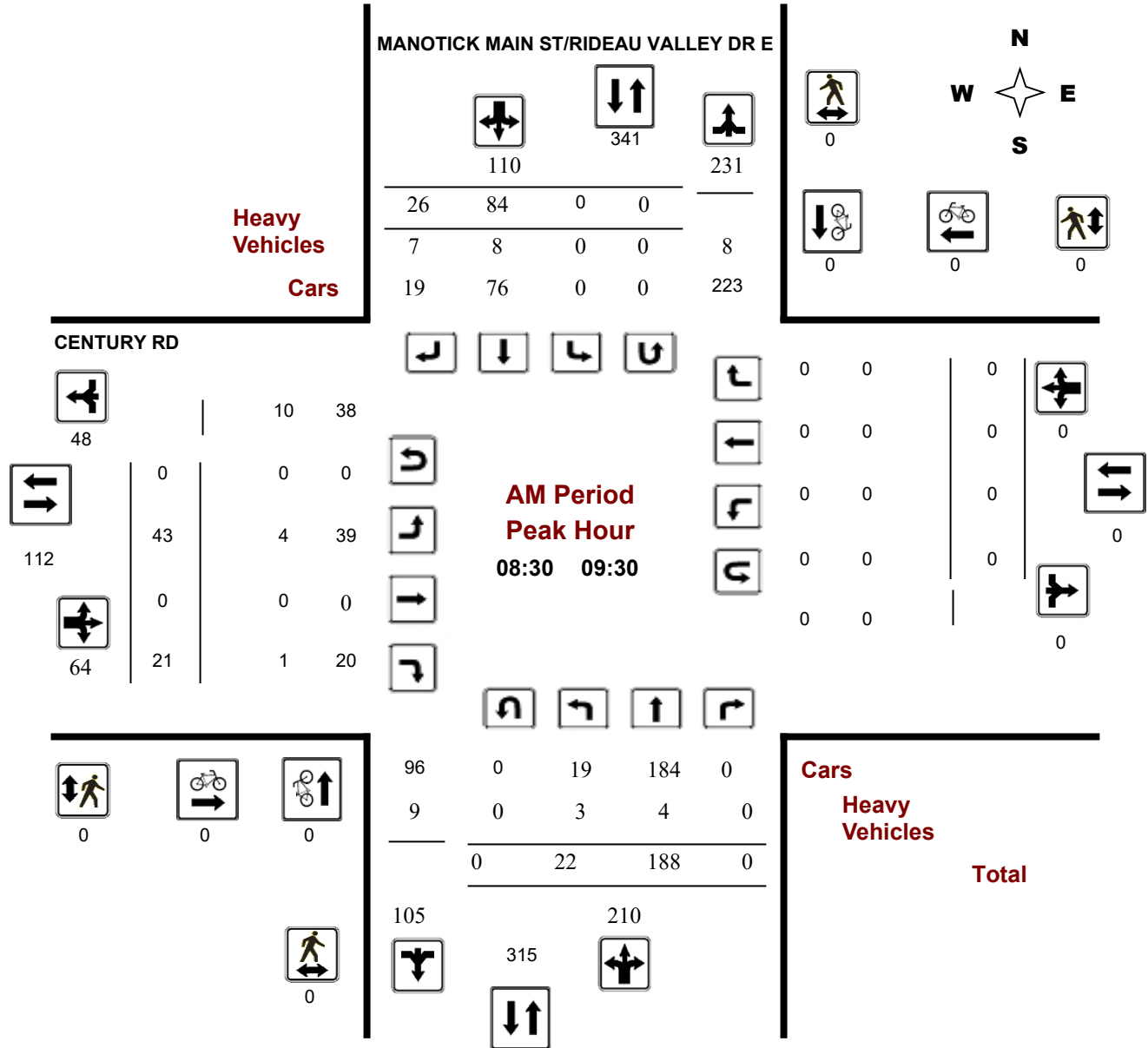
MANOTICK MAIN ST/RIDEAU VALLEY DR E @ CENTURY

Survey Date: Tuesday, November 08, 2022

Start Time: 07:00

WO No: 40683

Device: Miovision



Comments

Turning Movement Count - Peak Hour Diagram

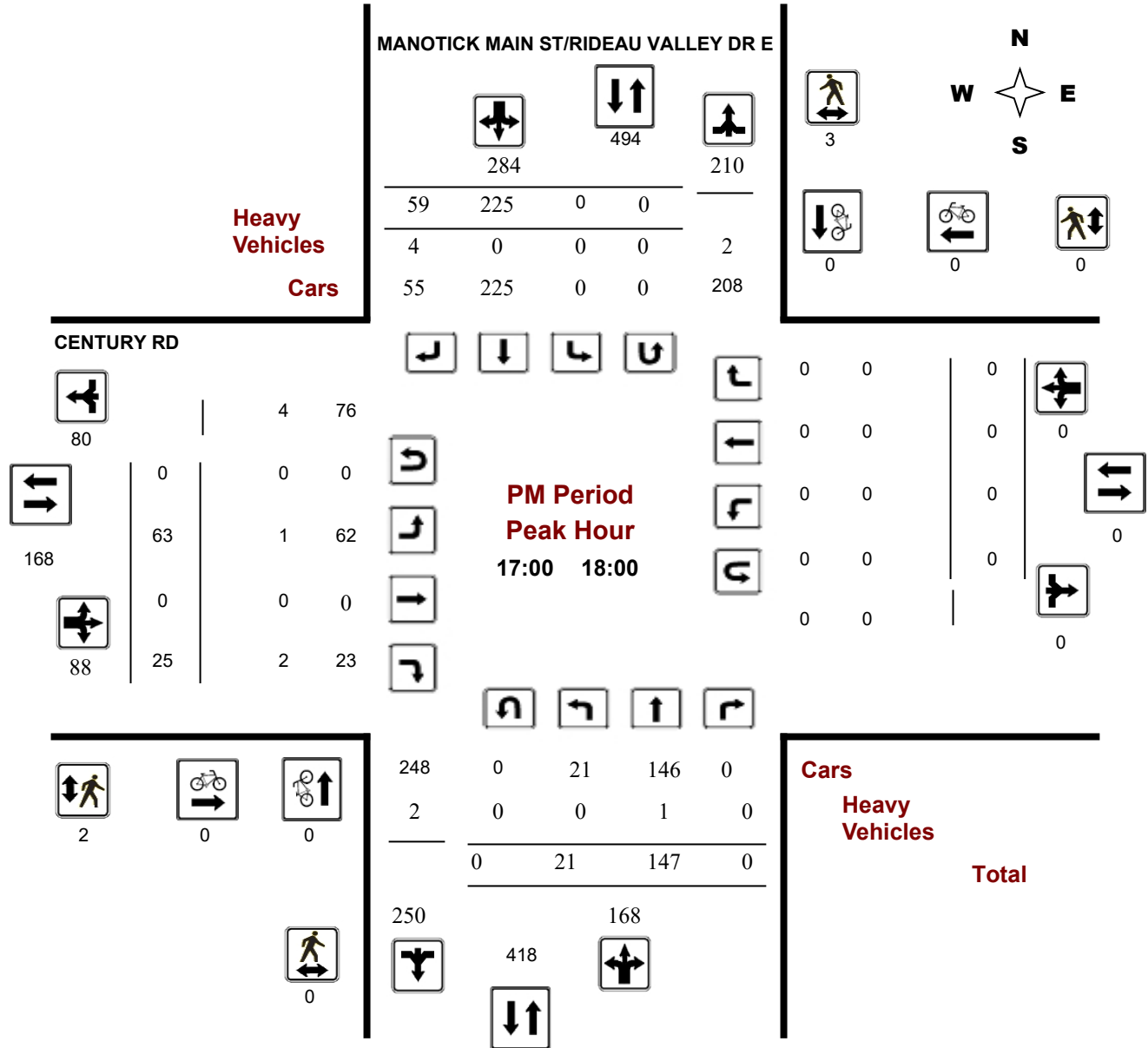
MANOTICK MAIN ST/RIDEAU VALLEY DR E @ CENTURY

Survey Date: Tuesday, November 08, 2022

Start Time: 07:00

WO No: 40683

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Study Results

MANOTICK MAIN ST/RIDEAU VALLEY DR E @ CENTURY

Survey Date: Tuesday, November 08, 2022

WO No: 40683

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, November 08, 2022

Total Observed U-Turns

AADT Factor

Northbound: 0 Southbound: 0

1.00

Eastbound: 0 Westbound: 0

MANOTICK MAIN ST/RIDEAU VALLEY DR E

CENTURY RD

Period	Northbound				Southbound				STR TOT	Eastbound				Westbound				STR TOT	Grand Total
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT		LT	ST	RT	EB TOT	LT	ST	RT	WB TOT		
07:00 08:00	13	58	0	71	0	34	16	50	121	16	0	1	17	0	0	0	0	17	138
08:00 09:00	19	169	0	188	0	69	20	89	277	32	0	13	45	0	0	0	0	45	322
09:00 10:00	14	169	0	183	0	85	28	113	296	55	0	17	72	0	0	0	0	72	368
11:30 12:30	8	105	0	113	0	89	32	121	234	36	0	10	46	0	0	0	0	46	280
12:30 13:30	6	105	0	111	0	130	46	176	287	45	0	3	48	0	0	0	0	48	335
15:00 16:00	8	103	0	111	0	144	29	173	284	33	0	13	46	0	0	0	0	46	330
16:00 17:00	13	147	0	160	0	174	45	219	379	33	0	10	43	0	0	0	0	43	422
17:00 18:00	21	147	0	168	0	225	59	284	452	63	0	25	88	0	0	0	0	88	540
Sub Total	102	1003	0	1105	0	950	275	1225	2330	313	0	92	405	0	0	0	0	405	2735
U Turns				0				0	0				0					0	0
Total	102	1003	0	1105	0	950	275	1225	2330	313	0	92	405	0	0	0	0	405	2735

