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Revision: 00

March 9, 2026

Transportation Impact Assessment (Brief)

6250 Hazeldean Road

J.L.Richards
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Certification Form for TIA Study PM

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

- ☑ 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;
- ☑ 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;
- ☑ 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
- ☑ I am either a licensed[1] or registered[2] professional in good standing, whose field of expertise.
  - ☑ 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

Dated at Ottawa (City) this 23 day of May, 2023.

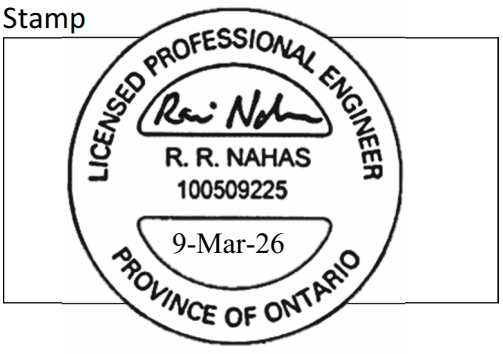
Name: Rani Nahas, P.Eng.
(Please Print)

Professional Title: Transportation Engineer

Signature of Individual certifier that she meets the above four criteria.

Office Contact Information (Please Print)	
Address:	343 Preston Street, Suite 1000
City / Postal Code:	Ottawa, ON K1S 1N4
Telephone / Extension:	613 728-3571
E-Mail Address:	rnahas@jlrichards.ca

Stamp



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1.0 Introduction

J.L. Richards & Associates Limited (JLR) has been retained by Q9 Planning & Design on behalf of Suncor Energy to undertake a Transportation Impact Assessment in support of a Minor Zoning By-law Amendment (ZBLA) and Site Plan Control (SPC) application for a proposed commercial development to be located at 6250 Hazeldean Road in the Stittsville neighbourhood of Ottawa.

The following study has been prepared in accordance with the City of Ottawa's Transportation Impact Assessment (TIA) Guidelines (as revised in June 2023). Through this process, a total of three separate submissions are required for City review/approval. Each submission comprises a portion of the study, resulting in the submission of a complete TIA report in support of the above noted development application(s). The required submissions are as follows:

- *Step 1 – Screening & Scoping*
- *Step 2 – Analysis*
- *Step 3 – TIA Submission* (i.e., Findings and Recommendations)

2.0 Screening

An initial screening was completed to confirm the need for a Transportation Impact Assessment by reviewing the following three triggers:

✓ **Trip Generation**: Based on the magnitude of the proposed development, the minimum development size threshold has been exceeded and therefore the Trip Generation trigger is satisfied.

✗ **Location**: The subject site does not propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Cross-Town Bikeways. It is not located a Design Priority Area (DPA), Transit-oriented Development (TOD) zone or Hub.

✓ **Safety**: Boundary street conditions were reviewed to determine if there is an elevated potential for safety concerns adjacent the site. Given the horizontal curve of Carp Road, proximity of one of the proposed accesses to the Hazeldean/Carp intersection, and the inclusion of a drive-through facility there may be a potential for safety concerns and therefore the Safety trigger is satisfied.

As the proposed development meets the Trip Generation and Safety triggers, the need to undertake a Transportation Impact Assessment is confirmed.

A copy of the Screening Form is provided in **Appendix A**.

3.0 Scoping

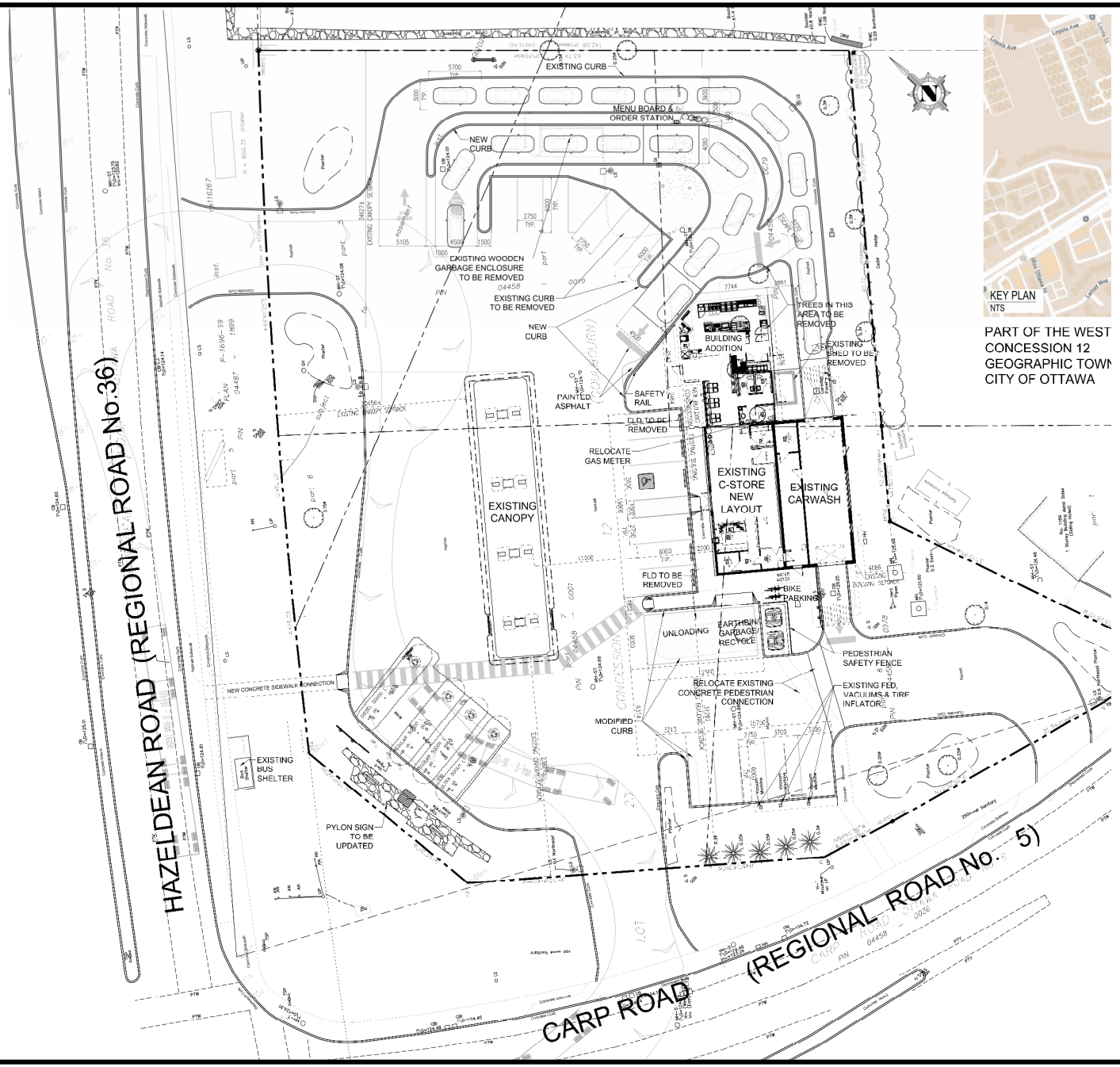
3.1 Proposed Development

Suncor Energy is seeking City approval for the redevelopment of an existing service station located at 6250 Hazeldean Road. Currently, a gas station, car wash, and convenience store (240 square meters, 8 vehicle fueling positions) exists at this site.

