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39 Years

Proposed Development
3711, 3715, 3719, and 3725 Carp Road, Ottawa
Transportation Impact Assessment

3711 - 3725 Carp Road

Transportation Impact Assessment

Prepared By:

NOVATECH
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6

May 2023

Novatech File: 121173
Ref: R-2023-055

NOVATECH
Engineers, Planners & Landscape Architects

May 12, 2023

City of Ottawa
Planning, Real Estate, and Economic Development Department
110 Laurier Ave. W., 4th Floor,
Ottawa, Ontario K1P 1J1

Attention: **Ms. Josiane Gervais**
Project Manager, Infrastructure Approvals

Dear Ms. Gervais:

Reference: **3711, 3715, 3719, and 3725 Carp Road**
Transportation Impact Assessment
Novatech File No. 121173

We are pleased to submit the following Transportation Impact Assessment (TIA) in support of a Draft Plan of Subdivision application on a site with four municipal addresses – 3711, 3715, 3719, and 3725 Carp Road, for your review and signoff. The structure and format of this report is in accordance with the City of Ottawa Transportation Impact Assessment Guidelines (June 2017).

If you have any questions or comments regarding this report, please feel free to contact Jennifer Luong, or the undersigned.

Yours truly,

NOVATECH

Joshua Audia, P.Eng., for Rochelle Fortier, P.Eng.
Project Engineer | Transportation

Suite 200, 240 Michael Cowpland Drive, Ottawa ON K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

TIA Plan Reports

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

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

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

CERTIFICATION

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

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

City Of Ottawa
Infrastructure Services and Community Sustainability
Planning and Growth Management
110 Laurier Avenue West, 4th fl.
Ottawa, ON K1P 1J1
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 __12th__ day of _____May_____, 2023.
(City)

Name: _____Jennifer Luong, P.Eng._____
(Please Print)

Professional Title: _____Senior Project Manager, Transportation_____

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

Office Contact Information (Please Print)	
Address:	240 Michael Cowpland Drive, Suite 200
City / Postal Code:	Ottawa, ON, K2M 1P6
Telephone / Extension:	613-254-9643 x 254
E-Mail Address:	j.luong@novatech-eng.com

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EXECUTIVE SUMMARY

This Transportation Impact Assessment (TIA) has been prepared in support of a Draft Plan of Subdivision application on a site with four municipal addresses - 3711, 3715, 3719, and 3725 Carp Road (together the "Subject Site").

The proposed mixed-use development conceptually includes seven buildings. A total of 78 residential units and 18 commercial units (1,606m^2 of GFA) are proposed. Two of the buildings fronting Carp Road are proposed to include 9 "lifestyle units" each which have ground floor commercial use with two levels of residential above. Behind these, the other five buildings are proposed to include 12 stacked dwellings each. Vehicular and pedestrian access is from Carp Road and access through the site would be via private streets. A total of 146 surface parking spaces are proposed throughout the site. The proposed development will be completed in a single phase, with anticipated buildout by 2027.

The main conclusions and recommendations of this TIA are summarized below:

Existing and Background Intersection Operations

- All study area intersections are anticipated to operate with delays of 13 seconds or less (LOS B or better). No queueing issues are anticipated.

- The maximum northbound queue at the Carp Road/Donald B. Munro Drive intersection is anticipated to be approximately 35m during the Saturday peak hour and is not anticipated to reach the railway crossing.

Development and Access Design

- Access to the development is provided by a private street that connects to Carp Road, approximately 70m north of Rivington Street, measured from nearest edge to nearest edge. Stop control will be provided at the access, with free flow on Carp Road. The width of the private street is proposed to be 6.7m.

- The proposed access meets all requirements of the City's Zoning By-Law, as well as TAC Geometric Design Guidelines.

- Sidewalks are shown on the Concept Plan and are proposed throughout the site, linking the main building entrances with the parking areas and connecting to the existing sidewalk along the Carp Road. The sidewalk along Carp Road will be continuous and depressed across the site access.

Boundary Streets

- Carp Road meets the target Truck Level of Service (TkLOS) but does not meet the target Pedestrian Level of Service (PLOS) or Bicycle Level of Service (BLOS).

- The target PLOS C is only achievable for an operating speed of 60km/h, no parking, and an AADT above 3,000vpd through the provision of a 2.0m sidewalk with a 2.0m boulevard. This is identified for the City's consideration.

- The target BLOS C is not achievable for mixed traffic on roadways with an operating speed of 60km/h. A minimum 1.2m wide bike lane would achieve the target BLOS. The Ontario Traffic Manual (OTM) – Book 18 *Desirable Cycling Facility Pre-Selection Nomograph (Urban Context)* suggests that a designated facility (such a bike lanes) should be considered. This is identified for the City's consideration.

- As part of the draft 2024 Transportation Master Plan, Carp Road from Galetta Side Road to Highway 417 and Donald B. Munro Drive east of Carp Road are shown as part of the proposed paved shoulder network (rural active transportation network).

Transportation Demand Management

- The proposed development conforms to the City's TDM initiatives by providing connections to the local pedestrian network and the provision of bicycle parking on-site.

Transit

- The proposed subdivision is not anticipated to generate any new transit trips. This is due to the limited transit service currently provided in the Village of Carp. Any transit users were accounted for as vehicle trips for this study, as they are anticipated to travel to Park-n-Ride facilities in order to access more reliable transit.

- The nearest facility is the Carp Park-n-Ride which is located north of Stittsville at Highway 417 on Westbrook Road (approximately 10km south of the subject site). It offers easy access to Connexion routes and free parking with up to 156 spaces.

Total Intersection Operations

- All study area intersections are anticipated to operate with a delay of 14 seconds or less (LOS B or better).

- The site access is anticipated to operate acceptably under side street stop control. Queues of less than one vehicle are anticipated leaving the site. A review of the MTO left turn lane warrant graphs indicates that no northbound left turn lane is required for the site.

- The maximum northbound queue at the Carp Road/Donald B. Munro Drive intersection is anticipated to be approximately 40m during the Saturday peak hour and is not anticipated to reach the railway crossing.

- The addition of traffic generated by the proposed development is not anticipated to have a significant impact on the overall intersection operations within the study area.

1.0 INTRODUCTION

This Transportation Impact Assessment (TIA) has been prepared in support of a Draft Plan of Subdivision application on a site with four municipal addresses - 3711, 3715, 3719, and 3725 Carp Road (together the "Subject Site").

The subject site comprises 2.28 hectares of land on the west side of Carp Road and on the north bank of the Carp River. Historically it has been developed with a number of detached dwellings and was previously (between 1976 and 2014) occupied by the office and depot for Karson Cartage. By 2015 all of the structures on-site (houses/depot buildings) have been removed, and it has been vacant of development since.

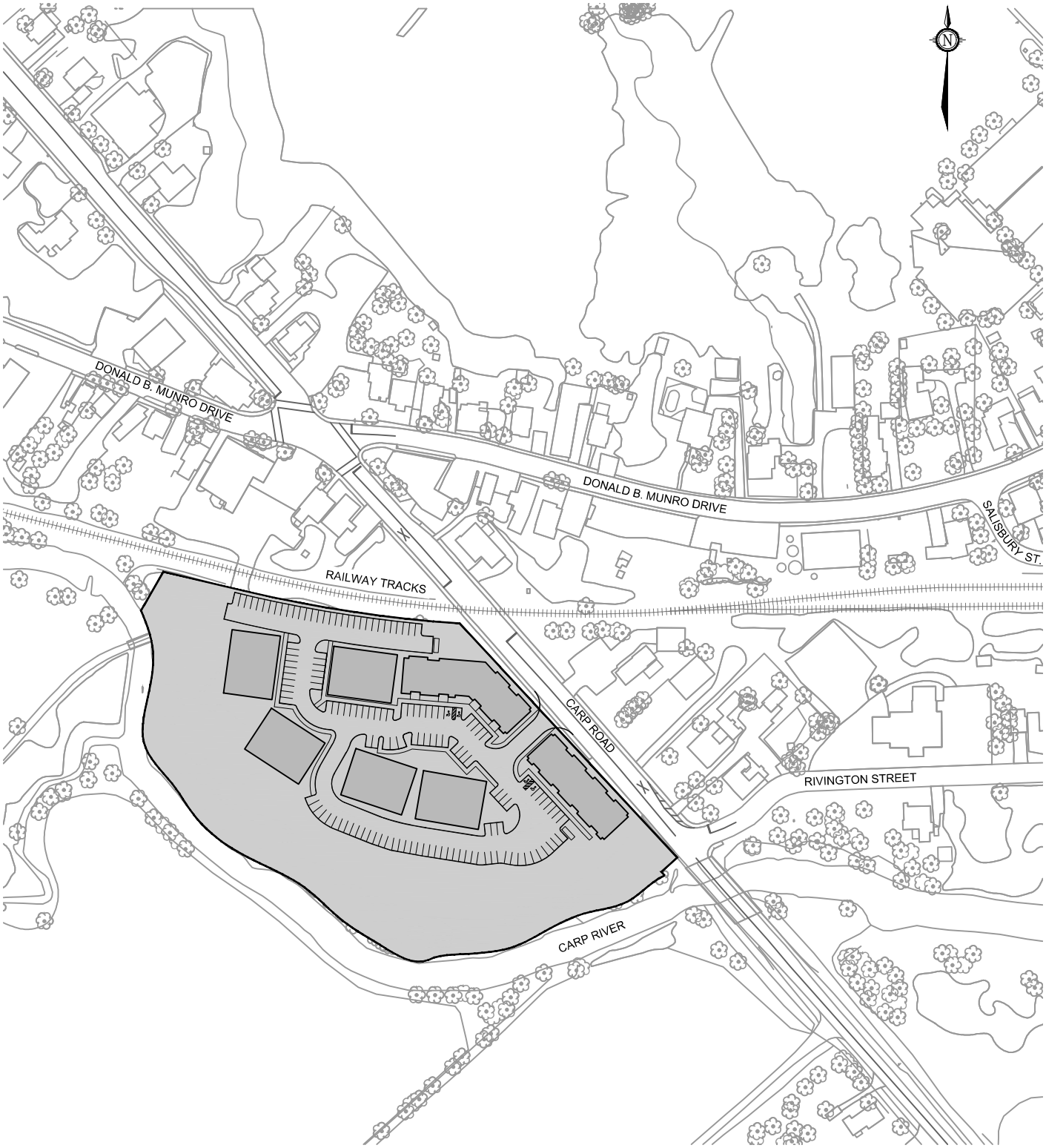
The subject site is surrounded by the following:

- An active rail line (Renfrew Rail Corridor) to the north;
- Carp Road to the east;
- The Carp River to the south and west.

The most recent aerial view of the subject site is provided in **Figure 1**. A context plan is included as **Figure 2**.

Figure 1: View of the Subject Site

GeoOttawa (2021 aerial)



NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

3725 CARP ROAD

CONTEXT PLAN

SCALE N.T.S.

DATE FEB 2023 | JOB 121173 | FIGURE FIGURE 2

SHT8X11.DWG - 216mmx279mm

C:\temp\AcPublish_13408\121173-Context.dwg, Context, Feb 23, 2023 - 10:39am, rhillier

2.0 PROPOSED DEVELOPMENT

The subject site is zoned Village Mixed Use with an exception – VM [666r]. Stacked dwelling is a permitted use. A future Zoning By-law Amendment will be required to permit this Planned Unit Development and to permit increased height and a reduced railway setback but is not being filed at this time. Schedule B9 of the Official Plan designates the subject site as Village Core. Schedule A of the Carp Secondary Plan designates the majority of the subject site as Village Core and the area abutting the Carp River as Village Greenspace.

The proposed mixed-use development conceptually includes seven buildings. A total of 78 residential units and 18 commercial units (1,606m^2 of GFA) are proposed. Two of the buildings fronting Carp Road are proposed to include 9 "lifestyle units" each which have ground floor commercial use with two levels of residential above. Behind these, the other five buildings are proposed to include 12 stacked dwellings each. Vehicular and pedestrian access is from Carp Road and access through the site would be via private streets. A total of 146 surface parking spaces are proposed throughout the site.

The proposed development will be completed in a single phase, with anticipated buildout by 2027.

Copies of the draft plan and concept plan are included in **Appendix A**.

3.0 SCREENING

The City's 2017 TIA Guidelines identify three triggers for completing a TIA report, including trip generation, location, and safety. The criteria for each trigger are outlined in the City's TIA Screening Form, which is included in **Appendix B**. The trigger results are as follows.

- Trip Generation Trigger – The development is anticipated to generate over 60 peak hour person trips; further assessment is required based on this trigger.

- Location Triggers – The development is located within the Carp Village Core Design Priority Area (DPA) and proposes a new connection to a Spine Cycling Route (Carp Road); further assessment is required based on this trigger.

- Safety Triggers – The site abuts an active rail line which is a safety concern within 500m of the development; further assessment is required based on this trigger.

4.0 SCOPING

4.1 Existing Conditions

4.1.1 Roadways

All roadways discussed below fall under the jurisdiction of the City of Ottawa. The roadway network of the greater area surrounding the subject site is illustrated in **Figure 3**.

Carp Road is an arterial roadway that generally runs on a north-south alignment between Galetta Side Road and Stittsville Main Street. Within the study area, Carp Road has a two-lane undivided urban cross-section and a posted speed of 50km/h. A concrete sidewalk is provided on the west side

of the road, north of the subject site's current driveway, and an asphalt sidewalk is provided on the east side north of Rivington Street, changing to concrete near Donald B. Munro Drive. Carp Road is classified as a truck route, allowing full loads. On-street parking is permitted on the east side of Carp Road opposite the subject site and on both sides of the road north of Donald B. Munro Drive, near the Carp Fairgrounds. The City of Ottawa's Official Plan identifies a right-of-way (ROW) protection of 23m for Carp Road between 600m south of Craig Side Road and 600m north of March Road. A road widening will be required as part of this application and is shown on the Draft Plan.

Donald B. Munro Drive is a collector roadway that generally runs on an east-west alignment within the study area, running between Kinburn Side Road and March Road. Within the study area, Donald B. Munro Drive has a two-lane undivided urban cross-section, sidewalks on both sides of the roadway, and a posted speed limit of 40km/h. Donald B. Munro Drive is not classified as a truck route. Street parking is permitted on the south side east of Carp Road.

Rivington Street is a local roadway which runs from Carp Road and continues east for approximately 600m, where is terminates in a cul-de-sac. This roadway has a two-lane cross-section, primarily urban, with a posted speed limit of 40km/h.

Figure 3: Roadway Network

4.1.2 Pedestrian and Cycling Facilities

The pedestrian and cycling network of the greater area surrounding the subject site is illustrated in **Figure 4**.

Figure 4: Pedestrian and Cycling Network

In the City of Ottawa's Ultimate Cycling Network, Carp Road is classified as a Spine Route south of Donald B. Munro Drive, and Donald B. Munro Drive is classified as a Local Route east of Carp Road. To the north and west of the Carp Road/Donald B. Munro Drive intersection, the study area roadways have no cycling route designation. The Renfrew Rail Corridor north of the subject site is classified as a Major Pathway.

Within the existing cycling network, Carp Road south of Donald B. Munro Drive is noted as having paved shoulders, and Donald B. Munro Drive east of Carp Road is noted as a Suggested Route.

Within the study area, concrete sidewalks are provided on both sides of Donald B. Munro Drive and on the west side of Carp Road. The sidewalks on the east side of Carp Road are concrete within proximity of the intersection with Donald B. Munro Drive, before transitioning to asphalt sidewalks to the south of the intersection and terminating at Rivington Street. A pedestrian crossover is provided on Carp Road near the Carp Fairgrounds (at Falldown Lane).

No dedicated pedestrian or cycling facilities are provided on Rivington Street.

4.1.3 Intersections

Carp Road/Donald B. Munro Drive

- Unsignalized four-legged intersection
- All-way stop controlled
- Single lane approaches on all legs
- Marked pedestrian crossings on all four approaches

Carp Road/Rivington Street

- Unsignalized three-legged intersection
- Stop control on Rivington Street with free flow on Carp Road
- Single lane approaches on all legs

Carp Road/Renfrew Rail Corridor

A railway corridor owned by the City of Ottawa crosses Carp Road north of the subject site and this intersection is controlled by a level crossing with bells and lights, but no gate.

4.1.4 Driveways

The City's 2017 TIA Guidelines requires a review of driveways on the boundary streets within 200m of any proposed access. The existing driveways in proximity to the subject site are described below.

Carp Road, east side:

- One shared driveway to the dwellings at 3696, 3698, and 3700 Carp Road
- One driveway to the Masonic Lodge at 3704 Carp Road
- One driveway to the animal hospital at 3710 Carp Road
- One driveway to the dwelling at 3722 Carp Road
- Two driveways to the restaurant at 421 Donald B. Munro Drive

Carp Road, west side:

- Two driveways serving the dwellings at 3667 and 3679 Carp Road
- One access to the farm at 3673 Carp Road
- One driveway to the vacant gravel lot at 3727 Carp Road
- One driveway to the dwelling at 3729 Carp Road
- One shared driveway serving the post office at 3731 Carp Road, the subject site, and the convenience store at 429 Donald B. Munro Drive

4.1.5 Area Traffic Management

There are no Area Traffic Management (ATM) studies within the study area that have been completed or are currently in progress.

There is a speed display board for the northbound direction along Carp Road, located approximately 80m south of Rivington Street, just after the posted speed reduces from 80km/h to 50km/h (for traffic entering the Village of Carp).

4.1.6 Transit

There are two bus stops located at the Carp Road/Donald B. Munro Drive intersection. Stop #6982 is located at the northwest corner and stop #6983 is located at the northeast corner of the intersection.

These stops serve OC Transpo Route 303 which is a free shopper route for residents of rural communities. Route 303 travels from Dunrobin and Carp to Bayshore, Lincoln Fields Shopping Centre, Kanata Centrum and Carlingwood Shopping Centre on Wednesdays, with one outbound trip in the morning and one inbound trip in the afternoons.

The OC Transpo Route map for Route 303 is included in **Appendix C** for reference.

4.1.7 Existing Traffic Volumes

Weekday traffic counts completed by the City of Ottawa and Saturday counts by Novatech have been used to determine the existing pedestrian, cyclist, and vehicular traffic volumes at the study area intersections. The most recent traffic counts were conducted on the following dates:

- Carp Road/Donald B. Munro Drive Tuesday April 2, 2019
- Carp Road/Donald B. Munro Drive Saturday September 17, 2022
- Carp Road/Rivington Street Wednesday August 16, 2017
- Carp Road/Rivington Street Saturday September 17, 2022

The Carp Farmer's Market, located at the Carp Fairgrounds, is open every Saturday between the months of May and October from 8AM to 1PM. This event is the most prolific trip generator in the Village of Carp that occurs on a regular basis, attracting a large number of trips from within the village and the outlying areas. The traffic volumes on the adjacent road network when the Farmer's Market is open are the heaviest volumes regularly encountered in the Village of Carp. The Carp Fair generates the absolute heaviest volumes of traffic within the Village of Carp; however, it is held annually during a short period and is not a regularly occurring event and as such is not considered to be within the scope of this study. The above listed Saturday traffic counts were performed between the hours of 8AM and 2PM and captured traffic from the Carp Farmer's Market.

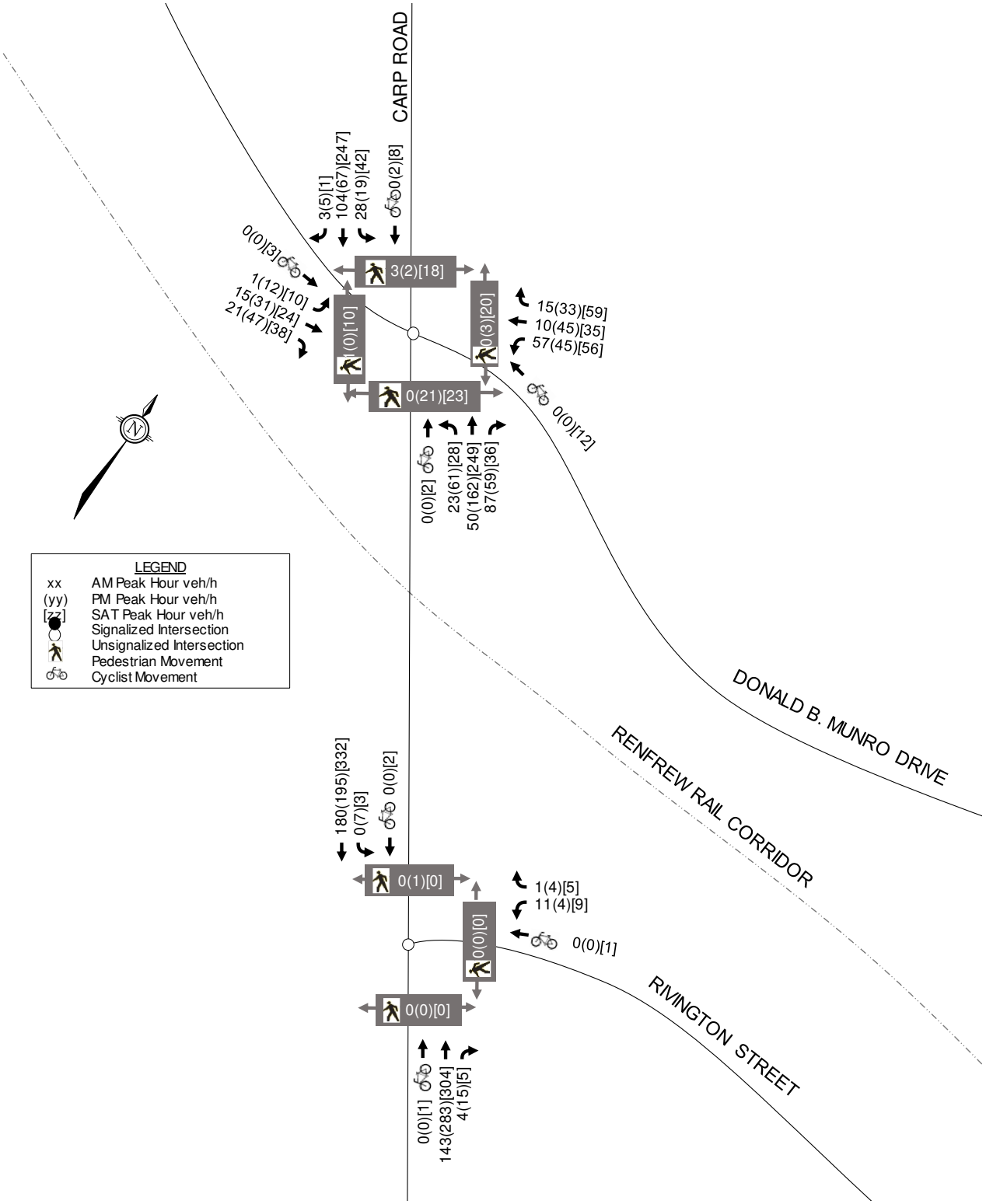
The following table indicates the observed peak hours at each study area intersection, based on the above-noted traffic counts.

Table 1: Peak Hours

Intersection	AM Peak Hour	PM Peak Hour	Saturday Peak Hour
Carp Road/Donald B. Munro Drive	7:30-8:30	4:30-5:30	11:15-12:15
Carp Road/Rivington Street	8:30-9:30	3:45-4:45	11:30-12:30

As there is a variation of weekday peak hours at the study area intersections, a consistent peak hour of 7:30-8:30AM and 4:30-5:30PM was chosen for the weekday analysis. Volumes have been balanced to within 10% of the higher adjacent intersection traffic volume. Traffic count data is included in **Appendix D**. Pedestrian, cyclist, and vehicular traffic volumes within the study area are shown in **Figure 5**.

Figure 5: Existing Network Traffic Volumes



4.1.8 Collision Records

Historical collision data from the last five years (January 1st, 2016 - December 31st, 2020) was obtained from the City's Public Works and Service Department for each study area intersection. A copy of the collision summary records is included in **Appendix E**.

The collision data has been evaluated to determine if there are any identifiable collision patterns, defined in the 2017 TIA Guidelines as 'more than six collisions in five years' for any one movement. The number of collisions reported at each intersection from January 1, 2016 to December 31, 2020 is summarized in **Table 2**.

Table 2: Reported Collisions

Intersection	Angle	Rear End	Sideswipe	Single/ Other	Turning	Total
Carp Road/Donald B. Munro Drive	2	1	-	-	-	**3**
Carp Road between Donald B. Munro Drive and Rivington Street	2	-	-	-	1	**3**
Carp Road/Rivington Street	1	-	-	-	-	**1**

Carp Road/Donald B. Munro Drive
A total of three collisions were reported at this intersection over the course of the last five years. Of these, there were two angle impacts and one rear end impact. One of the angle impacts caused injuries but no fatalities and the other two collisions were classified as causing property damage only. No pedestrians or cyclists were involved.

Carp Road between Donald B. Munro Drive and Rivington Street
A total of three collisions were reported at this location over the course of the last five years. Of these, there were two angle impacts and one turning movement impact between a southbound left turning cyclist and a southbound travelling motorcyclist. The turning movement impact caused injuries, but no fatalities and the other two collisions were classified as causing property damage only.

Carp Road/Rivington Street
One collision was reported at this intersection over the course of the last five years. It was an angle impact that occurred in snowy conditions. The collisions caused property damage only and no injuries.

4.2 Planned Conditions

The City of Ottawa's 2013 Transportation Master Plan (TMP) does not identify any upcoming projects within the study area in its Affordable Rapid Transit and Transit Priority (RTTP) or Affordable Road Networks. The City's 2013 Pedestrian and Cycling Plans do not identify any projects within the study area.

As part of the draft 2024 Transportation Master Plan, Carp Road from Galetta Side Road to Highway 417 and Donald B. Munro Drive east of Carp Road are shown as part of the proposed paved shoulder network (rural active transportation network).

The City's interactive capital construction forecast map identifies that Donald B. Munro Drive is planned for road resurfacing with a targeted start of this year and sidewalk renewal within the next

1-2 years. Carp Road north of Donald B. Munro Drive is also shown as planned for road resurfacing within the next 2-3 years.

A review of the City's Development Application search tool identifies the following developments in proximity of the subject site that are under construction, approved, or in the approval process.

147 Langstaff Drive
A Transportation Impact Study (August 2020, revised in April 2021 and May 2022 by McIntosh Perry) was submitted in support of a Draft Plan of Subdivision application for a new residential subdivision located at 147 Langstaff Road. A total of 128 mid-rise apartment units and 68 semi-detached townhome units are proposed. A buildout year of 2023 is anticipated.

437 Donald B. Munro Drive
A Traffic Impact Assessment (May 2019, by Novatech) was submitted in support of a Site Plan application at 437 Donald B. Munro Drive. The proposed development would include two office spaces on the ground floor (total GFA of 4,200ft^2) as well as two residential units on the second floor. A buildout of 2020 was anticipated; however, this development has not yet been constructed and is still in the approvals process.

4.3 Study Area and Time Periods

The study area for this report includes the boundary roadway (Carp Road) as well as the intersections of Carp Road/Donald B. Munro Drive and Carp Road/Rivington Street.

The selected time periods for the analysis are the weekday AM and PM peak hours as well as the Saturday peak hour, as they represent the 'worst case' combination of site generated traffic and adjacent street traffic. As the buildout year is anticipated to be 2027, this TIA will consider the buildout year 2027 and the horizon year 2032.

4.4 Exemptions Review

This module reviews possible exemptions from the final Transportation Impact Assessment, as outlined in the TIA guidelines. The applicable exemptions for this site are shown in **Table 3**.

Table 3: TIA Exemptions

Module	Element	Exemption Criteria	Exemption Status
Design Review Component			
4.1 Development Design	*4.1.2* Circulation and Access	• Only required for site plans	Exempt
	4.1.3 New Street Networks	• Only required for plans of subdivision	Not Exempt
4.2 Parking	*4.2.1* Parking Supply	• Only required for site plans	Exempt
	4.2.2 Spillover Parking	• Only required for site plans where parking supply is 15% below unconstrained demand	Exempt

Module	Element	Exemption Criteria	Exemption Status
Network Impact Component			
4.5 Transportation Demand Management	*All elements*	• Not required for non-residential site plans expected to have fewer than 60 employees and/or students on location at any given time	Not Exempt
4.6 Neighbourhood Traffic Management	*4.6.1* Adjacent Neighbourhoods	• Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Exempt
4.8 Network Concept	*All elements*	• Only required when proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by the established zoning	Exempt

It is anticipated that the scope of this TIA will also meet the requirements of the future zoning application provided there are no significant changes to the concept plan.

5.0 FORECASTING

5.1 Development-Generated Travel Demand

5.1.1 Trip Generation

The subject site would conceptually include a total of 78 stacked dwellings and 1,606m^2 (17,285ft^2) of commercial at-grade.

Trips generated by the residential portion of the proposed development during the weekday AM and PM peak period have been estimated based on relevant rates presented in the City's 2020 TRANS *Trip Generation Manual Summary Report*, prepared in October 2020 by WSP. The manual includes data to estimate the trip generation and mode share for residential uses, divided into single-family detached housing, low-rise multifamily housing (one to two storeys), and mid- to high-rise multifamily housing (three or more storeys). The person trips generated by the proposed residences during the weekday AM and PM peak hour are based on the Mid- to High-Rise Multifamily Housing rates for the Rural West District.

As there are no rates identified for the Saturday peak hour in the TRANS report, the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (11th Edition) has been used to identify a ratio of Saturday trips to PM trips. ITE Land Use 220 Multifamily Housing (Low-Rise) includes apartments, townhouses, and condominiums that are located within the same building with at least three other dwelling units and have two or three floors. However, there is only one survey for Saturdays for this land use code. Instead, the Land Use 221 Multifamily Housing (Mid-Rise) was used to identify a ratio of Saturday trips to PM trips, as there is more data available. The directional split between inbound and outbound trips for the Saturday peak hour is based on the splits identified in the ITE manual. The ratio of Saturday trips to PM trips was then applied to the TRANS PM rate to estimate Saturday trips.

Trips generated by the proposed commercial uses have been estimated based on relevant rates presented in the ITE *Trip Generation Manual*. Peak hour trips, based on Land Use 820 Shopping

Centre, have been converted to person trips using an ITE Trip to Person Trip factor of 1.28, consistent with the 2017 *TIA Guidelines*.

Table 4: Peak Hour Person Trip Generation

Land Use	Units	AM Peak Hour (pph[1])			PM Peak Hour (pph)			SAT Peak Hour (pph)		
		IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
Mid-Rise Multifamily	78	10	21	31	18	13	31	16	15	31
Shopping Centre	1,606m^2	11	8	19	36	40	76	51	46	97
Total		**21**	**29**	**50**	**54**	**53**	**107**	**67**	**61**	**128**

1. pph: Person Trips per Peak Hour

Table 8 and 13 of the TRANS report includes data to estimate the mode shares for the AM and PM peak periods based on district. Based on the TRANS report, the residential and commercial mode shares in the Rural West District are summarized in the following table.

Table 5: Modal Shares in the Rural Districts

Type	Period	Mode				
		Auto Driver	Auto Pass	Transit	Cycling	Walking
Mid-Rise Multifamily Housing	AM	63%	15%	19%	0%	3%
	PM	64%	18%	16%	0%	1%
Commercial	AM	87%	9%	0%	0%	3%
	PM	80%	14%	1%	2%	4%

For the proposed development, one set of mode shares has been assumed for both peak hours, based on the above shares. As there is currently limited transit service for the Village of Carp, a 0% transit share has been assumed for this development. Transit users have been accounted for as vehicle trips as they are likely to travel to the Carp Park-n-Ride facility to access transit. A breakdown of the peak period person trips by modal share is shown in the following table.

Table 6: Peak Hour Person Trips by Modal Share

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
		IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
Residential Person Trips		10	21	31	18	13	31	16	15	31
Auto Driver	80%	8	17	25	15	10	25	13	12	25
Auto Passenger	15%	2	3	5	2	2	4	2	2	4
Cyclist	2%	0	0	0	1	0	1	1	0	1
Pedestrian	3%	0	1	1	0	1	1	0	1	1
Commercial Person Trips		11	8	19	36	40	76	51	46	97
Auto Driver	80%	9	6	15	29	32	61	41	37	78
Auto Passenger	15%	2	1	3	5	6	11	8	7	15
Cyclist	2%	0	0	0	1	1	2	1	1	2
Pedestrian	3%	0	1	1	1	1	2	1	1	2
Total Person Trips		**21**	**29**	**50**	**54**	**53**	**107**	**67**	**61**	**128**
Auto Driver (Total)		**17**	**23**	**40**	**44**	**42**	**86**	**54**	**49**	**103**
Auto Passenger (Total)		**4**	**4**	**8**	**7**	**8**	**15**	**10**	**9**	**19**
Cyclist (Total)		**0**	**0**	**0**	**2**	**1**	**3**	**2**	**1**	**3**
Pedestrian (Total)		**0**	**2**	**2**	**1**	**2**	**3**	**1**	**2**	**3**

From the previous table, the proposed development is estimated to generate 50 person trips (including 40 vehicle trips) during the AM peak hour, 107 person trips (including 86 vehicle trips) during the PM peak hour, and 128 person trips (including 103 vehicle trips) during the Saturday peak hour.

The commercial land use is expected to generate two types of external peak hour trips: primary and pass-by trips. Primary trips are made for the specific purpose of visiting the site, and pass-by trips are made as intermediate stops on the way to another destination. Peak hour pass-by trips have been estimated based on a pass-by rate of 34% for the PM peak hour and 26% for the Saturday peak hour. The ITE *Trip Generation Handbook* (3rd Edition) identifies these percentages as an average rate for Shopping Centre. The pass-by trips generated by the development are part of the observed background traffic and do not constitute new trips on the adjacent road network. The primary and pass-by trip generation for the development is summarized in the following table.

Table 7: Primary and Pass-By Trips (Commercial)

Travel Mode	AM Peak Hour (pph[1])			PM Peak Hour (pph)			SAT Peak Hour (pph)		
	IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
Auto Driver Trips	9	6	15	29	32	61	41	37	78
Pass-By	0	0	0	10	10	20	10	10	20
Primary	**9**	**6**	**15**	**19**	**22**	**41**	**31**	**27**	**58**

Due to the nature of the proposed land uses of the development, it is possible that some of the total volume of site-generated trips will be internally captured within the site (i.e., residents of the stacked dwellings that frequent the commercial uses). With respect to the adjacent road network, this would result in only a single vehicle entering and exiting the site. However, in the interest of making a conservative estimate of the likely traffic impact associated with the development, the possibility of traffic being internally captured has been ignored. The analysis presented in this study assumes that all trips generated by the proposed development are 'external' trips.

5.1.2 Trip Distribution

The distribution of traffic generated by the proposed residential component has been estimated based on logical trip routing, existing outbound traffic patterns during the AM peak hour, and existing inbound traffic patterns during the PM peak hour. The distribution of traffic generated by the proposed commercial component has been estimated based on logical trip routing and existing total traffic during the Saturday peak hour.

The trip distribution can be described as follows:

Residential Distribution
- 15% to/from the north via Carp Road
- 10% to/from the west via Donald B. Munro Drive
- 25% to/from the east via Donald B. Munro Drive
- 50% to/from the south via Carp Road

Commercial Distribution
- 40% to/from the north via Carp Road
- 5% to/from the west via Donald B. Munro Drive
- 15% to/from the east via Donald B. Munro Drive
- 40% to/from the south via Carp Road

Pass-by trips from the commercial uses have been distributed based on existing patterns along Carp Road.

Primary trips generated by the proposed residential and commercial can be found in **Figures 6** and **7**, respectively. Pass-by trips can be found in **Figure 8**. Total site generated traffic volumes are shown in **Figure 9**.