EQ 12Hr 142 1394 0 1536 0 1320 382 1703 3239 435 0 128 563 0 0 0 0 0 563 3802

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

1.39

AVG 12Hr 142 1394 0 1536 0 1730 501 1703 3239 435 0 128 563 0 0 0 0 0 563 3802

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

1.00

AVG 24Hr 186 1826 0 2012 0 2266 656 2231 4243 570 0 168 738 0 0 0 0 0 738 4981

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

1.31

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



Transportation Services - Traffic Services

Turning Movement Count - Study Results

MANOTICK MAIN ST/RIDEAU VALLEY DR E @ CENTURY

Survey Date: Tuesday, November 08, 2022

WO No: 40683

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

MANOTICK MAIN ST/RIDEAU VALLEY DR
E

CENTURY RD

Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	0	0	0	0	0	0
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	0	0	0
15:00 15:15	0	1	1	0	0	0	1
15:15 15:30	0	0	0	0	0	0	0
15:30 15:45	0	0	0	0	0	0	0
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	0	0	0	0	0	0	0
16:15 16:30	0	0	0	0	0	0	0
16:30 16:45	0	1	1	1	0	1	2
16:45 17:00	0	0	0	0	0	0	0
17:00 17:15	0	0	0	0	0	0	0
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0
Total	0	2	2	1	0	1	3

Vehicular Turning Movements (15 Min. Volumes) – All Vehicles

MANOTICK MAIN STREET at MAHOGANY HARBOUR LANE / FIREFLY LANE in Ottawa, ON

Survey Date: Thursday, 2 February 2023

Performed By: BTE

Grey = Peak Hour

Time Period	Manotick Main Street Northbound				Manotick Main Street Southbound					Mahogany Harbour Lane Eastbound				Firefly Lane Westbound			SUB TOT	STR TOT	GRAND TOTAL
	L	T	R	SUB TOT	L	T	R	SUB TOT	STR TOT	L	T	R	SUB TOT	L	T	R			
7:00 – 7:15	0	53	0	53	0	23	0	23	76	0	0	0	0	0	0	1	1	1	77
7:15 – 7:30	0	64	0	64	0	33	0	33	97	0	0	0	0	0	0	0	0	0	97
7:30 – 7:45	0	77	0	77	0	35	0	35	112	0	0	0	0	0	0	1	1	1	113
7:45 – 8:00	0	111	0	111	0	46	0	46	157	2	0	0	2	0	0	0	0	2	159
8:00 – 8:15	0	112	0	112	0	46	0	46	158	0	0	0	0	0	0	0	0	0	158
8:15 – 8:30	0	84	0	84	0	56	0	56	140	1	0	0	1	0	0	0	0	1	141
8:30 – 8:45	0	72	0	72	0	47	0	47	119	0	0	0	0	0	0	2	2	2	121
8:45 – 9:00	0	62	0	62	0	49	0	49	111	0	0	0	0	0	0	0	0	0	111
16:15 – 16:30	0	60	0	60	0	87	0	87	147	1	0	0	1	0	0	1	1	2	149
16:30 – 16:45	0	83	0	83	1	108	0	109	192	0	0	0	0	0	0	0	0	0	192
16:45 – 17:00	0	78	0	78	0	80	0	80	158	0	0	0	0	0	0	0	0	0	158
17:00 – 17:15	0	62	0	62	2	98	2	102	164	1	0	0	1	0	0	0	0	1	165
17:15 – 17:30	0	69	0	69	0	91	1	92	161	0	0	0	0	0	0	0	0	0	161
17:30 – 17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45 – 18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00 – 18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	1184	0	1184	6	1082	4	1092	2276	5	0	0	5	0	0	7	7	12	2288

Note:

Volumes above include **cars** and **heavy vehicles**.

Cars include motorcycles, passenger cars, pick-up trucks (including "heavy-duty"), full-size vans (i.e. Econoline), and any of these with a trailer.

Vehicular Turning Movements (15 Min. Volumes) – Heavy Vehicles

MANOTICK MAIN STREET at MAHOGANY HARBOUR LANE / FIREFLY LANE in Ottawa, ON

Survey Date: Thursday, 2 February 2023

Performed By: BTE

Time Period	Manotick Main Street Northbound				Manotick Main Street Southbound					Mahogany Harbour Lane Eastbound				Firefly Lane Westbound					
	L	T	R	SUB	L	T	R	SUB	STR	L	T	R	SUB	L	T	R	SUB	STR	GRAND
				TOT				TOT	TOT				TOT				TOT	TOT	
7:00 – 7:15	0	8	0	8	0	4	0	4	12	0	0	0	0	0	0	0	0	0	12
7:15 – 7:30	0	4	0	4	0	6	0	6	10	0	0	0	0	0	0	0	0	0	10
7:30 – 7:45	0	9	0	9	0	5	0	5	14	0	0	0	0	0	0	0	0	0	14
7:45 – 8:00	0	7	0	7	0	8	0	8	15	0	0	0	0	0	0	0	0	0	15
8:00 – 8:15	0	8	0	8	0	13	0	13	21	0	0	0	0	0	0	0	0	0	21
8:15 – 8:30	0	12	0	12	0	8	0	8	20	0	0	0	0	0	0	0	0	0	20
8:30 – 8:45	0	9	0	9	0	5	0	5	14	0	0	0	0	0	0	0	0	0	14
8:45 – 9:00	0	8	0	8	0	5	0	5	13	0	0	0	0	0	0	0	0	0	13
16:15 – 16:30	0	2	0	2	0	3	0	3	5	0	0	0	0	0	0	0	0	0	5
16:30 – 16:45	0	0	0	0	0	2	0	2	2	0	0	0	0	0	0	0	0	0	2
16:45 – 17:00	0	3	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
17:00 – 17:15	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	1
17:15 – 17:30	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	1
17:30 – 17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45 – 18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00 – 18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	86	0	86	0	76	0	76	162	0	0	0	0	0	0	0	0	0	162

Note:

Heavy vehicles include vehicles with more than 2 axles (with the exception of cars with trailers) and buses.



Vehicular Turning Movements (15 Min. Volumes) – Cyclists

MANOTICK MAIN STREET at MAHOGANY HARBOUR LANE / FIREFLY LANE in Ottawa, ON

Survey Date: Thursday, 2 February 2023

Performed By: BTE

Time Period	Manotick Main Street Northbound				Manotick Main Street Southbound					Mahogany Harbour Lane Eastbound				Firefly Lane Westbound					
	L	T	R	SUB TOT	L	T	R	SUB TOT	STR TOT	L	T	R	SUB TOT	L	T	R	SUB TOT	STR TOT	GRAND TOTAL
7:00 – 7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 – 7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 – 7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 – 8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 – 8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 – 8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 – 8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 – 9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15 – 16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30 – 16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45 – 17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00 – 17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15 – 17:30	0	0	0	0	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	0	0	0	0
17:45 – 18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00 – 18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

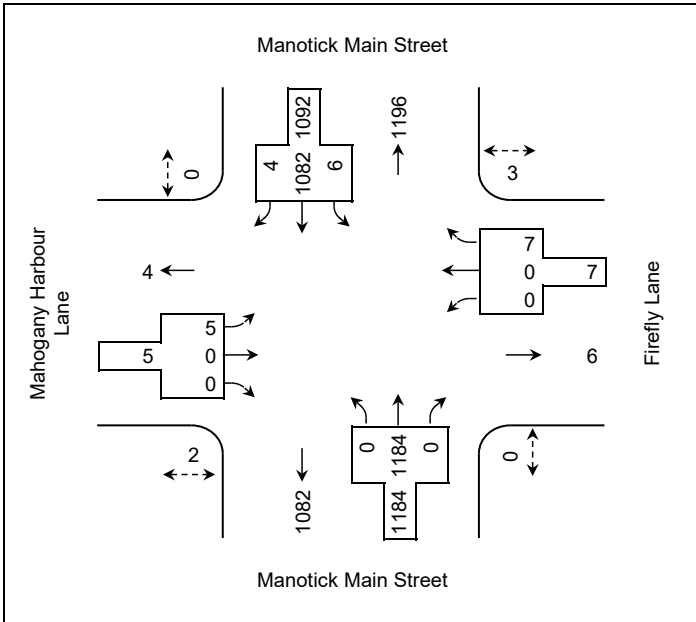
Vehicular Turning Movements – All Vehicles and Pedestrians

MANOTICK MAIN STREET at MAHOGANY HARBOUR LANE / FIREFLY LANE in Ottawa, ON

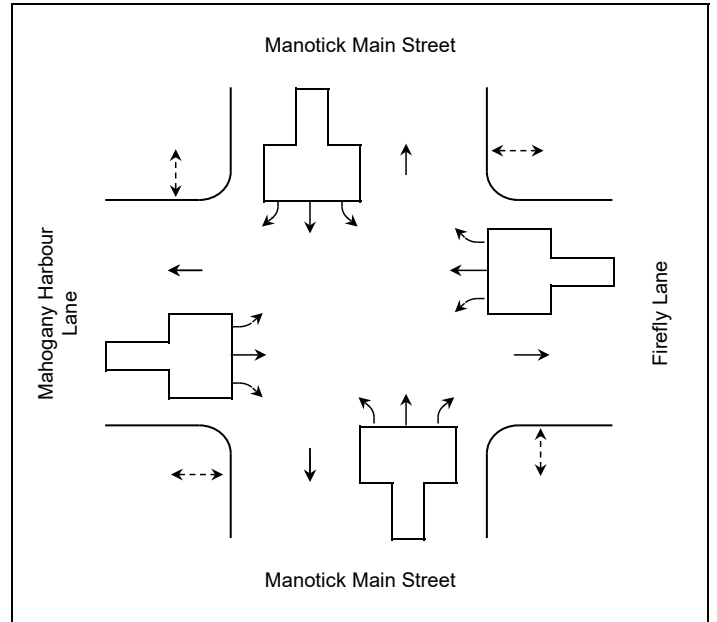
Survey Date: Thursday, 2 February 2023
Performed By: BTE



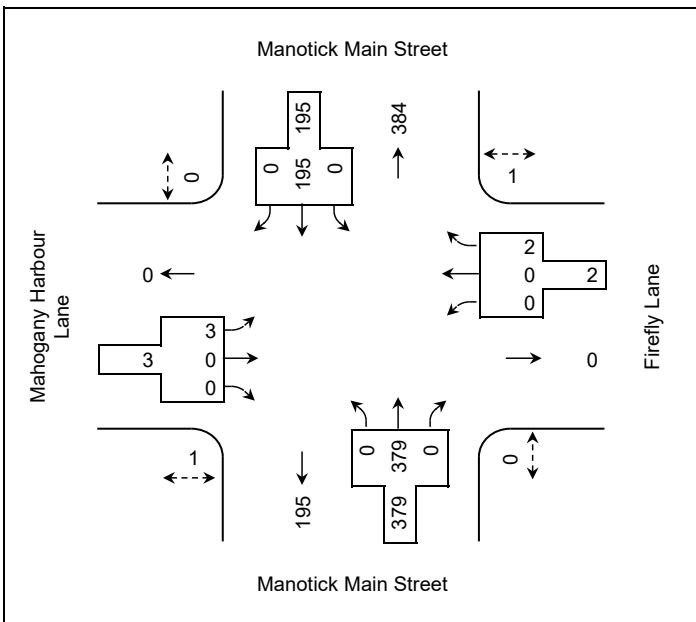
Full Period (4 hours)