The planned configuration of the site retains the existing site layout, however, will include a fast-food restaurant with a drive-through (KFC Restaurant) with indoor seating. As the existing car wash will remain, the drive-through queuing lane associated with it will be re-routed to accommodate the proposed restaurant drive-through lane. The overall parking supply will increase slightly from 11 to 15 spaces. Access to the proposed redeveloped site will be maintained through the three existing private approaches: one right-in/right-out driveway on Carp Road, one left-in/right-out driveway on Carp Road, and one full movement access to Hazeldean Road. It is important to note that the full-movement access on Hazeldean Road currently features a depressed median. This configuration may be reviewed as part of the ongoing re-design of the Carp/Hazeldean intersection by the City. The subject site is currently zoned as Arterial Mainstreet AM9 and is located in the southeast quadrant of the Hazeldean Road & Carp Road intersection. The subject development will be constructed in a single phase, with an estimated build-out year of 2027.

The local context surrounding the subject development site is depicted in the following **Figure 1**, and the proposed Site Plan is depicted in the subsequent **Figure 2**.

Figure 1: Transportation Context Area



J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

J.L. Richards
& Associates Limited
343 Preston Street, Suite 1000
Ottawa, Ontario
K1S 1N4
Tel: 613 728 3571
Fax: 613 728 6012

Figure 2: Proposed Development

3.2 Existing Conditions

3.2.1 Area Road Network

All major and relevant local roads, within the context area of the site are outlined in **Figure 1** above and described as follows:

Hazeldean Road is an east-west arterial roadway (i.e., two travel lanes per direction) that extends from Spruce Ridge Road in the west to Eagleson Road in the east, where it continues as Robertson Road. Generally, the roadway has a 4-lane cross section (two travel lanes in each direction), however west of Carp Road, has a 2-lane cross-section (one travel lane per direction). Within the vicinity of the subject development site, the posted speed limit is 60 km/h. Hazeldean Road is a designated truck route for full loads.

Carp Road is a two-lane north-south arterial roadway (i.e., one travel lane per direction). It extends from Galetta Side Road in the north to Stittsville Main Street in the south. The posted speed limit is 60 km/h. Carp Road is a designated truck route for full loads.

Stittsville Main Street is a two-lane north-south roadway (i.e., one travel lane per direction). North of Hazeldean Road it is classified as a collector roadway and south of Hazeldean Road it is classified as an arterial roadway. It extends from Tony George Place in the north to Flewellyn Road in the south. The posted speed limit is 50 km/h south of Hazeldean Road and 40 km/h north of Hazeldean Road. Stittsville Main Street is a designated truck route for full loads south of Hazeldean Road only.

Kittiwake Drive / Echo Woods Avenue is a two-lane collector roadway (i.e., one travel lane per direction). Kittiwake Drive extends from Hazeldean Road in the southwest where it travels north and turns eastward to Carp Road. At Carp Road, it continues as Echo Woods Drive to Lloydalex Crescent where it continues as Kimpton Drive. The posted speed limit is 40 km/h. On-street parking is permitted on the west side of the roadway. On-street parking regulations are not posted.

Hobin Street is an east-west two-lane collector roadway (i.e., one travel lane per direction). It extends from Carp Road in the north to Stittsville Main Street in the south. The posted speed limit is 40 km/h. On-street parking is not permitted.

3.2.2 Pedestrian / Cycling Network

Within the context area, pedestrian facilities are generally provided on both sides of arterial roadways (e.g., Hazeldean Road and Stittsville Main Street) with the exception of Carp Road which only has a sidewalk on the east side from Hazeldean to Stittsville Main. Sidewalks are absent from most local roads in the context area, while sidewalks are typically only provided on one side of collector roads, though there are some segments of collector roads without sidewalks on either side (e.g. Hobin Street).

With regard to cyclists within the context area, facilities provided include painted bike lanes and paved shoulders on Hazeldean Road and Carp Road. Additionally, there are several multi-use pathways (MUPs) connecting the broader neighbourhood bounded by Hazeldean Road, Carp Road, and Rothebourne.

Hazeldean Road and Carp Road are the main active transportation corridors through the context area, while Kittiwake Drive and Hobin Street are suggested cycling routes, despite them having no exclusive facilities. A map of the existing pedestrian/cycling network within the vicinity of the subject site, and how it connects to the greater network, is depicted in **Figure 3** below, as sourced from GeoOttawa.

Figure 3: Existing Pedestrian and Cycling Network

3.2.3 Transit Network

Table 1 provides information on the OC Transpo bus routes currently operating along the frontage the site. Transit stop locations nearest the site are shown in **Figure 4**.

Table 1: Existing Transit Routes

Route	Origin/Destination	Service Type	Peak Hour Peak Direction Headway AM Peak (PM Peak)
61	Tunney's Pasture ↔ N Rideau	Local	30 mins. (30 mins.)
163	Terry Fox ↔ Kittiwake	Local	30 mins. (30 mins.)

Figure 4: Transit Stop Locations

3.3 Planned Conditions

3.3.1 Study Area Transportation Network Changes

Active Transportation Projects

The 2025 Transportation Master Plan's Pedestrian Projects with Prioritization (Map C1) indicates sidewalks will be constructed along Hobin Street between Carp Road to Crossing Bridge Park within the First Phase (completion within the next 7 to 10 years). No other pedestrian or cycling projects are identified within the context area.

Transit Projects

The 2025 Transportation Master Plan's Needs-Based and Priority Transit Network maps (Maps A1 and A2) indicate that there are no future transit projects identified adjacent to the proposed development.