Figure 6: Residential Site-Generated Traffic Volumes

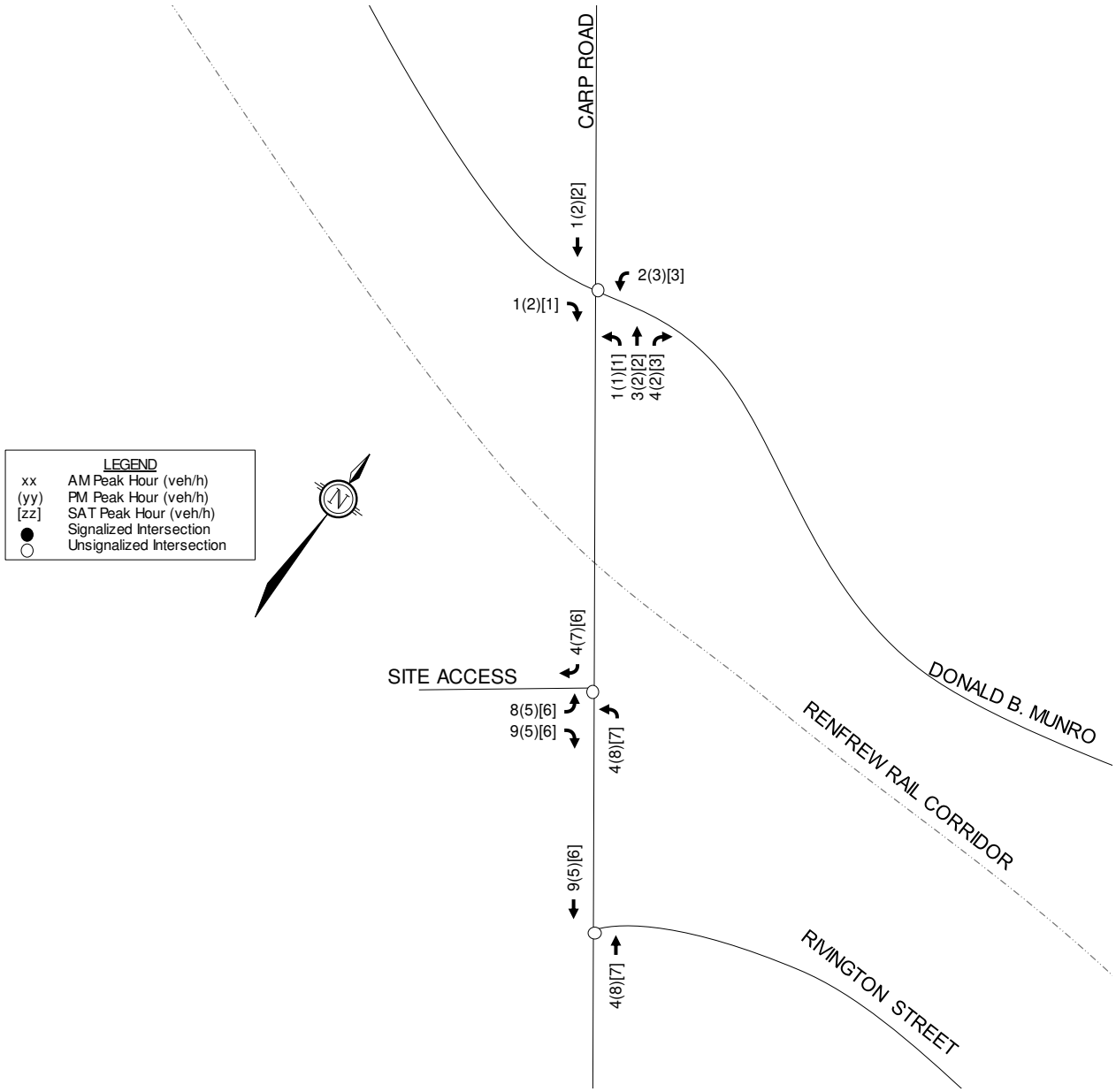


Figure 7: Primary Commercial Site-Generated Traffic Volumes

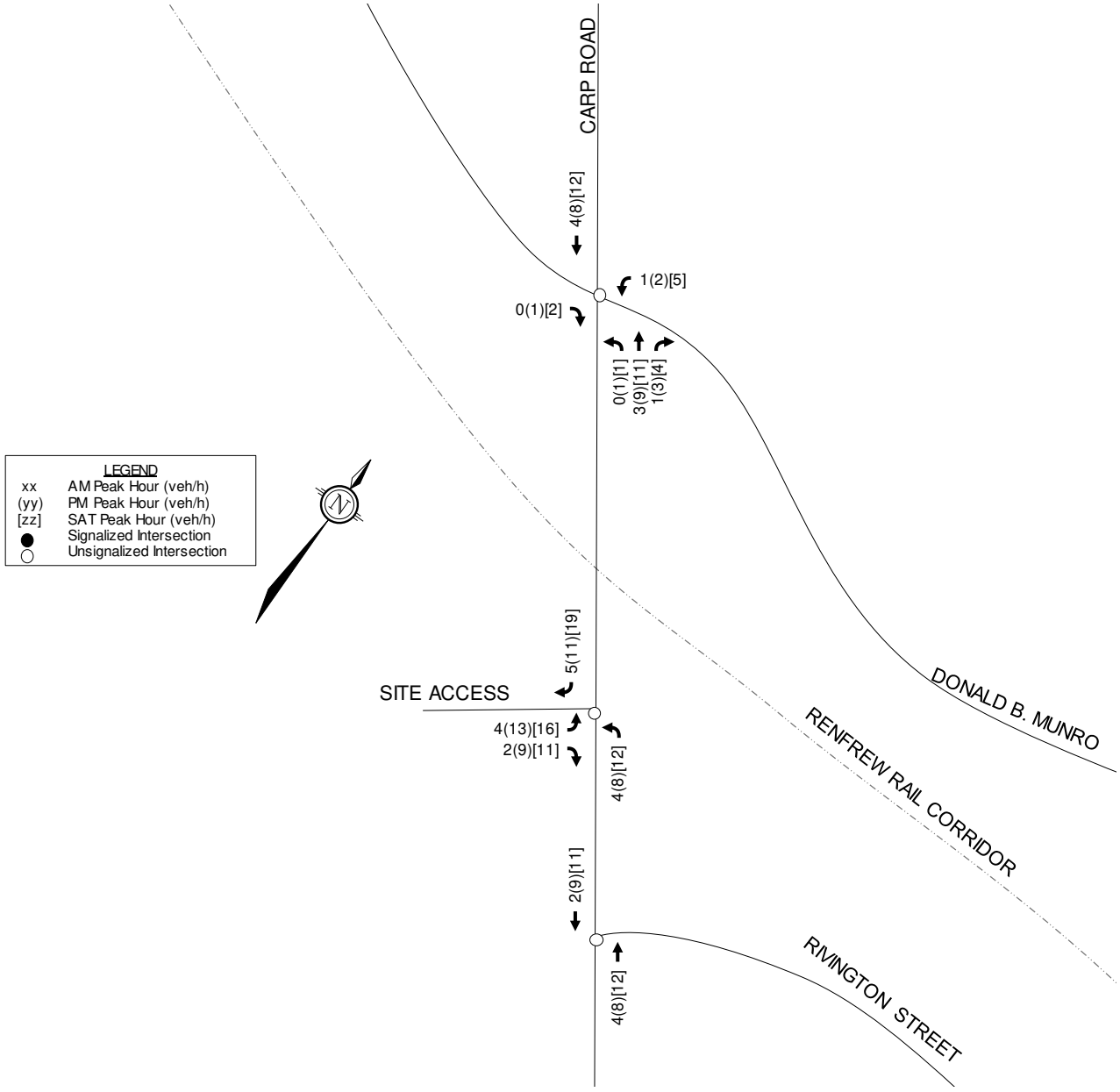


Figure 8: Pass-By Commercial Site-Generated Traffic Volumes

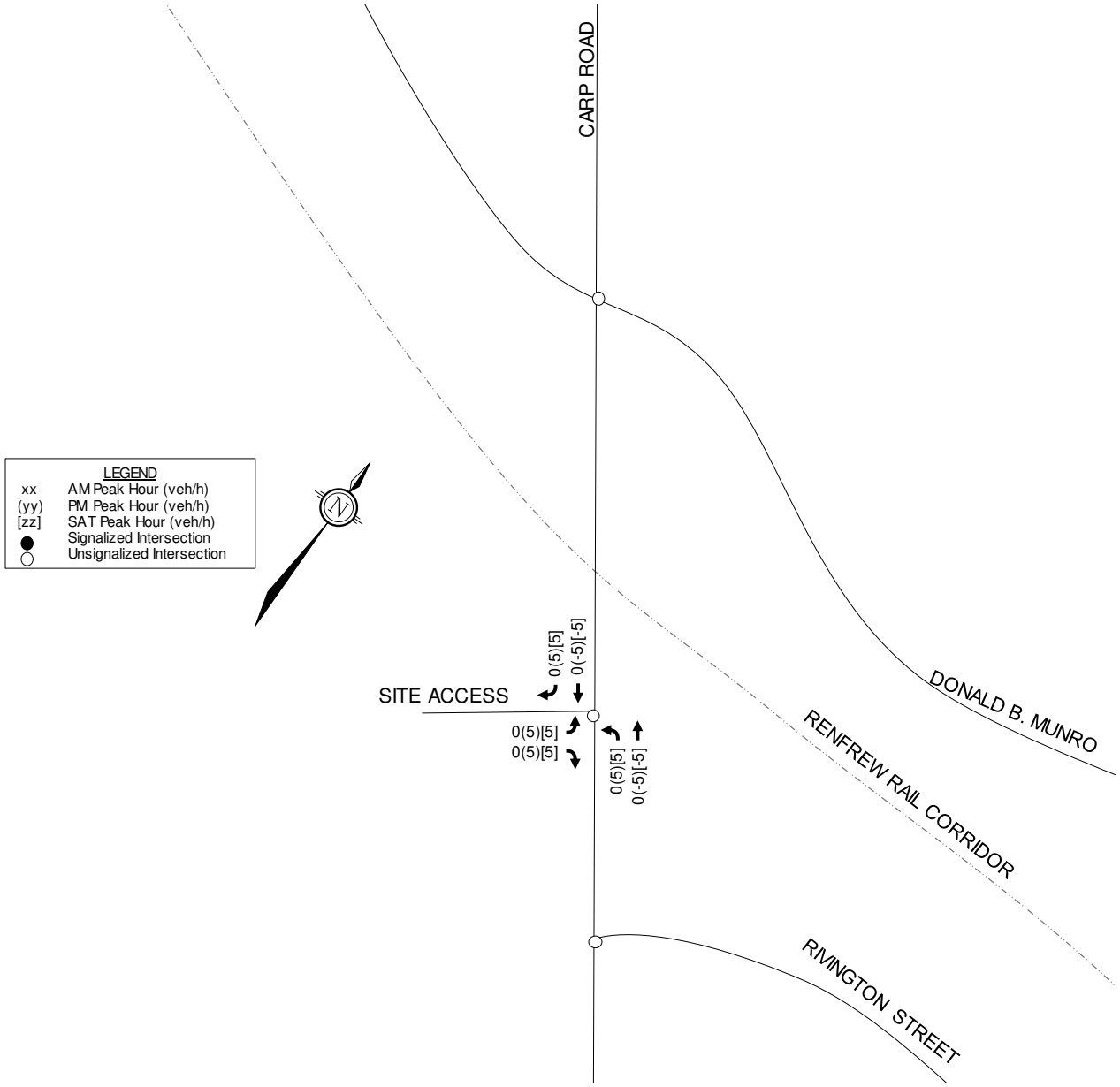
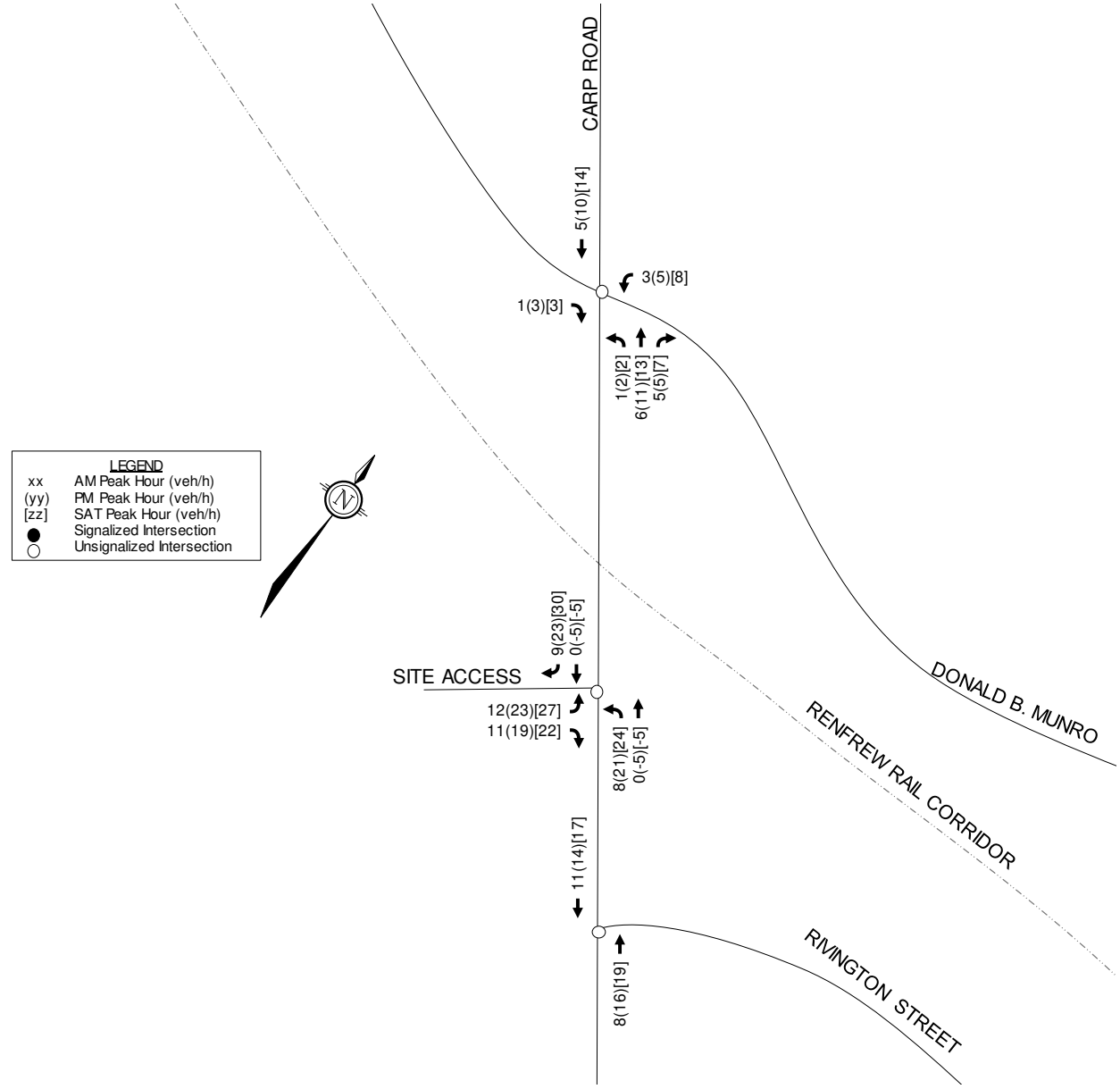


Figure 9: Total Site-Generated Traffic Volumes



5.2 Background Traffic

5.2.1 Other Area Developments

A description of other study area development is included in Section 4.2.

Buildout of the residential subdivision at 147 Langstaff Road is anticipated for 2023. Traffic generated by this development has been added to the 2027 buildout and 2032 horizon years, using the distribution as outlined in the May 2022 TIA. Saturday traffic for this development has been estimated using the methodology described in Section 5.1.1 and added to the area roadways using the

distribution outlined in the May 2022 TIA. Relevant excerpts from the TIA for this development are included in **Appendix F**.

Traffic generated by the 437 Donald B. Munro Drive development is expected to have a negligible impact on the adjacent roadways. As the trip generation trigger for this development was not met, traffic generated by this development has been considered negligible and has not been explicitly added to background traffic.

5.2.2 General Background Growth Rate

A review of the City's *Strategic Long-Range Model* (comparing snapshots of the 2011 and 2031 AM peak hour traffic volumes), Section 2.3 of the City's 2013 TMP (comparing 2011 and 2031 population and employment projections), and other recent studies, was completed to establish general background growth. The long-range snapshots and Section 2.3 of the 2013 TMP are included in **Appendix G**.

A comparison of the 2011 AM and 2031 AM peak hour volumes included in the long-range model along the study area roadways indicates that Carp Road and Donald B. Munro Drive are anticipated to increase at a rate of 1.2% per year.

Section 2.3 of the City's 2013 TMP projects a 22% growth in the population of Rural Ottawa between 2011 and 2031, which translates to an annual linear growth rate of 1% per annum.

The May 2022 TIA for the 147 Langstaff Road development utilized an annual background growth rate of 1% for the study area roads (including Carp Road and Donald B. Munro Drive), based on population growth calculated from the TRANS O-D survey for the Rural West region.

Based on the foregoing, a 1% annual growth rate has been applied to Carp Road and Donald B. Munro Drive. No growth rate was applied to Rivington Street as the background growth rate is intended to account for growth in regional traffic which is not anticipated on lower class roads. Other area developments have been accounted for separately.

5.3 Future Traffic Conditions

The figures listed below present the following future traffic conditions:

- Background traffic volumes in 2027 are shown in **Figure 10**;
- Background traffic volumes in 2032 are shown in **Figure 11**;
- Total traffic volumes in 2027 are shown in **Figure 12**;
- Total traffic volumes in 2032 are shown in **Figure 13**.

Figure 10: 2027 Background Traffic Volumes

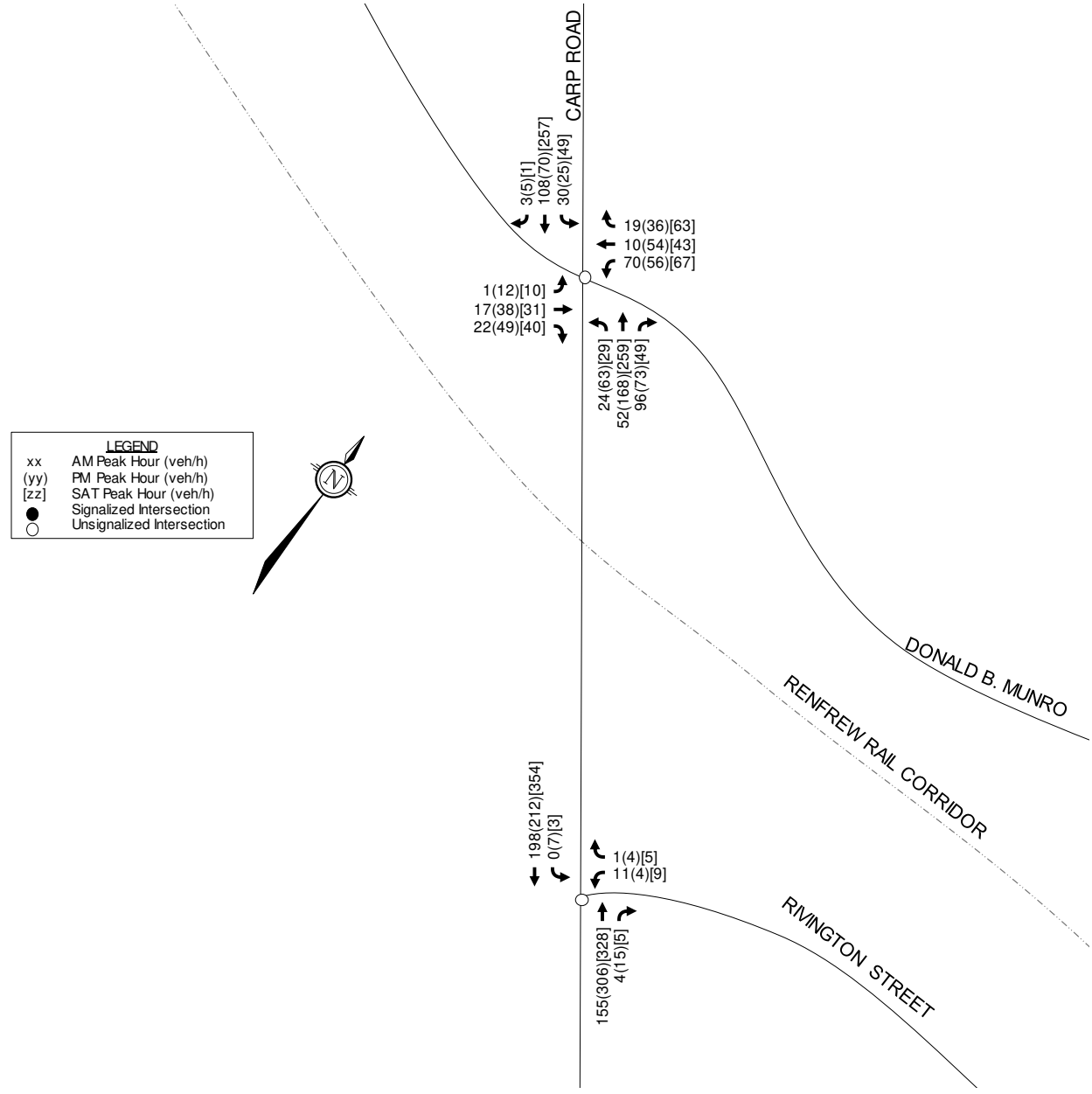


Figure 11: 2032 Background Traffic Volumes

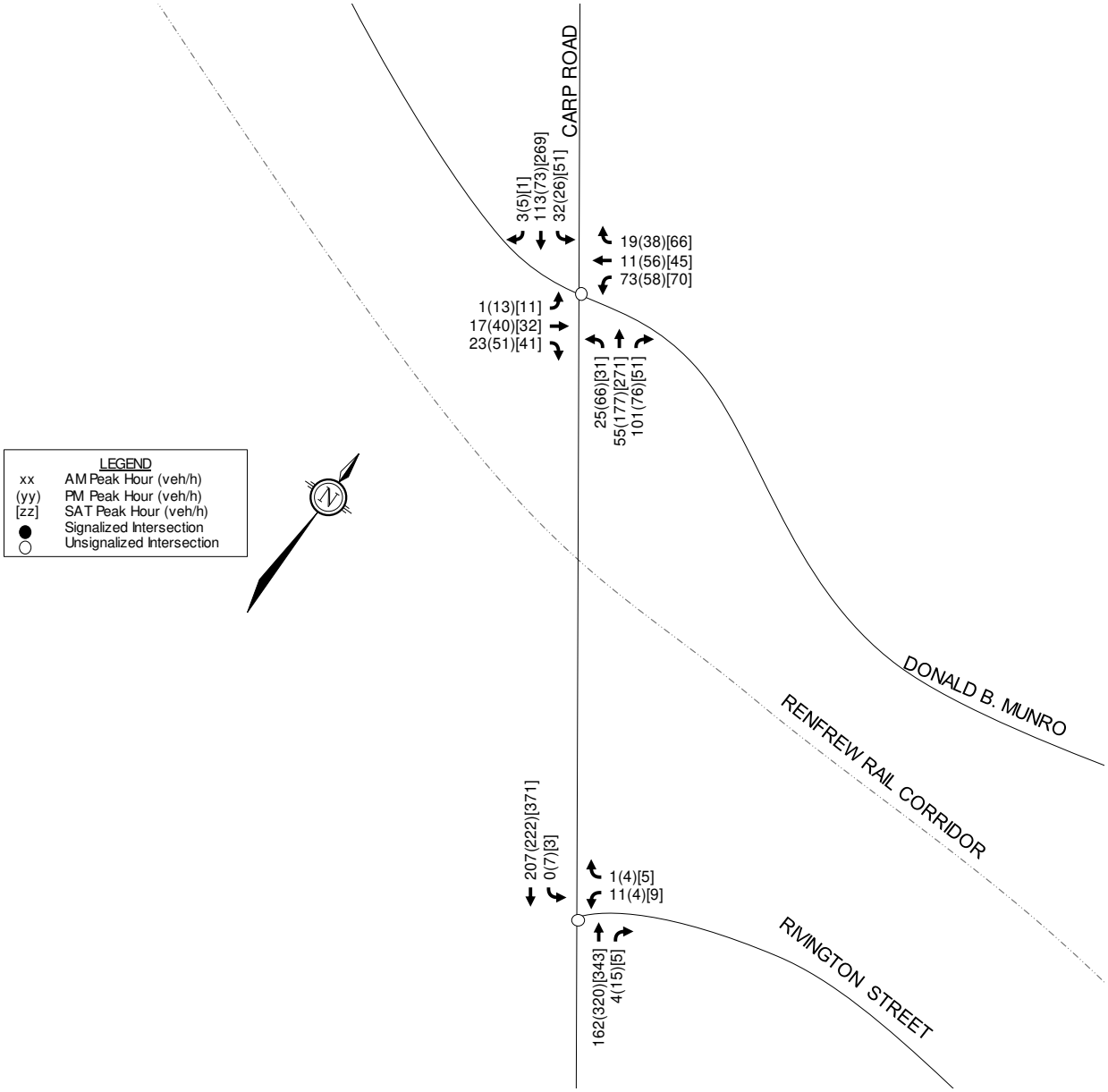


Figure 12: 2027 Total Traffic Volumes

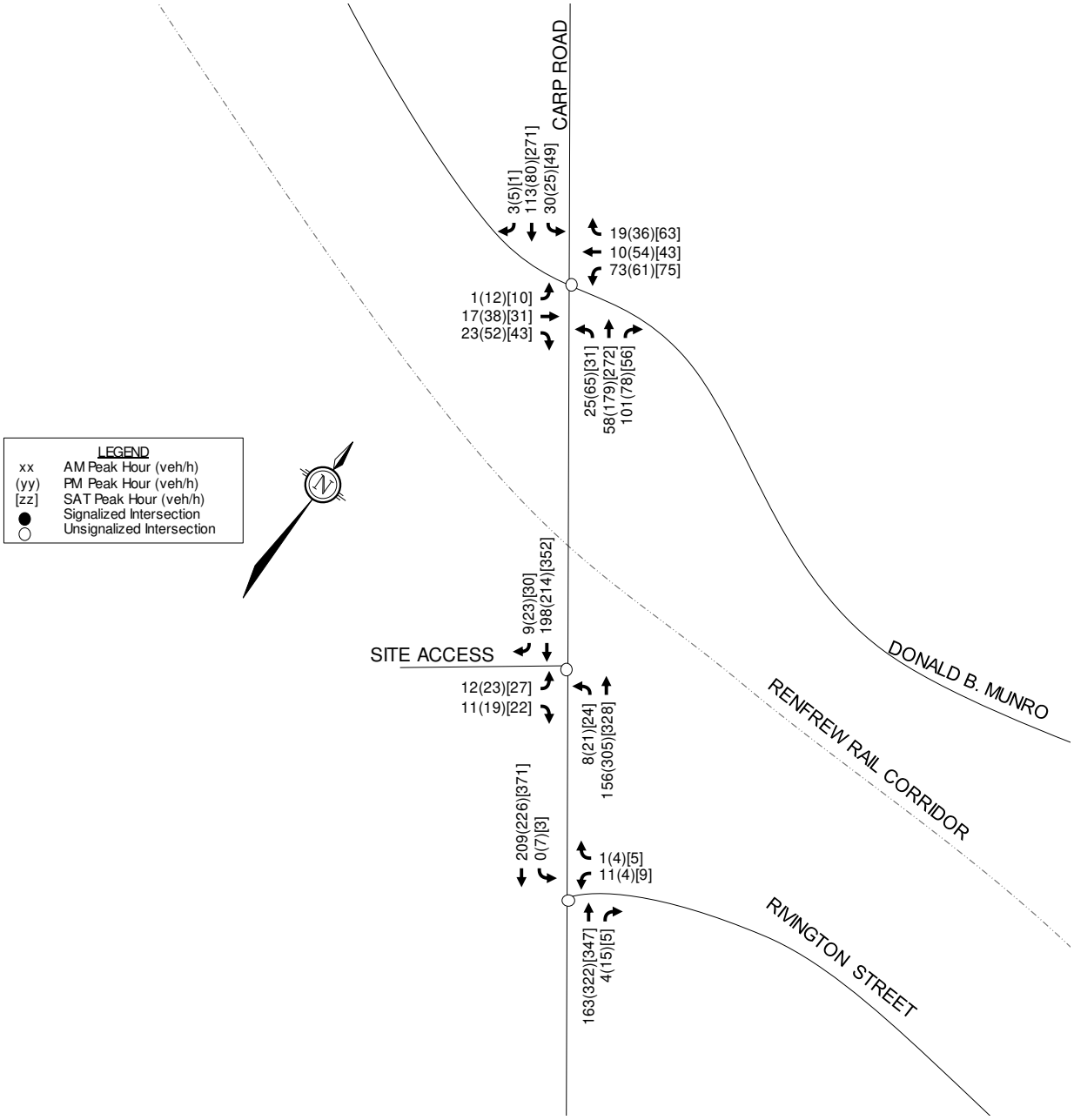
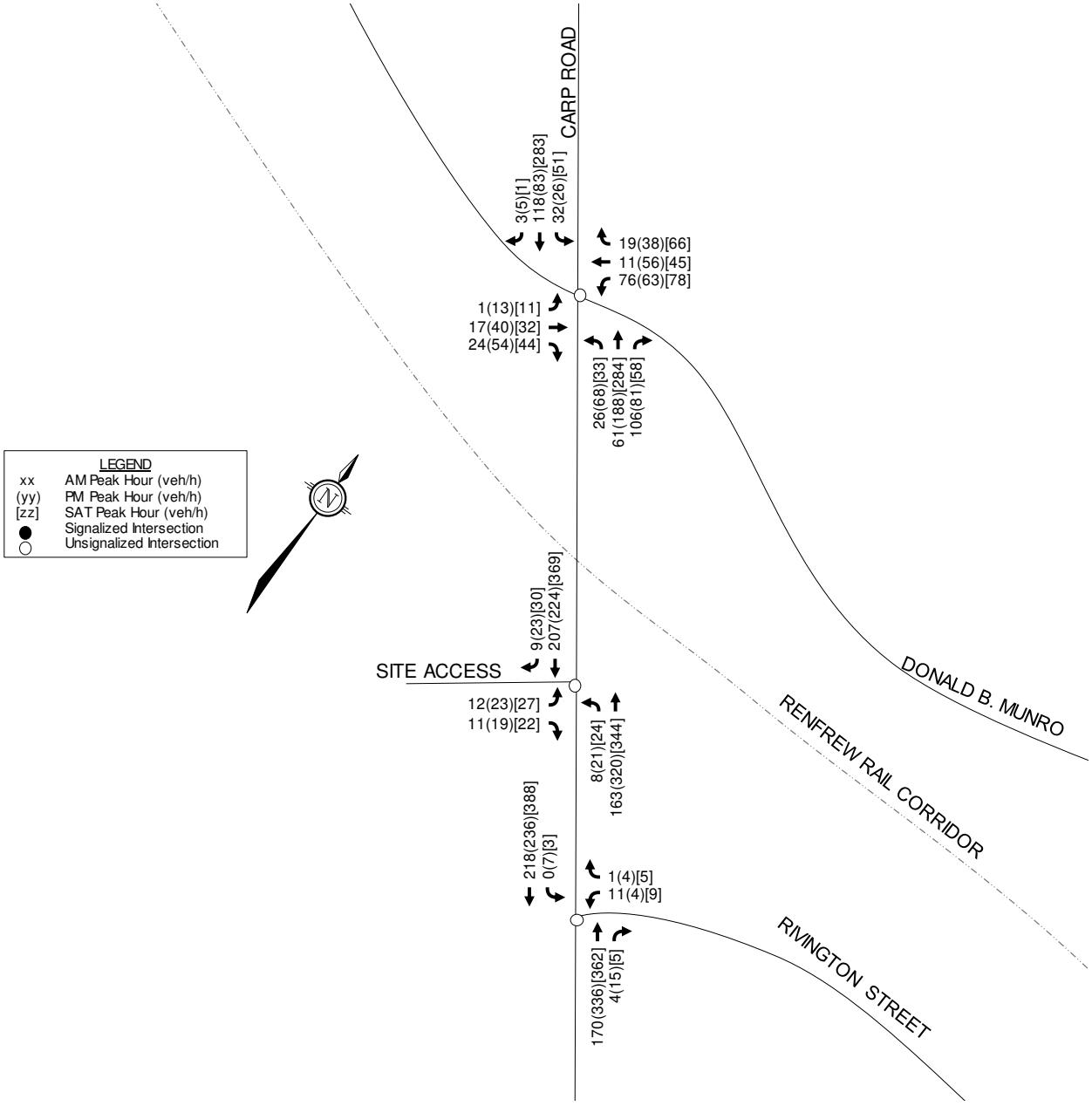


Figure 13: 2032 Total Traffic Volumes



5.4 Demand Rationalization

A review of the existing and background intersection operations (using Synchro software) has been conducted to determine if observed traffic volumes or projected background traffic volumes will exceed capacity within the study area. The intersection parameters used in the analysis are consistent with the TIA Guidelines (Saturation Flow Rate: 1,800 vphpl, Peak Hour Factor: 0.9 for existing conditions and 1.0 for future conditions). Detailed Synchro reports are included in **Appendix H**.

5.4.1 Existing Intersection Operations

Intersection capacity analysis has been conducted for the existing traffic conditions. The results of the analysis are summarized in the following table for the weekday AM and PM peak hours.

Table 8: Existing Traffic Operations

Intersection	AM Peak			PM Peak			SAT Peak		
	Max Delay	LOS	Mvmt	Max Delay	LOS	Mvmt	Max Delay	LOS	Mvmt
Carp Road/ Donald B. Munro Drive	9 sec.	A	WB/SB	10 sec.	B	NB	13 sec.	B	NB
Carp Road/ Rivington Street	11 sec.	B	WB	11 sec.	B	WB	13 sec.	B	WB

Under existing traffic conditions, all study area intersections are operating with delays of 13 seconds or less (LOS B or better). No queueing issues are anticipated.

A further review of intersection operations was conducted using the SimTraffic 11 software. The SimTraffic software is designed to model networks of signalized and unsignalized intersection and is useful for analyzing complex situations including closely spaced intersection with queuing or blocking problems. The SimTraffic software was used to run ten models with a 15-minute seed period and a 60-minute run time representing the AM, PM, and Saturday peak hours in order to verify queueing near the rail crossing on Carp Road. The 95th percentile queue length (averaged over ten models) is provided in the following table for critical movements. Detailed results from the SimTraffic software are included in **Appendix H**.

Table 9: SimTraffic Queues – Existing Traffic

Intersection	Mvmt	95th Percentile Queue (m)		
		AM Peak	PM Peak	SAT Peak
Carp Road/Donald B. Munro Drive	NB	20	26	31

The maximum northbound queue at the Carp Road/Donald B. Munro Drive intersection is approximately 30m during the Saturday peak hour and is not anticipated to reach the railway crossing. The spacing between the Carp Road/Donald B. Munro Drive stop bar and the rail line is approximately 75m.

5.4.2 2027 Background Intersection Operations

Intersection capacity analysis has been conducted for the 2027 background traffic conditions. The results of the analysis are summarized in the following table for the weekday AM and PM peak hours.

Table 10: 2027 Background Traffic Operations

Intersection	AM Peak			PM Peak			SAT Peak		
	Max Delay	LOS	Mvmt	Max Delay	LOS	Mvmt	Max Delay	LOS	Mvmt
Carp Road/ Donald B. Munro Drive	9 sec.	A	WB	11 sec.	B	NB	13 sec.	B	NB
Carp Road/ Rivington Street	11 sec.	B	WB	11 sec.	B	WB	13 sec.	B	WB

Under 2027 background traffic conditions, all study area intersections are anticipated to operate with delays of 13 seconds or less (LOS B or better). No queueing issues are anticipated.

A further review of intersection operations was conducted using the SimTraffic 11 software to verify queueing near the rail crossing on Carp Road. The 95th percentile queue length (averaged over ten models) is provided in the following table for critical movements.

Table 11: SimTraffic Queues – 2027 Background Traffic

Intersection	Mvmt	95th Percentile Queue (m)		
		AM Peak	PM Peak	SAT Peak
Carp Road/Donald B. Munro Drive	NB	20	28	36

The maximum northbound queue at the Carp Road/Donald B. Munro Drive intersection is anticipated to be approximately 35m during the Saturday peak hour and is not anticipated to reach the railway crossing. The spacing between the Carp Road/Donald B. Munro Drive stop bar and the rail line is approximately 75m.

5.4.3 2032 Background Intersection Operations

Intersection capacity analysis has been conducted for the 2032 background traffic conditions. The results of the analysis are summarized in the following table for the weekday AM and PM peak hours.

Table 12: 2032 Background Traffic Operations

Intersection	AM Peak			PM Peak			SAT Peak		
	Max Delay	LOS	Mvmt	Max Delay	LOS	Mvmt	Max Delay	LOS	Mvmt
Carp Road/ Donald B. Munro Drive	9 sec.	A	WB	11 sec.	B	NB	13 sec.	B	NB
Carp Road/ Rivington Street	11 sec.	B	WB	11 sec.	B	WB	13 sec.	B	WB

Under 2032 background traffic conditions, all study area intersections are anticipated to operate with delays of 13 seconds or less (LOS B or better). No queueing issues are anticipated.

A further review of intersection operations was conducted using the SimTraffic 11 software to verify queueing near the rail crossing on Carp Road. The 95th percentile queue length (averaged over ten models) is provided in the following table for critical movements.

Table 13: SimTraffic Queues – 2032 Background Traffic

Intersection	Mvmt	95th Percentile Queue (m)		
		AM Peak	PM Peak	SAT Peak
Carp Road/Donald B. Munro Drive	NB	20	28	34

The maximum northbound queue at the Carp Road/Donald B. Munro Drive intersection is anticipated to be approximately 35m during the Saturday peak hour and is not anticipated to reach the railway crossing. The spacing between the Carp Road/Donald B. Munro Drive stop bar and the rail line is approximately 75m.

6.0 ANALYSIS

6.1 Development and Access Design

This section provides a review of the development design in terms of the road network and roadway cross-section. A review of the City's *Transportation Demand Management (TDM)-Supportive Development Design and Infrastructure Checklist* is exempt from Draft Plan of Subdivision applications.

6.1.1 Access

Access to the development is provided by a private street that connects to Carp Road, approximately 70m north of Rivington Street, measured from nearest edge to nearest edge. Stop control will be provided at the access, with free flow on Carp Road. The access is located approximately 45m south of the railway and 140m south of Donald B. Munro Drive, measured from nearest edge to nearest edge. The width of the private street is proposed to be 6.7m.

A review of sight distances was completed for the proposed intersection of Carp Road/Site Access, using the relevant standards presented in the Transportation of Canada (TAC) *Geometric Design Guide for Canadian Roads*.

Carp Road has a posted speed limit of 50km/h along the site's frontage. For a design speed of 60km/h (10km/h over the posted speed), the required sight distances are as follows:

- Stopping Sight Distance (SSD): 85m
- Intersection Sight Distance (ISD):
    - Left turn from stop (looking right): 130m
    - Right turn from stop (looking left): 110m

The required stopping sight distance is available on the north and south Carp Road approaches to the proposed site access and there is adequate intersection sight distance north and south of the intersection for vehicles to safely turn left and right. The required sight distances are shown in **Figures 14** and **15** and the proposed buildings do not encroach on the required sightlines.

DONALD B. MUNRO DRIVE

CITY OF OTTAWA RAILWAY
CORRIDOR (LEVEL CROSSING)

RIVINGTON
STREET

110m

130m

CARP ROAD

BLDG B
9 Lifestyle Unit Block/
9 Commerial Units

BLDG A
9 Lifestyle Unit Block/
9 Commercial Units

SUBJECT SITE

BLDG C
12 Stacked Units

BLDG G
12 Stacked Units

BLDG F
12 Stacked Units

BLDG D
12 Stacked Units

BLDG E
12 Stacked Units

Courtyard

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

3725 CARP ROAD

INTERSECTION SIGHT DISTANCE

SCALE 1 : 750 (0, 10, 20, 30)

DATE FEB 2023 | JOB 121173 | FIGURE FIGURE 14

DONALD B. MUNRO DRIVE

CITY OF OTTAWA RAILWAY
CORRIDOR (LEVEL CROSSING)

85m

CARP ROAD

85m

RIVINGTON
STREET

BLDG A
9 Lifestyle Unit Block/
9 Commercial Units

BLDG B
9 Lifestyle Unit Block/
9 Commerial Units

BLDG C
12 Stacked Units

BLDG D
12 Stacked Units

BLDG E
12 Stacked Units

BLDG F
12 Stacked Units

BLDG G
12 Stacked Units

Courtyard

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Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

3725 CARP ROAD

STOPPING SIGHT DISTANCE

SCALE 1 : 750 (0 10 20 30)

DATE FEB 2023 | JOB 121173 | FIGURE FIGURE 15

Section 68 of the Zoning By-law states that no obstructions higher than 1m are permitted on a lot abutting an at-grade intersection of a street and a railway track within the triangle formed by connecting to a point 45m from the intersection of the centerline of the street and the centerline of the railway right-of-way. Carp Road and the Renfrew Rail Corridor intersect adjacent to the northeast corner of the site. No parking areas or other obstructions are proposed within this triangle, thereby meeting the requirements.

The Transportation Association of Canada (TAC) *Geometric Design Guide for Canadian Roads* identifies a minimum clear throat length of 15m for driveways serving apartments with less than 100 units and for driveways serving shopping centres with less than 25,000m^2 on arterial roadways. The proposed plan exceeds the minimum required clear throat length.

The TAC guidelines a minimum corner clearance of 35m is suggested for an access to an arterial roadway from an intersection with stop control on the arterial road. The proposed access is located approximately 70m from Rivington Street (measured from nearest edge to nearest edge) and approximately 45m from the railway crossing (measured from nearest edge of access to the railway crossing stop bar), thereby meeting this requirement.

A minimum centreline radius of 12m is required to accommodate a fire truck. The proposed fire route is shown on the concept plan. Curb radii of 9m on either side of the access are proposed and are sufficient to accommodate a fire truck.

Sidewalks are shown on the Concept Plan and are proposed throughout the site, linking the main building entrances with the parking areas and connecting to the existing sidewalk along Carp Road. The sidewalk along Carp Road will be continuous and depressed across the site access.

Turning movements for a fire truck are shown in **Figure 16**. Turning movements for a Medium Single Unit (MSU) truck are shown in **Figures 17** and **18**. The MSU represents a garbage truck or delivery/moving truck.

CARP ROAD

Pumper Fire Truck

FUTURE ROAD WIDENING

RAIL CORRIDOR

BLDG A
9 Lifestyle Unit Block/
9 Commercial Units

BLDG B
9 Lifestyle Unit Block/
9 Commerial Units

BLDG C
12 Stacked Units

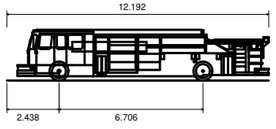
BLDG D
12 Stacked Units

BLDG E
12 Stacked Units

BLDG F
12 Stacked Units

BLDG G
12 Stacked Units

Courtyard



Pumper Fire Truck

Overall Length	12.192m
Overall Width	2.489m
Overall Body Height	2.361m
Min Body Ground Clearance	0.200m
Track Width	2.489m
Lock-to-lock time	5.00s
Max Wheel Angle	LILOTFK°

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

3725 CARP ROAD

TURNING MOVEMENT (FIRE TRUCK)

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE FEB 2023 | JOB 121173 | FIGURE FIGURE 16

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CARP ROAD

FUTURE ROAD WIDENING

RAIL CORRIDOR

BLDG A
9 Lifestyle Unit Block/
9 Commercial Units

BLDG B
9 Lifestyle Unit Block/
9 Commerial Units

BLDG C
12 Stacked Units

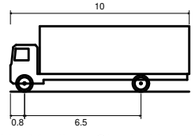
BLDG D
12 Stacked Units

BLDG E
12 Stacked Units

BLDG F
12 Stacked Units

BLDG G
12 Stacked Units

Courtyard



MSU - Medium Single Unit Truck

Overall Length	10.000m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	11.100m

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

3725 CARP ROAD

TURNING MOVEMENT (MSU/GARBAGE TRUCK)

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE FEB 2023 | JOB 121173 | FIGURE FIGURE 17

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CARP ROAD

FUTURE ROAD WIDENING

RAIL CORRIDOR

MSU - Medium Single Unit Truck

BLDG A
9 Lifestyle Unit Block/
9 Commercial Units

BLDG B
9 Lifestyle Unit Block/
9 Commerial Units

BLDG C
12 Stacked Units

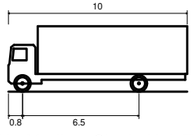
BLDG D
12 Stacked Units

BLDG E
12 Stacked Units

BLDG F
12 Stacked Units

BLDG G
12 Stacked Units

Courtyard



MSU - Medium Single Unit Truck

Overall Length	10.000m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	11.100m

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Website www.novatech-eng.com

3725 CARP ROAD

TURNING MOVEMENT (MSU/GARBAGE TRUCK)

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE FEB 2023 | JOB 121173 | FIGURE FIGURE 18

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6.1.2 Parking

The subject site is located within Area D of Schedule 1A of the City's 2013 Official Plan. Parking requirements are identified in the City's Zoning By-law and are summarized in the following table.

Table 14: Parking Requirements

Land Use	Rate	Units/GFA	Required	Provided
Vehicular Parking				
Stacked Dwellings	Resident: 1 per dwelling unit Visitor: 0.2 per dwelling unit	78	94	94
Commercial (Retail Store)	3.4 per 100m^2 GFA	1,606m^2	55	52
		Total	**149**	**146**
Bicycle Parking				
Stacked Dwellings (without a garage)	0.5 per dwelling unit	78	39	TBD
Commercial (Retail Store)	1 per 250m^2 GFA	1,606m^2	6	TBD
		Total	**45**	**TBD**

The site is proposed to provide a total of 146 vehicular parking spaces while 149 spaces are required. A further review of vehicular parking will be conducted at site plan.

A total of 45 bicycle parking spaces are required for the proposed land uses. Bicycle parking will be provided on-site and will be further reviewed at site plan.

A total of 71 spaces are required for the visitor and commercial land uses. Of these 71 parking spaces, 3 accessible spaces are required (one Type A, two Type B). Two Type A and two Type B spaces are shown, thereby meeting this requirement.

For retail stores with less than 2,000m^2 of GFA, no loading spaces are required.

6.2 Boundary Streets

A review of the boundary street (Carp Road) has been conducted, using complete streets principles. The *Multi-Modal Level of Service (MMLOS) Guidelines*, produced by IBI Group in October 2015, were used to evaluate the levels of service for each alternative mode of transportation. Schedule B9 of the Official Plan designates the subject site as Village Core.

Targets for pedestrian level of service (PLOS), bicycle level of service (BLOS), and truck level of service (TkLOS) adhere to those outlined in Exhibit 22 of the MMLOS Guidelines for the Village OP Designation/Policy Area. There are no targets for transit level of service (TLOS) for Carp Road.

The boundary street review evaluates the MMLOS for the boundary roadways based on existing conditions. A detailed MMLOS review is included in **Appendix I**, and a summary of the segment MMLOS analysis is included in **Table 15**.

Table 15: Segment MMLOS Summary

Segment	PLOS	BLOS	TkLOS
Carp Road	F	F	B
Target	**C**	**C**	**D**

Carp Road meets the target TkLOS but does not meet the target PLOS and BLOS.