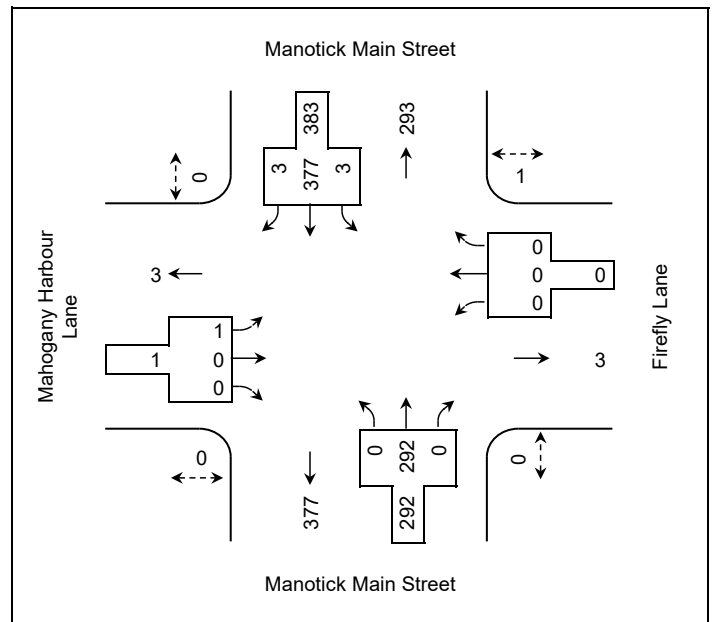
Midday Peak



Morning Peak (7:45–8:45)



Afternoon Peak (16:30–17:30)



Note:
Volumes above include **cars** and **heavy vehicles**.
Cars include motorcycles, passenger cars, pick-up trucks (including "heavy-duty"), full-size vans (i.e. Econoline), and any of these with a trailer.

Appendix D

Collision Details Report

List of Collisions 2016-2020

Location	Date and Time	Classification	Initial Impact Type	Environment	Light	Road Surface	Number of Pedestrians
ANTOCHI LANE @ MANOTICK MAIN ST	2017-02-15 22:46	03 - P.D. only	07 - SMV other	03 - Snow	07 - Dark	03 - Loose snow	
ANTOCHI LANE @ MANOTICK MAIN ST	2017-07-28 09:30	03 - P.D. only	03 - Rear end	01 - Clear	01 - Daylight	01 - Dry	
ANTOCHI LANE @ MANOTICK MAIN ST	2020-06-05 16:17	02 - Non-fatal injury	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	0
ISLAND VIEW DR N @ MANOTICK MAIN ST	2016-03-02 12:37	03 - P.D. only	05 - Turning movement	03 - Snow	01 - Daylight	05 - Packed snow	0
ISLAND VIEW DR N @ MANOTICK MAIN ST	2018-10-15 11:12	02 - Non-fatal injury	03 - Rear end	01 - Clear	01 - Daylight	01 - Dry	0
MANOTICK MAIN ST btwn EASTMAN AVE & FIREFLY LANE	2020-11-05 10:45	02 - Non-fatal injury	07 - SMV other	01 - Clear	01 - Daylight	01 - Dry	0
MANOTICK MAIN ST btwn MAHOGANY HARBOUR LANE & ANTOCHI I	2017-09-19 12:22	03 - P.D. only	06 - SMV unattended vehicle	01 - Clear	01 - Daylight	01 - Dry	

Appendix E

O-D Survey

Rural Southwest

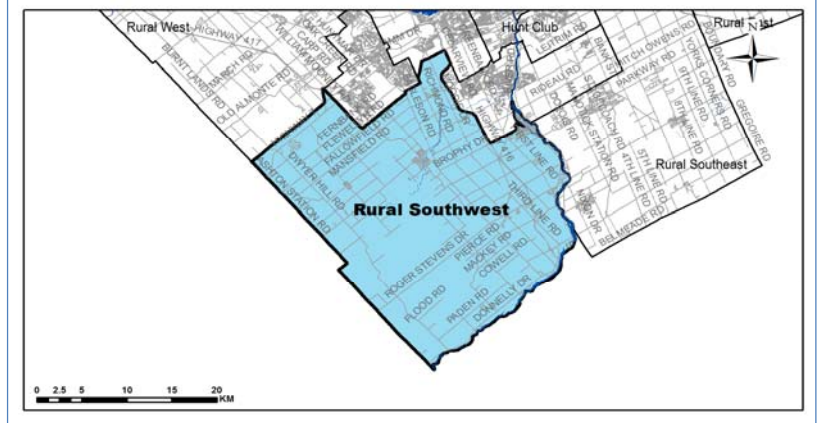
Demographic Characteristics

Population	26,460	Actively Travelled	20,890
Employed Population	12,530	Number of Vehicles	19,080
Households	9,190	Area (km ²)	729.3

Occupation Status (age 5+)	Male	Female	Total
Full Time Employed	6,450	4,690	11,140
Part Time Employed	430	960	1,390
Student	2,830	2,870	5,700
Retiree	2,340	2,720	5,070
Unemployed	260	150	410
Homemaker	10	870	880
Other	250	210	460
Total:	12,580	12,470	25,050

Traveller Characteristics	Male	Female	Total
Transit Pass Holders	410	710	1,110
Licensed Drivers	10,170	10,250	20,420
Telecommuters	50	40	90
Trips made by residents	33,080	33,470	66,550

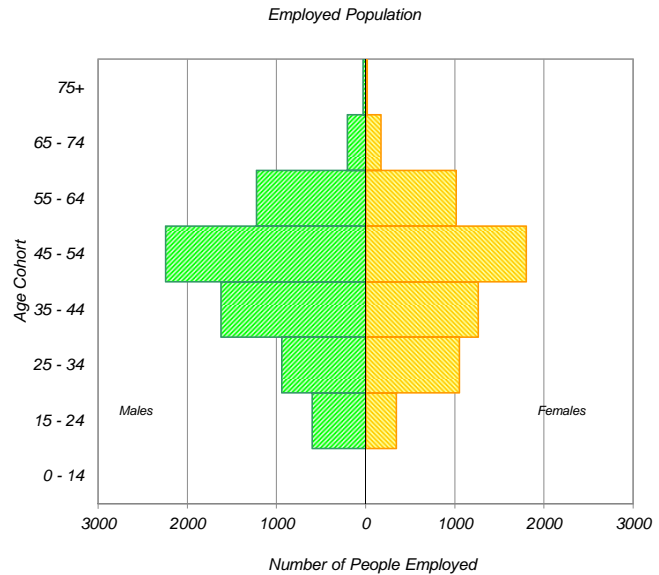
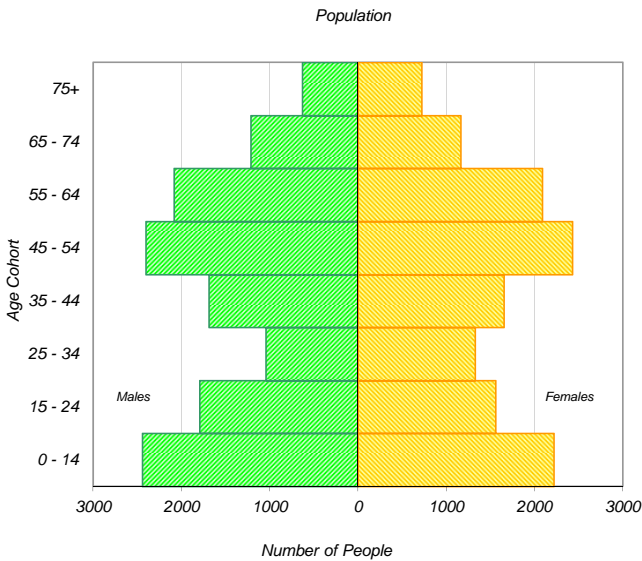
Selected Indicators	
Daily Trips per Person (age 5+)	2.66
Vehicles per Person	0.72
Number of Persons per Household	2.88
Daily Trips per Household	7.24
Vehicles per Household	2.08
Workers per Household	1.36
Population Density (Pop/km ²)	40



Household Size		
1 person	1,340	15%
2 persons	3,500	38%
3 persons	1,540	17%
4 persons	1,790	19%
5+ persons	1,020	11%
Total:	9,190	100%

Households by Vehicle Availability		
0 vehicles	160	2%
1 vehicle	2,180	24%
2 vehicles	4,430	48%
3 vehicles	1,820	20%
4+ vehicles	590	6%
Total:	9,190	100%

Households by Dwelling Type		
Single-detached	8,660	94%
Semi-detached	160	2%
Townhouse	190	2%
Apartment/Condo	180	2%
Total:	9,190	100%

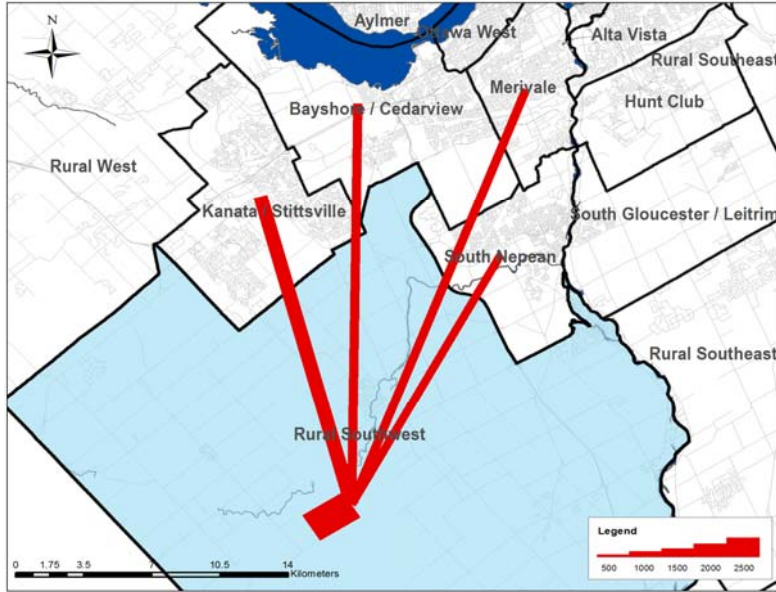


* In 2005 data was only collected for household members aged 11+ therefore these results cannot be compared to the 2011 data.