Road Projects

The Transportation Master Plan's Needs-Based and Priority Road network maps (Maps B1 and B2) indicate the following projects located in proximity to the proposed development:

Carp Road Widening

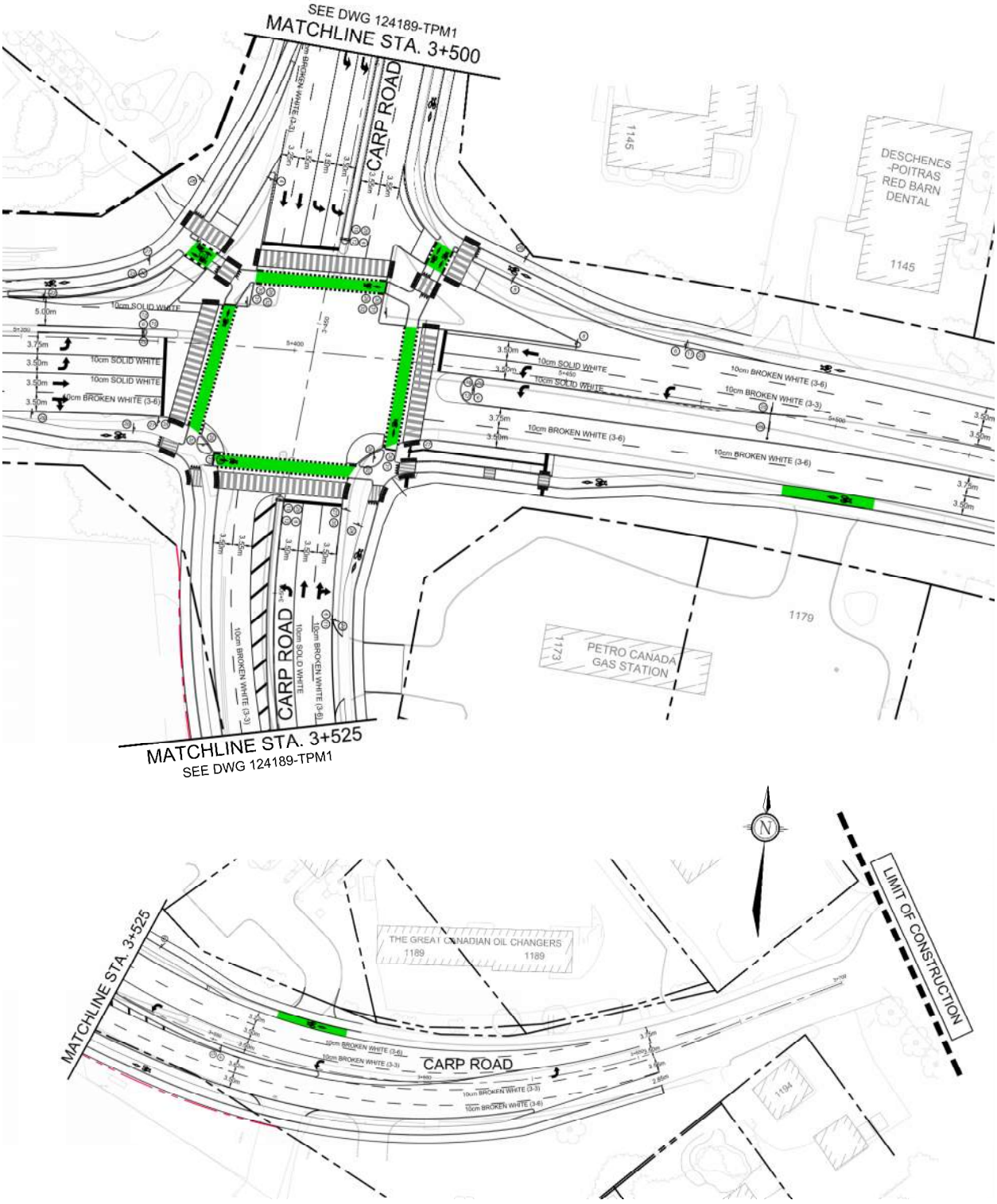
Carp Road is scheduled for widening from Highway 417 to Hazeldean Road as part of the Needs-Based and Priority Road Network initiatives. The Carp and Hazeldean intersection is currently undergoing a preliminary design, with project completion targeted for 2027. This project is also referenced in the 2024 City-Wide and Area-Specific Development Charges Background Study.

Based on the preliminary design (dated March 2026), improvements at the Carp/Hazeldean intersection include:

- Dual southbound through lanes
- Dual eastbound left-turn lanes
- Dual southbound left-turn lanes
- Cross-rides on all legs of the intersection

It is noted that the existing median and left-turn lane into the southernmost Carp Road access and depressed median on the east leg of the intersection is contemplated to be removed by the City. These design changes restrict all traffic originating in the east from entering the site, resulting in patrons needing to complete a u-turn at the intersection to enter the proposed development. The current proposed intersection modifications are illustrated in **Figure 5** below.

Figure 5: Hazeldean/Carp Proposed Intersection Changes



Hazeldean Road Urbanization

The urbanization of Hazeldean Road west of Carp Road is identified within the Priority Road Network as part of Phase 2 – Urbanization Projects. This will include new pedestrian and cyclist facilities on the south side of the roadway and improvements to the existing active mode facilities on the north side of the roadway. There is no planned construction date at this time.