The asphalt sidewalk along the east side of Carp Road is 1.8m and achieves a PLOS F. The concrete sidewalk along the west side of Carp Road is 1.8m and achieves a PLOS F. Exhibit 4 of the MMLOS guidelines suggests that a PLOS C is only achievable for an operating speed of 60km/h, no parking, and an AADT above 3,000vpd through the provision of a 2.0m sidewalk with a 2.0m boulevard. This is identified for the City's consideration.

Exhibit 11 of the MMLOS guidelines suggest that a BLOS C is not achievable for mixed traffic on roadways with an operating speed of 60km/h. A minimum 1.2m wide bike lane would achieve the target BLOS. The Ontario Traffic Manual (OTM) – Book 18 *Desirable Cycling Facility Pre-Selection Nomograph (Urban Context)* suggests that a designated cycling facility (such as bike lanes) should be considered. This is identified for the City's consideration.

As part of the draft 2024 Transportation Master Plan, Carp Road from Galetta Side Road to Highway 417 and Donald B. Munro Drive east of Carp Road are shown as part of the proposed paved shoulder network (rural active transportation network).

6.3 Transportation Demand Management

A review of the City's *TDM Measures Checklist* has been conducted. However, due to the location of the subject site and the lack of available transit, many of the TDM measures are not applicable or would have minimal impacts. The proposed development conforms to the City's TDM initiatives by providing connections to the local pedestrian network and the provision of bicycle parking on-site. A copy of the *TDM Measures Checklist* is included in **Appendix J**.

Transportation Demand Management measures will be further reviewed at site plan.

6.4 Transit

Based on the trip generation estimates presented in Section 5.1.1, the proposed subdivision is not anticipated to generate any new transit trips. This is due to the limited transit service currently provided in the Village of Carp. Any transit users were accounted for as vehicle trips for this study, as they are anticipated to travel to Park-n-Ride facilities in order to access more reliable transit. The nearest facility is the Carp Park-n-Ride which is located north of Stittsville at Highway 417 on Westbrook Road (approximately 10km south of the subject site). It offers easy access to Connexion routes and free parking with up to 156 spaces.

6.5 Intersection Design

6.5.1 2027 Total Intersection Operations

Intersection capacity analysis has been conducted for the 2027 total traffic conditions. The results of the analysis are summarized in the following table for the weekday AM and PM peak hours. Detailed reports are included in **Appendix K**.

Table 16: 2027 Total Traffic Operations

Intersection	AM Peak			PM Peak			SAT Peak		
	Max Delay	LOS	Mvmt	Max Delay	LOS	Mvmt	Max Delay	LOS	Mvmt
Carp Road/ Donald B. Munro Drive	9 sec.	A	WB/SB	11 sec.	B	NB	14 sec.	B	NB
Carp Road/ Rivington Street	11 sec.	B	WB	11 sec.	B	WB	13 sec.	B	WB
Carp Road/ Site Access	10 sec.	B	EB	11 sec.	B	EB	14 sec.	B	EB

Under 2027 total traffic, all study area intersections are anticipated to operate with a delay of 14 seconds or less (LOS B or better).

The site access is anticipated to operate acceptably under side street stop control. Queues of less than one vehicle are anticipated leaving the site.

A further review of intersection operations was conducted using the SimTraffic 11 software to verify queueing near the rail crossing on Carp Road. The 95th percentile queue length (averaged over ten models) is provided in the following table for critical movements.

Table 17: SimTraffic Queues – 2027 Total Traffic

Intersection	Mvmt	95th Percentile Queue (m)		
		AM Peak	PM Peak	SAT Peak
Carp Road/Donald B. Munro Drive	NB	21	28	37

The maximum northbound queue at the Carp Road/Donald B. Munro Drive intersection is anticipated to be approximately 40m during the Saturday peak hour and is not anticipated to reach the railway crossing. The spacing between the Carp Road/Donald B. Munro Drive stop bar and the rail line is approximately 75m.

6.5.2 2032 Total Intersection Operations

Intersection capacity analysis has been conducted for the 2032 total traffic conditions. The results of the analysis are summarized in the following table for the weekday AM and PM peak hours. Detailed reports are included in **Appendix K**.

Table 18: 2032 Total Traffic Operations

Intersection	AM Peak			PM Peak			SAT Peak		
	Max Delay	LOS	Mvmt	Max Delay	LOS	Mvmt	Max Delay	LOS	Mvmt
Carp Road/ Donald B. Munro Drive	9 sec.	A	WB/SB	11 sec.	B	NB	14 sec.	B	NB
Carp Road/ Rivington Street	11 sec.	B	WB	12 sec.	B	WB	13 sec.	B	WB
Carp Road/ Site Access	10 sec.	B	EB	12 sec.	B	EB	14 sec.	B	EB

Under 2032 total traffic, all study area intersections are anticipated to operate with a delay of 14 seconds or less (LOS B or better).

The site access is anticipated to operate acceptably under side street stop control. Queues of less than one vehicle are anticipated leaving the site. A review of the MTO left turn lane warrant graphs (included in **Appendix L**) indicates that no northbound left turn lane is required for the site.

The addition of traffic generated by the proposed development is not anticipated to have a significant impact on the overall intersection operations within the study area.

A further review of intersection operations was conducted using the SimTraffic 11 software to verify queueing near the rail crossing on Carp Road. The 95th percentile queue length (averaged over ten models) is provided in the following table for critical movements.

Table 19: SimTraffic Queues – 2032 Total Traffic

Intersection	Mvmt	95th Percentile Queue (m)		
		AM Peak	PM Peak	SAT Peak
Carp Road/Donald B. Munro Drive	NB	21	28	40

The maximum northbound queue at the Carp Road/Donald B. Munro Drive intersection is anticipated to be approximately 40m during the Saturday peak hour and is not anticipated to reach the railway crossing. The spacing between the Carp Road/Donald B. Munro Drive stop bar and the rail line is approximately 75m.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the foregoing, the conclusions and recommendations of this TIA can be summarized as follows:

Existing and Background Intersection Operations

- All study area intersections are anticipated to operate with delays of 13 seconds or less (LOS B or better). No queueing issues are anticipated.

- The maximum northbound queue at the Carp Road/Donald B. Munro Drive intersection is anticipated to be approximately 35m during the Saturday peak hour and is not anticipated to reach the railway crossing.

Development and Access Design

- Access to the development is provided by a private street that connects to Carp Road, approximately 70m north of Rivington Street, measured from nearest edge to nearest edge. Stop control will be provided at the access, with free flow on Carp Road. The width of the private street is proposed to be 6.7m.

- The proposed access meets all requirements of the City's Zoning By-Law, as well as TAC Geometric Design Guidelines.

- Sidewalks are shown on the Concept Plan and are proposed throughout the site, linking the main building entrances with the parking areas and connecting to the existing sidewalk along the Carp Road. The sidewalk along Carp Road will be continuous and depressed across the site access.

Boundary Streets

- Carp Road meets the target Truck Level of Service (TkLOS) but does not meet the target Pedestrian Level of Service (PLOS) or Bicycle Level of Service (BLOS).

- The target PLOS C is only achievable for an operating speed of 60km/h, no parking, and an AADT above 3,000vpd through the provision of a 2.0m sidewalk with a 2.0m boulevard. This is identified for the City's consideration.

- The target BLOS C is not achievable for mixed traffic on roadways with an operating speed of 60km/h. A minimum 1.2m wide bike lane would achieve the target BLOS. The Ontario Traffic Manual (OTM) – Book 18 *Desirable Cycling Facility Pre-Selection Nomograph (Urban Context)* suggests that a designated facility (such a bike lanes) should be considered. This is identified for the City's consideration.

- As part of the draft 2024 Transportation Master Plan, Carp Road from Galetta Side Road to Highway 417 and Donald B. Munro Drive east of Carp Road are shown as part of the proposed paved shoulder network (rural active transportation network).

Transportation Demand Management

- The proposed development conforms to the City's TDM initiatives by providing connections to the local pedestrian network and the provision of bicycle parking on-site.

Transit

- The proposed subdivision is not anticipated to generate any new transit trips. This is due to the limited transit service currently provided in the Village of Carp. Any transit users were accounted for as vehicle trips for this study, as they are anticipated to travel to Park-n-Ride facilities in order to access more reliable transit.

- The nearest facility is the Carp Park-n-Ride which is located north of Stittsville at Highway 417 on Westbrook Road (approximately 10km south of the subject site). It offers easy access to Connexion routes and free parking with up to 156 spaces.

Total Intersection Operations

- All study area intersections are anticipated to operate with a delay of 14 seconds or less (LOS B or better).
- The site access is anticipated to operate acceptably under side street stop control. Queues of less than one vehicle are anticipated leaving the site. A review of the MTO left turn lane warrant graphs indicates that no northbound left turn lane is required for the site.
- The maximum northbound queue at the Carp Road/Donald B. Munro Drive intersection is anticipated to be approximately 40m during the Saturday peak hour and is not anticipated to reach the railway crossing.
- The addition of traffic generated by the proposed development is not anticipated to have a significant impact on the overall intersection operations within the study area.

NOVATECH

Prepared by:

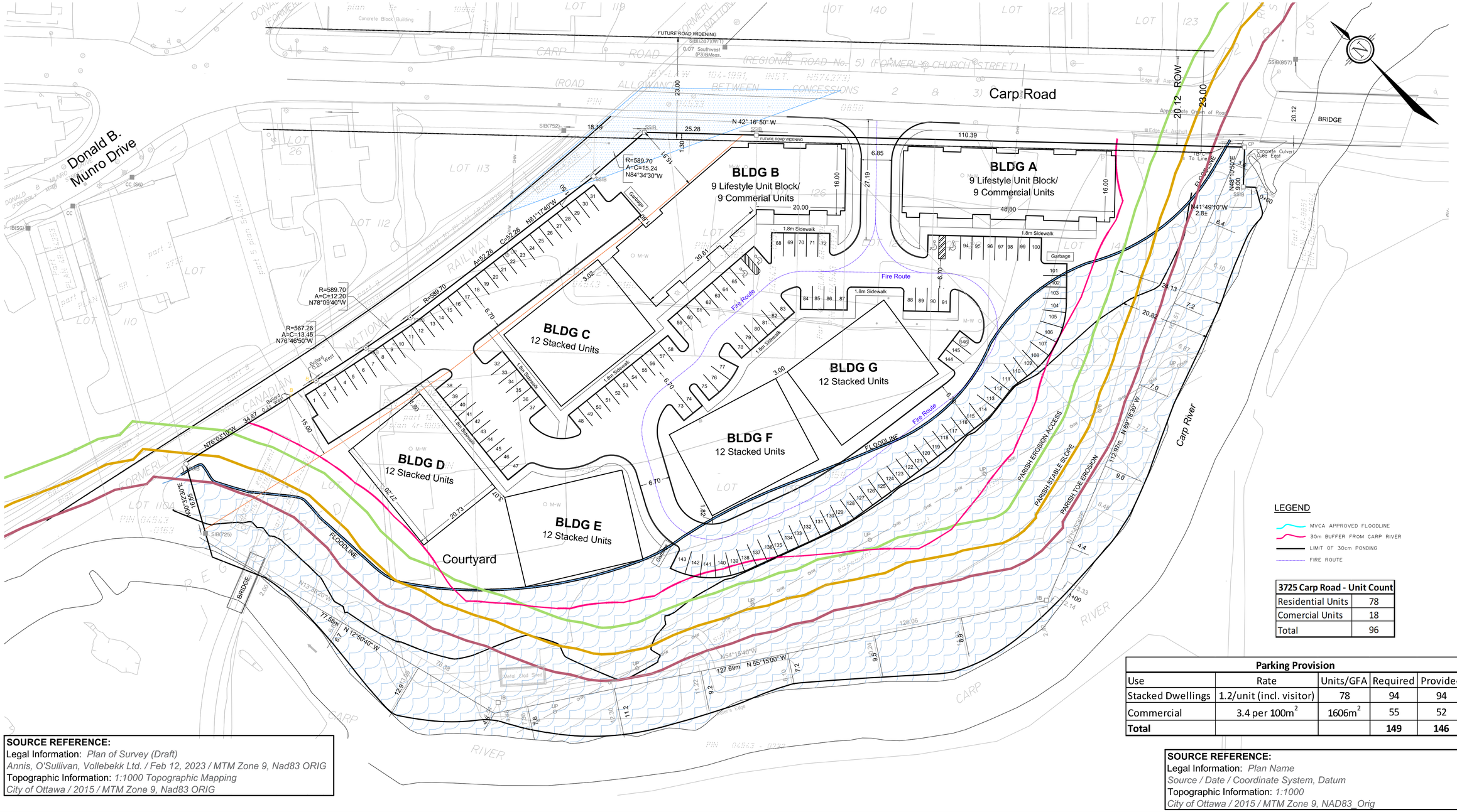
Reviewed by:

Rochelle Fortier, P.Eng.
Project Engineer | Transportation

Jennifer Luong, P.Eng.
Senior Project Manager | Transportation

APPENDIX A

Draft Plan and Concept Plan



3725 Carp Road - Unit Count	
Residential Units	78
Comercial Units	18
Total	96

Parking Provision				
Use	Rate	Units/GFA	Required	Provided
Stacked Dwellings	1.2/unit (incl. visitor)	78	94	94
Commercial	3.4 per 100m^2	1606m^2	55	52
Total			**149**	**146**

SOURCE REFERENCE:
Legal Information: *Plan of Survey (Draft)*
Annis, O'Sullivan, Vollebekk Ltd. / Feb 12, 2023 / MTM Zone 9, Nad83 ORIG
Topographic Information: *1:1000 Topographic Mapping*
City of Ottawa / 2015 / MTM Zone 9, Nad83 ORIG

SOURCE REFERENCE:
Legal Information: *Plan Name*
Source / Date / Coordinate System, Datum
Topographic Information: *1:1000*
City of Ottawa / 2015 / MTM Zone 9, NAD83_Orig

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
2.	GENERAL REVISION	MAR 21/23	JI
1.	UPDATED LEGAL BOUNDARY	MAR 15/23	JI

SCALE
1:400 (A1)
1:400
0 4 8 12 16

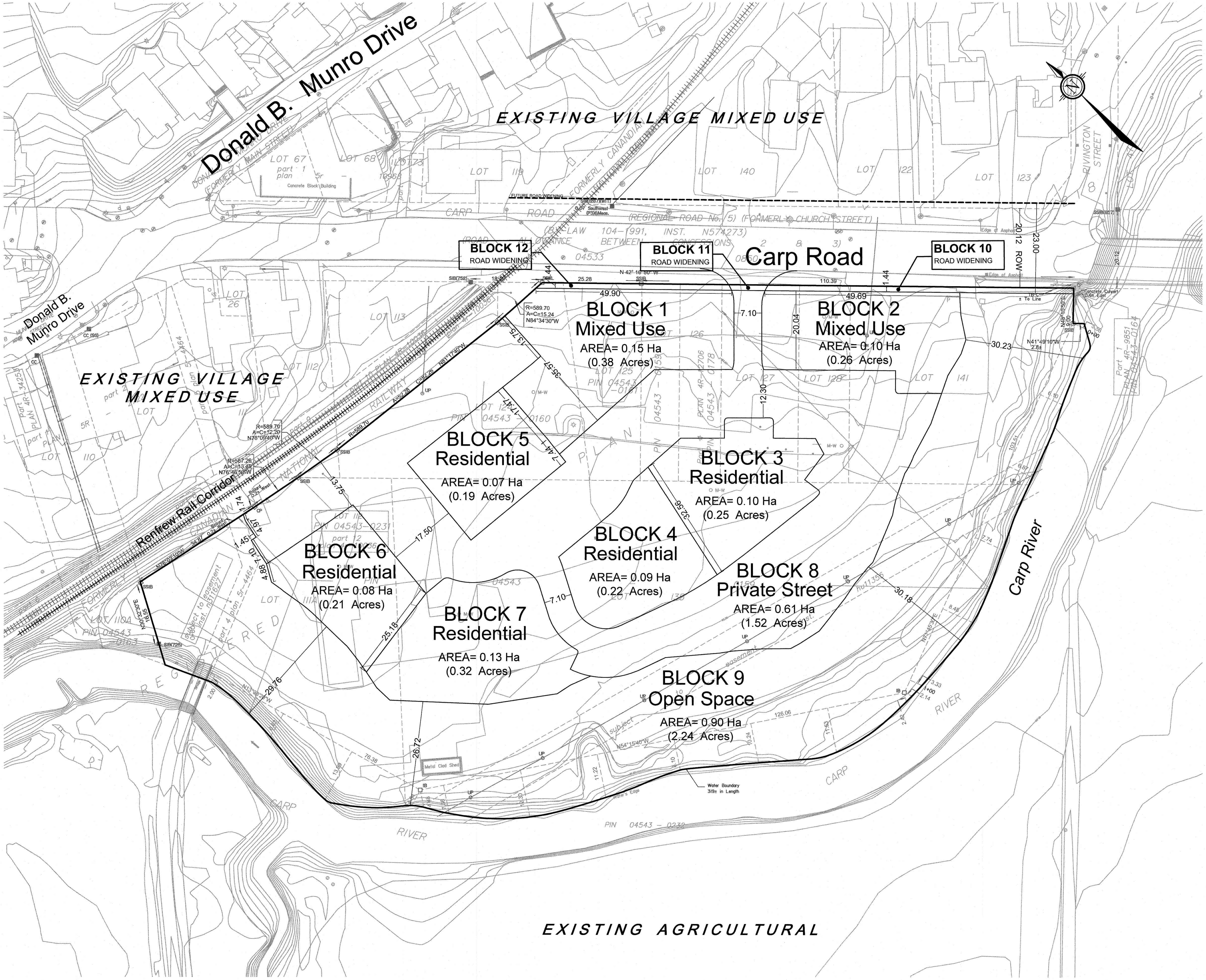
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

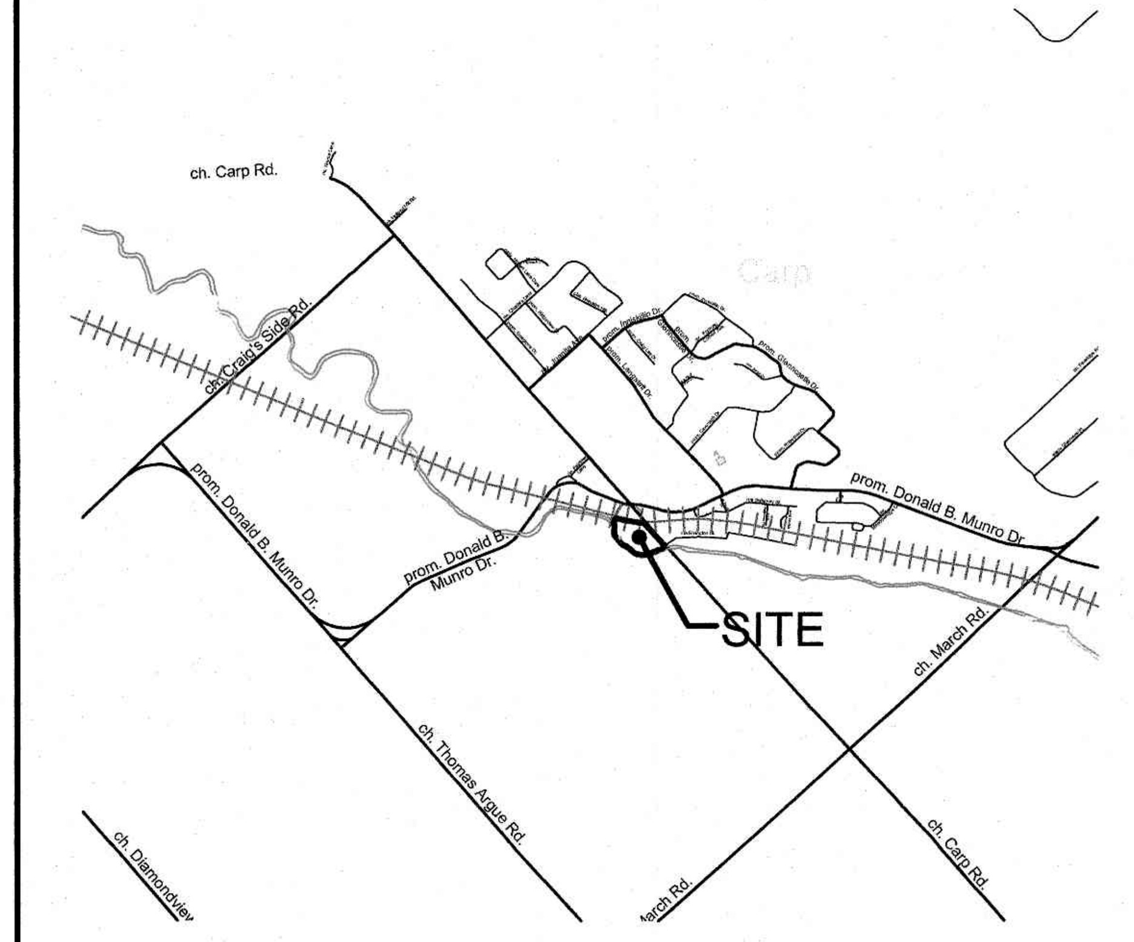
CITY of OTTAWA
3725 CARP ROAD

DRAWING NAME
CONCEPT PLAN 6

PROJECT No. 121173-00
REV REV #2
DRAWING No. 121173-CP6

M:\2021\121173\CAD\Planning\Concept Plans\121173-CP6.dwg, Concept Plan - Dual Scale, Mar 21, 2023 - 11:10am, wdoss





KEY MAP
NOT TO SCALE

METRIC : MEASUREMENTS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

DRAFT PLAN OF SUBDIVISION OF
LOTS 111A, 124, 125, 126, 127, 128, 135
AND PART OF LOTS 112, 141
REGISTERED PLAN 218
CITY OF OTTAWA

Scale 1 : 500
20 15 10 5 0 10 20 Metres

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO ADJOINING LANDS ARE CORRECTLY SHOWN.

DATED March 31, 2023

J. Cody Anderson
ONTARIO LAND SURVEYOR

Annis, O'Sullivan, Vollebekk Ltd.
ONTARIO LAND SURVEYORS
Job No. 23130-23

OWNER'S CERTIFICATE

I/WE, KARSON HOLDINGS INC.,BEING THE REGISTERED OWNER(S), HEREBY AUTHORIZE NOVATECH TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE CITY OF OTTAWA FOR REVIEW AND APPROVAL.

DATED ____________________ ____________________
owner name

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51 (17) OF THE PLANNING ACT.

A) The boundaries of the land proposed to be subdivided, certified by an Ontario land Surveyor;
As shown on Draft Plan

B) The locations, widths & names of the proposed highways within the proposed subdivision & of existing highways on which the proposed subdivision abuts;
As shown on Draft Plan

C) On a small keyplan, on a scale of not less than 1cm to 100m, all of the land adjacent to the proposed subdivision that is owned by the applicant or in which the applicant has an interest, every subdivision adjacent to the proposed subdivision & the relationship of the boundaries of the land to be subdivided to the boundaries of the township lot of other original grant of which the land forms the whole part;
As Shown on Draft Plan

D) The purpose for which the proposed lots are to be used;
Residential and Mixed Use shown on Draft Plan

E) The existing uses of all adjoining lands;
Village Mixed Use and Agricultural shown on Draft Plan

F) The approximate dimensions & layout of the proposed lots;
As shown on Draft Plan

G) Natural & artificial features such as buildings or other structures or installations, railways, highways, watercources, drainage ditches, wetlands & wooded areas within or adjacent to the land proposed to be subdivided;
As shown on Draft Plan

H) The availability and nature of domestic water supplies;
Development will be supplied with full municipal piped water service

I) The nature & porosity of the soil;
Refer to Geotechnical Report submitted with application

J) Existing contours or elevations as may be required to determine the grade of the highways and the drainage of the land proposed to be subdivided;
Contours shown at 0.25 metre intervals on Draft Plan

K) The municipal services available or to be available to the land proposed to be subdivided;
Development will be supplied with full sanitary and storm water sewer services.

L) The nature & extent of any restrictions affecting the land proposed to be subdivided, including restrictive covenants or easements. 1994, c. 23, s. 30; 1996, c. 4, s. 28 (3).;
As shown on Draft Plan.

3725 CARP ROAD

SOURCE REFERENCE:
Legal Information: *Plan of Survey*
Annis O'Sullivan Vollebekk Ltd. / March 17, 2023
Topographic Information: *1:1000*
City of Ottawa / 2015 / MTM Zone 9, NAD83_Orig

SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR LETTER DATED ____________, THIS DRAFT PLAN IS APPROVED BY THE CITY OF OTTAWA UNDER SECTION 51 OF THE PLANNING ACT THIS ______ DAY OF ________, 20____

DERRICK MOODIE, MANAGER
DEVELOPMENT REVIEW WEST
PLANNING, INFRASTRUCTURE AND ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

PROJECT No. 121173

APPENDIX B

TIA Screening Form

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	**3725 Carp Road**
Description of Location	**Bound by the Carp River to the south and west, the Renfrew Rail Corridor to the north, and Carp Road to the east**
Land Use Classification	**Residential Townhouses and Mixed-Use Commercial**
Development Size (units)	**78 dwellings**
Development Size (m^2)	**Approx. 1,605 m^2 GFA of ground-floor commercial or retail space**
Number of Accesses and Locations	**One proposed access to Carp Road**
Phase of Development	**1**
Buildout Year	**2027**

If available, please attach a sketch of the development or site plan to this form.

2. Trip Generation Trigger

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Land Use Type	Minimum 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
Destination retail	***1,000 m^2***
Gas station or convenience market	75 m^2

** If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.

3. Location Triggers

	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?	✓	
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*	✓	

**DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).*

If any of the above questions were answered with 'Yes,' the Location Trigger is satisfied.

4. Safety Triggers

	Yes	No
Are posted speed limits on a boundary street are 80 km/hr or greater?		✓
Are there any horizontal/vertical curvatures on a boundary street limiting sight lines at a proposed driveway?		✓
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)?		✓
Is the proposed driveway within auxiliary lanes of an intersection?		✓
Does the proposed driveway make use of an existing median break that serves an existing site?		✓
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	✓	
Does the development include a drive-thru facility?		✓

If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.

5. Summary

	Yes	No
Does the development satisfy the Trip Generation Trigger?	✓	
Does the development satisfy the Location Trigger?	✓	
Does the development satisfy the Safety Trigger?	✓	

If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).

APPENDIX C

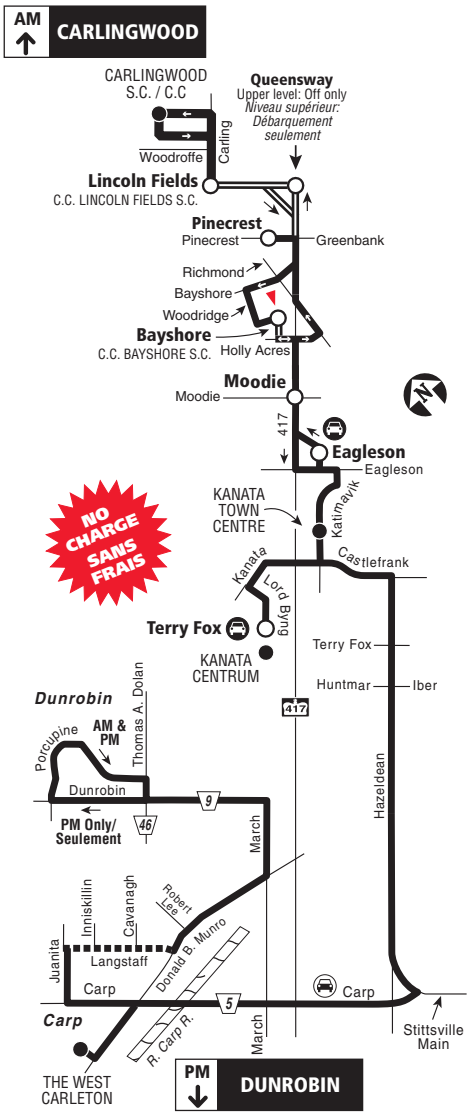
OC Transpo Route Maps

303 CARLINGWOOD / DUNROBIN, CARP

Local

Wednesday only / Mercredi seulement

Selected time periods
Périodes sélectionnées



2022.04

Transitway & Station
Request stop zone / Zone d'arrêt sur demande
Park & Ride / Parc-o-bus

2022.04

Schedule / Horaire 613-560-1000
Text / Texto* 560560
plus your four digit bus stop number / *plus* votre numéro d'arrêt à quatre chiffres
*Standard message rates may apply / Les tarifs réguliers de messagerie texte peuvent s'appliquer

Customer Service
Service à la clientèle **613-560-5000**
Lost and Found / Objets perdus..... **613-563-4011**
Security / Sécurité **613-741-2478**

Effective April 24, 2022
En vigueur 24 avril 2022

OC Transpo
INFO 613-560-5000
octranspo.com

APPENDIX D

Traffic Count Data

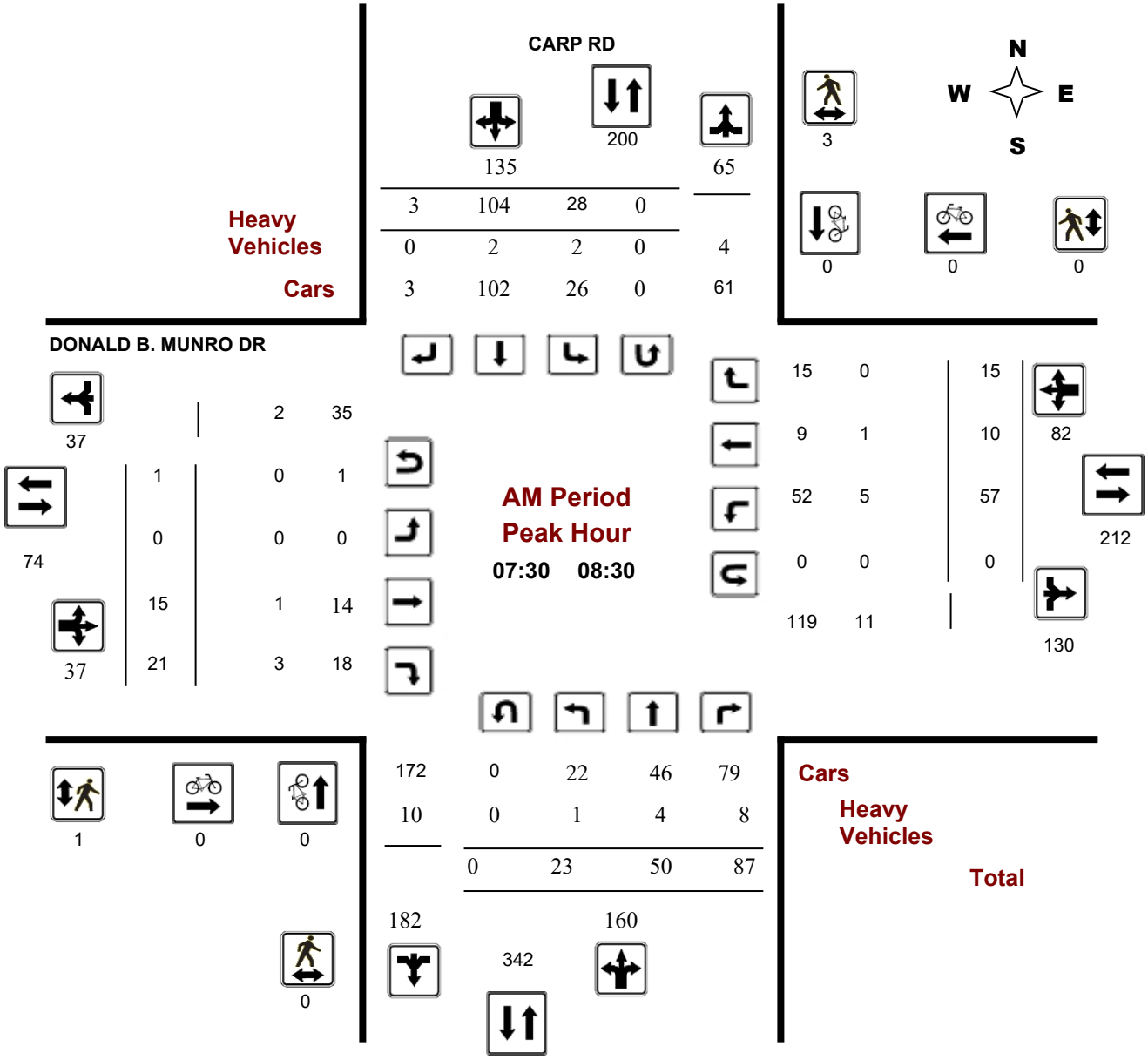
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ DONALD B. MUNRO DR

Survey Date: Tuesday, April 02, 2019 **WO No:** 38471

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



Comments

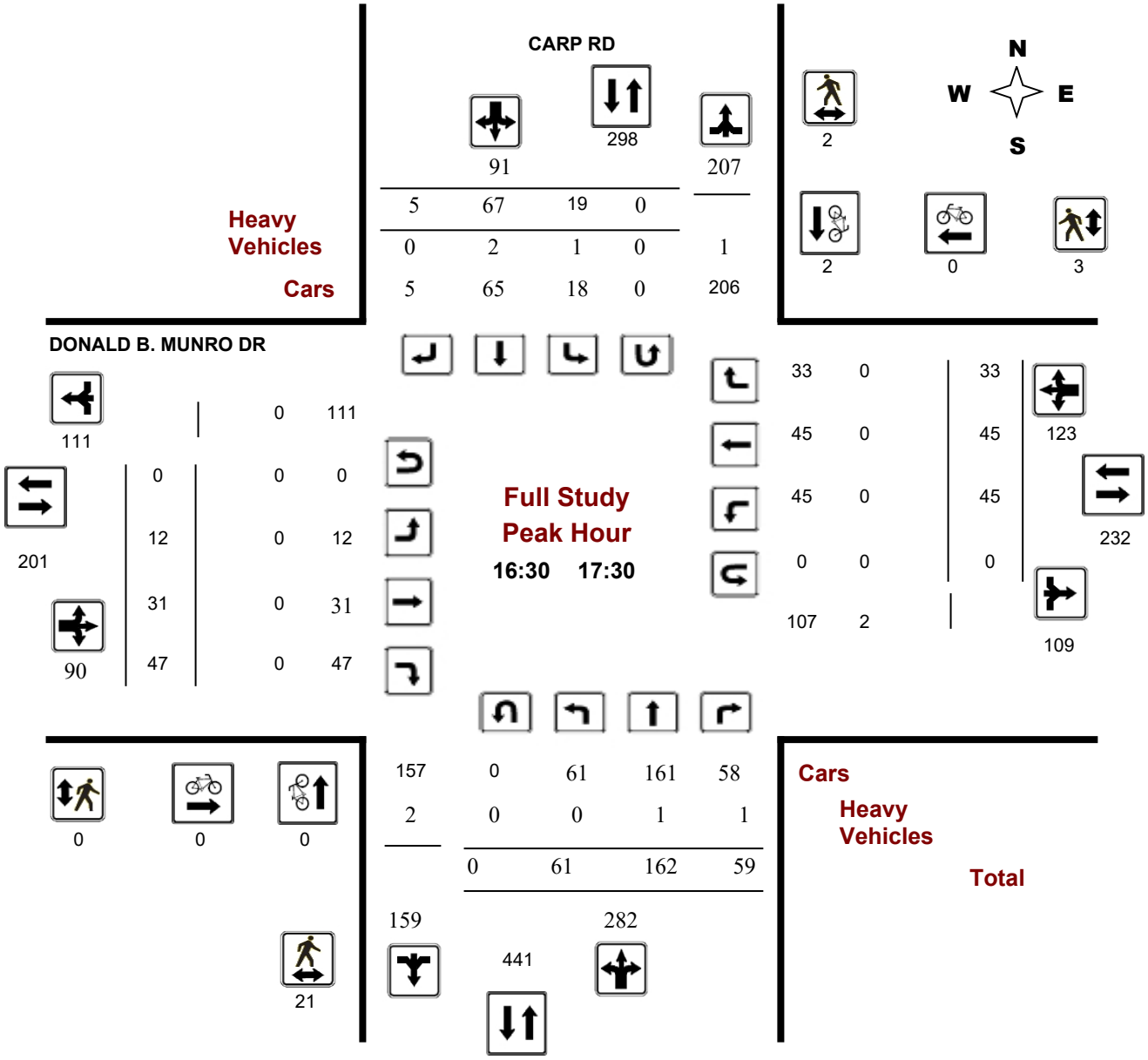
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ DONALD B. MUNRO DR

Survey Date: Tuesday, April 02, 2019 **WO No:** 38471

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



Comments

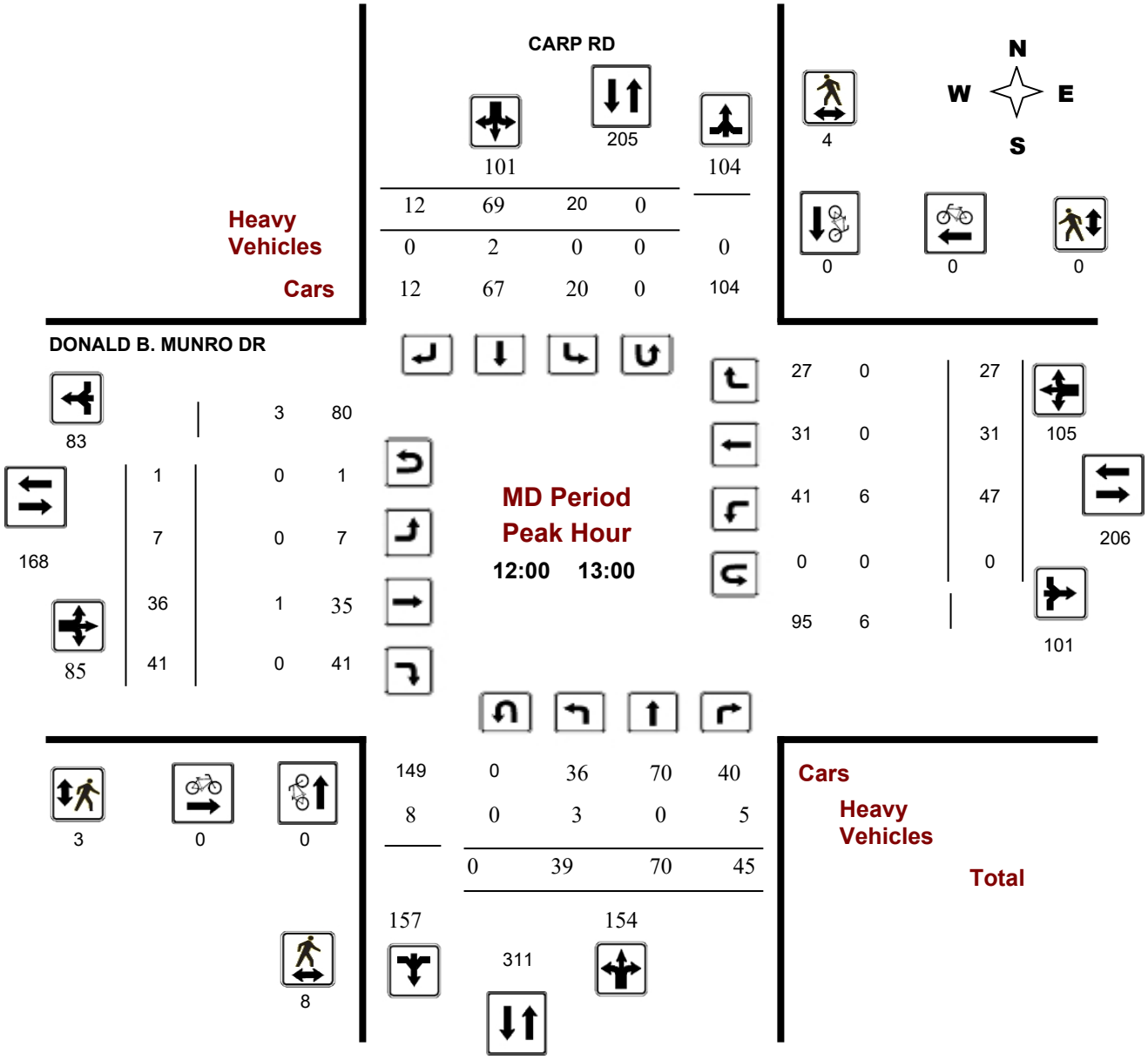
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ DONALD B. MUNRO DR