Travel Patterns

Top Five Destinations of Trips from Rural Southwest

AM Peak Period



Summary of Trips to and from Rural Southwest

AM Peak Period (6:30 - 8:59)

Districts	Destinations of Trips From		Origins of Trips To	
	District	% Total	District	% Total
Ottawa Centre	620	5%	40	0%
Ottawa Inner Area	580	5%	150	2%
Ottawa East	120	1%	20	0%
Beacon Hill	90	1%	0	0%
Alta Vista	690	6%	160	2%
Hunt Club	220	2%	180	2%
Merivale	840	7%	200	2%
Ottawa West	400	3%	80	1%
Bayshore / Cedarview	810	7%	190	2%
Orléans	70	1%	70	1%
Rural East	0	0%	20	0%
Rural Southeast	390	3%	520	6%
South Gloucester / Leitrim	220	2%	120	1%
South Nepean	970	8%	580	7%
Rural Southwest	4,280	34%	4,280	53%
Kanata / Stittsville	1,850	15%	1,130	14%
Rural West	80	1%	160	2%
Île de Hull	120	1%	0	0%
Hull Périphérie	70	1%	30	0%
Plateau	0	0%	0	0%
Aylmer	0	0%	60	1%
Rural Northwest	0	0%	0	0%
Pointe Gatineau	0	0%	10	0%
Gatineau Est	0	0%	10	0%
Rural Northeast	0	0%	0	0%
Buckingham / Masson-Angers	0	0%	0	0%
Ontario Sub-Total:	12,230	98%	7,900	99%
Québec Sub-Total:	190	2%	110	1%
Total:	12,420	100%	8,010	100%

Trips by Trip Purpose

24 Hours	From District		To District		Within District	
Work or related	7,730	27%	3,170	11%	1,930	11%
School	2,200	8%	1,000	4%	2,640	15%
Shopping	3,390	12%	1,450	5%	1,610	9%
Leisure	3,560	13%	2,420	9%	1,700	9%
Medical	1,000	4%	660	2%	130	1%
Pick-up / drive passenger	1,980	7%	1,250	4%	750	4%
Return Home	7,290	26%	17,280	61%	7,960	44%
Other	1,130	4%	930	3%	1,250	7%
Total:	28,280	100%	28,160	100%	17,970	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Work or related	4,820	59%	1,900	51%	1,110	26%
School	1,830	22%	960	26%	2,290	54%
Shopping	140	2%	20	1%	40	1%
Leisure	280	3%	220	6%	90	2%
Medical	210	3%	90	2%	0	0%
Pick-up / drive passenger	500	6%	230	6%	290	7%
Return Home	130	2%	190	5%	180	4%
Other	240	3%	80	2%	280	7%
Total:	8,150	100%	3,690	100%	4,280	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Work or related	260	5%	120	1%	60	2%
School	50	1%	0	0%	0	0%
Shopping	480	10%	390	5%	250	7%
Leisure	940	19%	760	9%	300	9%
Medical	10	0%	10	0%	30	1%
Pick-up / drive passenger	550	11%	360	4%	100	3%
Return Home	2,410	48%	6,370	77%	2,480	73%
Other	290	6%	220	3%	180	5%
Total:	4,990	100%	8,230	100%	3,400	100%

Peak Period (%)	Total:	% of 24 Hours	Within District (%)
24 Hours	74,410		24%
AM Peak Period	16,120	22%	27%
PM Peak Period	16,620	22%	20%

Trips by Primary Travel Mode

24 Hours	From District		To District		Within District	
Auto Driver	20,550	73%	20,370	72%	9,040	50%
Auto Passenger	4,420	16%	4,490	16%	2,460	14%
Transit	1,100	4%	1,130	4%	60	0%
Bicycle	60	0%	80	0%	250	1%
Walk	100	0%	120	0%	1,630	9%
Other	2,030	7%	1,960	7%	4,530	25%
Total:	28,260	100%	28,150	100%	17,970	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Auto Driver	5,620	69%	2,280	61%	1,630	38%
Auto Passenger	910	11%	340	9%	420	10%
Transit	410	5%	270	7%	10	0%
Bicycle	20	0%	20	1%	30	1%
Walk	40	0%	20	1%	190	4%
Other	1,150	14%	800	21%	1,990	47%
Total:	8,150	100%	3,730	100%	4,270	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Auto Driver	3,620	73%	6,060	74%	1,660	49%
Auto Passenger	860	17%	1,430	17%	510	15%
Transit	290	6%	430	5%	30	1%
Bicycle	40	1%	20	0%	80	2%
Walk	0	0%	80	1%	330	10%
Other	180	4%	220	3%	780	23%
Total:	4,990	100%	8,240	100%	3,390	100%

Avg Vehicle Occupancy	From District		To District		Within District	
24 Hours	1.22		1.22		1.27	
AM Peak Period	1.16		1.15		1.26	
PM Peak Period	1.24		1.24		1.31	

Transit Modal Split	From District		To District		Within District	
24 Hours	4%		4%		1%	
AM Peak Period	6%		9%		0%	
PM Peak Period	6%		5%		1%	

Appendix F

TRANS Regional Model

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Manotick Main Street

2011 Model - Basecase

N/A

User Initials: TIMW

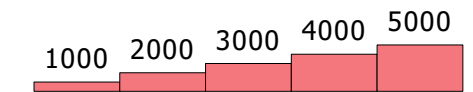
Plot Prepared: January, 2023

EMME Scenario: 21713



Legend

AM Peak Hour Total Traffic Volume



Distance (m)



N



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

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

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

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Mitch Owens/Stagecoach Area

2031 Model - Basecase

N/A

User Initials: TIMW

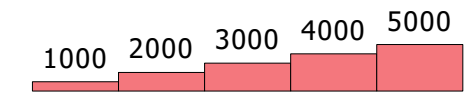
Plot Prepared: January, 2023

EMME Scenario: 21715



Legend

AM Peak Hour Total Traffic Volume



Distance (m)



N

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

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



Appendix G

TDM-Supportive Development Design and Infrastructure Checklist

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

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

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
1. WALKING & CYCLING: ROUTES		
1.1 Building location & access points		
BASIC	1.1.1 Locate building close to the street, and do not locate parking areas between the street and building entrances	<input type="checkbox"/>
BASIC	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	<input checked="" type="checkbox"/>
BASIC	1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	<input checked="" type="checkbox"/>
1.2 Facilities for walking & cycling		
REQUIRED	1.2.1 Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations (<i>see Official Plan policy 4.3.3</i>)	<input type="checkbox"/> No nearby rapid transit
REQUIRED	1.2.2 Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible (<i>see Official Plan policy 4.3.12</i>)	<input checked="" type="checkbox"/>

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

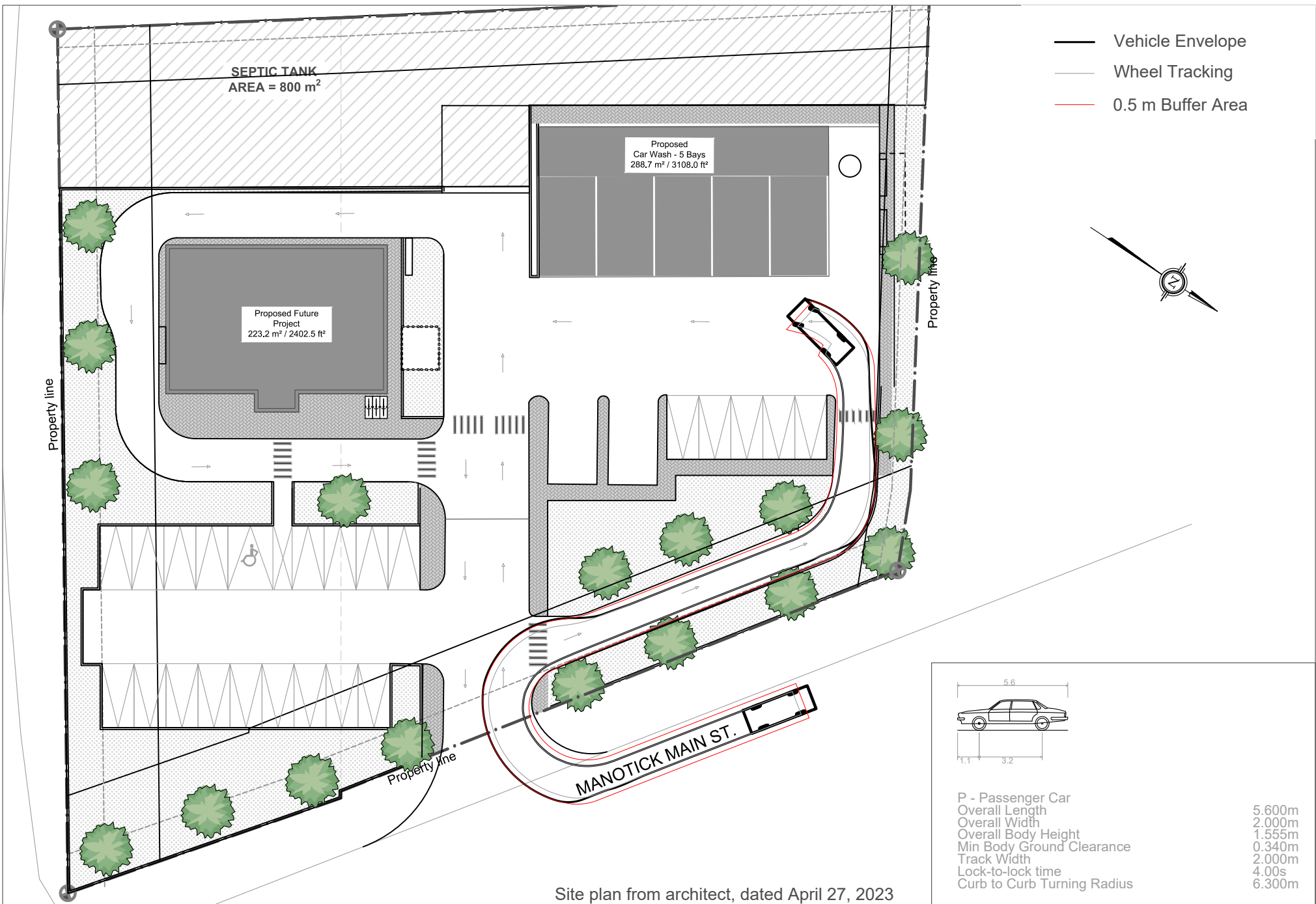
TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
2. WALKING & CYCLING: END-OF-TRIP FACILITIES		
2.1 Bicycle parking		
REQUIRED	2.1.1 Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible (see <i>Official Plan policy 4.3.6</i>)	<input checked="" type="checkbox"/>
REQUIRED	2.1.2 Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas (see <i>Zoning By-law Section 111</i>)	<input checked="" type="checkbox"/>
REQUIRED	2.1.3 Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored (see <i>Zoning By-law Section 111</i>)	<input checked="" type="checkbox"/>
BASIC	2.1.4 Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	<input checked="" type="checkbox"/>
BETTER	2.1.5 Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	<input checked="" type="checkbox"/>
2.2 Secure bicycle parking		
REQUIRED	2.2.1 Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers (see <i>Zoning By-law Section 111</i>)	<input type="checkbox"/> Not applicable
BETTER	2.2.2 Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	<input type="checkbox"/>
2.3 Shower & change facilities		
BASIC	2.3.1 Provide shower and change facilities for the use of active commuters	<input type="checkbox"/>
BETTER	2.3.2 In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	<input type="checkbox"/>
2.4 Bicycle repair station		
BETTER	2.4.1 Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	<input type="checkbox"/>