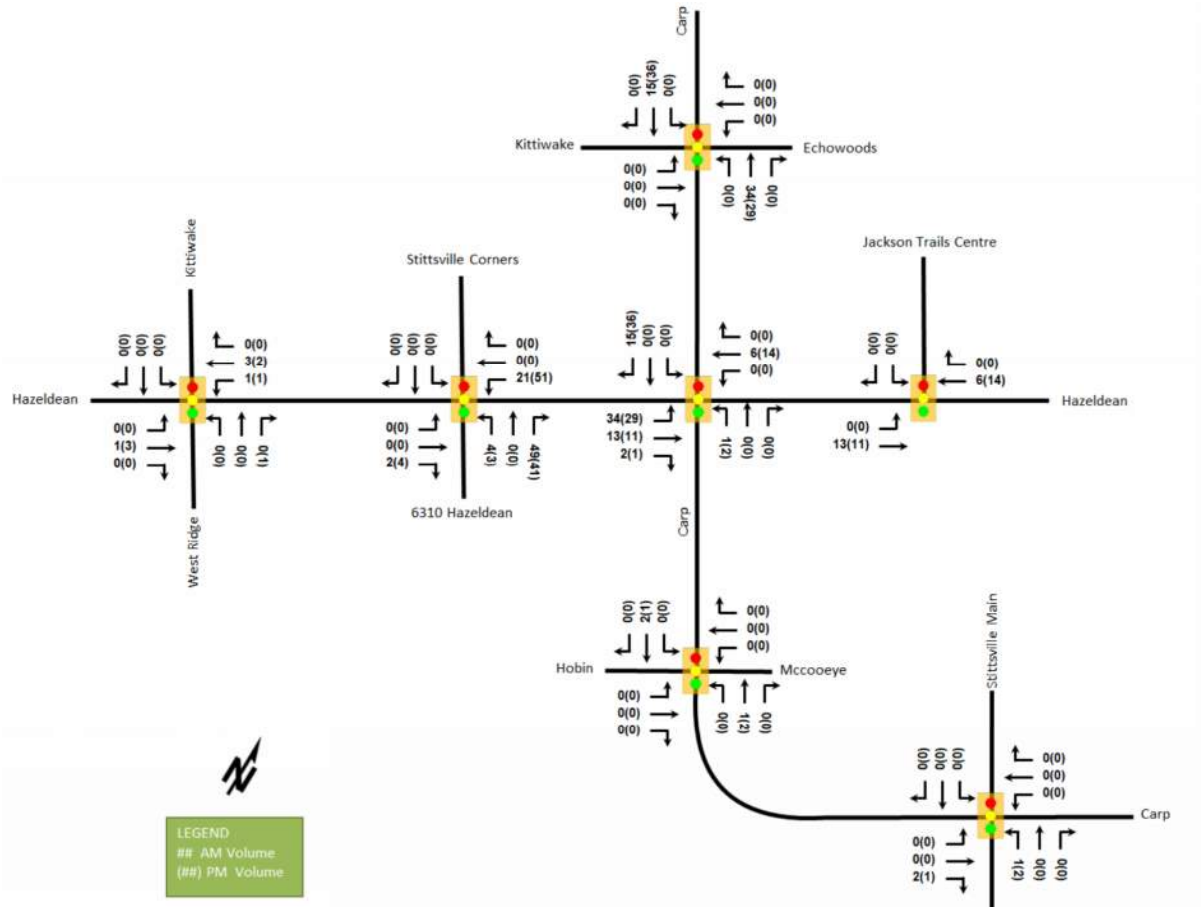
3.3.2 Other Area Development

Based on the City's online Development Application site, there is currently only one planned development within the context area, as follows.

6310 Hazeldean Road

The TIA Strategy Report prepared by CGH in 2024 outlines a proposed redevelopment at the above noted address. The new development consists of two residential apartment buildings comprising a total of 456 units. The anticipated build-out is 2027 with construction expected to be completed in a single phase. Approximately 185 new person-trips are expected during the weekday the peak hours. This translates to 75 and 99 new auto trips during the morning and afternoon peak hours, respectively. These are illustrated in the following **Figure 6**.

Figure 6: 6310 Hazeldean Site Generated Traffic



Source: 6310 Hazeldean Road Transportation Impact Assessment, CGH 2024

3.4 Analysis Periods

Traffic generation associated with the proposed land use is directly related to the traffic patterns of the adjacent streets. Given the proposed land-use and surrounding road network typically experience the heaviest volumes during the weekday morning and afternoon peak hours, these two periods will be considered in this study to isolate the net impact of the proposed development such that an appropriate mitigation strategy can be established.

3.5 Analysis Years

This study considers the following two analysis years:

- **2027** – Estimated full build-out of the subject development
- **2032** – 5-year horizon beyond full build-out, required under the City's TIA Guidelines

3.6 Study Area

With consideration of the information presented thus far, a study area bound by Hazeldean Road to the north and Carp Road to the west will provide a sufficient assessment of the development's impact on the adjacent transportation network. As the proposed development will generate a high proportion of pass-by traffic, the impacts are expected to be localized and thus the study will only include the Hazeldean/Carp intersection. This Study Area is further justified by the trip generation estimates provided in *Section 3.8 'Development Generated Traffic'*, below.

As a functional design exists for the Carp/Hazeldean intersection and along Carp Road and Hazeldean Road within the defined study area, neither and intersection-based or segment-based Multi-Modal Level of Service (MMLOS) evaluation is required for the site's boundary streets.

3.6.1 Study Area Intersections

Carp/Hazeldean

The Carp/Hazeldean intersection is a signalized four-legged intersection. The northbound approach consists of an auxiliary left-turn lane, a through lane and a shared through/right-turn lane. The southbound approach consists of a left-turn lane, a through lane, and a channelized right-turn lane. The eastbound approach consists of an auxiliary left-turn lane, a through lane, and a shared through/right-turn lane. The westbound approaches consist of an auxiliary left-turn lane, a through lane, and a channelized right-turn lane.

All movements are permitted at this intersection. Painted bike lanes are provided on all approaches. However, no advanced cyclist signal phasing is provided at the intersection, nor are there are provisions to facilitate single-stage left-turns by cyclists at the intersection, thereby requiring cyclists to dismount and walk.

3.6.2 Area Traffic Management

There are no notable traffic-calming measures within the context area with any relevance to the subject development.

3.6.3 Peak Hour Travel Demands

The following weekday morning and afternoon peak hour turning movement counts were obtained from the City of Ottawa:

- Carp/Hazeldean (September 19, 2024)

To ensure the volumes represent existing conditions, a growth rate of 1% has been applied to the eastbound and westbound through volumes, while a growth rate of 2.5% has been applied to the northbound and southbound through volumes at the Hazeldean/Carp intersection. This is in line with the previously approved TIA for the proposed development at 6310 Hazeldean Road. The following **Figure 7** depicts the observed weekday morning and afternoon peak hour vehicular volumes at study area intersection based on the raw data noted above and with consideration of an annual growth rate. **Figure 8** provides an estimate of existing pedestrian and cyclist volumes during the same peak hours. Detailed traffic volume data is provided as **Appendix B**.