Survey Date: Tuesday, April 02, 2019 **WO No:** 38471

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



Comments

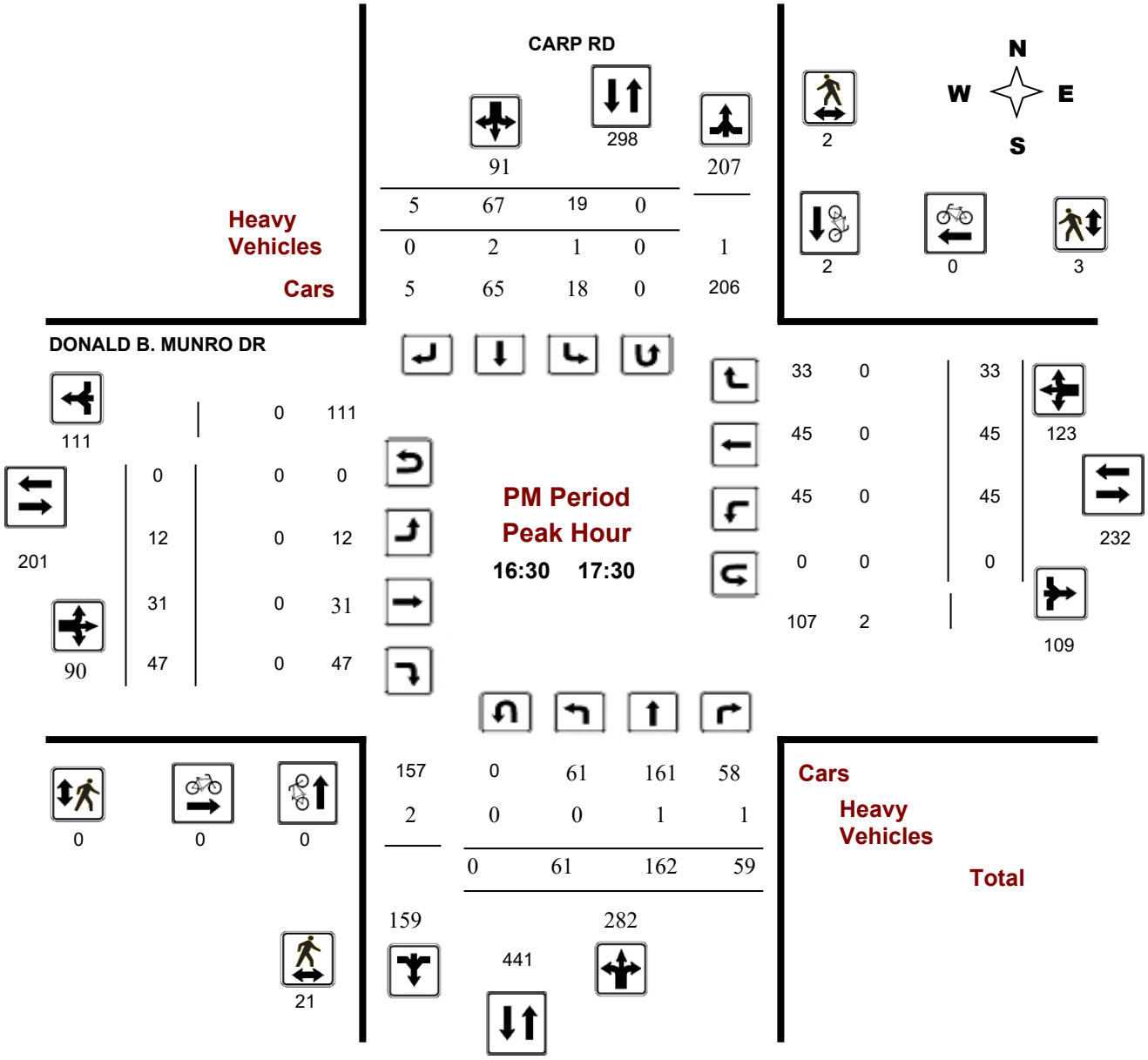
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ DONALD B. MUNRO DR

Survey Date: Tuesday, April 02, 2019 **WO No:** 38471

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



Comments

Transportation Services - Traffic Services

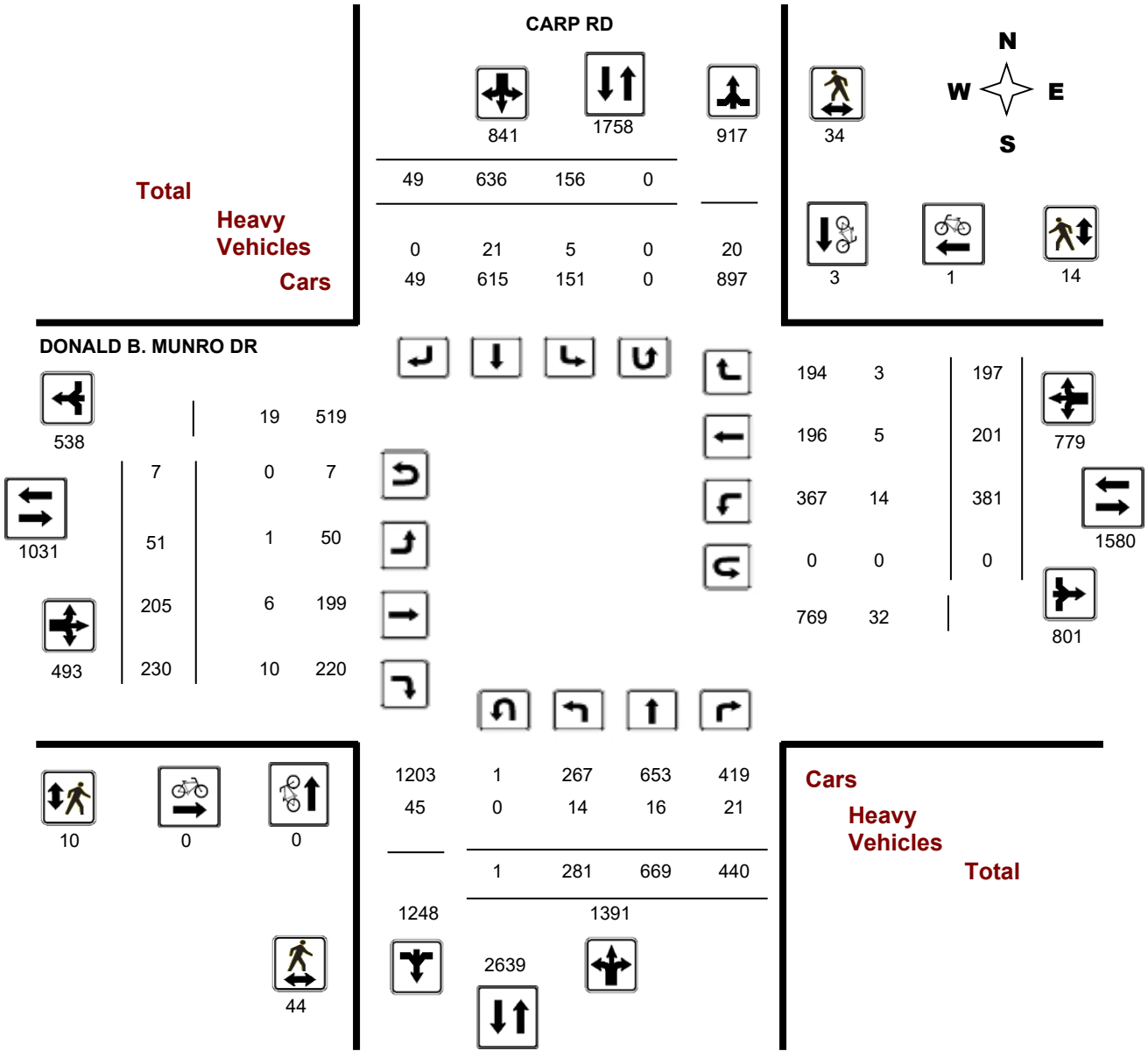
Turning Movement Count - Full Study Diagram

CARP RD @ DONALD B. MUNRO DR

Survey Date: Tuesday, April 02, 2019

WO#: 38471

Device: Miovision



Comments

Transportation Services - Traffic Services

Work Order 38471

Turning Movement Count - Full Study Summary Report

CARP RD @ DONALD B. MUNRO DR

Survey Date: Tuesday, April 02, 2019

Total Observed U-Turns

Northbound: 1 Southbound: 0

Eastbound: 7 Westbound: 0

AADT Factor .90

Full Study

	CARP RD									DONALD B. MUNRO DR									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	**NB TOT**	LT	ST	RT	**SB TOT**	**STR TOT**	LT	ST	RT	**EB TOT**	LT	ST	RT	**WB TOT**	**STR TOT**	**Grand Total**
07:00 08:00	25	46	60	**131**	25	138	3	**166**	**297**	1	10	16	**27**	41	5	7	**53**	**80**	**377**
08:00 09:00	21	55	61	**137**	27	87	2	**116**	**253**	1	23	17	**41**	56	12	22	**90**	**131**	**384**
09:00 10:00	20	45	50	**115**	15	81	11	**107**	**222**	5	16	24	**45**	29	19	17	**65**	**110**	**332**
11:30 12:30	36	58	54	**148**	15	65	10	**90**	**238**	10	23	38	**71**	49	35	19	**103**	**174**	**412**
12:30 13:30	30	63	45	**138**	23	78	9	**110**	**248**	10	36	33	**79**	37	27	37	**101**	**180**	**428**
15:00 16:00	53	134	49	**236**	16	71	6	**93**	**329**	8	29	25	**62**	68	29	23	**120**	**182**	**511**
16:00 17:00	54	149	64	**267**	17	76	5	**98**	**365**	5	41	44	**90**	59	37	33	**129**	**219**	**584**
17:00 18:00	42	119	57	**218**	18	40	3	**61**	**279**	11	27	33	**71**	42	37	39	**118**	**189**	**468**
Sub Total	281	669	440	**1390**	156	636	49	**841**	**2231**	51	205	230	**486**	381	201	197	**779**	**1265**	**3496**
U Turns				**1**				**0**	**1**				**7**				**0**	**7**	**8**
Total	281	669	440	**1391**	156	636	49	**841**	**2232**	51	205	230	**493**	381	201	197	**779**	**1272**	**3504**
EQ 12Hr	391	930	612	**1933**	217	884	68	**1169**	**3102**	71	285	320	**685**	530	279	274	**1083**	**1768**	**4870**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	352	837	550	**1740**	195	796	61	**1052**	**2792**	64	256	288	**617**	477	251	246	**975**	**1592**	**4384**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**.90**						
AVG 24Hr	461	1096	721	**2280**	256	1042	80	**1378**	**3658**	84	336	377	**808**	624	329	323	**1277**	**2085**	**5743**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													**1.31**						

Comments:

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

Transportation Services - Traffic Services

W.O. 38471

Turning Movement Count - 15 Minute Summary Report

CARP RD @ DONALD B. MUNRO DR

Survey Date: Tuesday, April 02, 2019

Total Observed U-Turns

Northbound: 1 Southbound: 0

Eastbound: 7 Westbound: 0

		CARP RD									DONALD B. MUNRO DR									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	5	7	7	**19**	9	37	0	**46**	**65**	1	2	1	**4**	14	1	1	**16**	**20**	**85**
07:15	07:30	5	13	8	**26**	5	44	1	**50**	**76**	0	3	4	**7**	7	2	3	**12**	**19**	**95**
07:30	07:45	4	16	13	**33**	7	34	0	**41**	**74**	0	1	6	**8**	8	2	2	**12**	**20**	**94**
07:45	08:00	11	10	32	**53**	4	23	2	**29**	**82**	0	4	5	**9**	12	0	1	**13**	**22**	**104**
08:00	08:15	2	11	24	**37**	13	26	0	**39**	**76**	0	6	5	**11**	20	5	6	**31**	**42**	**118**
08:15	08:30	6	13	18	**37**	4	21	1	**26**	**63**	0	4	5	**9**	17	3	6	**26**	**35**	**98**
08:30	08:45	6	10	5	**21**	3	18	1	**22**	**43**	0	5	3	**8**	7	3	2	**12**	**20**	**63**
08:45	09:00	7	21	14	**42**	7	22	0	**29**	**71**	1	8	4	**13**	12	1	8	**21**	**34**	**105**
09:00	09:15	4	12	14	**30**	1	20	2	**23**	**53**	2	6	6	**14**	8	3	4	**15**	**29**	**82**
09:15	09:30	9	18	11	**38**	3	30	6	**39**	**77**	1	5	6	**12**	8	8	5	**21**	**33**	**110**
09:30	09:45	3	5	14	**22**	7	15	2	**24**	**46**	1	2	8	**12**	10	2	3	**15**	**27**	**73**
09:45	10:00	4	10	11	**25**	4	16	1	**21**	**46**	1	3	4	**8**	3	6	5	**14**	**22**	**68**
11:30	11:45	7	11	17	**35**	4	18	2	**24**	**59**	3	4	10	**19**	7	9	8	**24**	**43**	**102**
11:45	12:00	5	15	15	**35**	4	20	3	**27**	**62**	5	4	5	**15**	15	9	3	**27**	**42**	**104**
12:00	12:15	15	12	10	**37**	5	14	4	**23**	**60**	1	8	13	**22**	17	8	4	**29**	**51**	**111**
12:15	12:30	9	20	12	**41**	2	13	1	**16**	**57**	1	7	10	**19**	10	9	4	**23**	**42**	**99**
12:30	12:45	8	22	15	**45**	6	9	4	**19**	**64**	2	12	9	**23**	8	7	9	**24**	**47**	**111**
12:45	13:00	7	16	8	**31**	7	33	3	**43**	**74**	3	9	9	**21**	12	7	10	**29**	**50**	**124**
13:00	13:15	9	13	15	**37**	4	18	1	**23**	**60**	3	8	6	**18**	7	6	11	**24**	**42**	**102**
13:15	13:30	6	12	7	**25**	6	18	1	**25**	**50**	2	7	9	**18**	10	7	7	**24**	**42**	**92**
15:00	15:15	10	34	15	**59**	2	24	2	**28**	**87**	1	4	5	**10**	18	6	8	**32**	**42**	**129**
15:15	15:30	16	25	11	**52**	4	17	2	**23**	**75**	3	9	6	**18**	17	6	10	**33**	**51**	**126**
15:30	15:45	10	38	12	**60**	8	15	1	**24**	**84**	2	6	5	**13**	8	6	3	**17**	**30**	**114**
15:45	16:00	17	37	11	**65**	2	15	1	**18**	**83**	2	10	9	**21**	25	11	2	**38**	**59**	**142**
16:00	16:15	9	32	18	**60**	3	25	2	**30**	**90**	0	9	11	**20**	15	9	10	**34**	**54**	**144**
16:15	16:30	12	30	11	**53**	5	12	0	**17**	**70**	1	14	7	**22**	18	9	11	**38**	**60**	**130**
16:30	16:45	18	36	17	**71**	5	24	0	**29**	**100**	1	12	7	**20**	11	12	5	**28**	**48**	**148**
16:45	17:00	15	51	18	**84**	4	15	3	**22**	**106**	3	6	19	**28**	15	7	7	**29**	**57**	**163**
17:00	17:15	13	35	10	**58**	4	14	1	**19**	**77**	5	8	11	**24**	8	17	5	**30**	**54**	**131**
17:15	17:30	15	40	14	**69**	6	14	1	**21**	**90**	3	5	10	**18**	11	9	16	**36**	**54**	**144**
17:30	17:45	8	23	21	**52**	4	5	1	**10**	**62**	2	6	7	**15**	12	5	10	**27**	**42**	**104**
17:45	18:00	6	21	12	**39**	4	7	0	**11**	**50**	1	8	5	**14**	11	6	8	**25**	**39**	**89**
TOTAL:		281	669	440	**1391**	156	636	49	**841**	**2232**	51	205	230	**493**	381	201	197	**779**	**1272**	**3504**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order
38471

CARP RD @ DONALD B. MUNRO DR

Count Date: Tuesday, April 02, 2019 **Start Time:** 07:00

	CARP RD			DONALD B. MUNRO DR			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	0	0	**0**	0	0	**0**	**0**
08:00 09:00	0	0	**0**	0	0	**0**	**0**
09:00 10:00	0	1	**1**	0	0	**0**	**1**
11:30 12:30	0	0	**0**	0	0	**0**	**0**
12:30 13:30	0	0	**0**	0	0	**0**	**0**
15:00 16:00	0	0	**0**	0	1	**1**	**1**
16:00 17:00	0	0	**0**	0	0	**0**	**0**
17:00 18:00	0	2	**2**	0	0	**0**	**2**
Total	0	3	**3**	0	1	**1**	**4**

Comment:

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

Transportation Services - Traffic Services

W.O. 38471

Turning Movement Count - Heavy Vehicle Report

CARP RD @ DONALD B. MUNRO DR

Survey Date: Tuesday, April 02, 2019

		CARP RD									DONALD B. MUNRO DR									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	08:00	3	5	5	**13**	0	2	0	**2**	**15**	1	2	2	**5**	0	0	0	**0**	**5**	**20**
08:00	09:00	3	6	5	**14**	2	3	0	**5**	**19**	0	1	2	**3**	5	3	1	**9**	**12**	**31**
09:00	10:00	3	3	0	**6**	1	7	0	**8**	**14**	0	0	4	**4**	1	1	0	**2**	**6**	**20**
11:30	12:30	0	0	4	**4**	0	3	0	**3**	**7**	0	0	0	**0**	4	0	0	**4**	**4**	**11**
12:30	13:30	4	0	5	**9**	0	2	0	**2**	**11**	0	1	1	**2**	4	0	0	**4**	**6**	**17**
15:00	16:00	1	0	0	**1**	1	1	0	**2**	**3**	0	1	0	**1**	0	0	1	**1**	**2**	**5**
16:00	17:00	0	2	2	**4**	0	3	0	**3**	**7**	0	1	1	**2**	0	1	1	**2**	**4**	**11**
17:00	18:00	0	0	0	**0**	1	0	0	**1**	**1**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
Sub Total		14	16	21	**51**	5	21	0	**26**	**77**	1	6	10	**17**	14	5	3	**22**	**39**	**116**
U-Turns (Heavy Vehicles)					**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total		14	16	21	**0**	5	21	0	**26**	**77**	1	6	10	**17**	14	5	3	**22**	**39**	**116**

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

Work Order
38471

Turning Movement Count - Pedestrian Volume Report

CARP RD @ DONALD B. MUNRO DR

Count Date: Tuesday, April 02, 2019 **Start Time:** 07:00

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	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**
07:00 08:00	0	0	**0**	0	0	**0**	**0**
08:00 08:15	0	1	**1**	0	0	**0**	**1**
08:15 08:30	0	2	**2**	1	0	**1**	**3**
08:30 08:45	1	2	**3**	0	0	**0**	**3**
08:45 09:00	1	3	**4**	1	0	**1**	**5**
08:00 09:00	2	8	**10**	2	0	**2**	**12**
09:00 09:15	0	1	**1**	0	1	**1**	**2**
09:15 09:30	0	12	**12**	0	0	**0**	**12**
09:30 09:45	0	2	**2**	0	0	**0**	**2**
09:45 10:00	0	0	**0**	0	0	**0**	**0**
09:00 10:00	0	15	**15**	0	1	**1**	**16**
11:30 11:45	0	1	**1**	0	0	**0**	**1**
11:45 12:00	1	0	**1**	0	3	**3**	**4**
12:00 12:15	1	1	**2**	1	0	**1**	**3**
12:15 12:30	4	1	**5**	0	0	**0**	**5**
11:30 12:30	6	3	**9**	1	3	**4**	**13**
12:30 12:45	2	2	**4**	2	0	**2**	**6**
12:45 13:00	1	0	**1**	0	0	**0**	**1**
13:00 13:15	1	0	**1**	2	0	**2**	**3**
13:15 13:30	1	0	**1**	0	0	**0**	**1**
12:30 13:30	5	2	**7**	4	0	**4**	**11**
15:00 15:15	1	1	**2**	2	2	**4**	**6**
15:15 15:30	2	0	**2**	0	0	**0**	**2**
15:30 15:45	2	1	**3**	1	1	**2**	**5**
15:45 16:00	0	1	**1**	0	1	**1**	**2**
15:00 16:00	5	3	**8**	3	4	**7**	**15**
16:00 16:15	0	1	**1**	0	2	**2**	**3**
16:15 16:30	2	0	**2**	0	0	**0**	**2**
16:30 16:45	9	0	**9**	0	2	**2**	**11**
16:45 17:00	3	2	**5**	0	0	**0**	**5**
16:00 17:00	14	3	**17**	0	4	**4**	**21**
17:00 17:15	2	0	**2**	0	1	**1**	**3**
17:15 17:30	7	0	**7**	0	0	**0**	**7**
17:30 17:45	2	0	**2**	0	0	**0**	**2**
17:45 18:00	1	0	**1**	0	1	**1**	**2**
17:00 18:00	12	0	**12**	0	2	**2**	**14**
Total	44	34	**78**	10	14	**24**	**102**

Comment:

Transportation Services - Traffic Services

Work Order
38471

Turning Movement Count - 15 Min U-Turn Total Report

CARP RD @ DONALD B. MUNRO DR

Survey Date: Tuesday, April 02, 2019

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	1	0	1
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	1	0	1
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	2	0	2
11:45	12:00	0	0	1	0	1
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	1	0	1
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	1	0	1
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	1	0	0	0	1
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		1	0	7	0	8

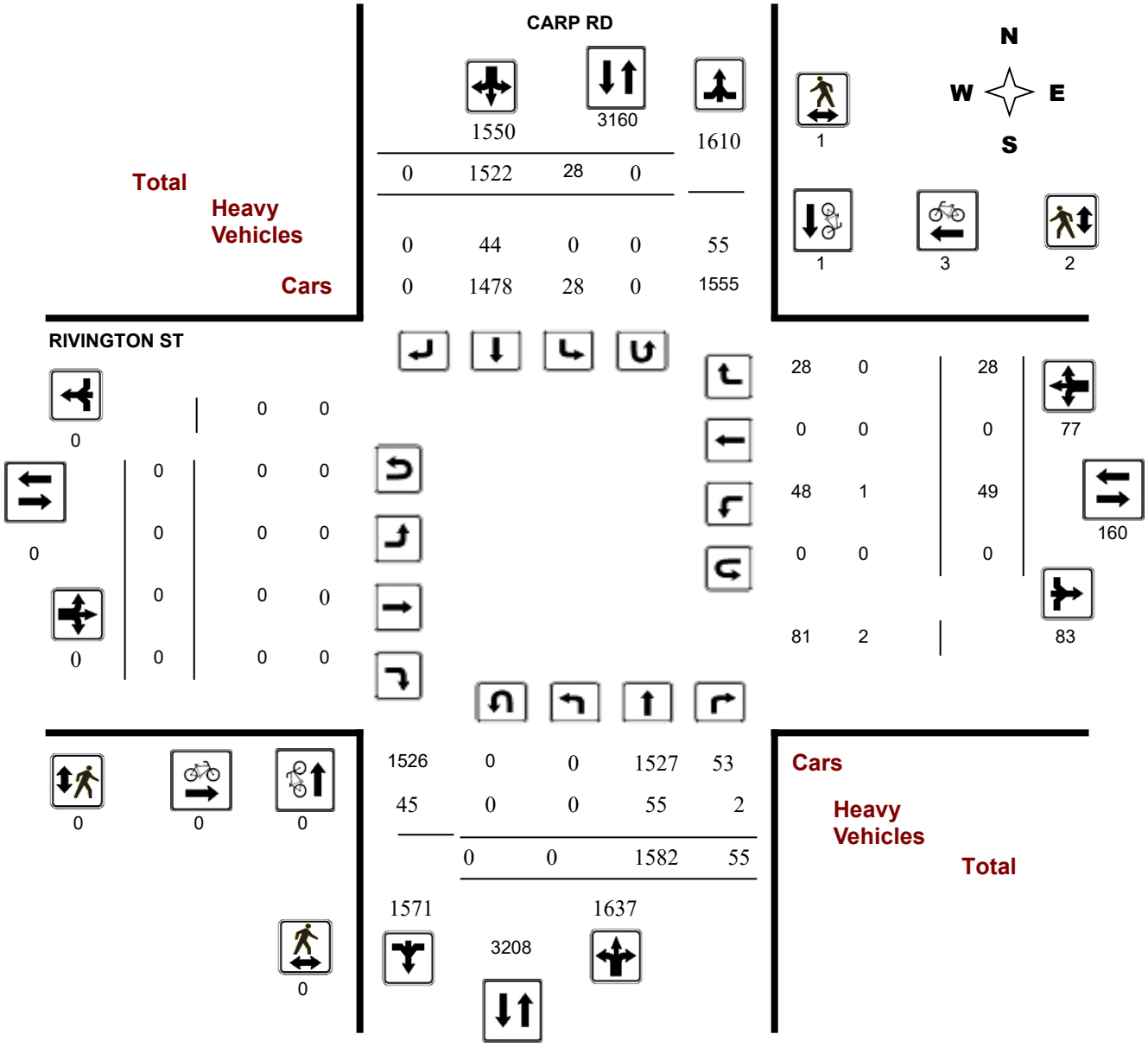
Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ RIVINGTON ST

Survey Date: Wednesday, August 16, 2017
Start Time: 07:00
WO No: 37207
Device: Miovision

Full Study Diagram



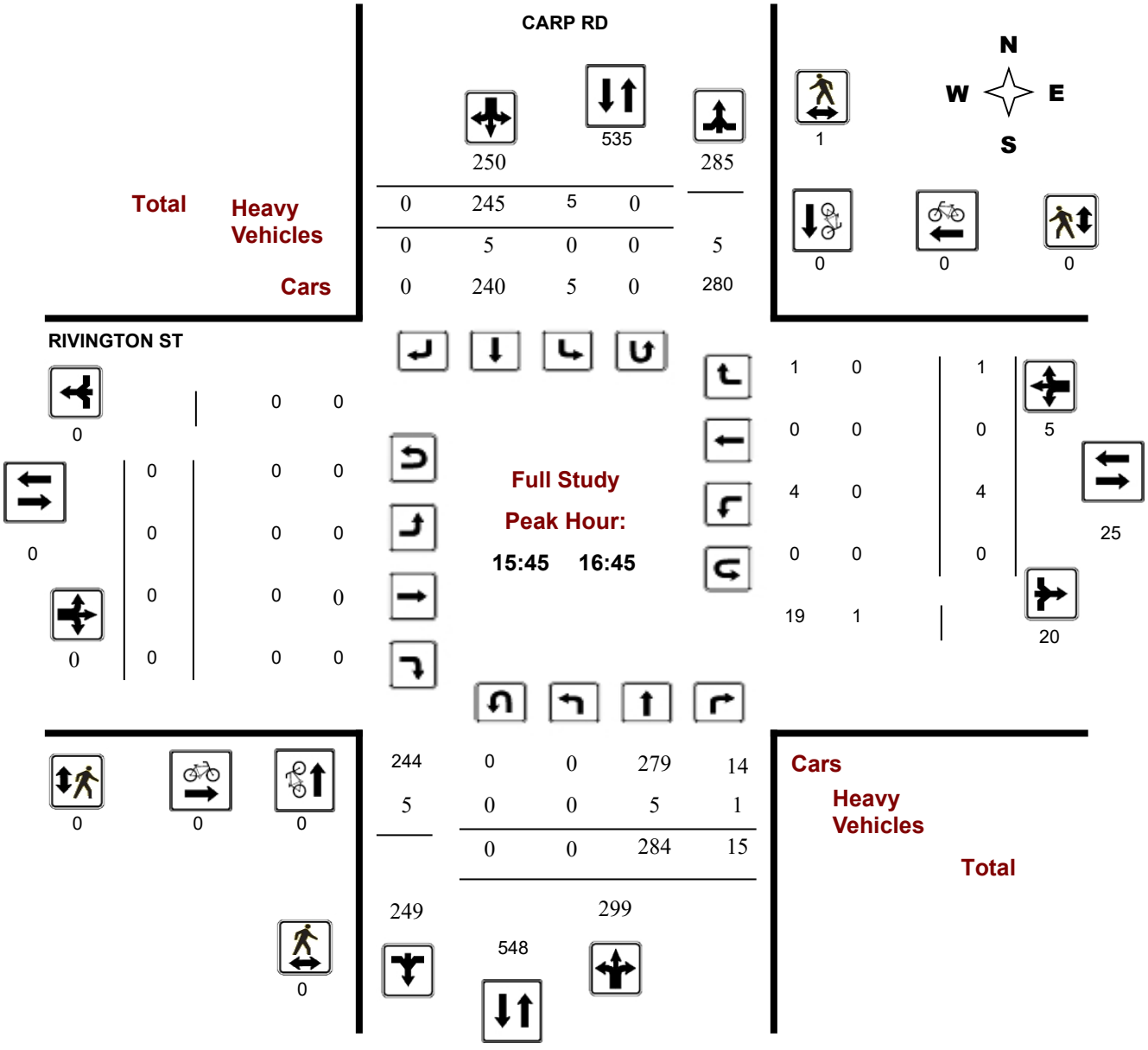
Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ RIVINGTON ST

Survey Date: Wednesday, August 16, 2017
Start Time: 07:00
WO No: 37207
Device: Miovision

Full Study Peak Hour Diagram



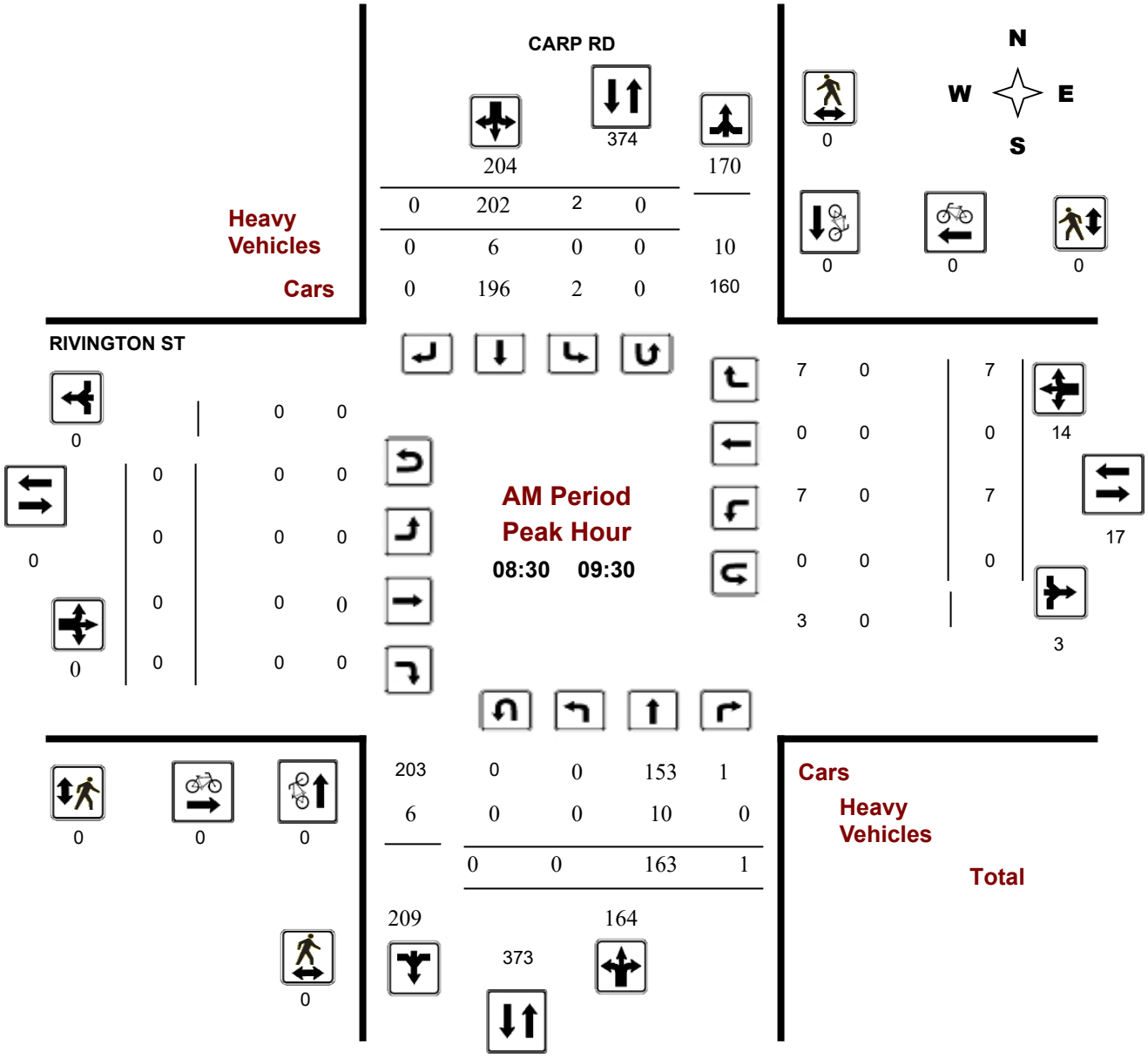
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ RIVINGTON ST

Survey Date: Wednesday, August 16, 2017 **WO No:** 37207

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



Comments

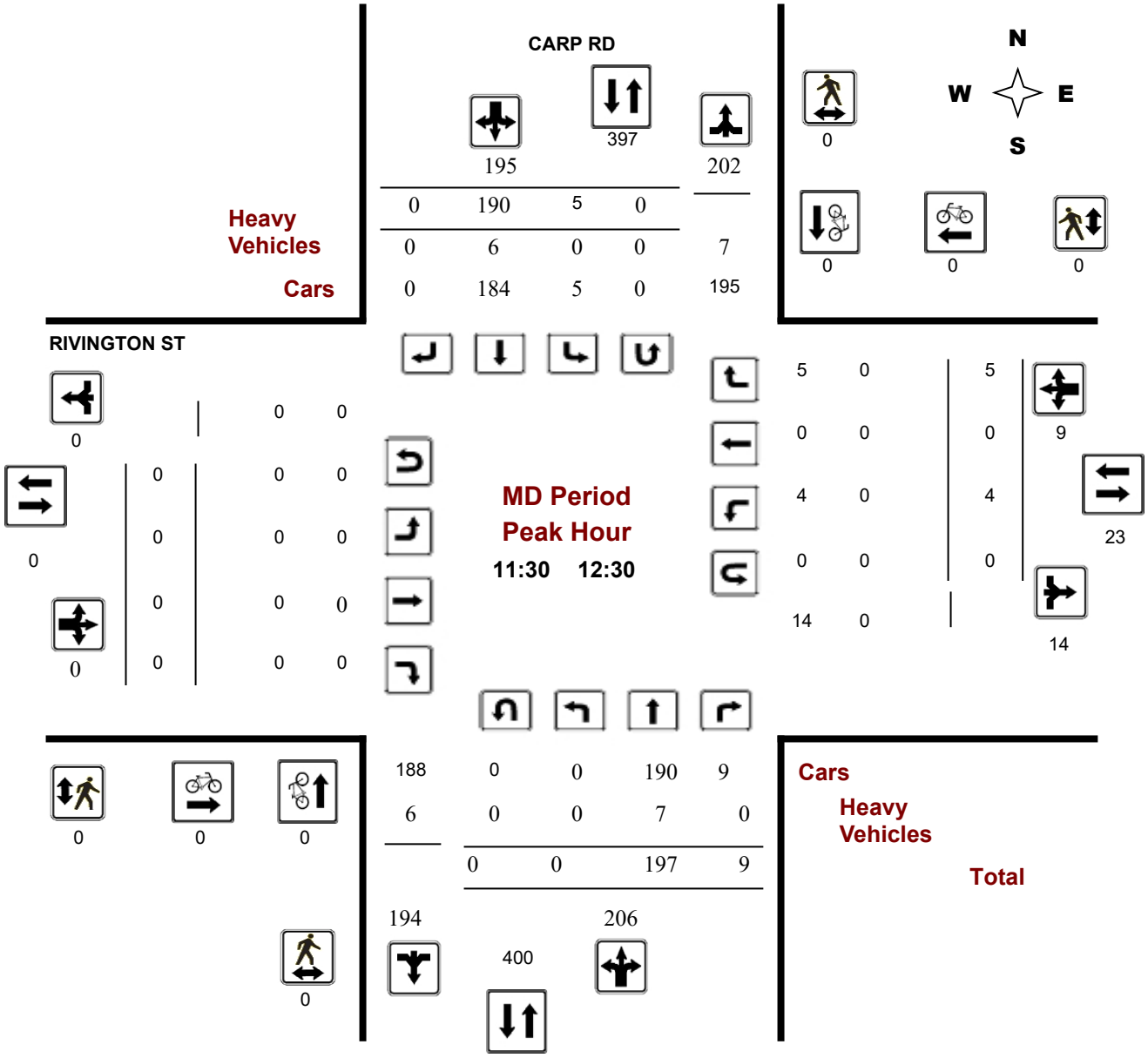
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ RIVINGTON ST

Survey Date: Wednesday, August 16, 2017 **WO No:** 37207

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



Comments

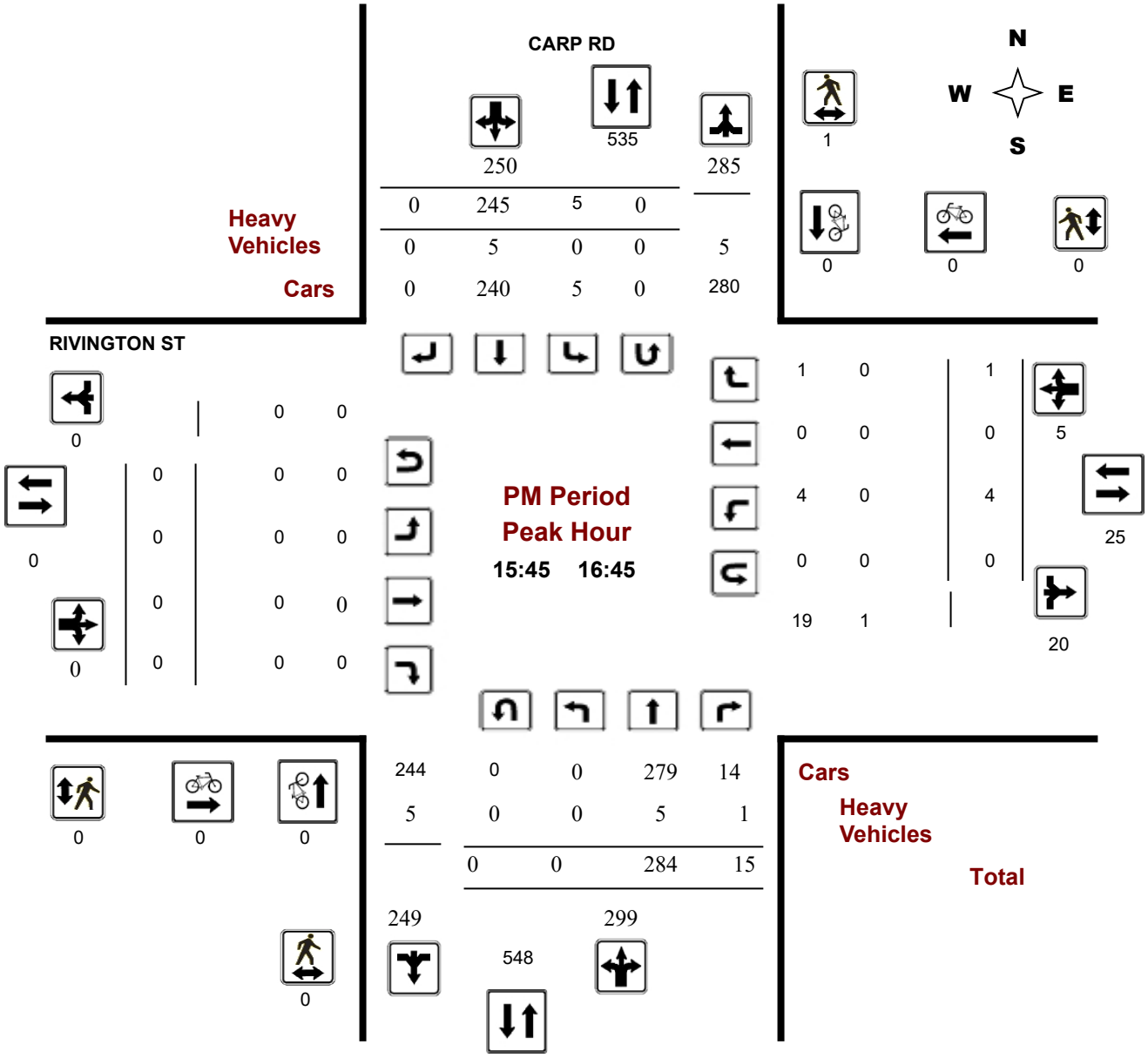
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARP RD @ RIVINGTON ST

Survey Date: Wednesday, August 16, 2017 **WO No:** 37207

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



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ RIVINGTON ST

Survey Date: Wednesday, August 16, 2017 **WO No:** 37207

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

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, August 16, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor

.90

	CARP RD									RIVINGTON ST									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	**NB TOT**	LT	ST	RT	**SB TOT**	**STR TOT**	LT	ST	RT	**EB TOT**	LT	ST	RT	**WB TOT**	**STR TOT**	**Grand Total**
07:00 08:00	0	102	3	**105**	1	199	0	**200**	**305**	0	0	0	**0**	11	0	1	**12**	**12**	**317**
08:00 09:00	0	137	3	**140**	2	202	0	**204**	**344**	0	0	0	**0**	12	0	6	**18**	**18**	**362**
09:00 10:00	0	162	2	**164**	1	174	0	**175**	**339**	0	0	0	**0**	3	0	4	**7**	**7**	**346**
11:30 12:30	0	197	9	**206**	5	190	0	**195**	**401**	0	0	0	**0**	4	0	5	**9**	**9**	**410**
12:30 13:30	0	200	2	**202**	5	164	0	**169**	**371**	0	0	0	**0**	2	0	2	**4**	**4**	**375**
15:00 16:00	0	242	7	**249**	4	201	0	**205**	**454**	0	0	0	**0**	12	0	4	**16**	**16**	**470**
16:00 17:00	0	284	15	**299**	6	242	0	**248**	**547**	0	0	0	**0**	3	0	1	**4**	**4**	**551**
17:00 18:00	0	258	14	**272**	4	150	0	**154**	**426**	0	0	0	**0**	2	0	5	**7**	**7**	**433**
Sub Total	0	1582	55	**1637**	28	1522	0	**1550**	**3187**	0	0	0	**0**	49	0	28	**77**	**77**	**3264**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	0	1582	55	**1637**	28	1522	0	**1550**	**3187**	0	0	0	**0**	49	0	28	**77**	**77**	**3264**
EQ 12Hr	0	2199	76	**2275**	39	2116	0	**2154**	**4430**	0	0	0	**0**	68	0	39	**107**	**107**	**4537**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	0	1979	68	**2048**	35	2494	0	**1939**	**3987**	0	0	0	**0**	61	0	35	**96**	**96**	**4083**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	0	2592	89	**2683**	46	3267	0	**2540**	**5223**	0	0	0	**0**	80	0	46	**126**	**126**	**5349**
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