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

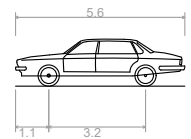
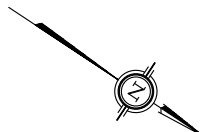
TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
6. PARKING		
6.1 Number of parking spaces		
REQUIRED	6.1.1 Do not provide more parking than permitted by zoning, nor less than required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

Appendix H

Vehicle Tracking



- Vehicle Envelope
- Wheel Tracking
- 0.5 m Buffer Area



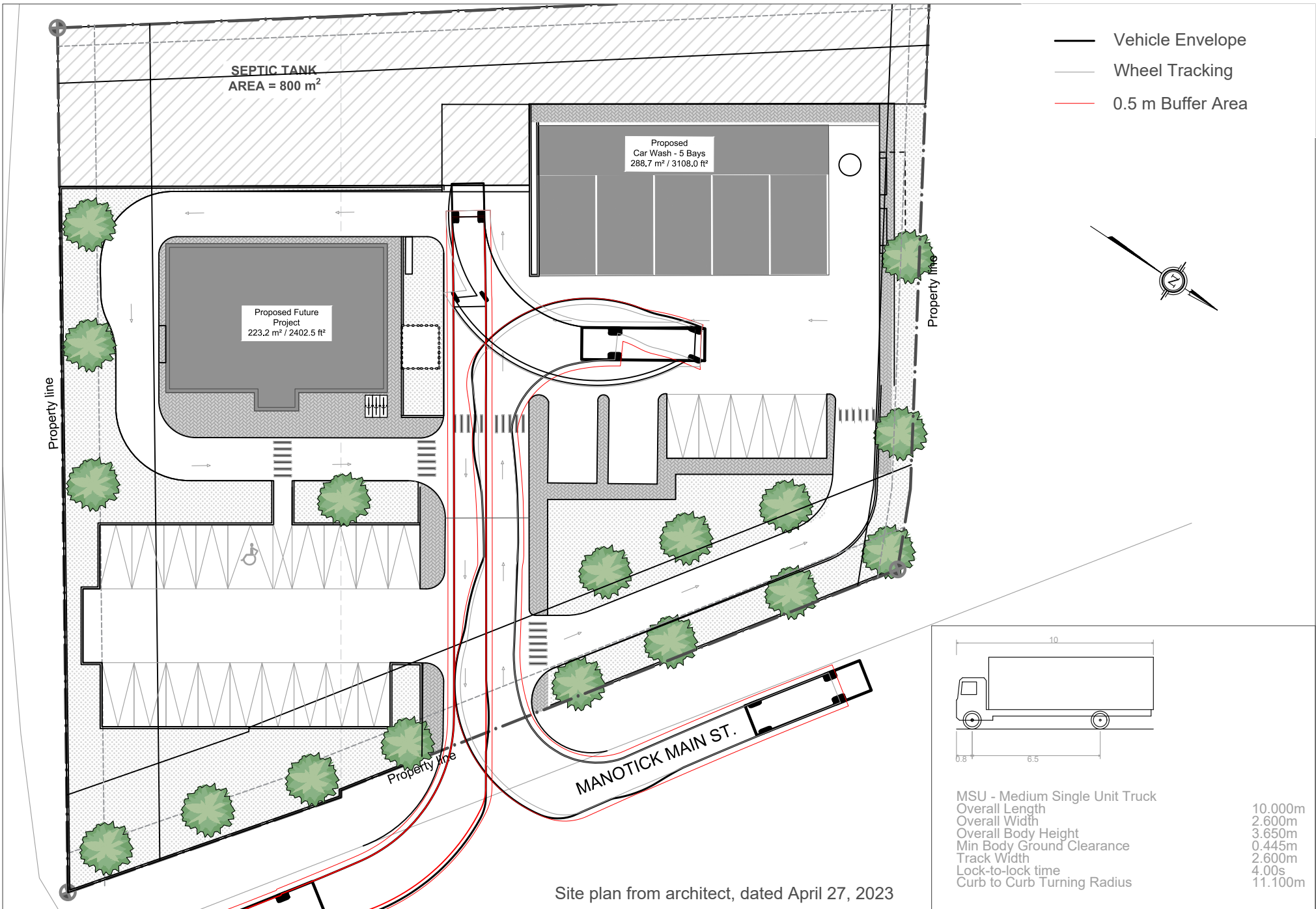
P - Passenger Car	
Overall Length	5.600m
Overall Width	2.000m
Overall Body Height	1.555m
Min Body Ground Clearance	0.340m
Track Width	2.000m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.300m