Figure 7: Existing Peak Hour Traffic Volumes

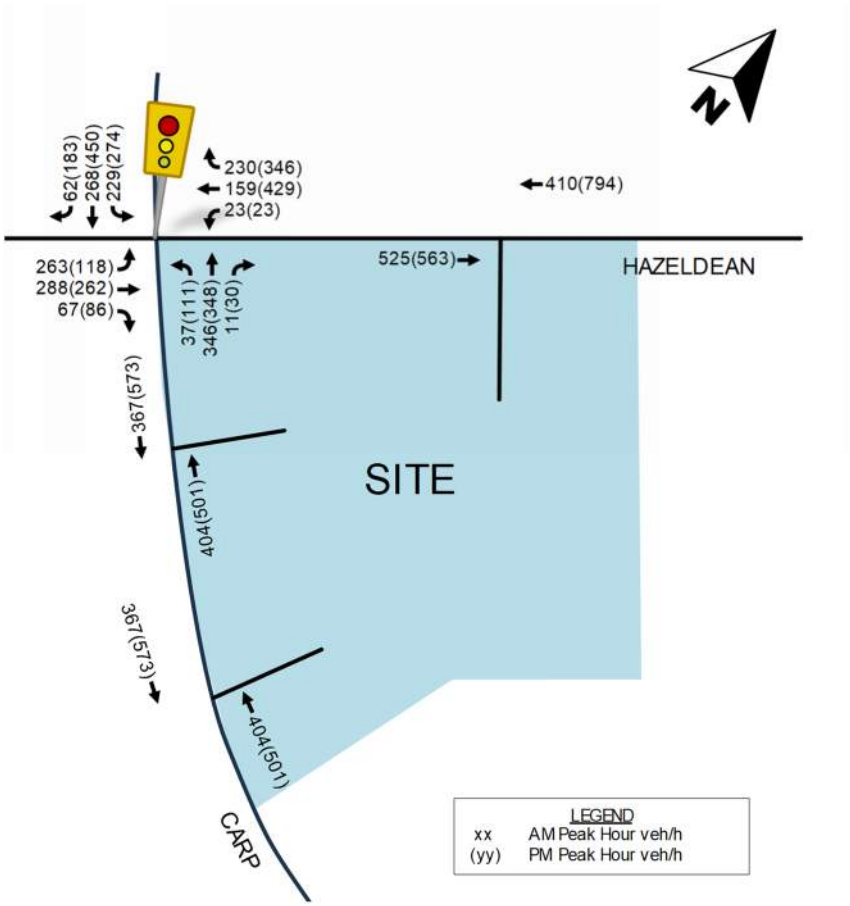
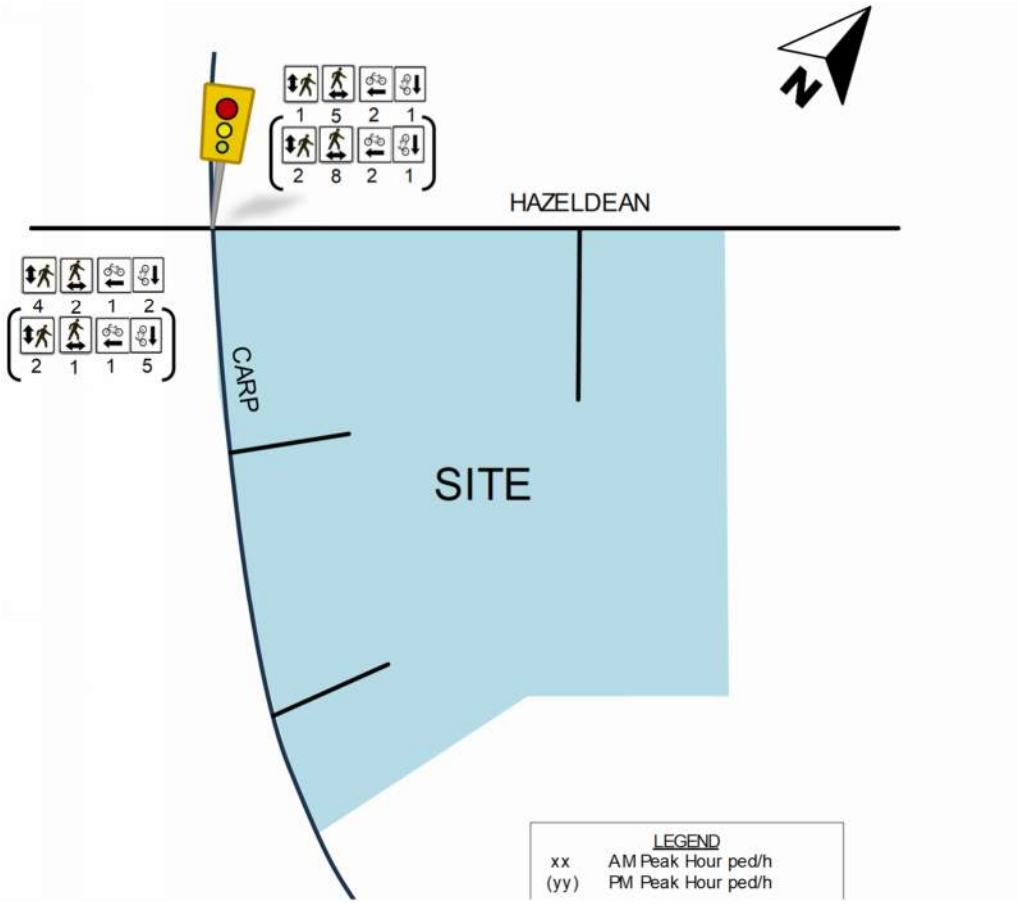


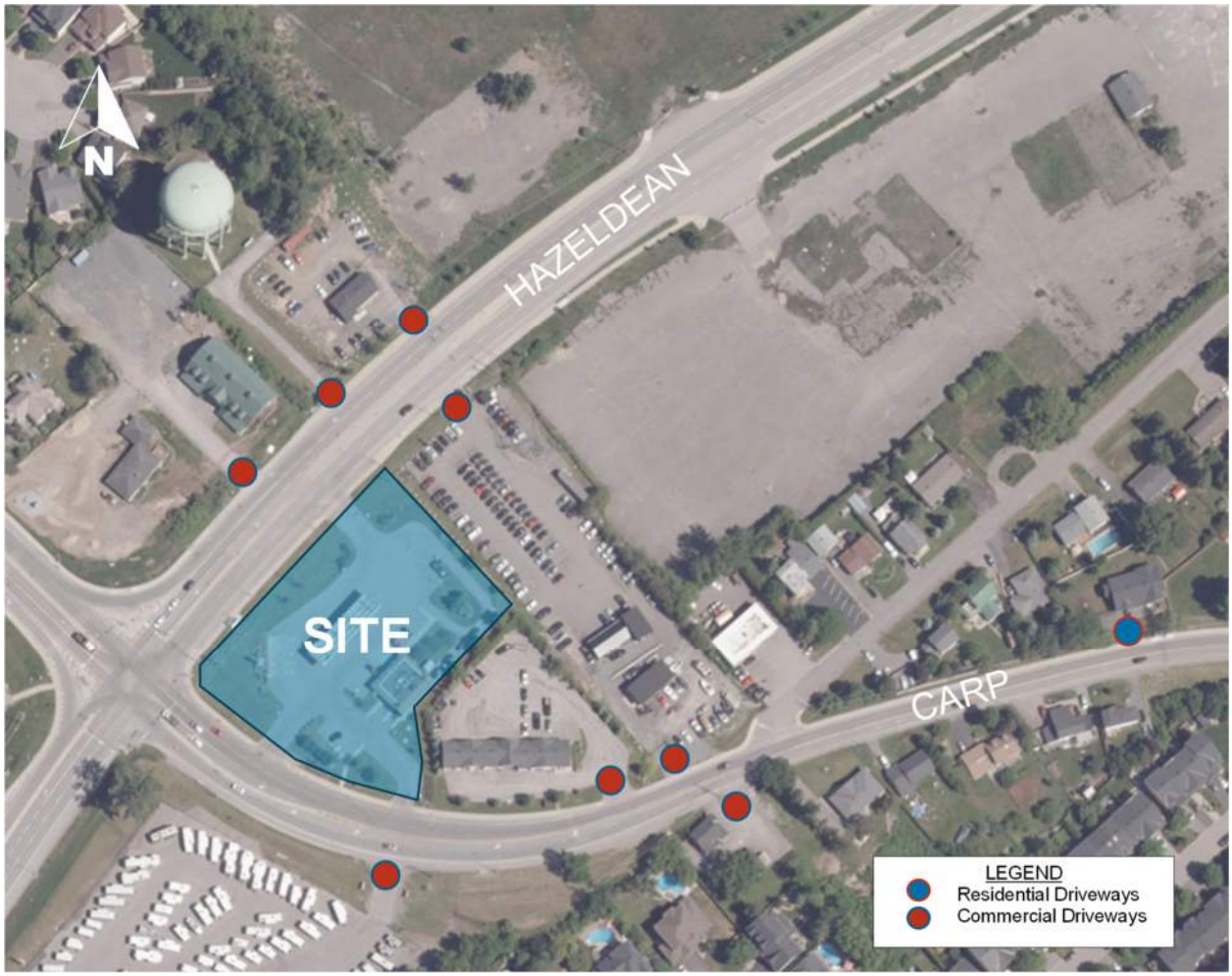
Figure 8: Existing Peak Hour Active Mode Volumes