CARP RD @ RIVINGTON ST

Survey Date: Wednesday, August 16, 2017 **WO No:** 37207

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

Full Study 15 Minute Increments

		CARP RD									RIVINGTON ST									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	17	1	18	1	50	0	51	69	0	0	0	0	4	0	1	5	5	74
07:15	07:30	0	18	1	19	0	60	0	60	79	0	0	0	0	2	0	0	2	2	81
07:30	07:45	0	25	0	25	0	39	0	39	64	0	0	0	0	3	0	0	3	3	67
07:45	08:00	0	42	1	43	0	50	0	50	93	0	0	0	0	2	0	0	2	2	95
08:00	08:15	0	29	1	30	0	45	0	45	75	0	0	0	0	2	0	0	2	2	77
08:15	08:30	0	31	2	33	0	46	0	46	79	0	0	0	0	4	0	1	5	5	84
08:30	08:45	0	47	0	47	0	62	0	62	109	0	0	0	0	3	0	2	5	5	114
08:45	09:00	0	30	0	30	2	49	0	51	81	0	0	0	0	3	0	3	6	6	87
09:00	09:15	0	45	1	46	0	44	0	44	90	0	0	0	0	0	0	1	1	1	91
09:15	09:30	0	41	0	41	0	47	0	47	88	0	0	0	0	1	0	1	2	2	90
09:30	09:45	0	38	1	39	0	45	0	45	84	0	0	0	0	0	0	0	0	0	84
09:45	10:00	0	38	0	38	1	38	0	39	77	0	0	0	0	2	0	2	4	4	81
11:30	11:45	0	42	0	42	2	62	0	64	106	0	0	0	0	0	0	2	2	2	108
11:45	12:00	0	54	2	56	1	42	0	43	99	0	0	0	0	2	0	1	3	3	102
12:00	12:15	0	64	0	64	0	45	0	45	109	0	0	0	0	2	0	0	2	2	111
12:15	12:30	0	37	7	44	2	41	0	43	87	0	0	0	0	0	0	2	2	2	89
12:30	12:45	0	54	0	54	2	46	0	48	102	0	0	0	0	0	0	1	1	1	103
12:45	13:00	0	51	1	52	1	36	0	37	89	0	0	0	0	0	0	0	0	0	89
13:00	13:15	0	49	1	50	0	34	0	34	84	0	0	0	0	1	0	0	1	1	85
13:15	13:30	0	46	0	46	2	48	0	50	96	0	0	0	0	1	0	1	2	2	98
15:00	15:15	0	43	2	45	0	54	0	54	99	0	0	0	0	4	0	1	5	5	104
15:15	15:30	0	56	1	57	2	42	0	44	101	0	0	0	0	3	0	0	3	3	104
15:30	15:45	0	72	1	73	1	44	0	45	118	0	0	0	0	3	0	3	6	6	124
15:45	16:00	0	71	3	74	1	61	0	62	136	0	0	0	0	2	0	0	2	2	138
16:00	16:15	0	62	5	67	2	70	0	72	139	0	0	0	0	0	0	1	1	1	140
16:15	16:30	0	68	2	70	0	64	0	64	134	0	0	0	0	1	0	0	1	1	135
16:30	16:45	0	83	5	88	2	50	0	52	140	0	0	0	0	1	0	0	1	1	141
16:45	17:00	0	71	3	74	2	58	0	60	134	0	0	0	0	1	0	0	1	1	135
17:00	17:15	0	59	2	61	1	48	0	49	110	0	0	0	0	1	0	2	3	3	113
17:15	17:30	0	70	5	75	2	39	0	41	116	0	0	0	0	1	0	2	3	3	119
17:30	17:45	0	59	2	61	1	31	0	32	93	0	0	0	0	0	0	1	1	1	94
17:45	18:00	0	70	5	75	0	32	0	32	107	0	0	0	0	0	0	0	0	0	107
Total:		0	1582	55	1637	28	1522	0	1550	3187	0	0	0	0	49	0	28	77	77	3,264

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ RIVINGTON ST

Survey Date: Wednesday, August 16, 2017 **WO No:** 37207

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

Full Study Cyclist Volume

Time Period		CARP RD			RIVINGTON ST			
		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	1	1	0	0	0	1
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	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	2	2	2
17:30	17:45	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	1	1	1
Total		0	1	**1**	0	3	3	4

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ RIVINGTON ST

Survey Date: Wednesday, August 16, 2017 **WO No:** 37207

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

Full Study Pedestrian Volume

	CARP RD			RIVINGTON ST			
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	**Total**	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	**Total**	**Grand Total**
07:00 07:15	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	1	**1**	**1**
07:45 08:00	0	0	**0**	0	0	**0**	**0**
08:00 08:15	0	0	**0**	0	1	**1**	**1**
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	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	1	**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	0	**0**	0	0	**0**	**0**
17:45 18:00	0	0	**0**	0	0	**0**	**0**
Total	0	1	**1**	0	2	**2**	**3**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ RIVINGTON ST

Survey Date: Wednesday, August 16, 2017 **WO No:** 37207

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

Full Study Heavy Vehicles

		CARP RD									RIVINGTON ST									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	2	0	**3**	0	1	0	**3**	**6**	0	0	0	**0**	0	0	0	**0**	**0**	**3**
07:15	07:30	0	1	0	**2**	0	1	0	**2**	**4**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
07:30	07:45	0	2	0	**2**	0	0	0	**2**	**4**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
07:45	08:00	0	5	0	**6**	0	1	0	**6**	**12**	0	0	0	**0**	0	0	0	**0**	**0**	**6**
08:00	08:15	0	2	0	**4**	0	2	0	**4**	**8**	0	0	0	**0**	0	0	0	**0**	**0**	**4**
08:15	08:30	0	2	0	**4**	0	2	0	**4**	**8**	0	0	0	**0**	0	0	0	**0**	**0**	**4**
08:30	08:45	0	3	0	**5**	0	2	0	**5**	**10**	0	0	0	**0**	0	0	0	**0**	**0**	**5**
08:45	09:00	0	2	0	**4**	0	2	0	**4**	**8**	0	0	0	**0**	0	0	0	**0**	**0**	**4**
09:00	09:15	0	2	0	**2**	0	0	0	**2**	**4**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
09:15	09:30	0	3	0	**5**	0	2	0	**5**	**10**	0	0	0	**0**	0	0	0	**0**	**0**	**5**
09:30	09:45	0	2	0	**9**	0	7	0	**9**	**18**	0	0	0	**0**	0	0	0	**0**	**0**	**9**
09:45	10:00	0	2	0	**2**	0	0	0	**2**	**4**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
11:30	11:45	0	2	0	**4**	0	2	0	**4**	**8**	0	0	0	**0**	0	0	0	**0**	**0**	**4**
11:45	12:00	0	2	0	**5**	0	3	0	**5**	**10**	0	0	0	**0**	0	0	0	**0**	**0**	**5**
12:00	12:15	0	1	0	**1**	0	0	0	**1**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
12:15	12:30	0	2	0	**3**	0	1	0	**3**	**6**	0	0	0	**0**	0	0	0	**0**	**0**	**3**
12:30	12:45	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
12:45	13:00	0	1	0	**2**	0	1	0	**2**	**4**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
13:00	13:15	0	3	0	**4**	0	1	0	**4**	**8**	0	0	0	**0**	0	0	0	**0**	**0**	**4**
13:15	13:30	0	3	0	**6**	0	3	0	**6**	**12**	0	0	0	**0**	0	0	0	**0**	**0**	**6**
15:00	15:15	0	2	0	**3**	0	1	0	**3**	**6**	0	0	0	**0**	0	0	0	**0**	**0**	**3**
15:15	15:30	0	2	0	**4**	0	2	0	**4**	**8**	0	0	0	**0**	0	0	0	**0**	**0**	**4**
15:30	15:45	0	1	0	**3**	0	2	0	**3**	**6**	0	0	0	**0**	0	0	0	**0**	**0**	**3**
15:45	16:00	0	2	0	**5**	0	3	0	**5**	**10**	0	0	0	**0**	0	0	0	**0**	**0**	**5**
16:00	16:15	0	1	1	**2**	0	0	0	**1**	**3**	0	0	0	**0**	0	0	0	**1**	**1**	**2**
16:15	16:30	0	2	0	**2**	0	0	0	**2**	**4**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
16:30	16:45	0	0	0	**2**	0	2	0	**2**	**4**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
16:45	17:00	0	1	0	**2**	0	1	0	**2**	**4**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
17:00	17:15	0	1	0	**3**	0	1	0	**2**	**5**	0	0	0	**0**	1	0	0	**1**	**1**	**3**
17:15	17:30	0	1	1	**3**	0	1	0	**2**	**5**	0	0	0	**0**	0	0	0	**1**	**1**	**3**
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**
Total:	None	0	55	2	**102**	0	44	0	**99**	**201**	0	0	0	**0**	1	0	0	**3**	**3**	**102**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ RIVINGTON ST

Survey Date: Wednesday, August 16, 2017 **WO No:** 37207

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

Full Study 15 Minute U-Turn Total

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

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

Carp Road & Rivington Street — Carp, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Saturday, September 17, 2022
0800-1400
6 Hour Survey
City of Ottawa Ward ▶ 5

Total vehicle volume, all approaches. (A + C + D)

Carp Rd.

(A) 1559 | 3157 | 1598
1559: 1543 | 16 | 0

3224

Rivington St.

(D) 64 | 103 | 39
64: 20 | 44 | 0

Carp Rd.

0 | 1578 | 23 | 1601
1587 | 1601 (C) | 3188

All Pedestrian Crossings
0 | 5 | 0
Total 5

AM Peak Hour Flow Diagram

Carp Rd.

(A) 219 | 493 | 274
219: 218 | 1 | 0

Pedestrian Crossings During **AM** Peak Hr.
0 / N/A | + | 1 / 0

(D) 11
3 | 8 | 11 | 15 | 0
4

Total vehicle volume, all approaches. (A + C + D)
504 (A+C+D)

0 | 271 | 3 | 274

Carp Rd.

226 | (C) 274 | 500

Summary - AM Peak Hr.	
Peak Hr.	0900-1000
Volume	504
PHF	0.82

PM Peak Hour Flow Diagram

Carp Rd.

(A) 0 | 0 | 0
0: 0 | 0 | 0

Pedestrian Crossings During **PM** Peak Hr.
N/A / N/A | + | N/A / N/A

(D) 0
0 | 0 | 0 | 0 | 0
0

Total vehicle volume, all approaches. (A + C + D)
0 (A+C+D)

0 | 0 | 0

Carp Rd.

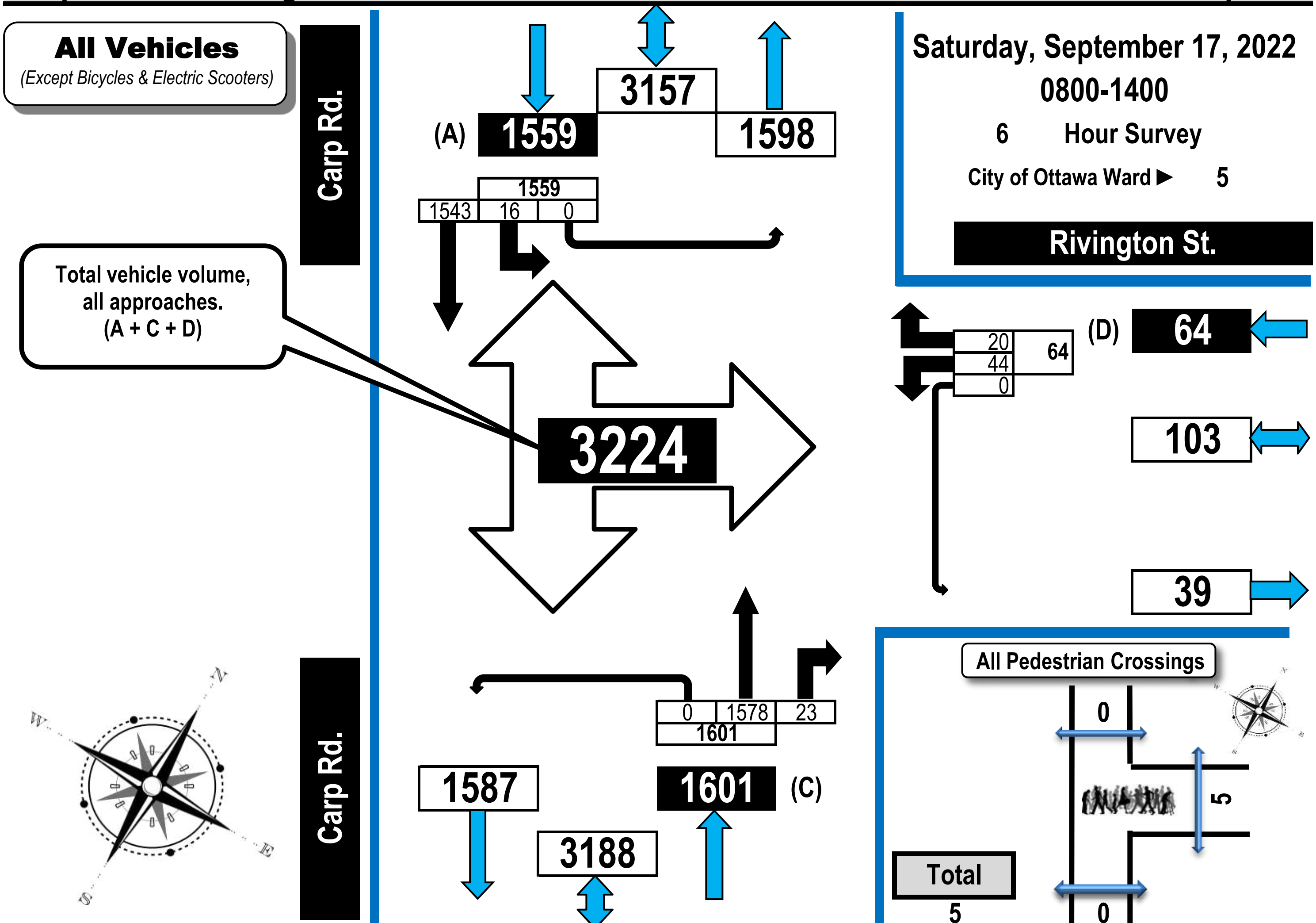
0 | (C) 0 | 0

Summary - PM Peak Hr.	
Peak Hr.	N/A
Volume	N/A
PHF	N/A

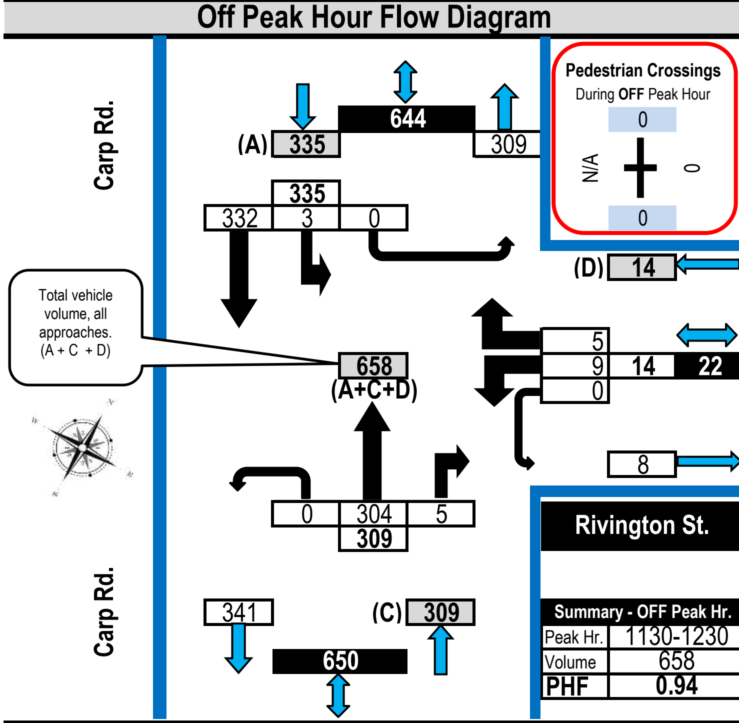
ACCURATE TRUSTED TRAFFIC DATA

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

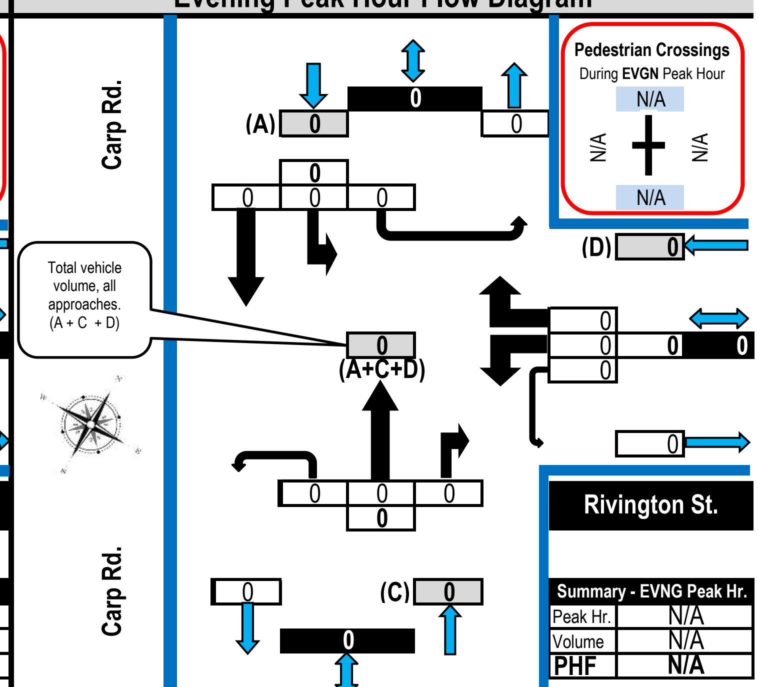
Carp Road & Rivington Street — Carp, ON



Off Peak Hour Flow Diagram



Evening Peak Hour Flow Diagram

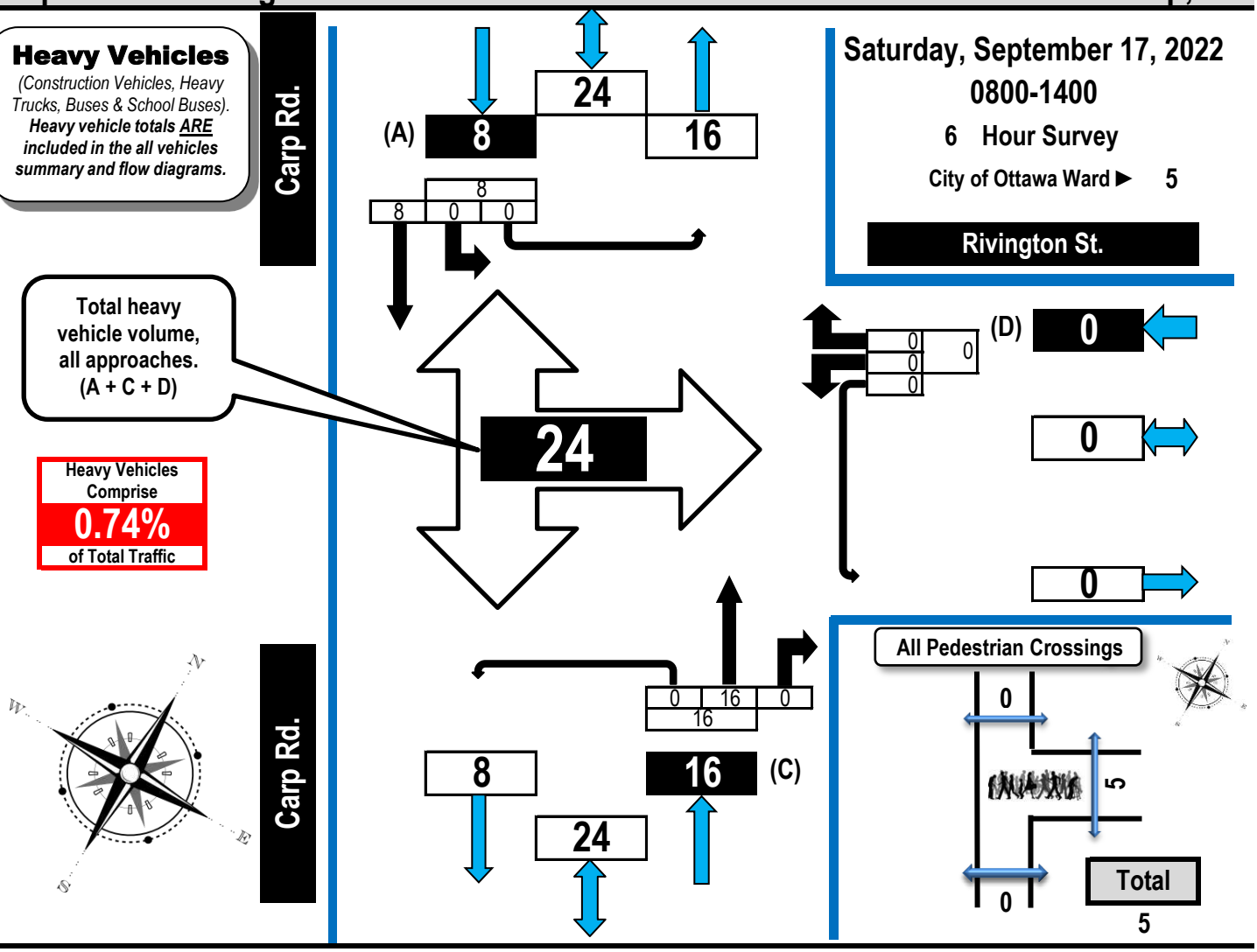


Turning Movement Count
Heavy Vehicle Summary (FHWA Class 4 to 13)
Flow Diagram

Carp Road & Rivington Street — Carp, ON

Heavy Vehicles
(Construction Vehicles, Heavy Trucks, Buses & School Buses).
Heavy vehicle totals ARE included in the all vehicles summary and flow diagrams.

Saturday, September 17, 2022
0800-1400
6 Hour Survey
City of Ottawa Ward ► 5



	N/A					Rivington St.					Carp Rd.					Carp Rd.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0800-0900						0		0	0	0		4	0	0	4	0	2		0	2	6
0900-1000						0		0	0	0		3	0	0	3	0	1		0	1	4
1000-1100						0		0	0	0		5	0	0	5	0	1		0	1	6
1100-1200						0		0	0	0		1	0	0	1	0	1		0	1	2
1200-1300						0		0	0	0		3	0	0	3	0	2		0	2	5
1300-1400						0		0	0	0		0	0	0	0	0	1		0	1	1
Totals						0		0	0	0		16	0	0	16	0	8		0	8	24

Turning Movement Count
Bicycle Summary
Flow Diagram

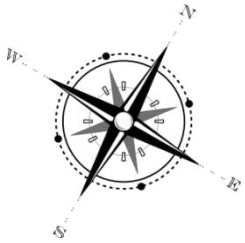
Carp Road & Rivington Street — Carp, ON

Bicycles
(Including electric bicycles and electric scooters)
Note:
Bicycle volumes are NOT included in vehicle totals.

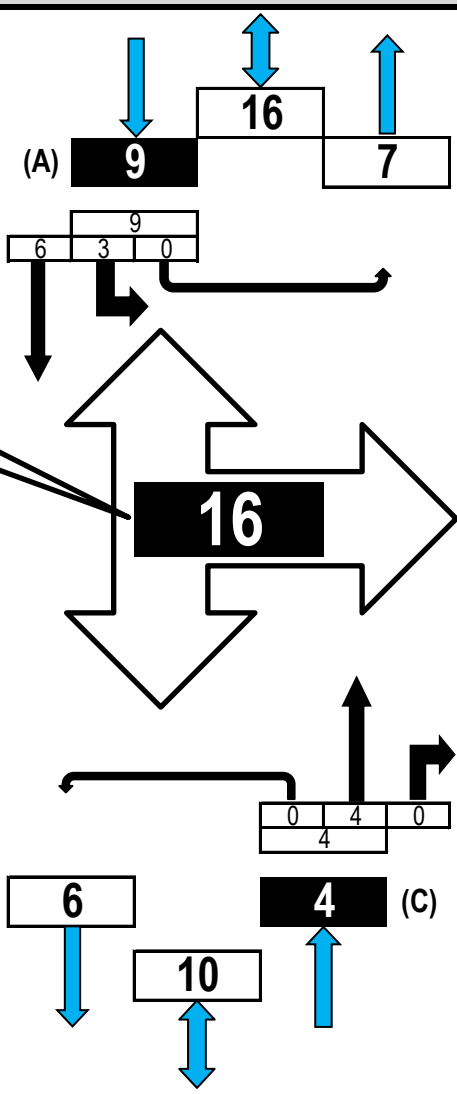
Total bicycle volume, all approaches. (A + C + D)

Bicycles comprise **0.49%** of total traffic

Includes all bicycles travelling on sidewalks.



Saturday, September 17, 2022
0800-1400
6 Hour Survey
City of Ottawa Ward ► 5



	N/A					Rivington St.					Carp Rd.					Carp Rd.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0800-0900						0		0	0	0		2	0	0	2	0	0		0	0	2
0900-1000						0		2	0	2		1	0	0	1	2	1		0	3	6
1000-1100						0		0	0	0		0	0	0	0	0	0		0	0	0
1100-1200						0		1	0	1		1	0	0	1	1	1		0	2	4
1200-1300						0		0	0	0		0	0	0	0	0	2		0	2	2
1300-1400						0		0	0	0		0	0	0	0	0	2		0	2	2
Totals						0		3	0	3		4	0	0	4	3	6		0	9	16

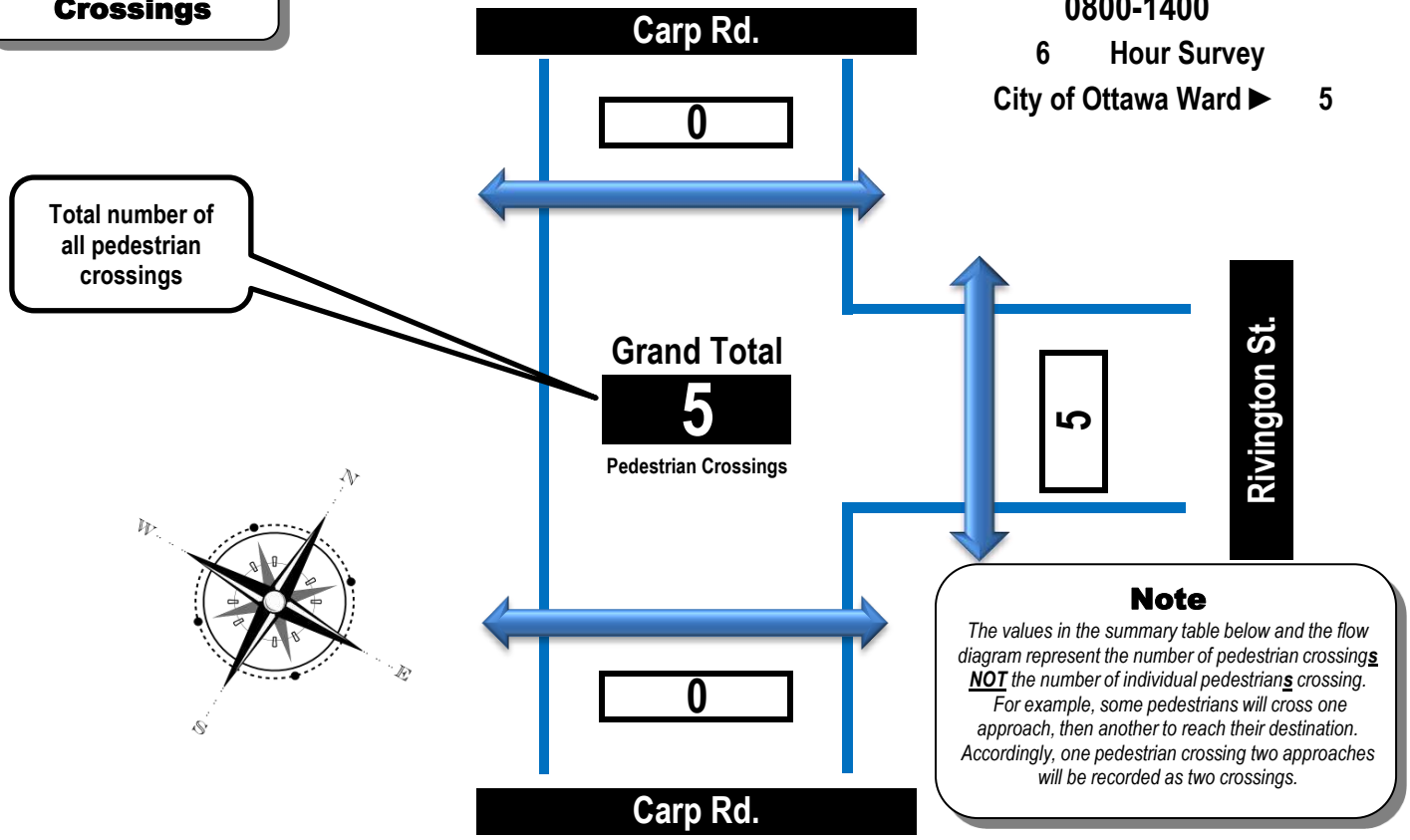
Turning Movement Count

Pedestrian Crossings Summary and Flow Diagram

Carp Road & Rivington Street — Carp, ON

Pedestrian Crossings

Saturday, September 17, 2022
0800-1400
6 Hour Survey
City of Ottawa Ward ► 5



Note

*The values in the summary table below and the flow diagram represent the number of pedestrian crossing**s** **NOT** the number of individual pedestrian**s** crossing. For example, some pedestrians will cross one approach, then another to reach their destination. Accordingly, one pedestrian crossing two approaches will be recorded as two crossings.*

Time Period	West Side Crossing N/A	East Side Crossing Rivington St.	Street Total	South Side Crossing Carp Rd.	North Side Crossing Carp Rd.	Street Total	Grand Total
0800-0900		1	1	0	0	0	1
0900-1000		1	1	0	0	0	1
1000-1100		3	3	0	0	0	3
1100-1200		0	0	0	0	0	0
1200-1300		0	0	0	0	0	0
1300-1400		0	0	0	0	0	0
Totals		5	5	0	0	0	5

Comments:
Traffic count conducted when the Carp Farmers' Market was open.

ACCURATE TRUSTED TRAFFIC DATA

Turning Movement Count

Summary Report Including AM, OFF Peak and PM Peak Hours Including PHF

All Vehicles Except Bicycles

Carp Road & Rivington Street — Carp, ON

Survey Date: Saturday, September 17, 2022 **Start Time:** 0800 **AADT Factor:** 1.2

Weather AM: Mostly Cloudy 9º C **Survey Duration:** 6 Hrs. **Survey Hours:** 0800-1400

Weather PM: Mostly Cloudy 20º C **Surveyor(s)** J. Mousseau

	N/A					Rivington St.						Carp Rd.					Carp Rd.						
	Eastbound					Westbound						Northbound					Southbound						
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
0800-0900						8		1	0	9	9		200	4	0	204	1	130		0	131	335	344
0900-1000						8		3	0	11	11		271	3	0	274	1	218		0	219	493	504
1000-1100						5		5	0	10	10		334	3	0	337	2	273		0	275	612	622
1100-1200						9		2	0	11	11		303	4	0	307	3	316		0	319	626	637
1200-1300						7		4	0	11	11		281	4	0	285	5	330		0	335	620	631
1300-1400						7		5	0	12	12		189	5	0	194	4	276		0	280	474	486
Totals						44		20	0	64	64		1578	23	0	1601	16	1543		0	1559	3160	3224

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

Average daily 12-hour vehicle volumes. These volumes are calculated by multiplying the 12-hour totals by the AADT factor of: 1.2

AADT 12 Hr	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

24-Hour AADT. These volumes are calculated by multiplying the average daily 12-hour vehicle volumes by the 12 ➡24 expansion factor of 1.31

AADT 24 Hr	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

AADT and Expansion Factors provided by the City of Ottawa

AM Peak Hour Factor ➡ 0.82												Highest Hourly Vehicle Volume between 0700h & 1000h										
AM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
0900-1000	0	0	0	0	0	8	0	3	0	11	11	0	271	3	0	274	1	218	0	0	219	493	504
OFF Peak Hour Factor ➡ 0.94												Highest Hourly Vehicle Volume Between 1000h & 1500h										
OFF Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1130-1230	0	0	0	0	0	9	0	5	0	14	14	0	304	5	0	309	3	332	0	0	335	644	658
PM Peak Hour Factor ➡ N/A												Highest Hourly Vehicle Volume Between 1500h & 1900h										
PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
N/A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments:

Traffic count conducted when the Carp Farmers' Market was open.

Notes:

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

ACCURATE TRUSTED TRAFFIC DATA

Turning Movement Count

Summary Report Including AM, OFF Peak and PM Peak Hours Including PHF

All Vehicles Except Bicycles

Carp Road & Donald B. Munro Drive — Carp, ON

Survey Date: Saturday, September 17, 2022 **Start Time:** 0800 **AADT Factor:** 1.2

Weather AM: Mostly Cloudy 9º C **Survey Duration:** 6 Hrs. **Survey Hours:** 0800-1400

Weather PM: Mostly Cloudy 20º C **Surveyor(s)** T. Carmody

	Donald B. Munro Dr. Eastbound					Donald B. Munro Dr. Westbound						Carp Rd. Northbound					Carp Rd. Southbound						
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
0800-0900	6	6	7	0	19	21	13	33	0	67	86	15	161	17	0	193	14	107	3	0	124	317	403
0900-1000	6	17	18	0	41	43	16	41	0	100	141	21	220	23	0	264	32	159	5	0	196	460	601
1000-1100	22	19	28	0	69	49	26	65	0	140	209	31	266	36	0	333	45	193	1	0	239	572	781
1100-1200	14	30	36	0	80	58	30	60	0	148	228	31	244	29	0	304	51	235	1	0	287	591	819
1200-1300	13	16	44	0	73	55	28	43	0	126	199	30	233	27	0	290	51	243	0	0	294	584	783
1300-1400	15	23	37	0	75	37	40	27	0	104	179	34	138	23	0	195	41	208	2	0	251	446	625
Totals	76	111	170	0	357	263	153	269	0	685	1042	162	1262	155	0	1579	234	1145	12	0	1391	2970	4012

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

Average daily 12-hour vehicle volumes. These volumes are calculated by multiplying the 12-hour totals by the AADT factor of: 1.2

AADT 12 Hr	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

24-Hour AADT. These volumes are calculated by multiplying the average daily 12-hour vehicle volumes by the 12 ➡24 expansion factor of 1.31

AADT 24 Hr	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

AADT and Expansion Factors provided by the City of Ottawa

AM Peak Hour Factor ➡ 0.90												Highest Hourly Vehicle Volume between 0700h & 1000h										
AM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
0900-1000	6	17	18	0	41	43	16	41	0	100	141	21	220	23	0	264	32	159	5	0	196	460	601
OFF Peak Hour Factor ➡ 0.97												**Highest Hourly Vehicle Volume Between 1000h & 1500h**										
OFF Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1115-1215	10	24	38	0	72	56	35	59	0	150	222	28	249	36	0	313	42	247	1	0	290	603	825
PM Peak Hour Factor ➡ N/A												**Highest Hourly Vehicle Volume Between 1500h & 1900h**										
PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
N/A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments:

Traffic count was conducted when the Carp Farmers' Market was open. There is a Canada Post Office access on the west side of Carp Road within the intersection and during this 6-hour traffic count, 26 vehicles entered the parking lot and 35 exited.