Site plan from architect, dated April 27, 2023

BTE 21-031
 2023-05-19
 Scale 1:400

5646 Manotick Main Street
 Vehicle Tracking – Car Wash



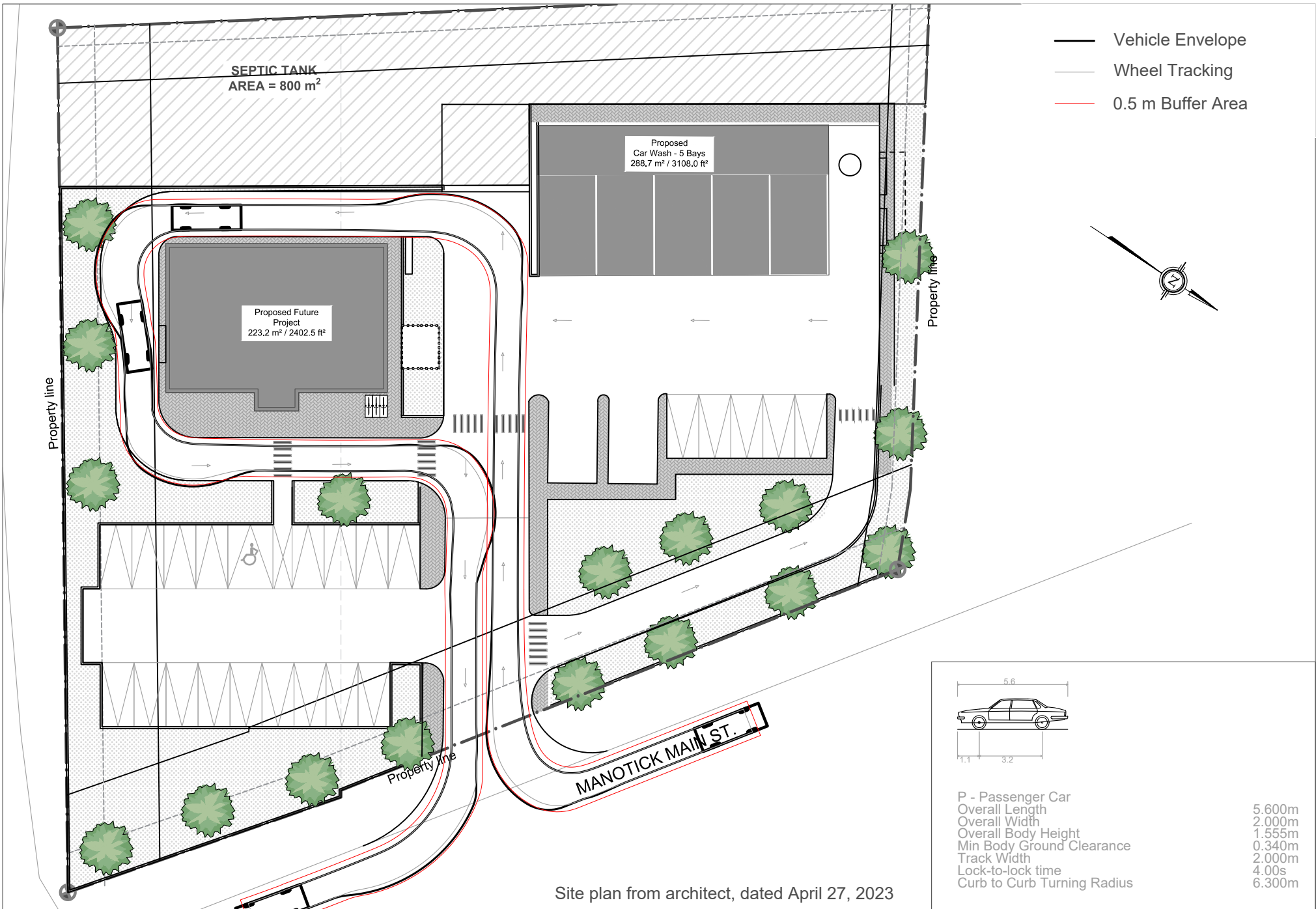


Site plan from architect, dated April 27, 2023

BTE 21-031
2023-05-19
Scale 1:400

5646 Manotick Main Street
Vehicle Tracking – Delivery

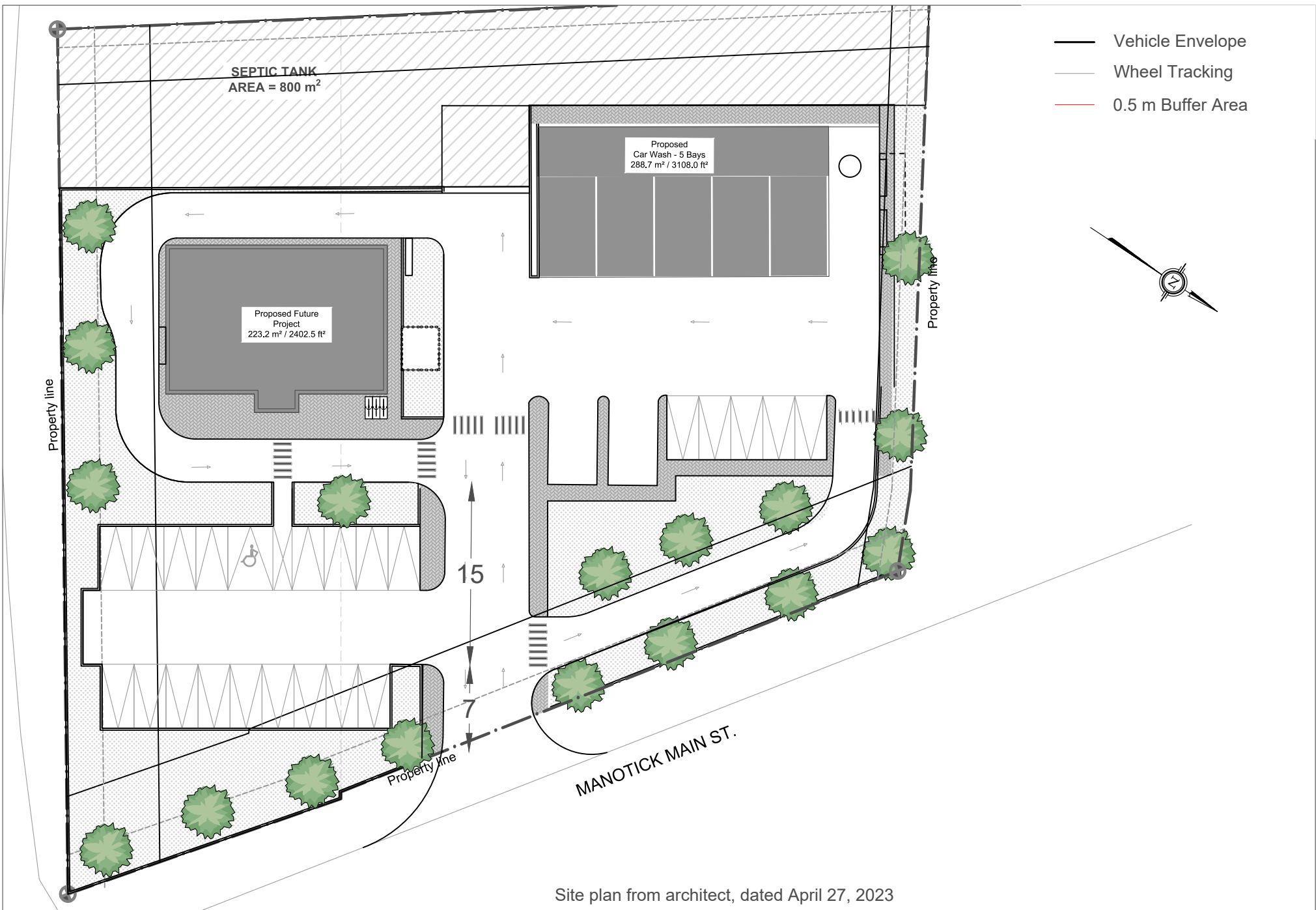




BTE 21-031
2023-05-19
Scale 1:400

5646 Manotick Main Street
Vehicle Tracking – Drive-Through





Site plan from architect, dated April 27, 2023

BTE 21-031
2023-05-19
Scale 1:400

5646 Manotick Main Street
Vehicle Tracking – Driveway Lengths



Appendix I

Traffic Signal Warrant Analysis Reports



Intersection: **Manotick Main Street / Project Site**
 Scenario: 2028 Total Traffic

Project 21-031
 2023-05-15

Date of Traffic Count: n/a

Conditions

Main road oriented north-south? Yes
Two lanes or more per approach on main road? No
Intersection with only 3 approaches (T)? Yes
Urban setting (restricted flow)? Yes
Future intersection or roadway(s)? Yes

Hourly Traffic Volumes (pc/h)

Peak Hour	Northbound (Main)			Eastbound (Minor)			Southbound (Main)			Westbound (Minor)			Peds Crossing Main Road
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
AM	69	622	0	68	0	34	0	286	35	0	0	0	8
PM	21	431	0	21	0	36	0	767	36	0	0	0	6
Average Hourly Volume (AHV)	23	263	0	22	0	18	0	263	18	0	0	0	4

Justification 7

	Justification	Threshold (pc/h)	Volume (pc/h)		Average Hourly Volume (pc/h)	Percentage of Threshold	Justification Met to 150%?
			AM	PM			
Volume	1A Total Traffic	720	1114	1312	607	84%	No
	1B Sidestreet Traffic	255	102	57	40	16%	
Delay	2A Main Road Traffic	720	1012	1255	567	79%	No
	2B Crossing Traffic & Pedestrians	75	76	27	26	34%	

Result

Traffic signals are not warranted

Intersection: **Manotick Main Street / Eastman Avenue**
Scenario: 2028 Total Traffic

Project 21-031
2023-05-15

Date of Traffic Count: Thursday, 10 October 2019

Conditions

Main road oriented north-south? Yes
Two lanes or more per approach on main road? No
Intersection with only 3 approaches (T)? Yes
Urban setting (restricted flow)? Yes
Future intersection or roadway(s)? Yes

Hourly Traffic Volumes (pc/h)

Peak Hour	Northbound (Main)			Eastbound (Minor)			Southbound (Main)			Westbound (Minor)			Peds Crossing Main Road
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
AM	41	648	0	36	0	27	0	294	10	0	0	0	0
PM	57	396	0	22	0	116	0	687	21	0	0	0	2
Average Hourly Volume (AHV)	25	261	0	15	0	36	0	245	8	0	0	0	1

Justification 7

	Justification	Threshold (pc/h)	Volume (pc/h)		Average Hourly Volume (pc/h)	Percentage of Threshold	Justification Met to 150%?
			AM	PM			
Volume	1A Total Traffic	720	1057	1298	589	82%	No
	1B Sidestreet Traffic	255	63	138	50	20%	
Delay	2A Main Road Traffic	720	993	1160	538	75%	No
	2B Crossing Traffic & Pedestrians	75	36	24	15	20%	

Result

Traffic signals are not warranted

Intersection: **Manotick Main Street / Mahogany Harbour Lane / Firefly Lane**
Scenario: 2028 Total Traffic

Project 21-031
2023-05-15

Date of Traffic Count: Thursday, 2 February 2023

Conditions

Main road oriented north-south? Yes
Two lanes or more per approach on main road? No
Intersection with only 3 approaches (T)? No
Urban setting (restricted flow)? Yes
Future intersection or roadway(s)? Yes

Hourly Traffic Volumes (pc/h)

Peak Hour	Northbound (Main)			Eastbound (Minor)			Southbound (Main)			Westbound (Minor)			Peds Crossing Main Road
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
AM	0	685	0	3	0	0	0	321	0	0	0	2	2
PM	0	451	0	1	0	0	3	797	3	0	0	0	1
Average Hourly Volume (AHV)	0	284	0	1	0	0	1	279	1	0	0	1	1

Justification 7

	Justification	Threshold (pc/h)	Volume (pc/h)		Average Hourly Volume (pc/h)	Percentage of Threshold	Justification Met to 150%?
			AM	PM			
Volume	1A Total Traffic	720	1011	1255	567	79%	No
	1B Sidestreet Traffic	170	5	1	2	1%	
Delay	2A Main Road Traffic	720	1006	1254	565	78%	No
	2B Crossing Traffic & Pedestrians	75	5	2	2	2%	

Result

Traffic signals are not warranted

Intersection: **Manotick Main Street / Century Road East**
Scenario: 2028 Total Traffic

Project 21-031
2023-05-15

Date of Traffic Count: Wednesday, 17 July 2019

Conditions

Main road oriented north-south? Yes
Two lanes or more per approach on main road? No
Intersection with only 3 approaches (T)? Yes
Urban setting (restricted flow)? Yes
Future intersection or roadway(s)? Yes

Hourly Traffic Volumes (pc/h)

Peak Hour	Northbound (Main)			Eastbound (Minor)			Southbound (Main)			Westbound (Minor)			Peds Crossing Main Road
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
AM	27	267	0	120	0	44	0	143	70	0	0	0	0
PM	48	181	0	93	0	48	0	307	165	0	0	0	0
Average Hourly Volume (AHV)	19	112	0	53	0	23	0	113	59	0	0	0	0

Justification 7

	Justification	Threshold (pc/h)	Volume (pc/h)		Average Hourly Volume (pc/h)	Percentage of Threshold	Justification Met to 150%?
			AM	PM			
Volume	1A Total Traffic	720	671	842	378	53%	No
	1B Sidestreet Traffic	255	164	141	76	30%	
Delay	2A Main Road Traffic	720	507	701	302	42%	No
	2B Crossing Traffic & Pedestrians	75	120	93	53	71%	

Result

Traffic signals are not warranted

Appendix J

Traffic Analysis Reports

HCM 2010 TWSC
1: Manotick Main St & Eastman Ave

Background AM

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↑	↑	↔
Traffic Vol, veh/h	36	26	39	617	278	10
Future Vol, veh/h	36	26	39	617	278	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	36	26	39	617	278	10
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	978	283	288	0	-	0
Stage 1	283	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Critical Hdwy	6.5	6.3	4.2	-	-	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	2.29	-	-	-
Pot Cap-1 Maneuver	269	737	1229	-	-	-
Stage 1	747	-	-	-	-	-
Stage 2	481	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	260	737	1229	-	-	-
Mov Cap-2 Maneuver	260	-	-	-	-	-
Stage 1	723	-	-	-	-	-
Stage 2	481	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	17.2	0.5	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1229	-	357	-	-	
HCM Lane V/C Ratio	0.032	-	0.174	-	-	
HCM Control Delay (s)	8	-	17.2	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-	