3.6.4 Existing Driveways to Adjacent Development

As illustrated in **Figure 9**, there are five (5) driveway connections along Carp Road and four (4) driveway connections along Hazeldean Road within 200 metres of the site. The driveways adjacent to the subject development provide access/egress to mostly commercial developments. It is noted that the existing commercial access opposite on Carp Road is aligned with the existing access to the subject site (the southern most Carp Road access). The accesses on the opposing side of Hazeldean Road are offset by approximately 5 m to 15 m to the existing Hazeldean access. There are no known operational concerns with this configuration.

Figure 9: Adjacent Driveways



3.6.5 Existing Road Safety Conditions

The most recent collision history for the past five (5) years was obtained from the City (i.e., available reported collision data for the years 2019 to 2024, inclusive). It should be noted that the 2023 collision data is currently unavailable on the City's Open Data website. The collision data includes all collisions occurring at intersections and roadway segments within the study area.

Based on the most recent available historical collision data, the five-year total number of recorded collisions within the study area is 65 collisions. Most of the collisions within the study area resulted in property damage only (a total of 57 collisions, or 88%), non-fatal injuries (a total of 7 collisions, or 11%) and non-reportable collisions (a total of 1 collision, or 2%). The most frequent types of collisions, as cited by police, were rear-end (54%), turning movement (22%), and single moving vehicle (other) (11%) type collisions within the study area.

Figure 10 illustrates the location and year of collisions within the study area.

Figure 10: Collison Frequency

The source collision data is provided in **Appendix C**, and a more detail collision analysis will be included in the subsequent Analysis section of this report.

3.7 Demand Rationalization

The purpose of this section is to rationalize future travel demands within the study area to account for potential capacity limitations in the transportation network and its ability to effectively accommodate the additional demand generated by a new development. The results of the demand rationalization exercise will be used to inform the existing capacity constraints of the adjacent road network and define the site-generated trip characteristics for the proposed development.

3.7.1 Description of Capacity Issues

Table 2 below summarizes the existing traffic operational performance at the study area intersections based on the Existing (2025) Traffic volumes, presented previously in **Figure 7**.

Note: The intersection capacity analysis is based on locally specific parameters as described in the TIA Guidelines and incorporates existing signal timing plans obtained from the City of Ottawa.

As prescribed in the TIA Guidelines, a peak hour factor (PHF) of 0.90 has been considered in the analysis of existing conditions.

The Synchro output files have been provided in **Appendix D**.

Table 2: Intersection Capacity Analysis: Existing Traffic

Intersection	Traffic Control	AM Peak		PM Peak	
		Overall	Critical Movement	Overall	Critical Movement
1: Carp & Hazeldean	Signalized	A (0.47)	EBL (0.76)	D (0.89)	WBT (0.92)

As shown in **Table 2**, the study area intersection 'as a whole' operates with an LOS 'D' or better during the weekday peak hours. The only critical movement observed from the analysis is the westbound-through movement which operates at 92% of its theorical capacity during the weekday afternoon peak hour.

3.7.2 Adjustment to Background Network Demands

Under existing conditions, the analysis of observed (i.e., processed) volumes cannot result in a condition that exceeds an intersection's theoretical capacity (i.e., v/c > 1.0). In situations where projected traffic demand results in volumes that exceed capacity, it is expected that the traffic demand will either spread out over a greater period of time (i.e., peak spreading) or shift to alternatives modes of transportation such as transit. In the analysis of future conditions, a peak hour factor (PHF) of 1.0 is therefore utilized in accordance with the City of Ottawa TIA Guidelines.

3.7.3 Adjustment to Development Generated Demands

Given the nature of the proposed land use, it is less likely to be influenced by the proximity to transit, with the exception of travel to/from the site by employees, though this is expected to be insignificant. As there are limited routes available to access the site, the distribution of site-generated traffic is unlikely to change based on congested conditions on the adjacent road network. As such, no adjustments to development-generated demands have been considered in this analysis, though the assignment of new trips amongst the site's existing access driveways will consider the peak hour traffic conditions noted above.

3.8 Development Generated Traffic

3.8.1 Trip Generation

Site-generated traffic was estimated using appropriate trip generation rates from the 12th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual. As previously described, the Site Plan illustrates that the proposed redevelopment will include the construction of a 125 m^2 fast-food restaurant with a drive-through, attached to the existing convenience store. As the other components of the site already exist, only the net increase in trips associated with the fast-food restaurant will be reviewed.

Table 3 summarizes the appropriate trip generation rates for estimating the net increase of site-generated traffic.

Table 3: ITE Peak Hour Trip Generation Rates

Land Use	ITE Land Use Code	AM Peak Hour	PM Peak Hour
Fast Food Restaurant with Drive-Through Window	ITE 934 General Urban/Suburban Vehicle Trips	T_A = 33.24(X); T_F = n/a	T_A = 31.60(X); T_F = n/a

Notes: *T_A = Average Vehicle Trips*
T_F = Vehicle Trips by Fitted Curve
X = 1,000 ft² of Gross Floor Area (GFA)

With respect to ITE trip generation rates, the data used to develop these rates only include vehicle trips (i.e., walking, cycling and transit trips are not captured in this data). To properly consider the multi-modal trips generated by the proposed development, projected site-generated traffic (estimated using the ITE trip generation rates) must be converted to person-trips, which can then be subdivided by mode based on local travel characteristics of the specific area of the city, based on the 2022 TRANS Origin-Destination Study.

To convert projected ITE vehicle trips to person trips, an auto occupancy factor and non-auto trip factor is applied to the ITE trip generation rates. As noted in the City's TIA Guidelines, the assumed modal share of non-auto person trips is approximately 10% and the typical auto occupancy is 1.15. Therefore, when combined, a factor of 1.28 is used to convert vehicle trips to person trips.