Notes:

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

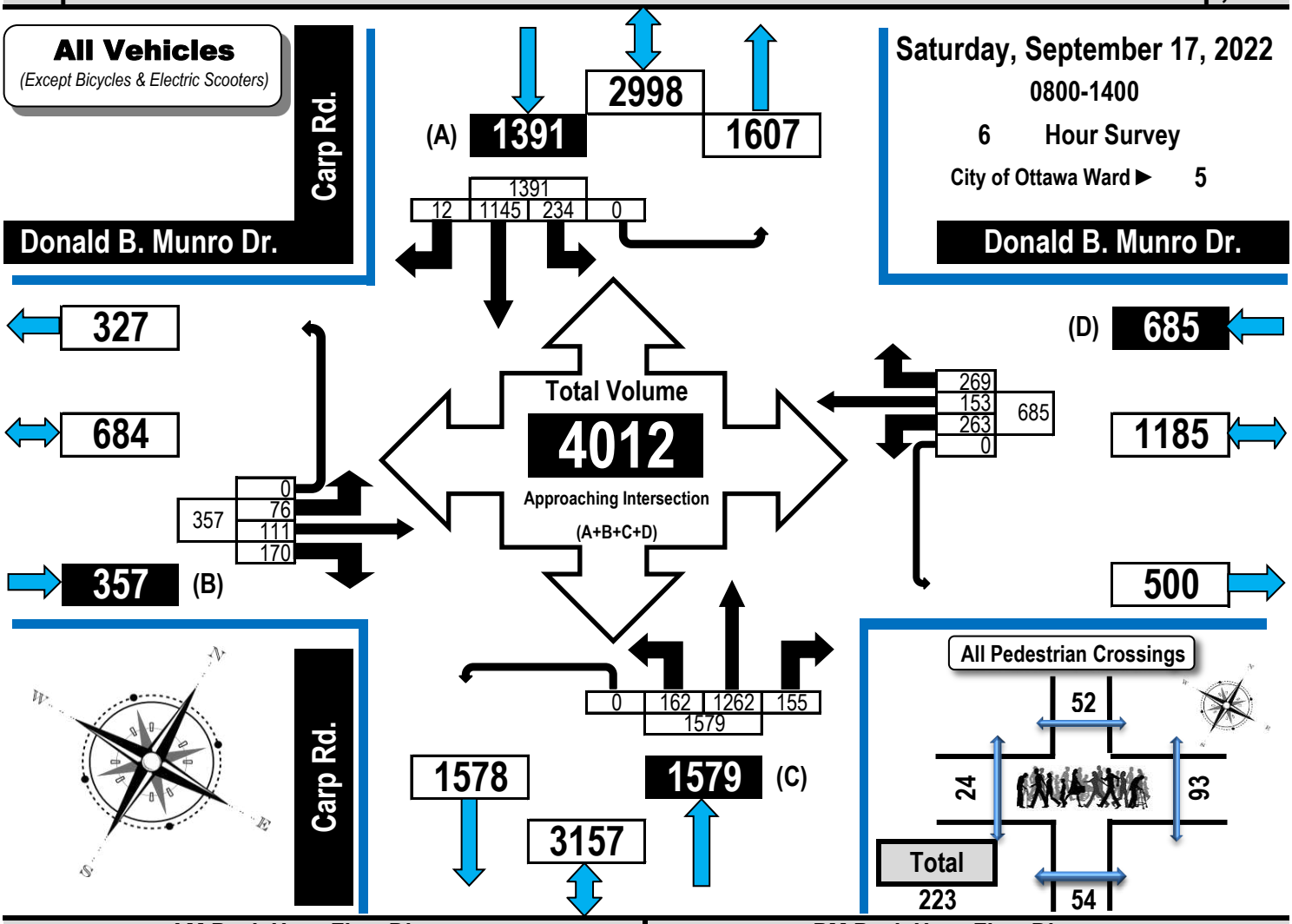
ACCURATE TRUSTED TRAFFIC DATA

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

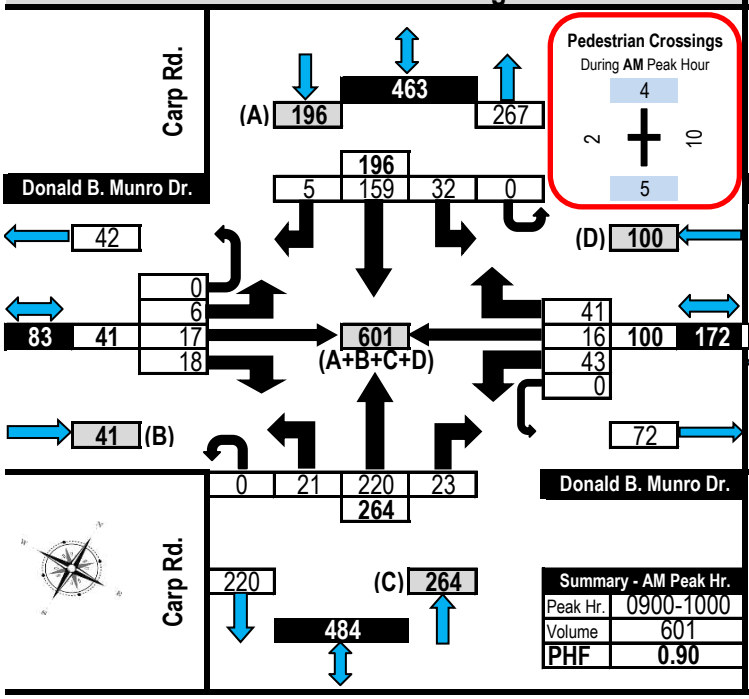
Carp Road & Donald B. Munro Drive — Carp, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Saturday, September 17, 2022
0800-1400
6 Hour Survey
City of Ottawa Ward ▶ 5

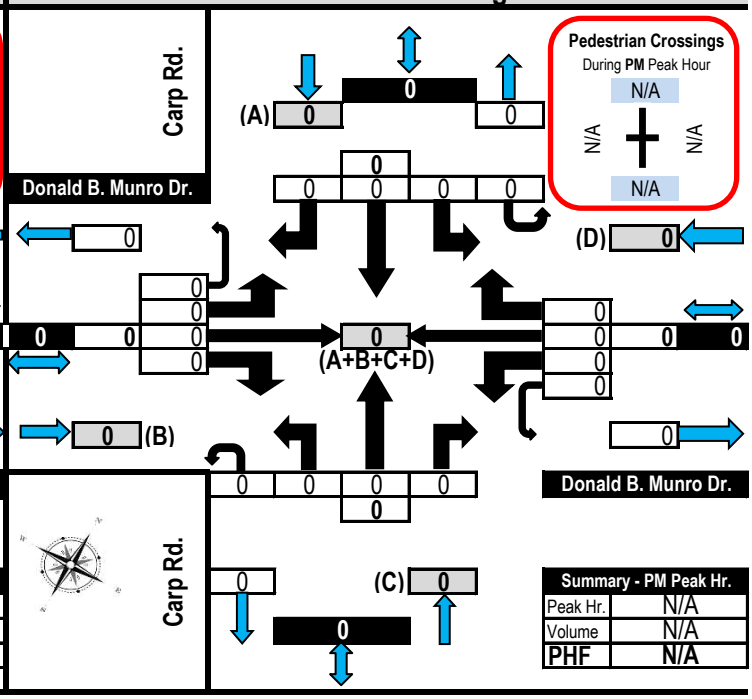


AM Peak Hour Flow Diagram



Summary - AM Peak Hr.	
Peak Hr.	0900-1000
Volume	601
PHF	0.90

PM Peak Hour Flow Diagram



Summary - PM Peak Hr.	
Peak Hr.	N/A
Volume	N/A
PHF	N/A

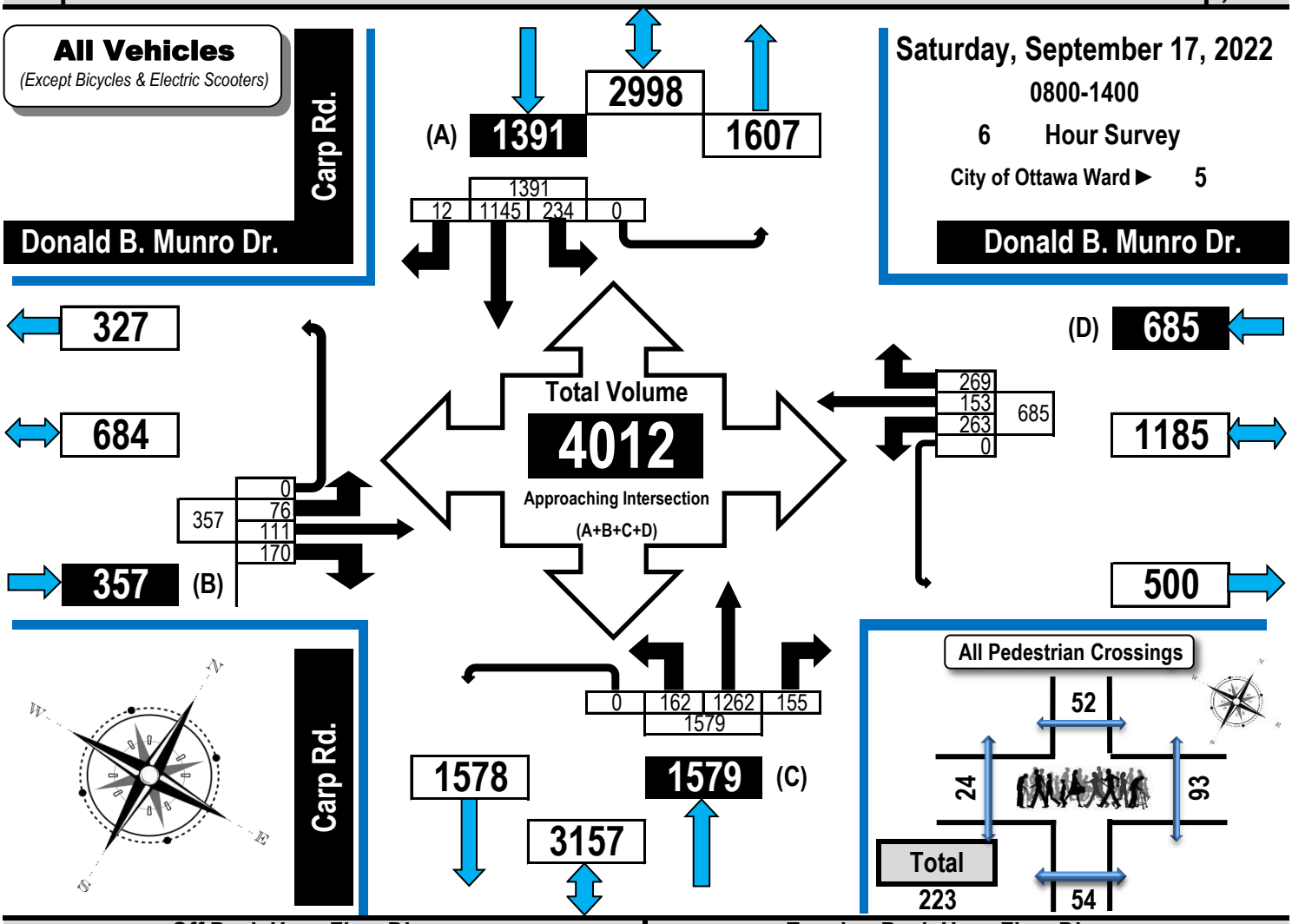
ACCURATE TRUSTED TRAFFIC DATA

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

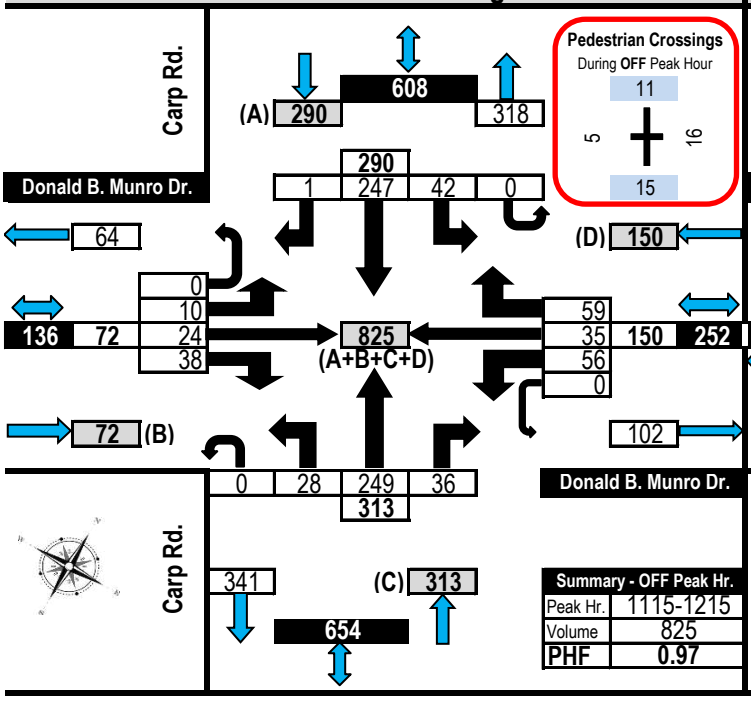
Carp Road & Donald B. Munro Drive — Carp, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Saturday, September 17, 2022
0800-1400
6 Hour Survey
City of Ottawa Ward ▶ 5



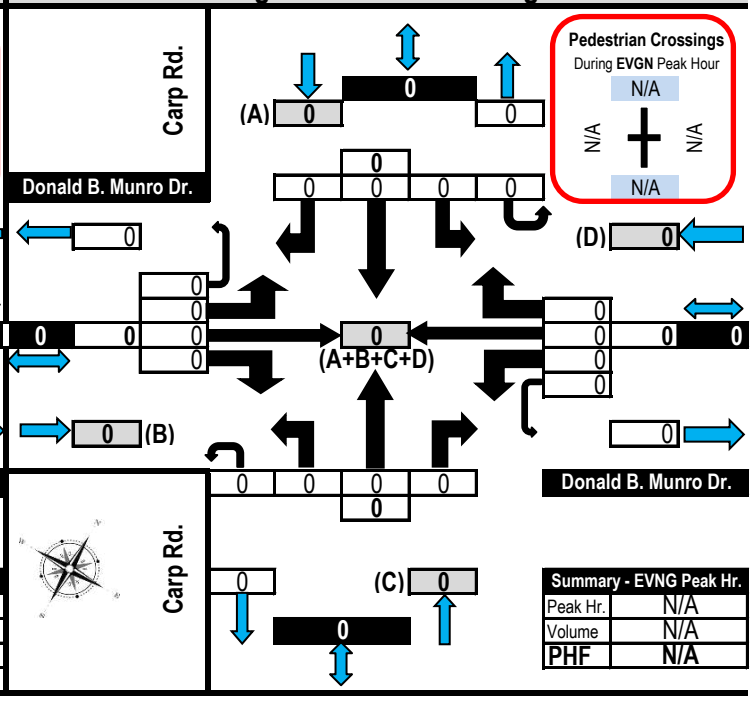
Off Peak Hour Flow Diagram



Summary - OFF Peak Hr.

Peak Hr.	1115-1215
Volume	825
PHF	0.97

Evening Peak Hour Flow Diagram



Summary - EVNG Peak Hr.

Peak Hr.	N/A
Volume	N/A
PHF	N/A

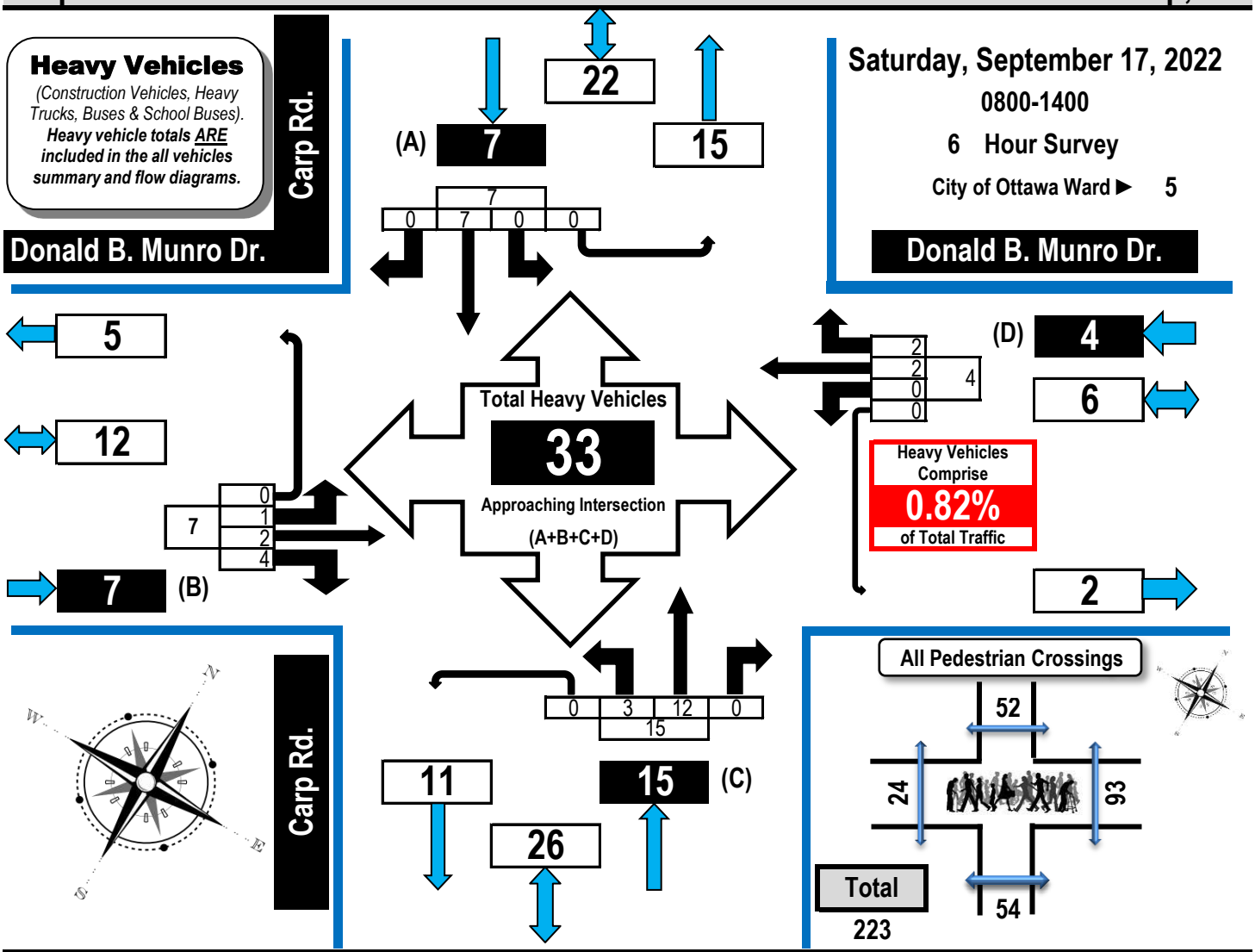
ACCURATE TRUSTED TRAFFIC DATA

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

Carp Road & Donald B. Munro Drive — Carp, ON

Heavy Vehicles
(Construction Vehicles, Heavy Trucks, Buses & School Buses).
Heavy vehicle totals ARE included in the all vehicles summary and flow diagrams.

Saturday, September 17, 2022
0800-1400
6 Hour Survey
City of Ottawa Ward ► 5



	Donald B. Munro Dr. Eastbound					Donald B. Munro Dr. Westbound					Carp Rd. Northbound					Carp Rd. Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0800-0900	0	0	1	0	1	0	0	0	0	0	1	3	0	0	4	0	2	0	0	2	7
0900-1000	1	0	0	0	1	0	1	0	0	1	2	1	0	0	3	0	1	0	0	1	6
1000-1100	0	2	0	0	2	0	0	2	0	2	0	5	0	0	5	0	1	0	0	1	10
1100-1200	0	0	2	0	2	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	4
1200-1300	0	0	1	0	1	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	4
1300-1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
Totals	1	2	4	0	7	0	2	2	0	4	3	12	0	0	15	0	7	0	0	7	33

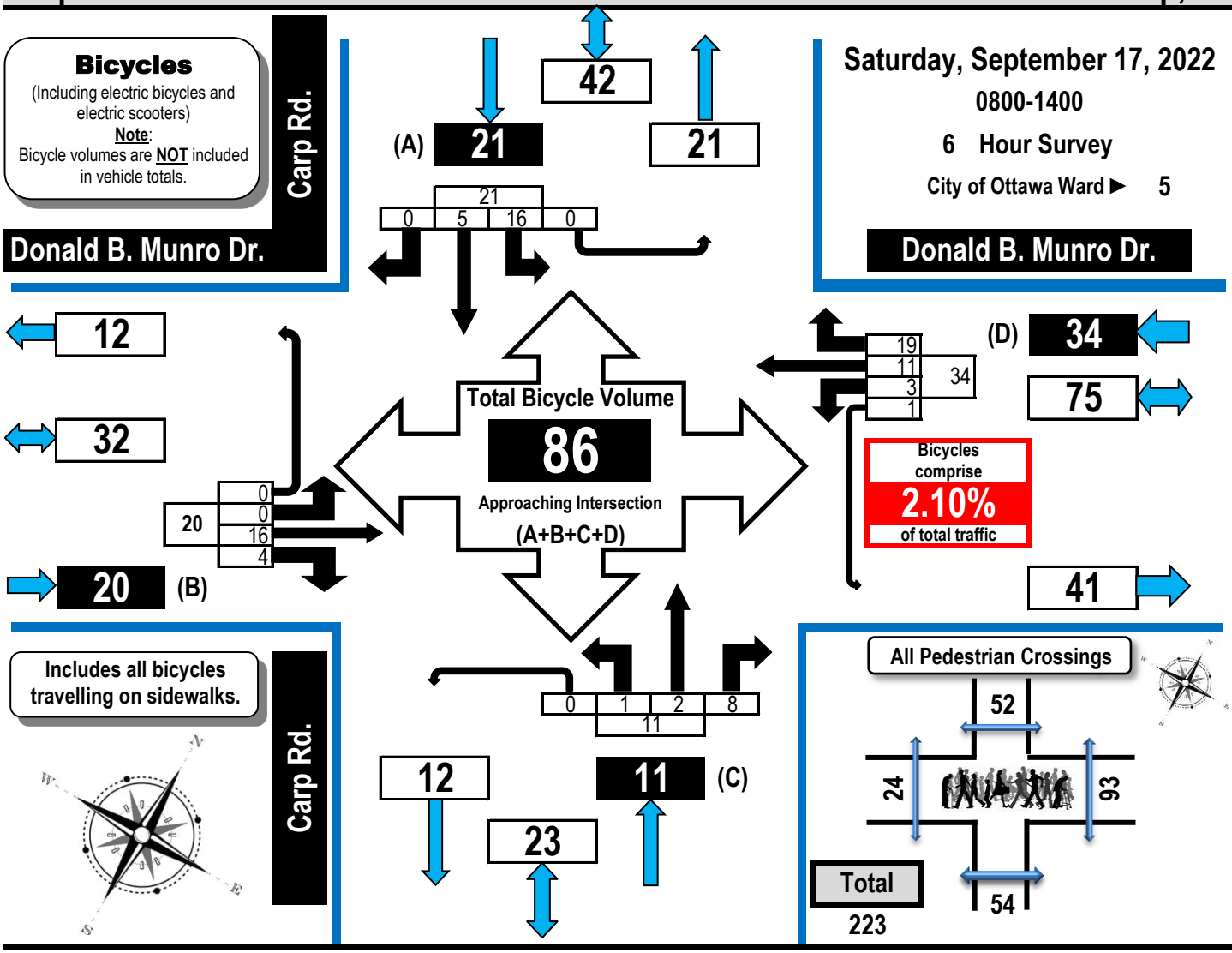
ACCURATE TRUSTED TRAFFIC DATA

Turning Movement Count
Bicycle Summary
Flow Diagram

Carp Road & Donald B. Munro Drive — Carp, ON

Bicycles
(Including electric bicycles and electric scooters)
Note: Bicycle volumes are NOT included in vehicle totals.

Saturday, September 17, 2022
0800-1400
6 Hour Survey
City of Ottawa Ward ▶ 5



	Donald B. Munro Dr.					Donald B. Munro Dr.					Carp Rd.					Carp Rd.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0800-0900	0	0	0	0	0	0	1	2	0	3	1	1	0	0	2	0	0	0	0	0	5
0900-1000	0	0	1	0	1	0	0	2	0	2	0	0	2	0	2	0	2	0	0	2	7
1000-1100	0	7	2	0	9	0	4	1	0	5	0	0	4	0	4	3	0	0	0	3	21
1100-1200	0	3	0	0	3	1	4	7	0	12	0	1	1	0	2	7	1	0	0	8	25
1200-1300	0	1	0	0	1	2	1	5	0	8	0	0	0	0	0	2	0	0	0	2	11
1300-1400	0	5	1	0	6	0	1	2	1	4	0	0	1	0	1	4	2	0	0	6	17
Totals	0	16	4	0	20	3	11	19	1	34	1	2	8	0	11	16	5	0	0	21	86

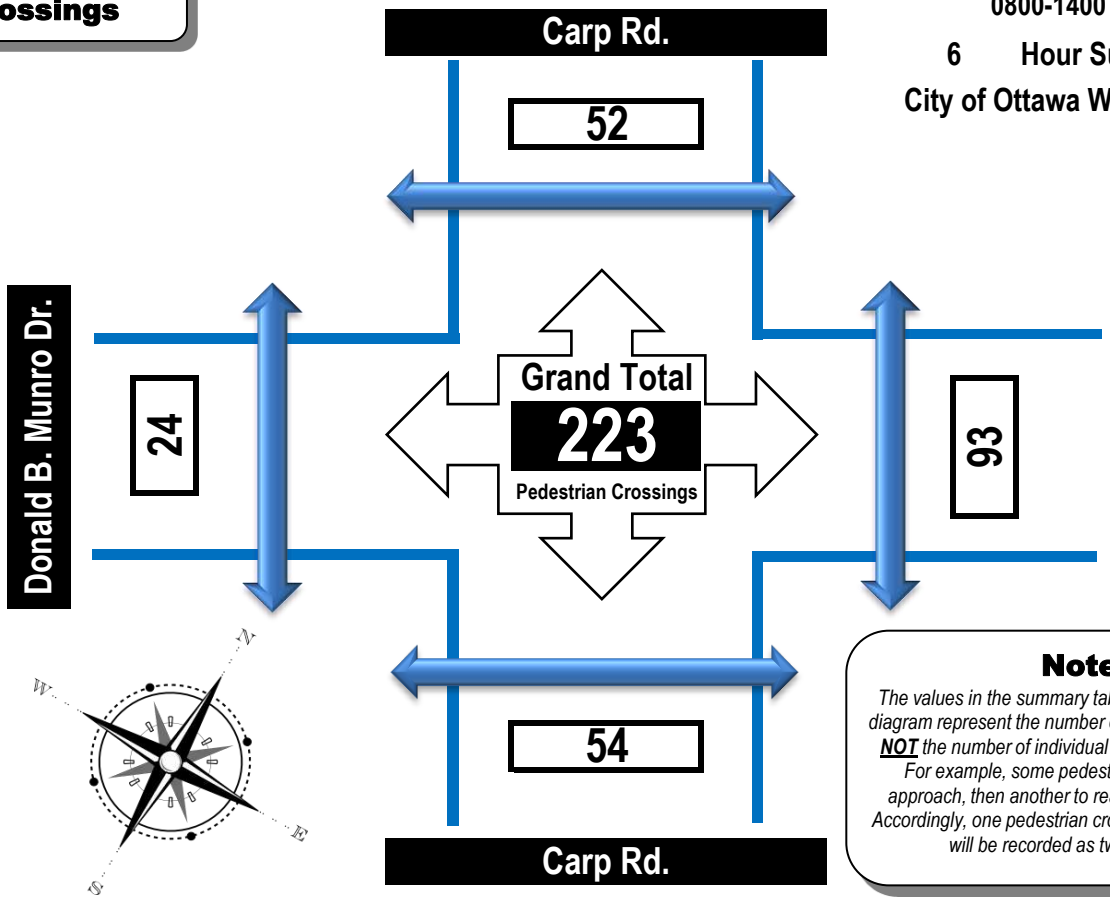
ACCURATE TRUSTED TRAFFIC DATA

Turning Movement Count
Pedestrian Crossings Summary and Flow Diagram

Carp Road & Donald B. Munro Drive — Carp, ON

Pedestrian Crossings

Saturday, September 17, 2022
0800-1400
6 Hour Survey
City of Ottawa Ward ► 5



Note

*The values in the summary table below and the flow diagram represent the number of pedestrian crossing**s** **NOT** the number of individual pedestrian**s** crossing. For example, some pedestrians will cross one approach, then another to reach their destination. Accordingly, one pedestrian crossing two approaches will be recorded as two crossings.*

Time Period	West Side Crossing Donald B. Munro Dr.	East Side Crossing Donald B. Munro Dr.	Street Total	South Side Crossing Carp Rd.	North Side Crossing Carp Rd.	Street Total	Grand Total
0800-0900	2	9	11	0	1	1	12
0900-1000	2	10	12	5	4	9	21
1000-1100	9	19	28	10	10	20	48
1100-1200	10	20	30	10	10	20	50
1200-1300	1	20	21	23	18	41	62
1300-1400	0	15	15	6	9	15	30
Totals	**24**	**93**	**117**	**54**	**52**	**106**	**223**

Comments:
Traffic count was conducted when the Carp Farmers' Market was open. There is a Canada Post Office access on the west side of Carp Road within the intersection and during this 6-hour traffic count, 26 vehicles entered the parking lot and 35 exited.

APPENDIX E

Collision Records

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: CARP RD @ DONALD B. MUNRO DR

Traffic Control: Stop sign **Total Collisions:** 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Jan-13, Wed,14:18	Clear	Angle	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Turning right	Automobile, station wagon	Other motor vehicle	
2016-Sep-03, Sat,13:36	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Mar-01, Wed,11:50	Rain	Angle	Non-fatal injury	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Pick-up truck	Other motor vehicle	

Location: CARP RD @ RIVINGTON ST

Traffic Control: Stop sign **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-Mar-15, Wed,16:10	Snow	Angle	P.D. only	Loose snow	West	Turning left	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: CARP RD btwn DONALD B. MUNRO DR & RIVINGTON ST

Traffic Control: No control **Total Collisions:** 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Feb-09, Sat,12:00	Clear	Angle	P.D. only	Dry	East	Reversing	Pick-up truck	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Aug-04, Sun,14:50	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Bicycle	Other motor vehicle	0
					South	Going ahead	Motorcycle	Cyclist	
2019-Oct-12, Sat,09:01	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Pick-up truck	Other motor vehicle	

APPENDIX F

Other Area Developments

Table 1: TIA Exemptions

Module	Element	Exemption Criteria	Exemption Status
Design Review Component			
4.1 Development Design	*4.1.2* Circulation and Access	• Only required for site plans	Not Exempt
	4.1.3 New Street Networks	• Only required for plans of subdivision	Exempt
4.2 Parking	*4.2.1* Parking Supply	• Only required for site plans	Not Exempt
	4.2.2 Spillover Parking	• Only required for site plans where parking supply is 15% below unconstrained demand	Exempt

Based on the foregoing, the following modules are included in the TIA report:

- Module 4.1: Development Design
- Module 4.2: Parking
- Module 4.3: Boundary Streets
- Module 4.4: Access Design

5.0 FORECASTING

The proposed development includes 4,200 ft^2 of office space on the ground floor, with two residential dwellings on the second floor. Trips generated by the proposed land uses have been estimated using the *ITE Trip Generation Manual, 10th Edition*. Residential trips have been estimated based on the Multifamily Housing, Low-Rise data (land use 220), and office trips have been estimated based on the Small Office Building data (land use 712). The estimated number of trips generated by the proposed development is shown in **Table 2**.

Table 2: Person Trip Generation

Land Use	ITE Code	Units/GFA	AM Peak (PPH[1])			PM Peak (PPH)		
			IN	OUT	TOT	IN	OUT	TOT
Multifamily Housing (Low-Rise)	220	2 units	0	1	1	1	1	2
Small Office Building	712	4,200 ft^2	8	2	10	4	9	13
		Total	**8**	**3**	**11**	**5**	**10**	**15**

1. PPH = Person Trips Per Hour – Calculated using an ITE Trip to Person Trip Factor of 1.28, consistent with the 2017 TIA Guidelines

From the previous table, the proposed development is projected to generate 11 person trips during the AM peak hour and 15 person trips during the PM peak hour.

The modal shares for the proposed development are anticipated to be generally consistent with the modal shares outlined in the *2011 TRANS O-D Survey Report*, specific to the Rural West region. The modal share values applied to the development-generated trips can be described as follows:

- Residential trips: From/within the Rural West district during the AM peak and to/within the Rural West district during the PM peak;
- Office trips: To/within the Rural West district during the AM peak and from/within the Rural West district during the PM peak.

As transit is only provided with a single shuttle on Wednesdays outside of the peak hours, a 0% transit share has been assigned. The residential and office modal shares are generally consistent with each other, and therefore the modal shares shown below have been applied to both uses. A full breakdown of the projected site-generated person trips by modal share is shown in **Table 3**.

Table 3: Person Trips by Modal Share

Travel Mode	Modal Share	AM Peak			PM Peak		
		IN	OUT	TOT	IN	OUT	TOT
Development Person Trips		*8*	*3*	*11*	*5*	*10*	*15*
Auto Driver	75%	6	2	8	4	7	11
Auto Passenger	20%	2	1	3	1	2	3
Transit	0%	0	0	0	0	0	0
Non-Auto	5%	0	0	0	0	1	1

From the previous table, the proposed development is projected to generate 8 vehicle trips during the AM peak hour and 11 vehicle trips during the PM peak hour.

As the development does not meet the 60 person trip trigger discussed in Section 3.0, trip distribution and trip assignment is not required. Further, as the number of trips generated by the proposed development are so low, future background growth has not been reviewed. As discussed in Section 4.2, there are no other development under construction, approved, or in the approval process within the study area.

6.0 ANALYSIS

6.1 Development Design

The sidewalk will continue to be depressed and continuous across the proposed access, in accordance with City standards. Walkway connections from the existing sidewalk to the front and rear entrances will also be provided.

A total of six exterior bicycle parking spaces will be provided by the proposed development, with three adjacent to the street at the northeast corner of the subject site, and three adjacent to the southwest corner of the building. Further review of the number of bicycle parking spaces is included in Section 6.2: Parking.

OC Transpo guidelines recommend that all developments within the vicinity of a bus route should have at least one stop within a walking distance of 400m, which translates to approximately a 5-minute walk. Stops #6982 and #6983 are both within approximately 100m walking distance from the front entrance of the proposed development. As discussed in Section 4.1.6, these stops serve OC Transpo Route 303, which is a shopping route for Dunrobin and Carp residents, and arrives at each stop once on Wednesdays.

A review of the Transportation Demand Management (TDM) – *Supportive Development Design and Infrastructure Checklist* has been conducted. A copy of the TDM checklist is included in **Appendix F**. All required TDM-supportive design and infrastructure measures in the TDM checklist are met.

On-site garbage collection will be accommodated at an enclosure west of the parking area, approximately 40m south of the Donald B. Munro Drive street line. The fire route for this development is curbside along Donald B. Munro Drive.

8.0 EXEMPTIONS REVIEW

Table 4 of Section 2.3 in the Transportation Impact Assessment Guidelines (2017) lists several possible exemptions that would reduce the scope of the TIA study.

- Section 4.1.2 concerning circulation and access is not expected to be included in the TIS study as the development site is a subdivision.
- Section 4.2 concerning parking is not expected to be included in the TIS as it is not required for a subdivision plan.
- Section 4.6 is exempt even though Langstaff Drive is classified as a collector street, the total volume on the road does not exceed the capacity threshold of 300 vph for collector roads as specified per guidelines.
- Section 4.8 concerning network concept is not expected to be included in the TIS study. Based on "TRANS Trip Generation Residential Trip Rates", it is expected the site will generate 102 and 125 person-trips during the AM and PM peak hour, respectively. As such the proposed development will not generate 200 person-trips in excess of the equivalent volume permitted by established by zoning.

9.0 DEVELOPMENT GENERATED TRAFFIC

9.1 Trip Generation

9.1.1 Trip Generation Rates

Trip generation was calculated in accordance with the "TRANS Trip Generation Residential Trip Rates" completed by McCormick Rankin Corporation for the City of Ottawa (MRC, Aug2009). Rates used to calculate the total vehicle trips associated with the proposed development were taken from Table 3.18, which do not account for a transit bonus. Furthermore, directional splits as well as conversion rates from vehicle trips to person trips were taken from Table 3.17 and Table 3.13, respectively. Using this methodology, the total number of person-trips generated from the proposed development is 119 person-trips in the AM peak hour and 169 person-trips during the PM peak hour. Tables 9.1.1.1 to 9.1.1.2 summarize the rates, conversion rates and directional splits used to calculate the inbound and outbound trips.

Table 9.1.1.1: Person-Trips for Inverness Homes

ITE Land Use	Unit of Measure	Quantity	Vehicle Trip Generation Rate		%Vehicle Trips		Total Person Trips	
			AM	PM	AM	PM	AM	PM
Mid-rise apartments (Code 223)	Dwelling Units	128	0.35	0.41	0.73	0.74	61	71
Semi-detached dwellings, townhouses, rowhouses (Code 224)	Dwelling Units	70	0.62	0.67	0.76	0.48	58	98
Development Totals:		**193**					**119**	**169**

Vehicle Trip Generation Rates taken from Table 3.18 "Recommended Vehicle Trip Generation Rates without Transit Bonus for residential land uses as per "TRANS Trip Generation Residential Rates" report (MRC, Aug2009)
%Vehicle Trips is the conversion rate from vehicle-trips to person-trips, taken from Table 3.13 (MRC, Aug2009)

Table 9.1.1.2: Directional Distribution for Generated Trips

ITE Land Use	Unit of Measure	Quantity	Directional Distribution				Total Person Trips					
			AM		PM		AM			PM		
			In	Out	In	Out	In	Out	Total	In	Out	Total
Mid-rise apartments (Code 223)	Dwelling Units	128	0.24	0.77	0.62	0.39	15	46	61	44	27	71
Semi-detached dwellings, townhouses, rowhouses (Code 224)	Dwelling Units	70	0.37	0.64	0.53	0.47	21	37	58	52	46	98
Development Totals:		**189**					**36**	**83**	**119**	**92**	**70**	**169**

Directional splits taken from Table 3.17 (MRC, Aug2009), blended rates.

9.1.2 Mode Shares

The most recent National Capital Region (NCR) Origin-Destination Survey was conducted in Fall of 2011 and can be found in Appendix C. Table 9.1.2.1 and Table 9.1.2.2 below, displays the trips by primary travel mode from/within the NCR during the AM and to/within the NCR during the PM peak hour.

Table 9.1.2.1: Trips by Primary Travel Mode – AM

Travel Mode	AM Peak (06:30 - 08:59)			
	% of Person Trips	Person Trips		
		In	Out	Total
Auto Driver	57%	21	47	68
Auto Passenger	10%	4	9	13
Transit	6%	2	5	7
Bicycle	0%	0	0	0
Walk	1%	0	1	1
Other	25%	9	21	30

Table 9.1.2.2: Trips by Primary Travel Mode – PM

Travel Mode	PM Peak (15:30 - 17:59)			
	% of Person Trips	Person Trips		
		In	Out	Total
Auto Driver	68%	65	49	114
Auto Passenger	17%	16	13	29
Transit	4%	4	3	7
Bicycle	0%	0	0	0
Walk	2%	2	1	3
Other	10%	9	7	16

As stated previously in this report, the expected build out year is 2023. There is no regular City transit network within the vicinity of the development. Since the development is a townhouse/mid-rise multi family housing, it is expected that attendees would mainly use a car to reach the development. As such the future mode shares are expected to be as follows:

Table 9.1.2.3: Future Mode Share Targets for the Development

Travel Mode	Mode Share Target		Rationale
	AM	PM	
Auto Driver	60%	70%	Auto Driver person trips are expected to slightly increase due to the nature of the development
Auto Passenger	11%	18%	% of auto passenger person trips is expected to slightly increase due to more guests and/or family trips
Transit	2%	2%	% of Transit person trips is expected to decrease due to limited transit service
Bicycle	1%	2%	% of bicycle person trips is expected to increase slightly due to the nature and location of the development
Walk	5%	6%	% of walking person trips is expected to increase slightly due to the nature and location of the development as well as school within the vicinity of the development. The development provides better connectivity to village with the proposed multiuse pathways.
Other	21%	2%	% of other person trips is expected to change due to more auto trips as a result of the development

Based on the future mode share targets, Table 9.1.2.4 and Table 9.1.2.5 have been updated with the projected development-generated trips for the year 2028 (5-years after the build out year of 2023).

Table 9.1.2.4: Projected Trips by Primary Travel Mode – AM

Travel Mode	AM Peak (06:30 - 08:59)			
	% of Person Trips	Person Trips		
		In	Out	Total
Auto Driver	60%	22	51	73
Auto Passenger	11%	4	10	14
Transit	2%	1	2	3
Bicycle	1%	0	0	0
Walk	5%	2	4	6
Other	21%	7	16	23

Table 9.1.2.5: Projected Trips by Primary Travel Mode – PM

Travel Mode	PM Peak (15:30 - 17:59)			
	% of Person Trips	Person Trips		
		In	Out	Total
Auto Driver	70%	67	51	118
Auto Passenger	18%	18	14	32
Transit	2%	2	2	4
Bicycle	2%	2	1	3
Walk	6%	5	4	9
Other	2%	2	1	3

No trip reduction factors have been assigned to the proposed development. Currently the site is not in use and due to the nature of the development, it is not expected to generate any pass-by vehicle trips.

9.2 Trip Distribution

A number of assumptions were made to better represent the distribution of trips to and from the development. The assumptions were based on review of the surrounding area developments, proximities to major urban centers, turning movement counts received from the City of Ottawa, and site visits performed by MP during both the AM and PM peak hour. All traffic data provided by the City of Ottawa can be found Appendix C. Through the review, significant population hubs include the downtown of the City of Ottawa to the east, the outer suburbs of Stittsville and Kanata to the southeast, and Arnprior to the northwest. Other relevant features include King's Highways 417 to the west and southwest of the site. Based on these features, a high-level trip distribution is summarized in Table 9.2.1.

Table 9.2.1: High-level Trip Distribution

CARDINAL DIRECTION	FEATURE(S)	DISTRIBUTION TO/FROM
East	City of Ottawa, Downtown	40%
South	Outer Suburbs, Stittsville, Kanata	35%
North/West	Highway 417, Arnprior	25%

Due to the locations of each entrance, and the split nature of the northern and southern sections of the development, specific distribution for each access were developed and combined to create the total trip distribution illustrated in Figure 9.2.1.

Access 1 being the primary access to the northern section of the development, and accesses 2 and 3 serving the southern section of the development. Accesses 2 and 3, being 50 meters apart, is expected to serve equal amounts of traffic. Therefore, the distribution of trips was split evenly between these two entrances. However, since Access 2 is located further north than Access 3, the distribution of trips coming from or heading to the north is expected to favour Access 2. Similarly, the distribution of trips coming from or heading to the south is expected to favour Access 3. Specific distributions for each access is provided in Appendix D. Furthermore, it was assumed that 80 % of the development generated trips travelling northbound on Langstaff Drive will end up at the intersection of Carp Road and Juanita Avenue.

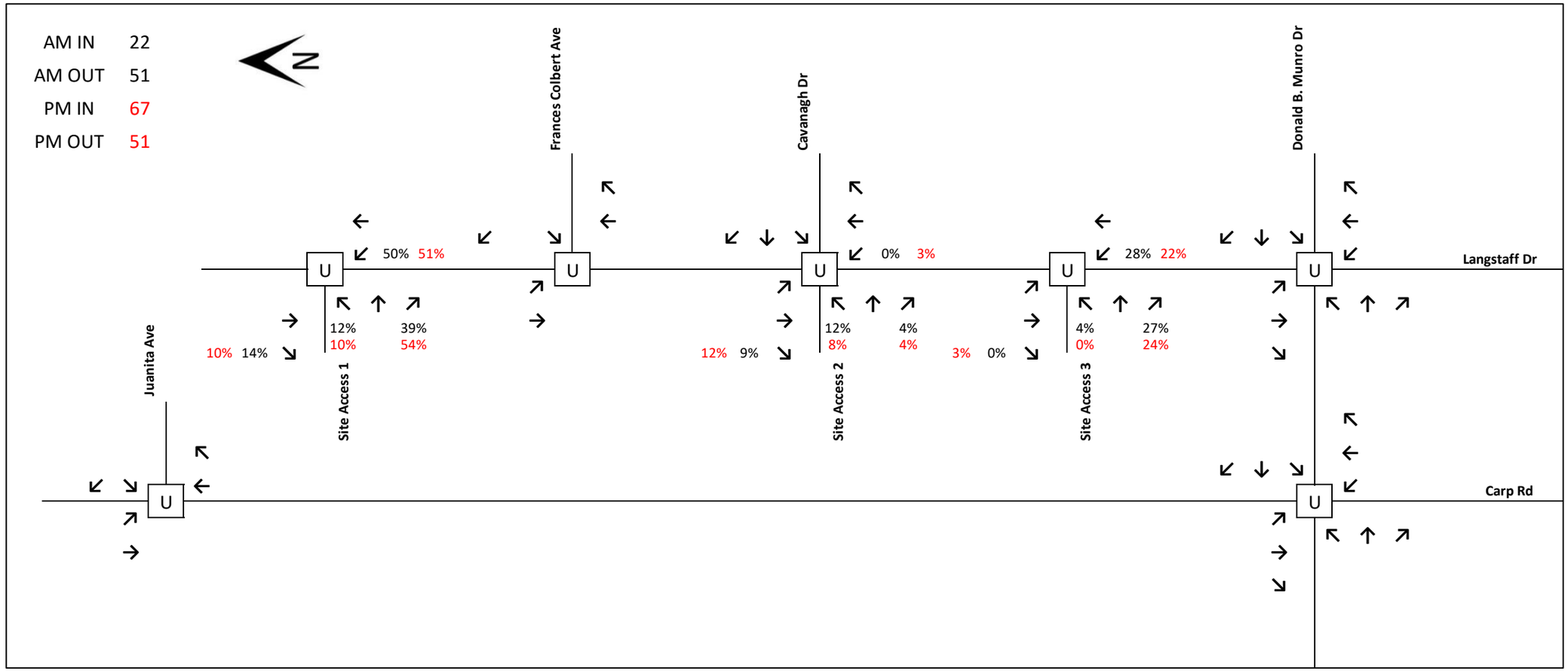


Figure 9.2.1: Trip Distribution at Entrances

LEGEND

U U = Unsignalized; S = Signalized

↖ Traffic Flow

↔ Pedestrian Crossing

9.3 Trip Assignment

The trips generated by the proposed development were assigned to the transportation network to reflect the traffic patterns shown in the turning movement counts. Figure 9.3.1 below shows development-generated vehicle demands applied to the surrounding transportation network in accordance with the trip distribution discussed in the previous section. All trip assignment figures can be found in Appendix D.