HCM 2010 TWSC
2: Manotick Main St & Project Site

Background AM

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↑	↑	↔
Traffic Vol, veh/h	0	0	0	656	304	0
Future Vol, veh/h	0	0	0	656	304	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	0	0	0	656	304	0
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	960	304	304	0	-	0
Stage 1	304	-	-	-	-	-
Stage 2	656	-	-	-	-	-
Critical Hdwy	6.5	6.3	4.2	-	-	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	2.29	-	-	-
Pot Cap-1 Maneuver	275	717	1213	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	502	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	275	717	1213	-	-	-
Mov Cap-2 Maneuver	275	-	-	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	502	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	0	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1213	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

HCM 2010 TWSC

Background AM

3: Manotick Main St & Mahogany Harbour Ln/Firefly Ln

Intersection													
Int Delay, s/veh	0.1												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔		↔		↔		↔		↔		↔		
Traffic Vol, veh/h	3	0	0	0	0	2	0	651	0	0	304	0	
Future Vol, veh/h	3	0	0	0	0	2	0	651	0	0	304	0	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100	
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10	
Mvmt Flow	3	0	0	0	0	2	0	651	0	0	304	0	

Major/Minor	Minor2	Minor1		Major1		Major2							
Conflicting Flow All	956	955	304	955	955	651	304	0	0	651	0	0	
Stage 1	304	304	-	651	651	-	-	-	-	-	-	-	
Stage 2	652	651	-	304	304	-	-	-	-	-	-	-	
Critical Hdwy	7.2	6.6	6.3	7.2	6.6	6.3	4.2	-	-	4.2	-	-	
Critical Hdwy Stg 1	6.2	5.6	-	6.2	5.6	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.2	5.6	-	6.2	5.6	-	-	-	-	-	-	-	
Follow-up Hdwy	3.59	4.09	3.39	3.59	4.09	3.39	2.29	-	-	2.29	-	-	
Pot Cap-1 Maneuver	230	250	717	230	250	455	1213	-	-	898	-	-	
Stage 1	689	649	-	444	452	-	-	-	-	-	-	-	
Stage 2	444	452	-	689	649	-	-	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	229	250	717	230	250	455	1213	-	-	898	-	-	
Mov Cap-2 Maneuver	229	250	-	230	250	-	-	-	-	-	-	-	
Stage 1	689	649	-	444	452	-	-	-	-	-	-	-	
Stage 2	442	452	-	689	649	-	-	-	-	-	-	-	

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.9	12.9	0	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1213	-	-	229	455	898	-	-
HCM Lane V/C Ratio	-	-	-	0.013	0.004	-	-	-
HCM Control Delay (s)	0	-	-	20.9	12.9	0	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

HCM 2010 Roundabout

Background AM

4: Manotick Main St & Bridgeport Ave/Antochi Ln

Intersection				
Intersection Delay, s/veh	9.0			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	300	4	352	304
Demand Flow Rate, veh/h	330	4	387	334
Vehicles Circulating, veh/h	214	715	329	3
Vehicles Exiting, veh/h	123	1	215	716
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.6	6.6	11.6	6.5
Approach LOS	A	A	B	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	330	4	387	334
Cap Entry Lane, veh/h	912	553	813	1127
Entry HV Adj Factor	0.909	1.000	0.910	0.909
Flow Entry, veh/h	300	4	352	304
Cap Entry, veh/h	829	553	740	1024
V/C Ratio	0.362	0.007	0.476	0.296
Control Delay, s/veh	8.6	6.6	11.6	6.5
LOS	A	A	B	A
95th %tile Queue, veh	2	0	3	1

5: Rideau Valley Dr N/Manotick Main St & Century Rd E

Intersection						
Int Delay, s/veh	3.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	113	44	27	239	131	66
Future Vol, veh/h	113	44	27	239	131	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	5
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	113	44	27	239	131	66
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	424	131	197	0	-	0
Stage 1	131	-	-	-	-	-
Stage 2	293	-	-	-	-	-
Critical Hdwy	6.5	6.3	4.2	-	-	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	2.29	-	-	-
Pot Cap-1 Maneuver	572	898	1329	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	739	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	559	898	1329	-	-	-
Mov Cap-2 Maneuver	559	-	-	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	739	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	12.7	0.8	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1329	-	625	-	-	
HCM Lane V/C Ratio	0.02	-	0.251	-	-	
HCM Control Delay (s)	7.8	0	12.7	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	1	-	-	

HCM 2010 TWSC
1: Manotick Main St & Eastman Ave

Background PM

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↓	
Traffic Vol, veh/h	22	113	55	387	672	21
Future Vol, veh/h	22	113	55	387	672	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	22	113	55	387	672	21

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	1180	683	693	0	- 0
Stage 1	683	-	-	-	-
Stage 2	497	-	-	-	-
Critical Hdwy	6.45	6.25	4.15	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-
Follow-up Hdwy	3.545	3.345	2.245	-	-
Pot Cap-1 Maneuver	207	444	888	-	-
Stage 1	496	-	-	-	-
Stage 2	605	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	194	444	888	-	-
Mov Cap-2 Maneuver	194	-	-	-	-
Stage 1	465	-	-	-	-
Stage 2	605	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.4	1.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	888	-	367	-	-
HCM Lane V/C Ratio	0.062	-	0.368	-	-
HCM Control Delay (s)	9.3	-	20.4	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.2	-	1.7	-	-

HCM 2010 TWSC
2: Manotick Main St & Project Site

Background PM

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↓	
Traffic Vol, veh/h	0	0	0	442	785	0
Future Vol, veh/h	0	0	0	442	785	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	0	0	0	442	785	0

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	1227	785	785	0	- 0
Stage 1	785	-	-	-	-
Stage 2	442	-	-	-	-
Critical Hdwy	6.45	6.25	4.15	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-
Follow-up Hdwy	3.545	3.345	2.245	-	-
Pot Cap-1 Maneuver	194	388	820	-	-
Stage 1	444	-	-	-	-
Stage 2	641	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	194	388	820	-	-
Mov Cap-2 Maneuver	194	-	-	-	-
Stage 1	444	-	-	-	-
Stage 2	641	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	820	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

HCM 2010 TWSC

Background PM

3: Manotick Main St & Mahogany Harbour Ln/Firefly Ln

Intersection													
Int Delay, s/veh	0												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔		↔		↔		↔		↔		↔		
Traffic Vol, veh/h	1	0	0	0	0	0	0	441	0	3	779	3	
Future Vol, veh/h	1	0	0	0	0	0	0	441	0	3	779	3	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100	
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5	
Mvmt Flow	1	0	0	0	0	0	0	441	0	3	779	3	

Major/Minor	Minor2	Minor1	Major1	Major2									
Conflicting Flow All	1228	1228	781	1228	1229	441	782	0	0	441	0	0	
Stage 1	787	787	-	441	441	-	-	-	-	-	-	-	
Stage 2	441	441	-	787	788	-	-	-	-	-	-	-	
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-	
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-	
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-	
Pot Cap-1 Maneuver	153	176	390	153	175	610	823	-	-	1103	-	-	
Stage 1	380	398	-	589	572	-	-	-	-	-	-	-	
Stage 2	589	572	-	380	398	-	-	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	152	175	390	152	174	610	823	-	-	1103	-	-	
Mov Cap-2 Maneuver	152	175	-	152	174	-	-	-	-	-	-	-	
Stage 1	380	396	-	589	572	-	-	-	-	-	-	-	
Stage 2	589	572	-	378	396	-	-	-	-	-	-	-	

Approach	EB	WB	NB	SB
HCM Control Delay, s	28.8	0	0	0
HCM LOS	D	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	823	-	-	152	-	1103	-	-
HCM Lane V/C Ratio	-	-	-	0.007	-	0.003	-	-
HCM Control Delay (s)	0	-	-	28.8	0	8.3	0	-
HCM Lane LOS	A	-	-	D	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-	-

HCM 2010 Roundabout

Background PM

4: Manotick Main St & Bridgeport Ave/Antochi Ln

Intersection				
Intersection Delay, s/veh	12.7			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	177	8	264	779
Demand Flow Rate, veh/h	186	8	277	818
Vehicles Circulating, veh/h	486	461	195	6
Vehicles Exiting, veh/h	338	11	477	463
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.8	5.2	7.3	15.4
Approach LOS	A	A	A	C

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	186	8	277	818
Cap Entry Lane, veh/h	695	713	930	1123
Entry HV Adj Factor	0.951	1.000	0.953	0.953
Flow Entry, veh/h	177	8	264	779
Cap Entry, veh/h	661	713	886	1070
V/C Ratio	0.268	0.011	0.298	0.728
Control Delay, s/veh	8.8	5.2	7.3	15.4
LOS	A	A	A	C
95th %tile Queue, veh	1	0	1	7

5: Rideau Valley Dr N/Manotick Main St & Century Rd E

Intersection

Int Delay, s/veh 2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	90	48	48	174	294	160
Future Vol, veh/h	90	48	48	174	294	160
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	5
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	90	48	48	174	294	160

Major/Minor

	Minor2	Major1	Major2		
Conflicting Flow All	564	294	454	0	- 0
Stage 1	294	-	-	-	-
Stage 2	270	-	-	-	-
Critical Hdwy	6.45	6.25	4.15	-	- -
Critical Hdwy Stg 1	5.45	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-
Follow-up Hdwy	3.545	3.345	2.245	-	- -
Pot Cap-1 Maneuver	482	738	1091	-	- -
Stage 1	749	-	-	-	-
Stage 2	768	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	458	738	1091	-	- -
Mov Cap-2 Maneuver	458	-	-	-	-
Stage 1	712	-	-	-	-
Stage 2	768	-	-	-	-

Approach

	EB	NB	SB
HCM Control Delay, s	14.2	1.8	0
HCM LOS	B		

Minor Lane/Major Mvmt

	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1091	-	528	-	-
HCM Lane V/C Ratio	0.044	-	0.261	-	-
HCM Control Delay (s)	8.5	0	14.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1	-	-