It should also be noted that given trip generation rates are predominantly developed using standalone land uses, it can be expected that a mixed-use development will generate multi-purpose trips. For example, someone going to a gas station may also go to the fast-food restaurant on the same site (i.e., a single trip with multiple purposes). Given multi-purpose trips often do not require individuals to leave and return to a site (to visit two different land uses on the same site), a multi-purpose trip is observed as a single trip. In order to account for multi-purpose trips for mixed-use developments, a percent reduction is applied to the total projected site-generated trips. This approach mitigates "double counting" when using trip generation rates that are predominantly developed using standalone land uses. This is considered a standard industry practice. Given the proposed development is considered mixed-use, a 'multi-purpose' trip reduction of 13% was applied based on the NCHRP 684 Internal Trip Capture Estimation Tool to account for the internal trips between the retail and restaurant land uses. The output from the estimation tool is included in **Appendix E**.

Based on the foregoing, the projected weekday morning and afternoon peak hour person trip generation for the proposed development is summarized in **Table 4**.

Table 4: Modified Peak Period Person Trips

Land Use	Area / Units	AM Peak Hour (Person Trips/h)			PM Peak Hour (Person Trips/h)		
		In	Out	Total	In	Out	Total
Fast Food Restaurant with Drive-Through Window	125 m^2	29	29	58	28	27	55
Total Person Trips		29	29	58	28	27	55
13% Multi-Purpose Trip Reduction		-4	-4	-8	-4	-4	-8
Total Future Person Trips		**25**	**25**	**50**	**24**	**23**	**47**

As summarized in **Table 4**, the proposed development is projected to generate an approximate two-way total increase of 50 and 47 person trips/h during weekday morning and afternoon peak hours, respectively.

3.8.2 Travel Mode Shares

With respect to the TRANS Trip Generation Manual Summary Report (2020), the proposed development is located in the Kanata - Stittsville district and the AM/PM peak period modal splits within this district, reveal person trips are generally compromised of 80% auto drivers, 5% auto passengers, 5% transit and 10% non-motorized modes of travel. Based on these mode share values for each land uses, the projected site-generated person trips were subdivided into separate travel modes. The total trips for the net change are summarized in the **Table 5** below.

Given the nature of the proposed land uses, it should be noted that a percentage of the projected site-generated trips can be attributed to 'pass-by' traffic (i.e., a quick diversion to/from the subject development on someone's otherwise, normal daily commute). This additional 'pass-by' traffic does not impact overall network capacity, as this traffic already exists and is using the adjacent transportation network; however, 'pass-by' trips do impact the performance of turning movements at intersections within close proximity to the proposed development, typically where development site access/egress is provided. As such, 50% of projected site-generated traffic generated by the subject development is estimated to be comprised of 'pass-by' trips for the proposed fast-food restaurant based on rates outlined in the Trip Generation Handbook 3rd Edition.

Table 5: Total Projected Site Generated Trips – Net Change

Travel Mode	AM Peak Hour (Person Trips/h)			PM Peak Hour (Person Trips/h)		
	In	Out	Total	In	Out	Total
Auto Driver	20	20	40	20	19	39
Auto Passenger	2	2	4	1	1	2
Transit	1	1	2	1	1	2
Non-motorized	2	2	4	2	2	4
Total Person Trips	25	25	50	24	23	47
Less Pass-by (50%)	-10	-10	-20	-10	-10	-20
Total Net Change Vehicle Trips	**10**	**10**	**20**	**10**	**9**	**19**

As shown in **Table 5,** the net change in vehicle trips illustrates an increase in two-way vehicle volumes of approximately 20 veh/h during the weekday morning and afternoon peak hours, respectively. Note that this vehicle trip increase is equal to one new vehicle entering/existing site approximately every 3 minutes, which is considered negligible. As such, no further trip assignment or distribution is necessary.

With regard to active modes, the proposed development is projected to generate approximately 4 additional two-way person trips during both weekday morning and afternoon peak hours. Transit trips are projected to increase by 2 person-trips, during the weekday morning and afternoon peak hours.

3.9 Exemptions Review

Given the size and nature of the proposed subject development, **Table 6** outlines which elements identified in the 2017 Transportation Impact Assessment Guidelines that can be exempt from this analysis.

Table 6: Module Exemption Review

Module	Element	Exemption Criteria	Exemption Status
Design Review			
4.1 Development Design	4.1.2 Circulation and Access	Required for Site Plans	***Required***
	4.1.3 New Street Network	Required for Plans of Subdivisions	Exempt
Network Impact			
4.6 Neighborhood Traffic Management	4.6.1 Adjacent Neighborhoods	Required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Exempt
4.7 Transit	4.7.1 Transit Route Capacity	Required when projected site new site transit trips are greater than 75	Exempt
	4.7.2 Transit Priority Requirements	Required when projected site new site auto trips are greater than 75	Exempt
4.8 Network Concept	All Elements	Required when development is projected to generate more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by established zoning	Exempt
4.9 Intersection Design	All Elements	Required when projected site new site auto trips are greater than 75	Exempt

4.0 Analysis

4.1 Background Network Travel Demands

Based on the projected vehicle trip generation outlined in **Section 3.8**, the effect of the proposed development on the surrounding transportation network is considered negligible. As such, the Background Network Travel Demands Section is exempt.

4.2 Traffic Volume Summary

Based on the projected vehicle trip generation outlined in **Section 3.8**, the effect of the proposed development on the surrounding transportation network is considered negligible. As such, the Traffic Volume Summary is exempt.

4.3 Development Design

4.3.1 Design for Sustainable Modes

The pedestrian network within the vicinity of the subject site is currently comprised of concrete sidewalks along both sides of Hazeldean Road and the east side of Carp Road (the site's frontage). Within the site, there are pedestrian connections provided to both Hazeldean Road and Carp Road; the former - a painted zebra crosswalk and new concrete sidewalk connection, and the latter - a concrete pedestrian pathway. This internal pedestrian network allows for a designated route for connectivity to nearby transit stops located on both Hazeldean Road and Carp Road.

With respect to the City's TIA Guidelines, design for these facilities is in accordance with the *TDM – Supportive Development Design and Infrastructure*. This TDM checklist is provided in **Appendix F** and is further discussed in **Section 4.5**.

4.3.2 Circulation and Access

The three existing site accesses are expected to remain with no geometric changes: one right-in/right-out driveway on Carp Road, one left-in/right-out driveway on Carp Road, and one full movement access to Hazeldean Road. It is noted that preliminary design for the Hazeldean/Carp intersection result in the closure of the medium break on the east leg of the Hazeldean/Carp intersection and the median extension on the south leg resulting in the removal of the southbound left-turn lane on Carp Road into site. This results in restricting the Hazeldean access driveway and south Carp access driveway to right-in/right-out only movements. Vehicles completing the left-out movement at the Hazeldean access will then be redirected to the Carp Road accesses to egress the site. Vehicles wishing to enter the site from the east would need to complete a westbound u-turn at the intersection.