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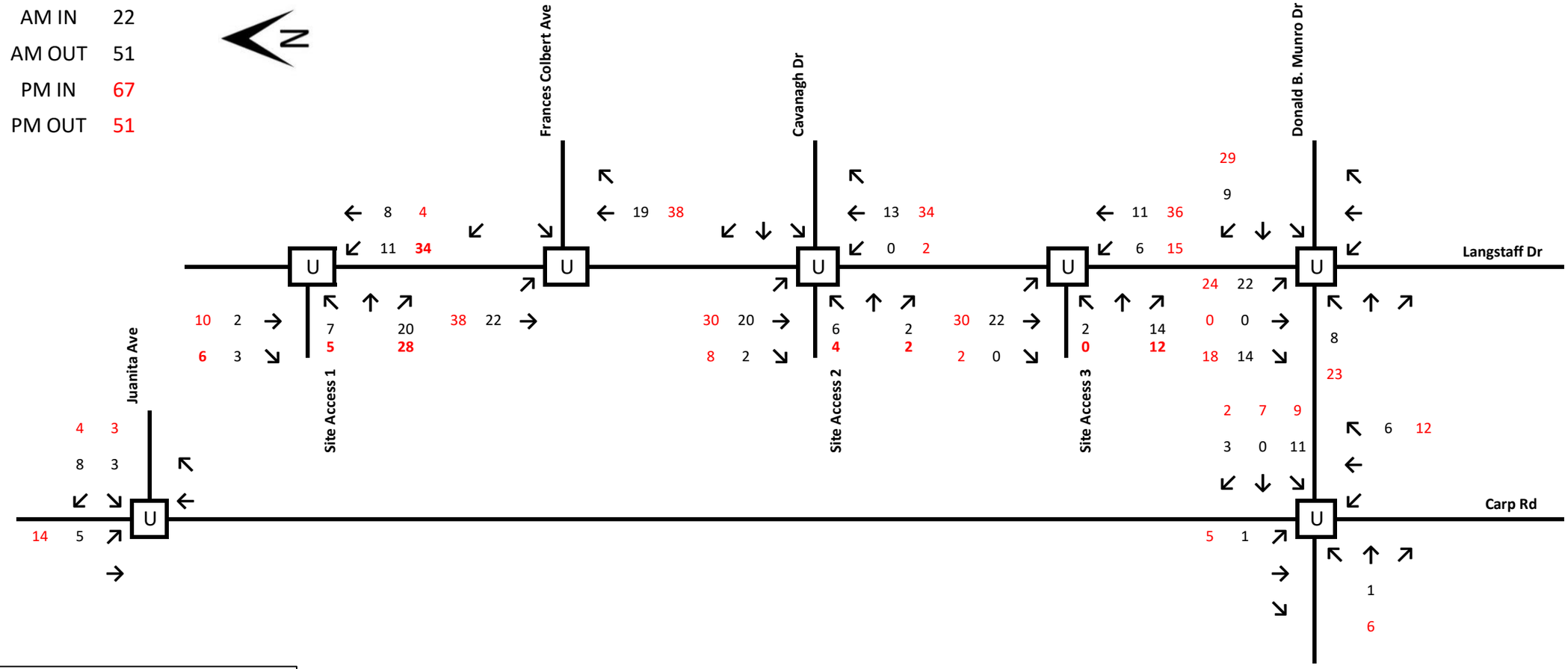


Figure 9.3.1: Development-Generated Vehicle Demand

APPENDIX G

Strategic Long-Range Model and 2013 TMP Projections

TRANS Regional Model

Version 1.13 - Assigned April 17, 2019

AM Peak Hour Total Traffic Volume

Carp

2011 - Base Scenario

User Initials: SG
Plot Prepared: April 18, 2019
EMME Scenario: 11138

TRANS

Legend

AM Peak Hour Total Traffic Volume

300 600 900 1200 1500

Distance (m)

200 400 600 800 1000

N

TRANS Regional Model

Version 1.14 - Assigned April 17, 2019

AM Peak Hour Total Traffic Volume

Carp

2031 - Base Scenario
TMP Affordabel Road & Transit Network

User Initials: SG
Plot Prepared: April 18, 2019
EMME Scenario: 14319

TRANS

Legend

AM Peak Hour Total Traffic Volume

300 600 900 1200 1500

Distance (m)

200 400 600 800 1000

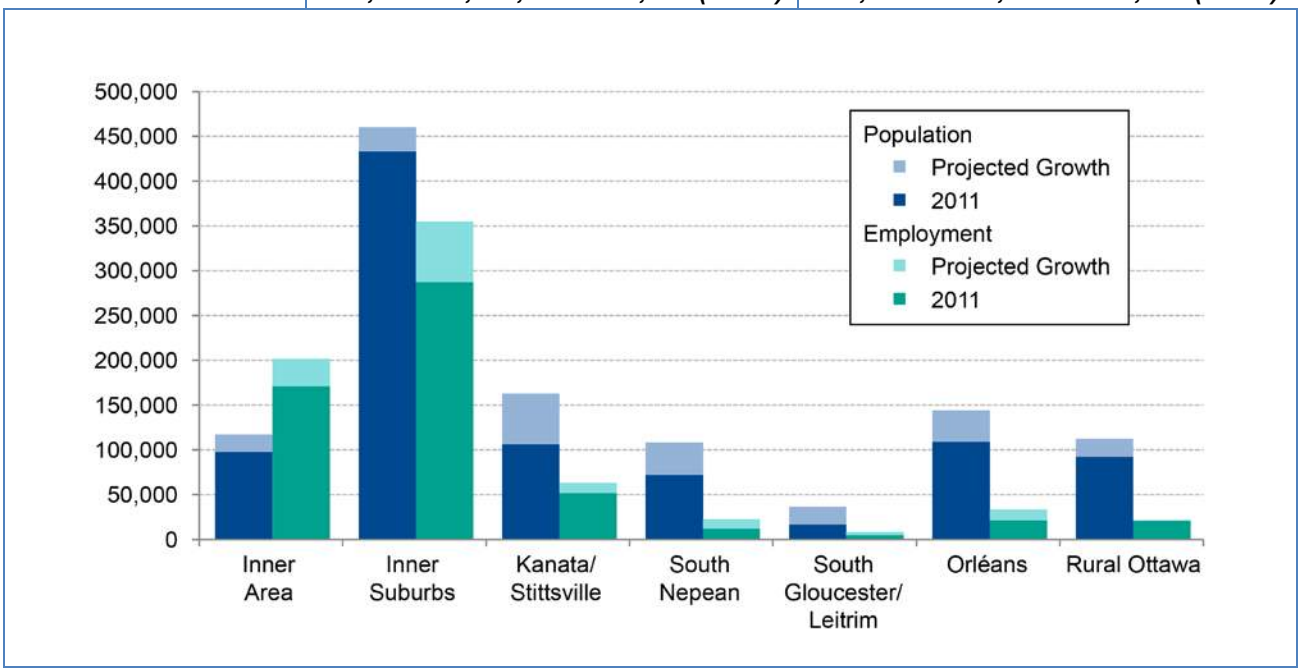
N

2.3 Population and Employment in 2031

Where growth will occur. The City has prepared population and employment growth projections for the period from 2011 to 2031 (see Exhibit 2.10). The City expects a 23% increase in population from 922,000 to 1.14 million people, and a 24% increase in employment from 565,000 to 703,000 jobs. Although infill development and intensification are forecast to increase the population of Ottawa's Inner Area and Inner Suburbs by about 46,000 people over the next 18 years, most growth (about 168,000 people) will occur in the Outer Suburbs. In contrast, 72% of employment growth will occur inside the Greenbelt.

Exhibit 2.10 Population and Employment: 2011 Actual and 2031 Projections

Area	Population			Employment		
	2011	2031	Growth and distribution	2011	2031	Growth & distribution
Inner Area	97,200	116,400	19,200 (9%)	170,600	201,800	31,200 (23%)
Inner Suburbs	432,500	459,300	26,800 (13%)	287,400	355,300	67,900 (49%)
Kanata/Stittsville	105,200	162,000	56,800 (27%)	51,300	62,500	11,200 (8%)
Barrhaven	71,200	107,400	36,200 (17%)	11,100	21,800	10,700 (8%)
Riverside South/Leitrim	15,900	35,800	19,900 (9%)	4,000	7,800	3,800 (3%)
Orléans	108,200	143,400	35,200 (16%)	20,600	33,000	12,400 (9%)
Rural Ottawa	91,400	111,700	20,300 (9%)	20,000	20,900	900 (1%)
Total	***922,000***	***1,135,900***	***213,900 (100%)***	***564,900***	***703,200***	***138,100 (100%)***



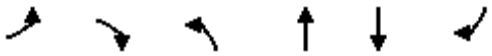
APPENDIX H

Capacity Analysis Reports (Existing/Background)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	1	143	4	0	180
Future Volume (Veh/h)	11	1	143	4	0	180
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	12	1	159	4	0	200
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	361	161			163	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	361	161			163	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	638	884			1416	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	13	163	200
Volume Left	12	0	0
Volume Right	1	4	0
cSH	652	1700	1416
Volume to Capacity	0.02	0.10	0.00
Queue Length 95th (m)	0.4	0.0	0.0
Control Delay (s)	10.6	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.6	0.0	0.0
Approach LOS	B		

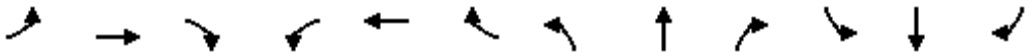
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	20.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	144	180	0
Future Volume (Veh/h)	0	0	0	144	180	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	160	200	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	360	200	200			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	360	200	200			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	639	841	1372			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	160	200
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1372	1700
Volume to Capacity	0.00	0.00	0.12
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	15	21	57	10	15	23	50	87	28	104	3
Future Volume (vph)	1	15	21	57	10	15	23	50	87	28	104	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	17	23	63	11	17	26	56	97	31	116	3

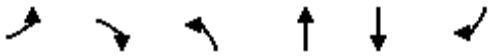
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	41	91	179	150
Volume Left (vph)	1	63	26	31
Volume Right (vph)	23	17	97	3
Hadj (s)	-0.15	0.16	-0.16	0.08
Departure Headway (s)	4.6	4.9	4.2	4.5
Degree Utilization, x	0.05	0.12	0.21	0.19
Capacity (veh/h)	711	686	814	761
Control Delay (s)	7.9	8.5	8.4	8.5
Approach Delay (s)	7.9	8.5	8.4	8.5
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.4			
Level of Service	A			
Intersection Capacity Utilization	30.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	4	283	15	7	195
Future Volume (Veh/h)	4	4	283	15	7	195
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	4	4	314	17	8	217
Pedestrians						1
Lane Width (m)						3.6
Walking Speed (m/s)						1.0
Percent Blockage						0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	556	324			331	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	556	324			331	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	489	717			1228	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	8	331	225
Volume Left	4	0	8
Volume Right	4	17	0
cSH	582	1700	1228
Volume to Capacity	0.01	0.19	0.01
Queue Length 95th (m)	0.3	0.0	0.1
Control Delay (s)	11.3	0.0	0.3
Lane LOS	B		A
Approach Delay (s)	11.3	0.0	0.3
Approach LOS	B		

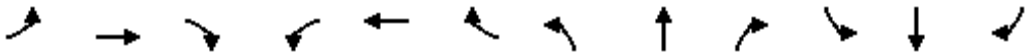
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	282	202	0
Future Volume (Veh/h)	0	0	0	282	202	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	313	224	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	537	224	224			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	537	224	224			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	505	815	1345			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	313	224
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1345	1700
Volume to Capacity	0.00	0.00	0.13
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	19.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	12	31	47	2	0	33	61	162	59	19	67	5
Future Volume (vph)	12	31	47	2	0	33	61	162	59	19	67	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	34	52	2	0	37	68	180	66	21	74	6

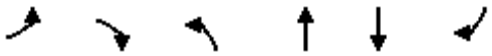
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	99	39	314	101
Volume Left (vph)	13	2	68	21
Volume Right (vph)	52	37	66	6
Hadj (s)	-0.25	-0.52	-0.05	0.07
Departure Headway (s)	4.6	4.5	4.3	4.6
Degree Utilization, x	0.13	0.05	0.38	0.13
Capacity (veh/h)	707	721	811	733
Control Delay (s)	8.3	7.7	9.9	8.3
Approach Delay (s)	8.3	7.7	9.9	8.3
Approach LOS	A	A	A	A

Intersection Summary				
Delay	9.2			
Level of Service	A			
Intersection Capacity Utilization	40.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	5	304	5	3	332
Future Volume (Veh/h)	9	5	304	5	3	332
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	6	338	6	3	369
Pedestrians	1					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	717	342			345	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	717	342			345	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	395	700			1213	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	16	344	372
Volume Left	10	0	3
Volume Right	6	6	0
cSH	472	1700	1213
Volume to Capacity	0.03	0.20	0.00
Queue Length 95th (m)	0.7	0.0	0.1
Control Delay (s)	12.9	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	12.9	0.0	0.1
Approach LOS	B		

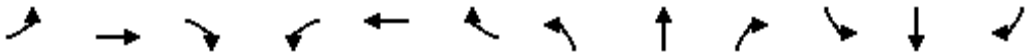
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	31.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	309	335	0
Future Volume (Veh/h)	0	0	0	309	335	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	343	372	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	715	372	372			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	715	372	372			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	397	674	1186			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	343	372
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1186	1700
Volume to Capacity	0.00	0.00	0.22
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	21.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	24	38	56	35	59	28	249	36	42	247	1
Future Volume (vph)	10	24	38	56	35	59	28	249	36	42	247	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	27	42	62	39	66	31	277	40	47	274	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	80	167	348	322
Volume Left (vph)	11	62	31	47
Volume Right (vph)	42	66	40	1
Hadj (s)	-0.22	-0.11	-0.01	0.06
Departure Headway (s)	5.8	5.7	5.1	5.2
Degree Utilization, x	0.13	0.26	0.49	0.46
Capacity (veh/h)	521	564	665	658
Control Delay (s)	9.6	10.7	13.0	12.6
Approach Delay (s)	9.6	10.7	13.0	12.6
Approach LOS	A	B	B	B

Intersection Summary				
Delay	12.1			
Level of Service	B			
Intersection Capacity Utilization	47.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	6:57	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	435	417	440	455	395	430	453
Vehs Exited	430	420	435	446	393	428	452
Starting Vehs	8	9	6	4	7	5	9
Ending Vehs	13	6	11	13	9	7	10
Travel Distance (km)	321	314	323	334	295	318	342
Travel Time (hr)	8.2	7.9	8.2	8.4	7.5	8.0	8.7
Total Delay (hr)	0.9	0.8	0.8	0.8	0.7	0.8	0.9
Total Stops	430	406	425	435	387	416	443
Fuel Used (l)	25.7	24.9	25.6	26.4	23.6	25.3	27.0

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	469	411	434	435
Vehs Exited	466	411	430	430
Starting Vehs	6	7	5	5
Ending Vehs	9	7	9	8
Travel Distance (km)	342	307	325	322
Travel Time (hr)	8.8	7.8	8.2	8.2
Total Delay (hr)	1.0	0.7	0.8	0.8
Total Stops	453	398	429	424
Fuel Used (l)	27.3	24.6	25.5	25.6

Interval #0 Information Seeding

Start Time	6:57
End Time	7:12
Total Time (min)	15

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	435	417	440	455	395	430	453
Vehs Exited	430	420	435	446	393	428	452
Starting Vehs	8	9	6	4	7	5	9
Ending Vehs	13	6	11	13	9	7	10
Travel Distance (km)	321	314	323	334	295	318	342
Travel Time (hr)	8.2	7.9	8.2	8.4	7.5	8.0	8.7
Total Delay (hr)	0.9	0.8	0.8	0.8	0.7	0.8	0.9
Total Stops	430	406	425	435	387	416	443
Fuel Used (l)	25.7	24.9	25.6	26.4	23.6	25.3	27.0

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	469	411	434	435
Vehs Exited	466	411	430	430
Starting Vehs	6	7	5	5
Ending Vehs	9	7	9	8
Travel Distance (km)	342	307	325	322
Travel Time (hr)	8.8	7.8	8.2	8.2
Total Delay (hr)	1.0	0.7	0.8	0.8
Total Stops	453	398	429	424
Fuel Used (l)	27.3	24.6	25.5	25.6

Intersection: 4: Carp Road & Rivington Street

Movement	WB
Directions Served	LR
Maximum Queue (m)	10.5
Average Queue (m)	2.8
95th Queue (m)	9.8
Link Distance (m)	228.9
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Carp Road & Site Access

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 7: Carp Road & Donald B. Munro Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	13.5	14.6	24.7	19.0
Average Queue (m)	2.4	2.7	10.9	8.7
95th Queue (m)	8.0	9.1	19.6	14.9
Link Distance (m)	196.5	333.3	136.7	210.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	4:00	4:00	4:00	4:00	4:00	4:00	4:00
End Time	5:15	5:15	5:15	5:15	5:15	5:15	5:15
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	565	597	604	596	561	631	646
Vehs Exited	562	591	611	599	554	624	638
Starting Vehs	8	7	14	8	5	6	5
Ending Vehs	11	13	7	5	12	13	13
Travel Distance (km)	393	420	419	418	389	442	462
Travel Time (hr)	9.8	10.4	10.4	10.3	9.8	11.2	11.5
Total Delay (hr)	1.1	1.2	1.2	1.1	1.1	1.4	1.3
Total Stops	462	494	494	485	477	535	557
Fuel Used (l)	30.9	32.9	33.0	32.4	30.6	34.6	36.3

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	4:00	4:00	4:00	4:00
End Time	5:15	5:15	5:15	5:15
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	616	598	624	603
Vehs Exited	619	599	628	603
Starting Vehs	14	8	11	6
Ending Vehs	11	7	7	10
Travel Distance (km)	431	418	439	423
Travel Time (hr)	10.8	10.4	11.3	10.6
Total Delay (hr)	1.2	1.1	1.4	1.2
Total Stops	531	483	515	504
Fuel Used (l)	33.4	33.1	34.6	33.2

Interval #0 Information Seeding

Start Time	4:00
End Time	4:15
Total Time (min)	15

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	4:15
End Time	5:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	565	597	604	596	561	631	646
Vehs Exited	562	591	611	599	554	624	638
Starting Vehs	8	7	14	8	5	6	5
Ending Vehs	11	13	7	5	12	13	13
Travel Distance (km)	393	420	419	418	389	442	462
Travel Time (hr)	9.8	10.4	10.4	10.3	9.8	11.2	11.5
Total Delay (hr)	1.1	1.2	1.2	1.1	1.1	1.4	1.3
Total Stops	462	494	494	485	477	535	557
Fuel Used (l)	30.9	32.9	33.0	32.4	30.6	34.6	36.3

Interval #1 Information Recording

Start Time	4:15
End Time	5:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	616	598	624	603
Vehs Exited	619	599	628	603
Starting Vehs	14	8	11	6
Ending Vehs	11	7	7	10
Travel Distance (km)	431	418	439	423
Travel Time (hr)	10.8	10.4	11.3	10.6
Total Delay (hr)	1.2	1.1	1.4	1.2
Total Stops	531	483	515	504
Fuel Used (l)	33.4	33.1	34.6	33.2

Intersection: 4: Carp Road & Rivington Street

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	9.7	10.9
Average Queue (m)	2.1	0.7
95th Queue (m)	8.3	5.3
Link Distance (m)	228.9	50.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Carp Road & Site Access

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 7: Carp Road & Donald B. Munro Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	11.3	8.2	32.2	19.5
Average Queue (m)	2.7	1.0	13.7	8.2
95th Queue (m)	7.6	4.4	25.6	15.0
Link Distance (m)	196.5	333.3	136.7	210.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	6:57	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	839	829	828	877	797	872	833
Vehs Exited	844	828	830	882	796	869	822
Starting Vehs	16	13	19	15	17	13	14
Ending Vehs	11	14	17	10	18	16	25
Travel Distance (km)	628	622	617	663	597	647	621
Travel Time (hr)	16.5	16.1	15.9	17.5	15.5	17.0	16.0
Total Delay (hr)	2.6	2.6	2.4	3.0	2.5	2.7	2.5
Total Stops	834	832	830	885	797	872	828
Fuel Used (l)	51.1	50.6	49.7	53.8	48.7	53.0	50.0

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	870	880	845	849
Vehs Exited	864	879	852	845
Starting Vehs	13	15	16	11
Ending Vehs	19	16	9	15
Travel Distance (km)	649	658	636	634
Travel Time (hr)	17.0	17.8	16.6	16.6
Total Delay (hr)	2.7	3.3	2.6	2.7
Total Stops	868	885	853	851
Fuel Used (l)	52.9	54.1	51.7	51.6

Interval #0 Information Seeding

Start Time	6:57
End Time	7:12
Total Time (min)	15

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	839	829	828	877	797	872	833
Vehs Exited	844	828	830	882	796	869	822
Starting Vehs	16	13	19	15	17	13	14
Ending Vehs	11	14	17	10	18	16	25
Travel Distance (km)	628	622	617	663	597	647	621
Travel Time (hr)	16.5	16.1	15.9	17.5	15.5	17.0	16.0
Total Delay (hr)	2.6	2.6	2.4	3.0	2.5	2.7	2.5
Total Stops	834	832	830	885	797	872	828
Fuel Used (l)	51.1	50.6	49.7	53.8	48.7	53.0	50.0

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	870	880	845	849
Vehs Exited	864	879	852	845
Starting Vehs	13	15	16	11
Ending Vehs	19	16	9	15
Travel Distance (km)	649	658	636	634
Travel Time (hr)	17.0	17.8	16.6	16.6
Total Delay (hr)	2.7	3.3	2.6	2.7
Total Stops	868	885	853	851
Fuel Used (l)	52.9	54.1	51.7	51.6

Intersection: 4: Carp Road & Rivington Street

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	10.4	5.4
Average Queue (m)	3.5	0.2
95th Queue (m)	10.6	2.6
Link Distance (m)	228.9	50.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Carp Road & Site Access

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 7: Carp Road & Donald B. Munro Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	14.6	20.7	40.0	36.5
Average Queue (m)	3.0	5.8	17.3	16.1
95th Queue (m)	8.7	14.8	30.9	28.7
Link Distance (m)	196.5	333.3	136.7	210.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

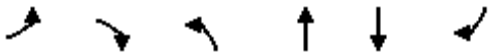
Network Summary

Network wide Queuing Penalty: 0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	1	155	4	0	198
Future Volume (Veh/h)	11	1	155	4	0	198
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	11	1	155	4	0	198
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	355	157			159	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	355	157			159	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	643	889			1420	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	12	159	198
Volume Left	11	0	0
Volume Right	1	4	0
cSH	658	1700	1420
Volume to Capacity	0.02	0.09	0.00
Queue Length 95th (m)	0.4	0.0	0.0
Control Delay (s)	10.6	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.6	0.0	0.0
Approach LOS	B		

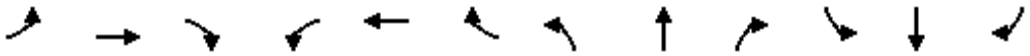
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	21.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	156	198	0
Future Volume (Veh/h)	0	0	0	156	198	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	156	198	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	354	198	198			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	354	198	198			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	644	843	1375			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	156	198
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1375	1700
Volume to Capacity	0.00	0.00	0.12
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	14.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	17	22	70	10	19	24	52	96	30	108	3
Future Volume (vph)	1	17	22	70	10	19	24	52	96	30	108	3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	17	22	70	10	19	24	52	96	30	108	3

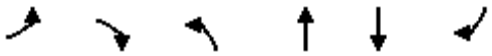
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	40	99	172	141
Volume Left (vph)	1	70	24	30
Volume Right (vph)	22	19	96	3
Hadj (s)	-0.14	0.16	-0.17	0.08
Departure Headway (s)	4.6	4.8	4.2	4.5
Degree Utilization, x	0.05	0.13	0.20	0.18
Capacity (veh/h)	715	694	813	758
Control Delay (s)	7.8	8.6	8.3	8.5
Approach Delay (s)	7.8	8.6	8.3	8.5
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.4			
Level of Service	A			
Intersection Capacity Utilization	31.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	4	306	15	7	212
Future Volume (Veh/h)	4	4	306	15	7	212
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	4	4	306	15	7	212
Pedestrians						1
Lane Width (m)						3.6
Walking Speed (m/s)						1.0
Percent Blockage						0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	540	314			321	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	540	314			321	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	500	725			1239	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	8	321	219
Volume Left	4	0	7
Volume Right	4	15	0
cSH	592	1700	1239
Volume to Capacity	0.01	0.19	0.01
Queue Length 95th (m)	0.3	0.0	0.1
Control Delay (s)	11.2	0.0	0.3
Lane LOS	B		A
Approach Delay (s)	11.2	0.0	0.3
Approach LOS	B		

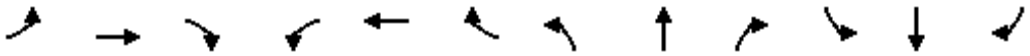
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	28.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	310	219	0
Future Volume (Veh/h)	0	0	0	310	219	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	310	219	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	529	219	219			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	529	219	219			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	510	821	1350			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	310	219
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1350	1700
Volume to Capacity	0.00	0.00	0.13
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	20.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	12	38	49	56	54	36	63	168	73	25	70	5
Future Volume (vph)	12	38	49	56	54	36	63	168	73	25	70	5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	12	38	49	56	54	36	63	168	73	25	70	5

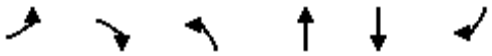
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	99	146	304	100
Volume Left (vph)	12	56	63	25
Volume Right (vph)	49	36	73	5
Hadj (s)	-0.24	-0.04	-0.07	0.08
Departure Headway (s)	4.9	5.0	4.6	5.0
Degree Utilization, x	0.13	0.20	0.39	0.14
Capacity (veh/h)	668	661	749	666
Control Delay (s)	8.6	9.2	10.5	8.8
Approach Delay (s)	8.6	9.2	10.5	8.8
Approach LOS	A	A	B	A

Intersection Summary				
Delay	9.7			
Level of Service	A			
Intersection Capacity Utilization	44.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	5	328	5	3	354
Future Volume (Veh/h)	9	5	328	5	3	354
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	5	328	5	3	354
Pedestrians	1					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	692	332			334	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	692	332			334	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	409	709			1224	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	14	333	357
Volume Left	9	0	3
Volume Right	5	5	0
cSH	482	1700	1224
Volume to Capacity	0.03	0.20	0.00
Queue Length 95th (m)	0.6	0.0	0.1
Control Delay (s)	12.7	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	12.7	0.0	0.1
Approach LOS	B		

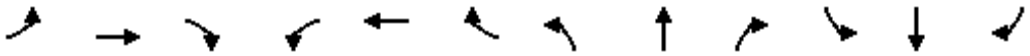
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	32.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	333	357	0
Future Volume (Veh/h)	0	0	0	333	357	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	333	357	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	690	357	357			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	690	357	357			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	411	687	1202			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	333	357
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1202	1700
Volume to Capacity	0.00	0.00	0.21
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	23.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	31	40	67	43	63	29	259	49	49	257	1
Future Volume (vph)	10	31	40	67	43	63	29	259	49	49	257	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	31	40	67	43	63	29	259	49	49	257	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	81	173	337	307
Volume Left (vph)	10	67	29	49
Volume Right (vph)	40	63	49	1
Hadj (s)	-0.21	-0.09	-0.02	0.06
Departure Headway (s)	5.7	5.6	5.1	5.2
Degree Utilization, x	0.13	0.27	0.48	0.44
Capacity (veh/h)	527	572	667	656
Control Delay (s)	9.5	10.7	12.6	12.3
Approach Delay (s)	9.5	10.7	12.6	12.3
Approach LOS	A	B	B	B

Intersection Summary				
Delay	11.8			
Level of Service	B			
Intersection Capacity Utilization	52.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	6:57	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	493	454	481	495	444	466	469
Vehs Exited	495	454	478	492	444	465	463
Starting Vehs	9	7	6	9	9	7	6
Ending Vehs	7	7	9	12	9	8	12
Travel Distance (km)	371	345	357	365	336	347	348
Travel Time (hr)	9.4	8.7	9.1	9.3	8.5	8.8	8.9
Total Delay (hr)	1.0	0.9	0.9	0.9	0.9	0.9	0.9
Total Stops	489	443	462	476	442	457	457
Fuel Used (l)	29.5	27.1	28.5	28.8	26.8	27.5	27.1

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	507	452	463	472
Vehs Exited	508	463	464	472
Starting Vehs	9	17	8	8
Ending Vehs	8	6	7	6
Travel Distance (km)	376	343	348	354
Travel Time (hr)	9.6	8.8	8.8	9.0
Total Delay (hr)	1.0	0.9	0.9	0.9
Total Stops	492	448	454	461
Fuel Used (l)	29.8	27.3	27.4	28.0

Interval #0 Information Seeding

Start Time	6:57
End Time	7:12
Total Time (min)	15

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	493	454	481	495	444	466	469
Vehs Exited	495	454	478	492	444	465	463
Starting Vehs	9	7	6	9	9	7	6
Ending Vehs	7	7	9	12	9	8	12
Travel Distance (km)	371	345	357	365	336	347	348
Travel Time (hr)	9.4	8.7	9.1	9.3	8.5	8.8	8.9
Total Delay (hr)	1.0	0.9	0.9	0.9	0.9	0.9	0.9
Total Stops	489	443	462	476	442	457	457
Fuel Used (l)	29.5	27.1	28.5	28.8	26.8	27.5	27.1

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	507	452	463	472
Vehs Exited	508	463	464	472
Starting Vehs	9	17	8	8
Ending Vehs	8	6	7	6
Travel Distance (km)	376	343	348	354
Travel Time (hr)	9.6	8.8	8.8	9.0
Total Delay (hr)	1.0	0.9	0.9	0.9
Total Stops	492	448	454	461
Fuel Used (l)	29.8	27.3	27.4	28.0

Intersection: 4: Carp Road & Rivington Street

Movement	WB
Directions Served	LR
Maximum Queue (m)	10.5
Average Queue (m)	2.8
95th Queue (m)	9.8
Link Distance (m)	228.9
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Carp Road & Site Access

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 7: Carp Road & Donald B. Munro Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	13.7	15.0	24.6	20.1
Average Queue (m)	2.3	3.6	11.3	9.0
95th Queue (m)	7.9	11.2	20.1	15.6
Link Distance (m)	196.5	333.3	136.7	210.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	4:00	4:00	4:00	4:00	4:00	4:00	4:00
End Time	5:15	5:15	5:15	5:15	5:15	5:15	5:15
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	676	693	689	691	648	752	696
Vehs Exited	677	693	695	689	646	749	697
Starting Vehs	18	11	11	14	10	10	16
Ending Vehs	17	11	5	16	12	13	15
Travel Distance (km)	494	499	500	502	469	546	505
Travel Time (hr)	12.7	12.7	13.0	12.9	12.2	14.3	13.0
Total Delay (hr)	1.5	1.5	1.7	1.6	1.5	1.9	1.6
Total Stops	629	630	644	628	594	691	645
Fuel Used (l)	39.4	39.5	39.8	39.9	37.2	43.2	40.6

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	4:00	4:00	4:00	4:00
End Time	5:15	5:15	5:15	5:15
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	712	699	728	698
Vehs Exited	712	703	719	699
Starting Vehs	10	18	11	10
Ending Vehs	10	14	20	10
Travel Distance (km)	512	510	532	507
Travel Time (hr)	13.4	13.1	13.7	13.1
Total Delay (hr)	1.7	1.6	1.7	1.6
Total Stops	646	633	658	639
Fuel Used (l)	40.4	40.8	42.0	40.3

Interval #0 Information Seeding

Start Time	4:00
End Time	4:15
Total Time (min)	15

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	4:15
End Time	5:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	676	693	689	691	648	752	696
Vehs Exited	677	693	695	689	646	749	697
Starting Vehs	18	11	11	14	10	10	16
Ending Vehs	17	11	5	16	12	13	15
Travel Distance (km)	494	499	500	502	469	546	505
Travel Time (hr)	12.7	12.7	13.0	12.9	12.2	14.3	13.0
Total Delay (hr)	1.5	1.5	1.7	1.6	1.5	1.9	1.6
Total Stops	629	630	644	628	594	691	645
Fuel Used (l)	39.4	39.5	39.8	39.9	37.2	43.2	40.6

Interval #1 Information Recording

Start Time	4:15
End Time	5:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	712	699	728	698
Vehs Exited	712	703	719	699
Starting Vehs	10	18	11	10
Ending Vehs	10	14	20	10
Travel Distance (km)	512	510	532	507
Travel Time (hr)	13.4	13.1	13.7	13.1
Total Delay (hr)	1.7	1.6	1.7	1.6
Total Stops	646	633	658	639
Fuel Used (l)	40.4	40.8	42.0	40.3

Intersection: 4: Carp Road & Rivington Street

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	9.1	2.1	10.6
Average Queue (m)	2.0	0.1	0.6
95th Queue (m)	8.1	2.1	4.7
Link Distance (m)	228.9	319.7	50.7
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Carp Road & Site Access

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 7: Carp Road & Donald B. Munro Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	13.2	17.0	34.8	21.8
Average Queue (m)	3.1	5.0	15.4	8.5
95th Queue (m)	8.6	12.8	27.6	15.7
Link Distance (m)	196.5	333.3	136.7	210.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	12:00	12:00	12:00	12:00	12:00	12:00	12:00
End Time	1:15	1:15	1:15	1:15	1:15	1:15	1:15
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	899	917	906	915	869	940	936
Vehs Exited	905	912	902	923	861	939	929
Starting Vehs	23	14	16	22	20	20	21
Ending Vehs	17	19	20	14	28	21	28
Travel Distance (km)	669	683	677	689	646	706	700
Travel Time (hr)	17.7	18.2	17.7	18.4	17.0	18.9	18.7
Total Delay (hr)	3.0	3.1	2.8	3.2	2.7	3.3	3.2
Total Stops	897	913	905	921	874	938	935
Fuel Used (l)	55.1	55.7	54.6	56.1	52.9	56.9	56.8

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	12:00	12:00	12:00	12:00
End Time	1:15	1:15	1:15	1:15
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	916	932	931	918
Vehs Exited	911	938	942	917
Starting Vehs	15	20	20	17
Ending Vehs	20	14	9	16
Travel Distance (km)	685	700	702	686
Travel Time (hr)	17.9	18.8	18.7	18.2
Total Delay (hr)	2.8	3.4	3.3	3.1
Total Stops	916	944	941	919
Fuel Used (l)	55.5	57.0	57.1	55.8

Interval #0 Information Seeding

Start Time	12:00
End Time	12:15
Total Time (min)	15

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	12:15
End Time	1:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	899	917	906	915	869	940	936
Vehs Exited	905	912	902	923	861	939	929
Starting Vehs	23	14	16	22	20	20	21
Ending Vehs	17	19	20	14	28	21	28
Travel Distance (km)	669	683	677	689	646	706	700
Travel Time (hr)	17.7	18.2	17.7	18.4	17.0	18.9	18.7
Total Delay (hr)	3.0	3.1	2.8	3.2	2.7	3.3	3.2
Total Stops	897	913	905	921	874	938	935
Fuel Used (l)	55.1	55.7	54.6	56.1	52.9	56.9	56.8

Interval #1 Information Recording

Start Time	12:15
End Time	1:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	916	932	931	918
Vehs Exited	911	938	942	917
Starting Vehs	15	20	20	17
Ending Vehs	20	14	9	16
Travel Distance (km)	685	700	702	686
Travel Time (hr)	17.9	18.8	18.7	18.2
Total Delay (hr)	2.8	3.4	3.3	3.1
Total Stops	916	944	941	919
Fuel Used (l)	55.5	57.0	57.1	55.8

Intersection: 4: Carp Road & Rivington Street

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	9.7	4.9
Average Queue (m)	3.6	0.2
95th Queue (m)	10.7	2.7
Link Distance (m)	228.9	50.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Carp Road & Site Access

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 7: Carp Road & Donald B. Munro Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	14.5	19.9	45.9	34.6
Average Queue (m)	3.8	7.0	20.0	16.8
95th Queue (m)	10.6	16.4	35.9	29.2
Link Distance (m)	196.5	333.3	136.7	210.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

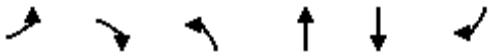
Network Summary

Network wide Queuing Penalty: 0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	1	162	4	0	207
Future Volume (Veh/h)	11	1	162	4	0	207
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	11	1	162	4	0	207
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	371	164			166	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	371	164			166	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	630	881			1412	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	12	166	207
Volume Left	11	0	0
Volume Right	1	4	0
cSH	645	1700	1412
Volume to Capacity	0.02	0.10	0.00
Queue Length 95th (m)	0.4	0.0	0.0
Control Delay (s)	10.7	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.7	0.0	0.0
Approach LOS	B		

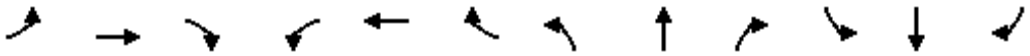
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	21.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	163	207	0
Future Volume (Veh/h)	0	0	0	163	207	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	163	207	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	370	207	207			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	370	207	207			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	630	833	1364			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	163	207
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1364	1700
Volume to Capacity	0.00	0.00	0.12
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	14.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	17	23	73	11	19	25	55	101	32	113	3
Future Volume (vph)	1	17	23	73	11	19	25	55	101	32	113	3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	17	23	73	11	19	25	55	101	32	113	3

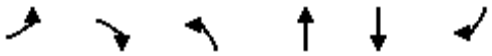
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	41	103	181	148
Volume Left (vph)	1	73	25	32
Volume Right (vph)	23	19	101	3
Hadj (s)	-0.15	0.16	-0.17	0.08
Departure Headway (s)	4.6	4.9	4.3	4.5
Degree Utilization, x	0.05	0.14	0.21	0.19
Capacity (veh/h)	707	686	808	753
Control Delay (s)	7.9	8.7	8.4	8.6
Approach Delay (s)	7.9	8.7	8.4	8.6
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.5			
Level of Service	A			
Intersection Capacity Utilization	32.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	4	320	15	7	222
Future Volume (Veh/h)	4	4	320	15	7	222
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	4	4	320	15	7	222
Pedestrians						1
Lane Width (m)						3.6
Walking Speed (m/s)						1.0
Percent Blockage						0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	564	328			335	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	564	328			335	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	484	712			1224	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	8	335	229
Volume Left	4	0	7
Volume Right	4	15	0
cSH	577	1700	1224
Volume to Capacity	0.01	0.20	0.01
Queue Length 95th (m)	0.3	0.0	0.1
Control Delay (s)	11.3	0.0	0.3
Lane LOS	B		A
Approach Delay (s)	11.3	0.0	0.3
Approach LOS	B		

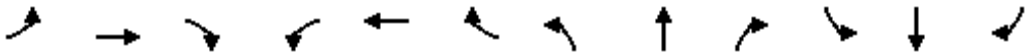
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	29.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	325	229	0
Future Volume (Veh/h)	0	0	0	325	229	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	325	229	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	554	229	229			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	554	229	229			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	493	810	1339			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	325	229
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1339	1700
Volume to Capacity	0.00	0.00	0.13
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	21.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	13	40	51	58	56	38	66	171	76	26	73	5
Future Volume (vph)	13	40	51	58	56	38	66	171	76	26	73	5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	13	40	51	58	56	38	66	171	76	26	73	5

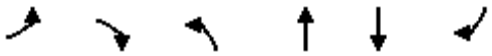
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	104	152	313	104
Volume Left (vph)	13	58	66	26
Volume Right (vph)	51	38	76	5
Hadj (s)	-0.24	-0.04	-0.07	0.08
Departure Headway (s)	4.9	5.0	4.6	5.0
Degree Utilization, x	0.14	0.21	0.40	0.15
Capacity (veh/h)	659	654	742	657
Control Delay (s)	8.7	9.4	10.7	8.9
Approach Delay (s)	8.7	9.4	10.7	8.9
Approach LOS	A	A	B	A

Intersection Summary				
Delay	9.8			
Level of Service	A			
Intersection Capacity Utilization	45.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	5	343	5	3	371
Future Volume (Veh/h)	9	5	343	5	3	371
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	5	343	5	3	371
Pedestrians	1					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	724	346			349	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	724	346			349	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	391	696			1209	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	14	348	374
Volume Left	9	0	3
Volume Right	5	5	0
cSH	464	1700	1209
Volume to Capacity	0.03	0.20	0.00
Queue Length 95th (m)	0.7	0.0	0.1
Control Delay (s)	13.0	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	13.0	0.0	0.1
Approach LOS	B		

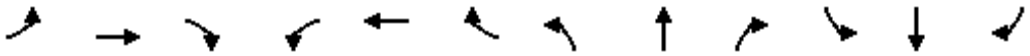
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	349	374	0
Future Volume (Veh/h)	0	0	0	349	374	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	349	374	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	723	374	374			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	723	374	374			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	393	672	1184			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	349	374
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1184	1700
Volume to Capacity	0.00	0.00	0.22
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	24.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	32	41	70	45	66	31	271	51	51	269	1
Future Volume (vph)	11	32	41	70	45	66	31	271	51	51	269	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	11	32	41	70	45	66	31	271	51	51	269	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	84	181	353	321
Volume Left (vph)	11	70	31	51
Volume Right (vph)	41	66	51	1
Hadj (s)	-0.20	-0.09	-0.02	0.06
Departure Headway (s)	5.8	5.7	5.2	5.3
Degree Utilization, x	0.14	0.29	0.51	0.47
Capacity (veh/h)	513	559	657	646
Control Delay (s)	9.8	11.0	13.3	12.9
Approach Delay (s)	9.8	11.0	13.3	12.9
Approach LOS	A	B	B	B