HCM 2010 TWSC
1: Manotick Main St & Eastman Ave

Total AM

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↓	
Traffic Vol, veh/h	36	27	41	648	294	10
Future Vol, veh/h	36	27	41	648	294	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	36	27	41	648	294	10
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1029	299	304	0	-	0
Stage 1	299	-	-	-	-	-
Stage 2	730	-	-	-	-	-
Critical Hdwy	6.5	6.3	4.2	-	-	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	2.29	-	-	-
Pot Cap-1 Maneuver	250	722	1213	-	-	-
Stage 1	734	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	242	722	1213	-	-	-
Mov Cap-2 Maneuver	242	-	-	-	-	-
Stage 1	709	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	18.1	0.5	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1213	-	338	-	-	
HCM Lane V/C Ratio	0.034	-	0.186	-	-	
HCM Control Delay (s)	8.1	-	18.1	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-	

HCM 2010 TWSC
2: Manotick Main St & Project Site

Total AM

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↓	
Traffic Vol, veh/h	68	34	69	622	286	35
Future Vol, veh/h	68	34	69	622	286	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	68	34	69	622	286	35
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1064	304	321	0	-	0
Stage 1	304	-	-	-	-	-
Stage 2	760	-	-	-	-	-
Critical Hdwy	6.5	6.3	4.2	-	-	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	2.29	-	-	-
Pot Cap-1 Maneuver	238	717	1195	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	448	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	224	717	1195	-	-	-
Mov Cap-2 Maneuver	224	-	-	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	448	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	23.9	0.8	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1195	-	291	-	-	
HCM Lane V/C Ratio	0.058	-	0.351	-	-	
HCM Control Delay (s)	8.2	-	23.9	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0.2	-	1.5	-	-	

HCM 2010 TWSC

Total AM

3: Manotick Main St & Mahogany Harbour Ln/Firefly Ln

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔		↔		↔		↔		↔	
Traffic Vol, veh/h	3	0	0	0	0	2	0	685	0	0	321	0
Future Vol, veh/h	3	0	0	0	0	2	0	685	0	0	321	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	3	0	0	0	0	2	0	685	0	0	321	0

Major/Minor	Minor2	Minor1	Major1	Major2
Conflicting Flow All	1007	1006	321	1006
Stage 1	321	321	-	685
Stage 2	686	685	-	321
Critical Hdwy	7.2	6.6	6.3	7.2
Critical Hdwy Stg 1	6.2	5.6	-	6.2
Critical Hdwy Stg 2	6.2	5.6	-	6.2
Follow-up Hdwy	3.59	4.09	3.39	3.59
Pot Cap-1 Maneuver	212	234	702	212
Stage 1	674	638	-	425
Stage 2	425	436	-	674
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	211	234	702	212
Mov Cap-2 Maneuver	211	234	-	212
Stage 1	674	638	-	425
Stage 2	423	436	-	674

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.3	13.3	0	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1195	-	-	211	435	872	-	-
HCM Lane V/C Ratio	-	-	-	0.014	0.005	-	-	-
HCM Control Delay (s)	0	-	-	22.3	13.3	0	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

HCM 2010 Roundabout

Total AM

4: Manotick Main St & Bridgeport Ave/Antochi Ln

Intersection				
Intersection Delay, s/veh	9.6			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	300	4	387	321
Demand Flow Rate, veh/h	330	4	426	353
Vehicles Circulating, veh/h	233	753	329	3
Vehicles Exiting, veh/h	123	1	234	754
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.8	6.9	12.7	6.7
Approach LOS	A	A	B	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	330	4	426	353
Cap Entry Lane, veh/h	895	532	813	1127
Entry HV Adj Factor	0.909	1.000	0.910	0.909
Flow Entry, veh/h	300	4	387	321
Cap Entry, veh/h	814	532	740	1024
V/C Ratio	0.369	0.008	0.524	0.313
Control Delay, s/veh	8.8	6.9	12.7	6.7
LOS	A	A	B	A
95th %tile Queue, veh	2	0	3	1

5: Rideau Valley Dr N/Manotick Main St & Century Rd E

Intersection						
Int Delay, s/veh	3.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	120	44	27	267	143	70
Future Vol, veh/h	120	44	27	267	143	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	5
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	120	44	27	267	143	70

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	464	143	213	0	-	0
Stage 1	143	-	-	-	-	-
Stage 2	321	-	-	-	-	-
Critical Hdwy	6.5	6.3	4.2	-	-	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	2.29	-	-	-
Pot Cap-1 Maneuver	542	884	1311	-	-	-
Stage 1	865	-	-	-	-	-
Stage 2	718	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	529	884	1311	-	-	-
Mov Cap-2 Maneuver	529	-	-	-	-	-
Stage 1	844	-	-	-	-	-
Stage 2	718	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1311	-	593	-	-
HCM Lane V/C Ratio	0.021	-	0.277	-	-
HCM Control Delay (s)	7.8	0	13.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.1	-	-

HCM 2010 TWSC
1: Manotick Main St & Eastman Ave

Total PM

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↕	↕	↔
Traffic Vol, veh/h	22	116	57	396	687	21
Future Vol, veh/h	22	116	57	396	687	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	22	116	57	396	687	21

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1208	698	708	0	-	0
Stage 1	698	-	-	-	-	-
Stage 2	510	-	-	-	-	-
Critical Hdwy	6.45	6.25	4.15	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	2.245	-	-	-
Pot Cap-1 Maneuver	199	435	877	-	-	-
Stage 1	488	-	-	-	-	-
Stage 2	597	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	186	435	877	-	-	-
Mov Cap-2 Maneuver	186	-	-	-	-	-
Stage 1	456	-	-	-	-	-
Stage 2	597	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.2	1.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	877	-	358	-	-
HCM Lane V/C Ratio	0.065	-	0.385	-	-
HCM Control Delay (s)	9.4	-	21.2	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.2	-	1.8	-	-

HCM 2010 TWSC
2: Manotick Main St & Project Site

Total PM

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↕	↕	↔
Traffic Vol, veh/h	21	36	21	431	767	36
Future Vol, veh/h	21	36	21	431	767	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	21	36	21	431	767	36

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1258	785	803	0	-	0
Stage 1	785	-	-	-	-	-
Stage 2	473	-	-	-	-	-
Critical Hdwy	6.45	6.25	4.15	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	2.245	-	-	-
Pot Cap-1 Maneuver	186	388	808	-	-	-
Stage 1	444	-	-	-	-	-
Stage 2	621	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	181	388	808	-	-	-
Mov Cap-2 Maneuver	181	-	-	-	-	-
Stage 1	432	-	-	-	-	-
Stage 2	621	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.6	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	808	-	273	-	-
HCM Lane V/C Ratio	0.026	-	0.209	-	-
HCM Control Delay (s)	9.6	-	21.6	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.8	-	-

HCM 2010 TWSC

Total PM

3: Manotick Main St & Mahogany Harbour Ln/Firefly Ln

Intersection													
Int Delay, s/veh	0												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔		↔		↔		↔		↔		↔		
Traffic Vol, veh/h	1	0	0	0	0	0	0	451	0	3	797	3	
Future Vol, veh/h	1	0	0	0	0	0	0	451	0	3	797	3	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100	
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5	
Mvmt Flow	1	0	0	0	0	0	0	451	0	3	797	3	

Major/Minor	Minor2	Minor1	Major1	Major2									
Conflicting Flow All	1256	1256	799	1256	1257	451	800	0	0	451	0	0	
Stage 1	805	805	-	451	451	-	-	-	-	-	-	-	
Stage 2	451	451	-	805	806	-	-	-	-	-	-	-	
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-	
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-	
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-	
Pot Cap-1 Maneuver	146	169	381	146	169	602	810	-	-	1094	-	-	
Stage 1	372	391	-	582	566	-	-	-	-	-	-	-	
Stage 2	582	566	-	372	391	-	-	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	145	168	381	145	168	602	810	-	-	1094	-	-	
Mov Cap-2 Maneuver	145	168	-	145	168	-	-	-	-	-	-	-	
Stage 1	372	389	-	582	566	-	-	-	-	-	-	-	
Stage 2	582	566	-	370	389	-	-	-	-	-	-	-	

Approach	EB	WB	NB	SB
HCM Control Delay, s	30	0	0	0
HCM LOS	D	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	810	-	-	145	-	1094	-	-
HCM Lane V/C Ratio	-	-	-	0.007	-	0.003	-	-
HCM Control Delay (s)	0	-	-	30	0	8.3	0	-
HCM Lane LOS	A	-	-	D	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-	-

HCM 2010 Roundabout

Total PM

4: Manotick Main St & Bridgeport Ave/Antochi Ln

Intersection				
Intersection Delay, s/veh	13.2			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	177	8	274	797
Demand Flow Rate, veh/h	186	8	287	837
Vehicles Circulating, veh/h	504	471	195	6
Vehicles Exiting, veh/h	338	11	495	473
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.0	5.2	7.4	16.2
Approach LOS	A	A	A	C

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	186	8	287	837
Cap Entry Lane, veh/h	683	706	930	1123
Entry HV Adj Factor	0.951	1.000	0.953	0.953
Flow Entry, veh/h	177	8	274	797
Cap Entry, veh/h	649	706	886	1070
V/C Ratio	0.272	0.011	0.309	0.745
Control Delay, s/veh	9.0	5.2	7.4	16.2
LOS	A	A	A	C
95th %tile Queue, veh	1	0	1	7

5: Rideau Valley Dr N/Manotick Main St & Century Rd E

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	93	48	48	181	307	165
Future Vol, veh/h	93	48	48	181	307	165
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	5
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	93	48	48	181	307	165
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	584	307	472	0	-	0
Stage 1	307	-	-	-	-	-
Stage 2	277	-	-	-	-	-
Critical Hdwy	6.45	6.25	4.15	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	2.245	-	-	-
Pot Cap-1 Maneuver	469	726	1074	-	-	-
Stage 1	739	-	-	-	-	-
Stage 2	763	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	446	726	1074	-	-	-
Mov Cap-2 Maneuver	446	-	-	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	763	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	14.7	1.8	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1074	-	513	-	-	
HCM Lane V/C Ratio	0.045	-	0.275	-	-	
HCM Control Delay (s)	8.5	0	14.7	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	1.1	-	-	