Intersection Summary				
Delay	12.4			
Level of Service	B			
Intersection Capacity Utilization	53.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	6:57	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	513	481	507	485	483	480	556
Vehs Exited	517	482	503	485	480	479	552
Starting Vehs	15	8	6	12	7	8	6
Ending Vehs	11	7	10	12	10	9	10
Travel Distance (km)	387	361	382	362	363	359	417
Travel Time (hr)	9.8	9.2	9.7	9.2	9.3	9.1	10.8
Total Delay (hr)	1.0	0.9	1.0	0.9	1.0	0.9	1.1
Total Stops	511	470	488	470	480	466	542
Fuel Used (l)	30.6	28.5	30.0	28.6	29.0	28.5	32.7

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	511	485	503	498
Vehs Exited	513	496	498	501
Starting Vehs	9	16	5	7
Ending Vehs	7	5	10	7
Travel Distance (km)	378	364	373	375
Travel Time (hr)	9.7	9.3	9.5	9.6
Total Delay (hr)	1.0	0.9	1.0	1.0
Total Stops	497	477	489	488
Fuel Used (l)	30.1	29.3	29.5	29.7

Interval #0 Information Seeding

Start Time	6:57
End Time	7:12
Total Time (min)	15

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	513	481	507	485	483	480	556
Vehs Exited	517	482	503	485	480	479	552
Starting Vehs	15	8	6	12	7	8	6
Ending Vehs	11	7	10	12	10	9	10
Travel Distance (km)	387	361	382	362	363	359	417
Travel Time (hr)	9.8	9.2	9.7	9.2	9.3	9.1	10.8
Total Delay (hr)	1.0	0.9	1.0	0.9	1.0	0.9	1.1
Total Stops	511	470	488	470	480	466	542
Fuel Used (l)	30.6	28.5	30.0	28.6	29.0	28.5	32.7

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	511	485	503	498
Vehs Exited	513	496	498	501
Starting Vehs	9	16	5	7
Ending Vehs	7	5	10	7
Travel Distance (km)	378	364	373	375
Travel Time (hr)	9.7	9.3	9.5	9.6
Total Delay (hr)	1.0	0.9	1.0	1.0
Total Stops	497	477	489	488
Fuel Used (l)	30.1	29.3	29.5	29.7

Intersection: 4: Carp Road & Rivington Street

Movement	WB
Directions Served	LR
Maximum Queue (m)	10.5
Average Queue (m)	2.9
95th Queue (m)	9.9
Link Distance (m)	228.9
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Carp Road & Site Access

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 7: Carp Road & Donald B. Munro Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	14.6	16.9	24.0	20.1
Average Queue (m)	2.7	4.0	11.8	9.1
95th Queue (m)	8.9	12.1	20.1	15.5
Link Distance (m)	196.5	333.3	136.7	210.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	4:00	4:00	4:00	4:00	4:00	4:00	4:00
End Time	5:15	5:15	5:15	5:15	5:15	5:15	5:15
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	727	793	760	744	748	762	754
Vehs Exited	728	786	765	735	742	758	756
Starting Vehs	16	10	22	9	15	12	13
Ending Vehs	15	17	17	18	21	16	11
Travel Distance (km)	525	569	533	529	536	545	538
Travel Time (hr)	13.6	15.0	13.9	13.9	13.9	14.2	14.0
Total Delay (hr)	1.7	2.1	1.7	2.0	1.8	1.8	1.7
Total Stops	650	728	670	662	670	685	688
Fuel Used (l)	41.7	45.2	43.1	42.4	42.5	43.1	42.9

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	4:00	4:00	4:00	4:00
End Time	5:15	5:15	5:15	5:15
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	764	698	754	750
Vehs Exited	764	696	753	749
Starting Vehs	13	11	14	11
Ending Vehs	13	13	15	13
Travel Distance (km)	552	501	549	538
Travel Time (hr)	14.5	12.9	14.2	14.0
Total Delay (hr)	2.0	1.7	1.8	1.8
Total Stops	699	634	685	677
Fuel Used (l)	43.6	40.3	44.0	42.9

Interval #0 Information Seeding

Start Time	4:00
End Time	4:15
Total Time (min)	15

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	4:15
End Time	5:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	727	793	760	744	748	762	754
Vehs Exited	728	786	765	735	742	758	756
Starting Vehs	16	10	22	9	15	12	13
Ending Vehs	15	17	17	18	21	16	11
Travel Distance (km)	525	569	533	529	536	545	538
Travel Time (hr)	13.6	15.0	13.9	13.9	13.9	14.2	14.0
Total Delay (hr)	1.7	2.1	1.7	2.0	1.8	1.8	1.7
Total Stops	650	728	670	662	670	685	688
Fuel Used (l)	41.7	45.2	43.1	42.4	42.5	43.1	42.9

Interval #1 Information Recording

Start Time	4:15
End Time	5:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	764	698	754	750
Vehs Exited	764	696	753	749
Starting Vehs	13	11	14	11
Ending Vehs	13	13	15	13
Travel Distance (km)	552	501	549	538
Travel Time (hr)	14.5	12.9	14.2	14.0
Total Delay (hr)	2.0	1.7	1.8	1.8
Total Stops	699	634	685	677
Fuel Used (l)	43.6	40.3	44.0	42.9

Intersection: 4: Carp Road & Rivington Street

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	9.1	8.3
Average Queue (m)	2.3	0.6
95th Queue (m)	8.6	4.6
Link Distance (m)	228.9	50.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Carp Road & Site Access

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 7: Carp Road & Donald B. Munro Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	15.6	18.3	36.2	21.2
Average Queue (m)	4.3	5.2	16.2	8.9
95th Queue (m)	11.7	13.5	27.5	16.3
Link Distance (m)	196.5	333.3	136.7	210.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	12:00	12:00	12:00	12:00	12:00	12:00	12:00
End Time	1:15	1:15	1:15	1:15	1:15	1:15	1:15
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	949	991	936	909	937	964	972
Vehs Exited	941	988	928	910	941	966	984
Starting Vehs	11	16	16	19	27	20	21
Ending Vehs	19	19	24	18	23	18	9
Travel Distance (km)	709	747	691	675	704	720	725
Travel Time (hr)	19.0	20.1	18.3	17.7	18.6	19.2	19.5
Total Delay (hr)	3.4	3.7	3.1	3.0	3.2	3.4	3.5
Total Stops	956	992	930	908	937	965	984
Fuel Used (l)	57.4	61.9	56.4	54.8	57.4	58.8	59.9

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	12:00	12:00	12:00	12:00
End Time	1:15	1:15	1:15	1:15
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	964	906	945	949
Vehs Exited	957	908	936	945
Starting Vehs	19	17	15	17
Ending Vehs	26	15	24	21
Travel Distance (km)	718	680	699	707
Travel Time (hr)	19.1	18.0	18.9	18.9
Total Delay (hr)	3.4	3.1	3.6	3.3
Total Stops	960	908	943	950
Fuel Used (l)	58.0	55.4	57.4	57.7

Interval #0 Information Seeding

Start Time	12:00
End Time	12:15
Total Time (min)	15

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	12:15
End Time	1:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	949	991	936	909	937	964	972
Vehs Exited	941	988	928	910	941	966	984
Starting Vehs	11	16	16	19	27	20	21
Ending Vehs	19	19	24	18	23	18	9
Travel Distance (km)	709	747	691	675	704	720	725
Travel Time (hr)	19.0	20.1	18.3	17.7	18.6	19.2	19.5
Total Delay (hr)	3.4	3.7	3.1	3.0	3.2	3.4	3.5
Total Stops	956	992	930	908	937	965	984
Fuel Used (l)	57.4	61.9	56.4	54.8	57.4	58.8	59.9

Interval #1 Information Recording

Start Time	12:15
End Time	1:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	964	906	945	949
Vehs Exited	957	908	936	945
Starting Vehs	19	17	15	17
Ending Vehs	26	15	24	21
Travel Distance (km)	718	680	699	707
Travel Time (hr)	19.1	18.0	18.9	18.9
Total Delay (hr)	3.4	3.1	3.6	3.3
Total Stops	960	908	943	950
Fuel Used (l)	58.0	55.4	57.4	57.7

Intersection: 4: Carp Road & Rivington Street

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	10.5	10.0
Average Queue (m)	3.3	0.4
95th Queue (m)	10.4	3.9
Link Distance (m)	228.9	50.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Carp Road & Site Access

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 7: Carp Road & Donald B. Munro Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	18.1	28.7	46.6	44.7
Average Queue (m)	4.1	8.3	19.2	18.3
95th Queue (m)	11.9	20.0	34.2	33.5
Link Distance (m)	196.5	333.3	136.7	210.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

APPENDIX I

Multi-Modal Level of Service Calculations

Segment MMLOS Analysis

This section provides a review of the boundary street (Carp Road), using complete streets principles. The *Multi-Modal Level of Service (MMLOS) Guidelines*, produced by IBI Group in October 2015, were used to evaluate the levels of service for each alternative mode of transportation. Schedule B9 of the Official Plan designates the subject site as Village Core.

Exhibit 4 of the MMLOS Guidelines has been used to evaluate the segment pedestrian level of service (PLOS). Exhibit 22 of the MMLOS Guidelines suggest a target PLOS C for all roadways within a Village. The results of the segment PLOS analysis are summarized in **Table 1**.

Exhibit 11 of the MMLOS Guidelines has been used to evaluate the segment bicycle level of service (BLOS). Within a Village, Exhibit 22 of the MMLOS Guidelines suggest a BLOS C for roadways classified as Spine Cycling Routes. The results of the segment BLOS analysis are summarized in **Table 2**.

Exhibit 20 of the MMLOS Guidelines has been used to evaluate the segment truck level of service (TkLOS). Within a Village, Exhibit 22 of the MMLOS Guidelines suggest a TkLOS D for all arterial roadways classified as truck routes. The results of the segment TkLOS analysis are summarized in **Table 3**.

Table 1: PLOS Segment Analysis

Sidewalk Width	Boulevard Width	Avg. Daily Curb Lane Traffic Volume	Presence of On-Street Parking	Operating Speed[1]	PLOS
Carp Road, east side (asphalt sidewalk)					
≥ 1.8m	0m	> 3,000 vpd	No	60 km/h	F
Carp Road, west side (concrete sidewalk)					
≥1.8m	0m	> 3,000 vpd	No	60 km/h	F

1. Operating speed taken as the speed limit plus 10 km/h.

Table 2: BLOS Segment Analysis

Road Class	Type of Route	Type of Bikeway	Travel Lanes	Operating Speed	BLOS
Carp Road					
Arterial	Spine Route	Mixed Traffic	2	60 km/h	F

Table 3: TkLOS Segment Analysis

Curb Lane Width	Number of Travel Lanes Per Direction	TkLOS
Carp Road		
>3.7m	1	B

APPENDIX J

Transportation Demand Management Checklist

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

Legend

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

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

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

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

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

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

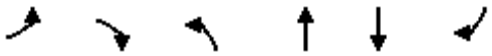
APPENDIX K

Capacity Analysis Reports (Total)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	1	163	4	0	209
Future Volume (Veh/h)	11	1	163	4	0	209
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	11	1	163	4	0	209
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	374	165			167	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	374	165			167	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	627	879			1411	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	12	167	209
Volume Left	11	0	0
Volume Right	1	4	0
cSH	642	1700	1411
Volume to Capacity	0.02	0.10	0.00
Queue Length 95th (m)	0.4	0.0	0.0
Control Delay (s)	10.7	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.7	0.0	0.0
Approach LOS	B		

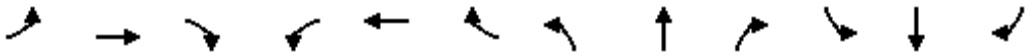
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	21.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	11	8	156	198	9
Future Volume (Veh/h)	12	11	8	156	198	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	12	11	8	156	198	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	374	202	207			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	374	202	207			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	99			
cM capacity (veh/h)	623	838	1364			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	23	164	207
Volume Left	12	8	0
Volume Right	11	0	9
cSH	710	1364	1700
Volume to Capacity	0.03	0.01	0.12
Queue Length 95th (m)	0.7	0.1	0.0
Control Delay (s)	10.2	0.4	0.0
Lane LOS	B	A	
Approach Delay (s)	10.2	0.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	25.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	17	23	73	10	19	25	58	101	30	113	3
Future Volume (vph)	1	17	23	73	10	19	25	58	101	30	113	3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	17	23	73	10	19	25	58	101	30	113	3

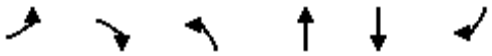
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	41	102	184	146
Volume Left (vph)	1	73	25	30
Volume Right (vph)	23	19	101	3
Hadj (s)	-0.15	0.16	-0.17	0.08
Departure Headway (s)	4.6	4.9	4.3	4.5
Degree Utilization, x	0.05	0.14	0.22	0.18
Capacity (veh/h)	707	685	809	753
Control Delay (s)	7.9	8.6	8.4	8.6
Approach Delay (s)	7.9	8.6	8.4	8.6
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.5			
Level of Service	A			
Intersection Capacity Utilization	33.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	4	322	15	7	226
Future Volume (Veh/h)	4	4	322	15	7	226
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	4	4	322	15	7	226
Pedestrians						1
Lane Width (m)						3.6
Walking Speed (m/s)						1.0
Percent Blockage						0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	570	330			337	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	570	330			337	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	481	710			1222	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	8	337	233
Volume Left	4	0	7
Volume Right	4	15	0
cSH	573	1700	1222
Volume to Capacity	0.01	0.20	0.01
Queue Length 95th (m)	0.3	0.0	0.1
Control Delay (s)	11.4	0.0	0.3
Lane LOS	B		A
Approach Delay (s)	11.4	0.0	0.3
Approach LOS	B		

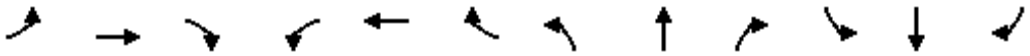
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	23	19	21	305	214	23
Future Volume (Veh/h)	23	19	21	305	214	23
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	23	19	21	305	214	23
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	572	226	237			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	572	226	237			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	98	98			
cM capacity (veh/h)	474	814	1330			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	42	326	237
Volume Left	23	21	0
Volume Right	19	0	23
cSH	584	1330	1700
Volume to Capacity	0.07	0.02	0.14
Queue Length 95th (m)	1.6	0.3	0.0
Control Delay (s)	11.6	0.6	0.0
Lane LOS	B	A	
Approach Delay (s)	11.6	0.6	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	12	38	52	61	54	36	65	179	78	25	80	5
Future Volume (vph)	12	38	52	61	54	36	65	179	78	25	80	5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	12	38	52	61	54	36	65	179	78	25	80	5

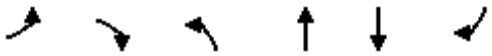
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	102	151	322	110
Volume Left (vph)	12	61	65	25
Volume Right (vph)	52	36	78	5
Hadj (s)	-0.25	-0.03	-0.07	0.08
Departure Headway (s)	4.9	5.1	4.6	5.0
Degree Utilization, x	0.14	0.21	0.41	0.15
Capacity (veh/h)	654	646	742	657
Control Delay (s)	8.7	9.4	10.9	9.0
Approach Delay (s)	8.7	9.4	10.9	9.0
Approach LOS	A	A	B	A

Intersection Summary				
Delay	9.9			
Level of Service	A			
Intersection Capacity Utilization	46.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	5	347	5	3	371
Future Volume (Veh/h)	9	5	347	5	3	371
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	5	347	5	3	371
Pedestrians	1					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	728	350			353	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	728	350			353	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	389	692			1205	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	14	352	374
Volume Left	9	0	3
Volume Right	5	5	0
cSH	461	1700	1205
Volume to Capacity	0.03	0.21	0.00
Queue Length 95th (m)	0.7	0.0	0.1
Control Delay (s)	13.0	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	13.0	0.0	0.1
Approach LOS	B		

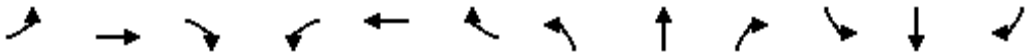
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	27	22	24	328	352	30
Future Volume (Veh/h)	27	22	24	328	352	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	27	22	24	328	352	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	743	367	382			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	743	367	382			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	97	98			
cM capacity (veh/h)	375	678	1176			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	49	352	382
Volume Left	27	24	0
Volume Right	22	0	30
cSH	469	1176	1700
Volume to Capacity	0.10	0.02	0.22
Queue Length 95th (m)	2.4	0.4	0.0
Control Delay (s)	13.6	0.7	0.0
Lane LOS	B	A	
Approach Delay (s)	13.6	0.7	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	31	43	75	43	63	31	272	56	49	271	1
Future Volume (vph)	10	31	43	75	43	63	31	272	56	49	271	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	31	43	75	43	63	31	272	56	49	271	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	84	181	359	321
Volume Left (vph)	10	75	31	49
Volume Right (vph)	43	63	56	1
Hadj (s)	-0.22	-0.08	-0.03	0.06
Departure Headway (s)	5.8	5.8	5.2	5.3
Degree Utilization, x	0.14	0.29	0.51	0.47
Capacity (veh/h)	512	556	658	644
Control Delay (s)	9.8	11.1	13.5	12.9
Approach Delay (s)	9.8	11.1	13.5	12.9
Approach LOS	A	B	B	B

Intersection Summary				
Delay	12.5			
Level of Service	B			
Intersection Capacity Utilization	53.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	6:57	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	504	519	503	501	492	513	522
Vehs Exited	508	516	509	501	493	515	519
Starting Vehs	11	8	13	10	12	13	9
Ending Vehs	7	11	7	10	11	11	12
Travel Distance (km)	373	381	367	368	358	372	381
Travel Time (hr)	9.5	9.8	9.5	9.4	9.2	9.6	9.7
Total Delay (hr)	1.0	1.0	1.1	1.0	1.0	1.1	1.1
Total Stops	507	519	511	493	494	512	512
Fuel Used (l)	29.4	30.4	29.7	29.8	28.6	29.8	30.6

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	517	496	479	504
Vehs Exited	512	494	479	504
Starting Vehs	7	5	7	8
Ending Vehs	12	7	7	7
Travel Distance (km)	378	363	353	369
Travel Time (hr)	9.6	9.3	9.0	9.5
Total Delay (hr)	1.0	1.0	0.9	1.0
Total Stops	507	493	475	502
Fuel Used (l)	30.8	28.9	28.2	29.6

Interval #0 Information Seeding

Start Time	6:57
End Time	7:12
Total Time (min)	15

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	504	519	503	501	492	513	522
Vehs Exited	508	516	509	501	493	515	519
Starting Vehs	11	8	13	10	12	13	9
Ending Vehs	7	11	7	10	11	11	12
Travel Distance (km)	373	381	367	368	358	372	381
Travel Time (hr)	9.5	9.8	9.5	9.4	9.2	9.6	9.7
Total Delay (hr)	1.0	1.0	1.1	1.0	1.0	1.1	1.1
Total Stops	507	519	511	493	494	512	512
Fuel Used (l)	29.4	30.4	29.7	29.8	28.6	29.8	30.6

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	517	496	479	504
Vehs Exited	512	494	479	504
Starting Vehs	7	5	7	8
Ending Vehs	12	7	7	7
Travel Distance (km)	378	363	353	369
Travel Time (hr)	9.6	9.3	9.0	9.5
Total Delay (hr)	1.0	1.0	0.9	1.0
Total Stops	507	493	475	502
Fuel Used (l)	30.8	28.9	28.2	29.6

Intersection: 4: Carp Road & Rivington Street

Movement	WB
Directions Served	LR
Maximum Queue (m)	9.1
Average Queue (m)	2.7
95th Queue (m)	9.5
Link Distance (m)	228.9
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Carp Road & Site Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (m)	11.8	10.6
Average Queue (m)	4.9	0.7
95th Queue (m)	12.4	5.3
Link Distance (m)	76.1	50.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Carp Road & Donald B. Munro Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	13.0	19.5	25.6	17.4
Average Queue (m)	2.2	4.3	11.7	8.8
95th Queue (m)	7.5	12.9	20.5	14.6
Link Distance (m)	196.5	333.3	136.7	210.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	4:00	4:00	4:00	4:00	4:00	4:00	4:00
End Time	5:15	5:15	5:15	5:15	5:15	5:15	5:15
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	769	793	840	789	814	807	853
Vehs Exited	768	799	839	788	805	810	846
Starting Vehs	14	18	21	14	17	12	9
Ending Vehs	15	12	22	15	26	9	16
Travel Distance (km)	535	557	576	549	567	566	591
Travel Time (hr)	14.0	14.6	15.5	14.6	14.9	14.9	15.8
Total Delay (hr)	1.7	2.0	2.2	2.0	1.9	2.0	2.3
Total Stops	703	745	778	737	750	749	804
Fuel Used (l)	43.4	45.1	47.7	44.9	45.6	46.5	48.2

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	4:00	4:00	4:00	4:00
End Time	5:15	5:15	5:15	5:15
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	765	764	784	800
Vehs Exited	761	764	780	797
Starting Vehs	14	13	11	11
Ending Vehs	18	13	15	14
Travel Distance (km)	532	537	553	556
Travel Time (hr)	13.9	14.0	14.6	14.7
Total Delay (hr)	1.8	1.9	2.0	2.0
Total Stops	714	711	745	744
Fuel Used (l)	42.9	43.8	45.0	45.3

Interval #0 Information Seeding

Start Time	4:00
End Time	4:15
Total Time (min)	15

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	4:15
End Time	5:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	769	793	840	789	814	807	853
Vehs Exited	768	799	839	788	805	810	846
Starting Vehs	14	18	21	14	17	12	9
Ending Vehs	15	12	22	15	26	9	16
Travel Distance (km)	535	557	576	549	567	566	591
Travel Time (hr)	14.0	14.6	15.5	14.6	14.9	14.9	15.8
Total Delay (hr)	1.7	2.0	2.2	2.0	1.9	2.0	2.3
Total Stops	703	745	778	737	750	749	804
Fuel Used (l)	43.4	45.1	47.7	44.9	45.6	46.5	48.2

Interval #1 Information Recording

Start Time	4:15
End Time	5:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	765	764	784	800
Vehs Exited	761	764	780	797
Starting Vehs	14	13	11	11
Ending Vehs	18	13	15	14
Travel Distance (km)	532	537	553	556
Travel Time (hr)	13.9	14.0	14.6	14.7
Total Delay (hr)	1.8	1.9	2.0	2.0
Total Stops	714	711	745	744
Fuel Used (l)	42.9	43.8	45.0	45.3

Intersection: 4: Carp Road & Rivington Street

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	9.7	0.8	14.1
Average Queue (m)	1.9	0.0	1.3
95th Queue (m)	7.9	0.8	7.6
Link Distance (m)	228.9	319.7	50.7
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Carp Road & Site Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (m)	11.4	17.8
Average Queue (m)	6.8	2.1
95th Queue (m)	13.3	10.0
Link Distance (m)	76.1	50.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Carp Road & Donald B. Munro Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	16.0	19.3	33.7	22.8
Average Queue (m)	4.1	5.5	16.4	9.4
95th Queue (m)	11.0	13.8	27.7	17.3
Link Distance (m)	196.5	333.3	136.7	210.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	12:00	12:00	12:00	12:00	12:00	12:00	12:00
End Time	1:15	1:15	1:15	1:15	1:15	1:15	1:15
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	1040	988	995	999	969	996	1051
Vehs Exited	1024	980	992	992	976	991	1047
Starting Vehs	11	14	20	16	24	15	20
Ending Vehs	27	22	23	23	17	20	24
Travel Distance (km)	749	714	711	723	697	710	759
Travel Time (hr)	20.4	19.1	19.3	19.6	18.9	19.8	20.9
Total Delay (hr)	3.8	3.4	3.5	3.5	3.4	4.0	4.0
Total Stops	1059	1008	1023	1019	989	1015	1068
Fuel Used (l)	62.3	59.1	59.9	60.3	58.0	59.9	63.5

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	12:00	12:00	12:00	12:00
End Time	1:15	1:15	1:15	1:15
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	1026	998	1065	1014
Vehs Exited	1018	989	1062	1007
Starting Vehs	18	18	19	16
Ending Vehs	26	27	22	21
Travel Distance (km)	730	715	768	728
Travel Time (hr)	20.2	19.2	21.3	19.9
Total Delay (hr)	3.9	3.4	4.2	3.7
Total Stops	1060	1014	1090	1036
Fuel Used (l)	61.5	59.8	63.9	60.8

Interval #0 Information Seeding

Start Time	12:00
End Time	12:15
Total Time (min)	15

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	12:15
End Time	1:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	1040	988	995	999	969	996	1051
Vehs Exited	1024	980	992	992	976	991	1047
Starting Vehs	11	14	20	16	24	15	20
Ending Vehs	27	22	23	23	17	20	24
Travel Distance (km)	749	714	711	723	697	710	759
Travel Time (hr)	20.4	19.1	19.3	19.6	18.9	19.8	20.9
Total Delay (hr)	3.8	3.4	3.5	3.5	3.4	4.0	4.0
Total Stops	1059	1008	1023	1019	989	1015	1068
Fuel Used (l)	62.3	59.1	59.9	60.3	58.0	59.9	63.5

Interval #1 Information Recording

Start Time	12:15
End Time	1:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	1026	998	1065	1014
Vehs Exited	1018	989	1062	1007
Starting Vehs	18	18	19	16
Ending Vehs	26	27	22	21
Travel Distance (km)	730	715	768	728
Travel Time (hr)	20.2	19.2	21.3	19.9
Total Delay (hr)	3.9	3.4	4.2	3.7
Total Stops	1060	1014	1090	1036
Fuel Used (l)	61.5	59.8	63.9	60.8

Intersection: 4: Carp Road & Rivington Street

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	9.8	0.9	7.7
Average Queue (m)	3.3	0.0	0.3
95th Queue (m)	10.4	0.8	3.6
Link Distance (m)	228.9	319.7	50.7
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Carp Road & Site Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (m)	17.9	21.1
Average Queue (m)	8.1	3.0
95th Queue (m)	15.3	12.7
Link Distance (m)	76.1	50.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Carp Road & Donald B. Munro Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	16.5	21.8	48.3	44.4
Average Queue (m)	4.3	7.8	21.0	19.1
95th Queue (m)	11.6	17.6	37.2	34.1
Link Distance (m)	196.5	333.3	136.7	210.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

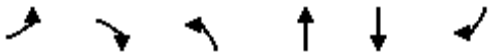
Network Summary

Network wide Queuing Penalty: 0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	1	170	4	0	218
Future Volume (Veh/h)	11	1	170	4	0	218
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	11	1	170	4	0	218
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	390	172			174	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	390	172			174	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	614	872			1403	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	12	174	218
Volume Left	11	0	0
Volume Right	1	4	0
cSH	629	1700	1403
Volume to Capacity	0.02	0.10	0.00
Queue Length 95th (m)	0.4	0.0	0.0
Control Delay (s)	10.8	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.8	0.0	0.0
Approach LOS	B		

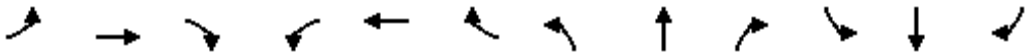
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	22.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	11	8	163	207	9
Future Volume (Veh/h)	12	11	8	163	207	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	12	11	8	163	207	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	390	212	216			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	390	212	216			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	99			
cM capacity (veh/h)	610	829	1354			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	23	171	216
Volume Left	12	8	0
Volume Right	11	0	9
cSH	698	1354	1700
Volume to Capacity	0.03	0.01	0.13
Queue Length 95th (m)	0.7	0.1	0.0
Control Delay (s)	10.3	0.4	0.0
Lane LOS	B	A	
Approach Delay (s)	10.3	0.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	25.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	17	24	76	11	19	26	61	106	32	118	3
Future Volume (vph)	1	17	24	76	11	19	26	61	106	32	118	3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	17	24	76	11	19	26	61	106	32	118	3

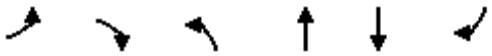
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	42	106	193	153
Volume Left (vph)	1	76	26	32
Volume Right (vph)	24	19	106	3
Hadj (s)	-0.15	0.17	-0.17	0.08
Departure Headway (s)	4.7	4.9	4.3	4.6
Degree Utilization, x	0.05	0.14	0.23	0.19
Capacity (veh/h)	698	678	803	748
Control Delay (s)	8.0	8.7	8.6	8.7
Approach Delay (s)	8.0	8.7	8.6	8.7
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.6			
Level of Service	A			
Intersection Capacity Utilization	33.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	4	336	15	7	236
Future Volume (Veh/h)	4	4	336	15	7	236
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	4	4	336	15	7	236
Pedestrians						1
Lane Width (m)						3.6
Walking Speed (m/s)						1.0
Percent Blockage						0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	594	344			351	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	594	344			351	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	465	698			1208	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	8	351	243
Volume Left	4	0	7
Volume Right	4	15	0
cSH	558	1700	1208
Volume to Capacity	0.01	0.21	0.01
Queue Length 95th (m)	0.3	0.0	0.1
Control Delay (s)	11.5	0.0	0.3
Lane LOS	B		A
Approach Delay (s)	11.5	0.0	0.3
Approach LOS	B		

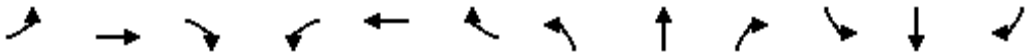
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	30.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	23	19	21	320	224	23
Future Volume (Veh/h)	23	19	21	320	224	23
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	23	19	21	320	224	23
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	598	236	247			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	598	236	247			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	98	98			
cM capacity (veh/h)	458	804	1319			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	42	341	247
Volume Left	23	21	0
Volume Right	19	0	23
cSH	569	1319	1700
Volume to Capacity	0.07	0.02	0.15
Queue Length 95th (m)	1.7	0.3	0.0
Control Delay (s)	11.8	0.6	0.0
Lane LOS	B	A	
Approach Delay (s)	11.8	0.6	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	13	40	54	63	56	38	68	188	81	26	83	5
Future Volume (vph)	13	40	54	63	56	38	68	188	81	26	83	5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	13	40	54	63	56	38	68	188	81	26	83	5

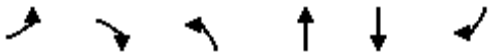
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	107	157	337	114
Volume Left (vph)	13	63	68	26
Volume Right (vph)	54	38	81	5
Hadj (s)	-0.24	-0.03	-0.07	0.08
Departure Headway (s)	5.0	5.1	4.7	5.1
Degree Utilization, x	0.15	0.22	0.44	0.16
Capacity (veh/h)	642	637	735	647
Control Delay (s)	8.9	9.6	11.3	9.1
Approach Delay (s)	8.9	9.6	11.3	9.1
Approach LOS	A	A	B	A

Intersection Summary				
Delay	10.2			
Level of Service	B			
Intersection Capacity Utilization	47.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	5	362	5	3	388
Future Volume (Veh/h)	9	5	362	5	3	388
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	5	362	5	3	388
Pedestrians	1					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	760	366			368	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	760	366			368	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	373	679			1189	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	14	367	391
Volume Left	9	0	3
Volume Right	5	5	0
cSH	444	1700	1189
Volume to Capacity	0.03	0.22	0.00
Queue Length 95th (m)	0.7	0.0	0.1
Control Delay (s)	13.4	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	13.4	0.0	0.1
Approach LOS	B		

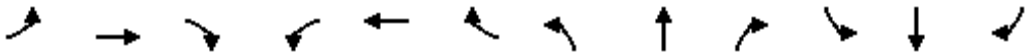
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	27	22	24	344	369	30
Future Volume (Veh/h)	27	22	24	344	369	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	27	22	24	344	369	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	776	384	399			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	776	384	399			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	97	98			
cM capacity (veh/h)	358	664	1160			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	49	368	399
Volume Left	27	24	0
Volume Right	22	0	30
cSH	452	1160	1700
Volume to Capacity	0.11	0.02	0.23
Queue Length 95th (m)	2.5	0.4	0.0
Control Delay (s)	13.9	0.7	0.0
Lane LOS	B	A	
Approach Delay (s)	13.9	0.7	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	32	44	78	45	66	33	284	58	51	283	1
Future Volume (vph)	11	32	44	78	45	66	33	284	58	51	283	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	11	32	44	78	45	66	33	284	58	51	283	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	87	189	375	335
Volume Left (vph)	11	78	33	51
Volume Right (vph)	44	66	58	1
Hadj (s)	-0.21	-0.08	-0.03	0.06
Departure Headway (s)	6.0	5.9	5.2	5.4
Degree Utilization, x	0.14	0.31	0.55	0.50
Capacity (veh/h)	497	544	649	634
Control Delay (s)	10.0	11.5	14.4	13.7
Approach Delay (s)	10.0	11.5	14.4	13.7
Approach LOS	B	B	B	B

Intersection Summary				
Delay		13.2		
Level of Service		B		
Intersection Capacity Utilization		54.6%	ICU Level of Service	A
Analysis Period (min)		15		

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	6:57	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	483	540	526	520	489	543	525
Vehs Exited	482	537	532	520	492	546	522
Starting Vehs	7	8	13	6	14	11	9
Ending Vehs	8	11	7	6	11	8	12
Travel Distance (km)	358	393	385	385	359	397	383
Travel Time (hr)	9.1	10.1	10.0	9.8	9.2	10.2	9.9
Total Delay (hr)	0.9	1.1	1.1	1.0	1.0	1.1	1.0
Total Stops	482	540	526	512	487	541	526
Fuel Used (l)	28.4	31.7	31.0	31.1	28.6	31.8	30.9

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	537	489	496	516
Vehs Exited	534	494	496	516
Starting Vehs	7	11	7	7
Ending Vehs	10	6	7	5
Travel Distance (km)	395	360	368	378
Travel Time (hr)	10.1	9.2	9.5	9.7
Total Delay (hr)	1.1	1.0	1.0	1.0
Total Stops	533	493	499	515
Fuel Used (l)	31.7	28.9	29.5	30.4

Interval #0 Information Seeding

Start Time	6:57
End Time	7:12
Total Time (min)	15

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	483	540	526	520	489	543	525
Vehs Exited	482	537	532	520	492	546	522
Starting Vehs	7	8	13	6	14	11	9
Ending Vehs	8	11	7	6	11	8	12
Travel Distance (km)	358	393	385	385	359	397	383
Travel Time (hr)	9.1	10.1	10.0	9.8	9.2	10.2	9.9
Total Delay (hr)	0.9	1.1	1.1	1.0	1.0	1.1	1.0
Total Stops	482	540	526	512	487	541	526
Fuel Used (l)	28.4	31.7	31.0	31.1	28.6	31.8	30.9

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	537	489	496	516
Vehs Exited	534	494	496	516
Starting Vehs	7	11	7	7
Ending Vehs	10	6	7	5
Travel Distance (km)	395	360	368	378
Travel Time (hr)	10.1	9.2	9.5	9.7
Total Delay (hr)	1.1	1.0	1.0	1.0
Total Stops	533	493	499	515
Fuel Used (l)	31.7	28.9	29.5	30.4

Intersection: 4: Carp Road & Rivington Street

Movement	WB
Directions Served	LR
Maximum Queue (m)	9.1
Average Queue (m)	2.7
95th Queue (m)	9.3
Link Distance (m)	228.9
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Carp Road & Site Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (m)	10.2	9.8
Average Queue (m)	4.9	0.5
95th Queue (m)	12.0	4.7
Link Distance (m)	76.1	50.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Carp Road & Donald B. Munro Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	11.7	17.6	27.0	20.5
Average Queue (m)	2.2	4.0	12.1	9.3
95th Queue (m)	7.1	11.8	21.1	16.1
Link Distance (m)	196.5	333.3	136.7	210.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	4:00	4:00	4:00	4:00	4:00	4:00	4:00
End Time	5:15	5:15	5:15	5:15	5:15	5:15	5:15
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	823	825	813	821	801	852	848
Vehs Exited	826	825	812	825	803	851	848
Starting Vehs	22	10	16	17	16	13	14
Ending Vehs	19	10	17	13	14	14	14
Travel Distance (km)	572	581	561	572	556	598	591
Travel Time (hr)	15.2	15.4	14.8	15.0	14.8	15.9	15.5
Total Delay (hr)	2.1	2.1	2.1	1.9	2.2	2.3	2.1
Total Stops	785	780	763	775	746	792	786
Fuel Used (l)	46.3	47.2	46.1	46.5	45.1	48.2	48.2

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	4:00	4:00	4:00	4:00
End Time	5:15	5:15	5:15	5:15
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	798	805	884	827
Vehs Exited	804	812	874	828
Starting Vehs	17	18	10	14
Ending Vehs	11	11	20	12
Travel Distance (km)	561	565	624	578
Travel Time (hr)	14.8	15.0	16.5	15.3
Total Delay (hr)	2.1	2.1	2.4	2.1
Total Stops	749	760	822	777
Fuel Used (l)	45.7	46.0	50.5	47.0

Interval #0 Information Seeding

Start Time	4:00
End Time	4:15
Total Time (min)	15

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	4:15
End Time	5:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	823	825	813	821	801	852	848
Vehs Exited	826	825	812	825	803	851	848
Starting Vehs	22	10	16	17	16	13	14
Ending Vehs	19	10	17	13	14	14	14
Travel Distance (km)	572	581	561	572	556	598	591
Travel Time (hr)	15.2	15.4	14.8	15.0	14.8	15.9	15.5
Total Delay (hr)	2.1	2.1	2.1	1.9	2.2	2.3	2.1
Total Stops	785	780	763	775	746	792	786
Fuel Used (l)	46.3	47.2	46.1	46.5	45.1	48.2	48.2

Interval #1 Information Recording

Start Time	4:15
End Time	5:15
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	798	805	884	827
Vehs Exited	804	812	874	828
Starting Vehs	17	18	10	14
Ending Vehs	11	11	20	12
Travel Distance (km)	561	565	624	578
Travel Time (hr)	14.8	15.0	16.5	15.3
Total Delay (hr)	2.1	2.1	2.4	2.1
Total Stops	749	760	822	777
Fuel Used (l)	45.7	46.0	50.5	47.0

Intersection: 4: Carp Road & Rivington Street

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	9.7	1.8	8.0
Average Queue (m)	2.3	0.1	0.6
95th Queue (m)	8.6	1.3	4.6
Link Distance (m)	228.9	319.7	50.7
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Carp Road & Site Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (m)	16.6	16.5
Average Queue (m)	7.3	1.6
95th Queue (m)	14.1	9.0
Link Distance (m)	76.1	50.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Carp Road & Donald B. Munro Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	14.9	16.8	35.2	22.5
Average Queue (m)	4.1	5.2	16.9	9.4
95th Queue (m)	10.8	13.1	27.8	17.2
Link Distance (m)	196.5	333.3	136.7	210.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	6:57	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	1008	1069	1027	966	1048	1072	1074
Vehs Exited	1005	1069	1025	965	1044	1070	1073
Starting Vehs	20	20	16	23	13	15	18
Ending Vehs	23	20	18	24	17	17	19
Travel Distance (km)	722	775	743	700	758	778	763
Travel Time (hr)	19.7	21.8	20.1	18.9	20.9	21.1	21.3
Total Delay (hr)	3.7	4.7	3.7	3.3	4.0	3.9	4.4
Total Stops	1029	1094	1032	988	1056	1102	1104
Fuel Used (l)	60.1	64.9	62.0	58.0	63.5	64.9	64.7

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	8:12	8:12	8:12	8:12
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	1053	1006	1042	1036
Vehs Exited	1058	995	1033	1034
Starting Vehs	28	11	16	14
Ending Vehs	23	22	25	20
Travel Distance (km)	767	725	746	748
Travel Time (hr)	21.7	19.5	20.1	20.5
Total Delay (hr)	4.7	3.5	3.6	4.0
Total Stops	1073	1004	1047	1053
Fuel Used (l)	64.7	60.4	61.8	62.5

Interval #0 Information Seeding

Start Time	6:57
End Time	7:12
Total Time (min)	15

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	1008	1069	1027	966	1048	1072	1074
Vehs Exited	1005	1069	1025	965	1044	1070	1073
Starting Vehs	20	20	16	23	13	15	18
Ending Vehs	23	20	18	24	17	17	19
Travel Distance (km)	722	775	743	700	758	778	763
Travel Time (hr)	19.7	21.8	20.1	18.9	20.9	21.1	21.3
Total Delay (hr)	3.7	4.7	3.7	3.3	4.0	3.9	4.4
Total Stops	1029	1094	1032	988	1056	1102	1104
Fuel Used (l)	60.1	64.9	62.0	58.0	63.5	64.9	64.7

Interval #1 Information Recording

Start Time	7:12
End Time	8:12
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	1053	1006	1042	1036
Vehs Exited	1058	995	1033	1034
Starting Vehs	28	11	16	14
Ending Vehs	23	22	25	20
Travel Distance (km)	767	725	746	748
Travel Time (hr)	21.7	19.5	20.1	20.5
Total Delay (hr)	4.7	3.5	3.6	4.0
Total Stops	1073	1004	1047	1053
Fuel Used (l)	64.7	60.4	61.8	62.5

Intersection: 4: Carp Road & Rivington Street

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	11.0	2.4
Average Queue (m)	3.1	0.1
95th Queue (m)	10.2	2.2
Link Distance (m)	228.9	50.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Carp Road & Site Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (m)	17.9	19.0
Average Queue (m)	7.7	2.8
95th Queue (m)	15.5	11.7
Link Distance (m)	76.1	50.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Carp Road & Donald B. Munro Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	19.2	25.0	51.5	45.9
Average Queue (m)	4.4	8.0	21.8	20.1
95th Queue (m)	12.8	18.6	40.3	35.7
Link Distance (m)	196.5	333.3	136.7	210.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

APPENDIX L

MTO Left Turn Lane Warrants

2032 Total Traffic

Exhibit 9A-7