Currently, fuel trucks enter from the west and access the site via Hazeldean Road and exit the site from the northern Carp Road access and head north. This swept path is illustrated on the site plan in **Figure 2**.

Regarding on-site drive-thru lanes, the existing car wash drive-thru lane provides storage for more than 11 vehicles, exceeding the minimum requirement outlined in the Zoning By-Law. The fast-food restaurant drive-thru lane will run parallel to the carwash drive-thru lane and provides storage for only 10 vehicles from the drive-thru window, thus deficient from the by-law by 1 queuing position. However, based on data of a local proxy site, the observed maximum queue length during the peak lunch-hour is 7 vehicles, which can be accommodated within the provided drive-thru lane.

4.3.3 New Street Networks

With respect to the City's TIA Guidelines, this module is exempt.

4.4 Parking

As outlined in **Table 7**, the current proposal includes 17 vehicle parking spaces. Of the 17 vehicle parking spaces, 1 accessible parking space is provided, and 3 vacuum parking spaces are provided. There are no bicycle parking spaces provided.

It is important to note that, Ottawa City Council had approved an update the City's zoning-bylaw in January 2026 which has significant impacts to parking requirements, though the bylaw is not yet in effect. **Table 7** below compares the site's parking requirements under the current by-law and new by-law requirements, with the proposed statistics.

Table 7: Parking Requirements (6250 Hazeldean Road)

Parking Type	Existing By-Law Requirements	New By-Law Requirements	Current Proposal
Vehicle Parking Minimum – Total[1]	Restaurant: 13 Car Wash, Gas Bar: 0	0	17
Vehicle Parking – Maximum[1]	N/A	Restaurant: 4 C-Store: 4	17
Bicycle Parking – Short Term	N/A	Restaurant: 2 Gas Bar: 2	4
Bicycle Parking – Long Term	0[2]	N/A	0

1 – This number includes all parking spaces provided on site (e.g., residential spots, accessible, visitor, etc.)
2 – Note that the existing Zoning By-law does not differentiate between long-term and short-term bicycle parking and as such, this is the minimum number required for the entirety of the proposed site.

Spillover Parking
With respect to the City's TIA Guidelines, this module is exempt. Furthermore, there are no options for public parking to occur off-site within reasonable proximity to the site.

4.5 Transportation Demand Management (TDM)

TDM measures associated with this development relate to the development design and its interface with municipal infrastructure, as well post-occupancy measures to incentivize and promote the use of sustainable travel modes. These post-occupancy measures are aimed to encourage employees who will support the use of sustainable modes and who are less reliant on private automobiles for their daily mobility needs. Two TDM checklists have therefore been provided (see **Attachment B**) which describe the specific measures planned for this development.

The *TDM Infrastructure* and *TDM Measures* checklists include the following measures:

- Confirmation that there are convenient and direct connections to adjacent sidewalks, cycling facilities, and transit facilities.
- A designated TDM internal coordinator, or contract with an external TDM coordinator will be provided.

- Multi-modal travel option information and personalized trip planning provided to new employees in on-boarding package.
- Discounts provided to employees for on-site amenities.

The completed TDM Measures Checklists are provided in **Appendix F**.

4.6 Collision Analysis

With regard to road safety implications that have potential to be exacerbated by the proposed development, collision records for boundary streets were examined to determine if locations exhibit any collision trends that might be mitigated by engineering intervention. If there is a collision trend that is outside the norm of what is expected, then the potential exists to reduce the collision experience by addressing the over-represented collision trend. Whenever changes are being made to the road environment, it is an opportunity to examine whether a safety intervention could result in meaningful safety benefits. Where there are identifiable safety trends, it is worthwhile to mitigate those, such that the added traffic from a new development does not increase the risk of new collisions.

Based on the same most recent five (5) years of historical collision data, the following **Table 8** summarizes the number and rate of collisions within the vicinity of the subject development site, at the study area intersection (i.e. collisions and collisions per million entering vehicles). While the number of collisions appears to be high, the collisions/MEV is less than 1.0, generally indicating there is not an issue. Furthermore, the Hazeldean/Carp intersection will be reconstructed as part of the Carp Road Widening which will likely address any existing safety concerns.

Table 8: Historical Collision Data Summary by Intersection

Intersection	Total Collisions (5-year Total)	Rate (C/MEV)	Classification			
			Property Damage	Non-fatal Injury	Non-reportable	Fatal Injury
Hazeldean/Carp	59	0.85	52	6	1	0
Notes: *C/MEV = Collisions per Million Entering Vehicles*						

4.7 Neighbourhood Traffic Management

With respect to the City's TIA Guidelines, this module is exempt.

4.8 Transit

With respect to the City's TIA Guidelines, this module is exempt.

4.9 Review of Network Concept

With respect to the City's TIA Guidelines, this module is exempt.

4.10 Intersection Operational Review

With respect to the City's TIA Guidelines, this module is exempt.

4.11 Multimodal Level of Service (MMLOS) Analysis

The City has prepared a complete street concept for the Hazeldean/Carp intersection and Hazeldean Road and Carp Road fronting the proposed development as part of the Carp Road Widening project. The improvements to the subject intersection are detailed in the preceding **Section 3.3.1** and illustrated in **Figure 5**.

4.12 Findings and Recommendations

J.L. Richards and Associates Limited has completed a review of the projected impacts of the fast-food restaurant and summarized the findings within this Transportation Impact Assessment Brief. The overall findings and conclusions of this study are as follows:

- The Hazeldean/Carp intersection is currently operating overall at an acceptable LOS 'D' or better during morning and afternoon peak hours, but the westbound-through movement is approaching its theoretical capacity during the weekday afternoon peak hour under existing conditions.
- Given the local context, the private auto is projected to be the primary mode choice for travel for all proposed land uses.
- The proposed development is projected to generate 'new' two-way vehicles volumes of 20 veh/h during weekday morning and afternoon peak hours, respectively, distributed amongst three (3) existing access driveways.
- With regard to active and transit modes, the proposed development is projected to generate approximate two-way person trips of 4 trips/h and 2 trips/h during both weekday morning and afternoon peak hours, respectively.
- The proposed parking supply for the subject development is proposed to meet minimum existing By-Law requirements.
- The City has prepared a preliminary design of the Hazeldean/Carp intersection as part of the Carp Widening project, with potential impacts to the subject site through the contemplated extension of the median along the entire Carp Road frontage and closure of the depressed median on Hazeldean Road.
- Based on the projected volumes and intersection capacity analysis, additional network modifications are not triggered by the proposed increase in traffic generation.
- The overall layout of the site is expected to operate acceptably despite a deficiency of one (1) queuing position in the proposed drive-thru lane associated with the fast-food restaurant.

The proposed development fits well into the context of the surrounding area and it is projected to have minimal impact on the surrounding transportation network. The design and location of the proposed development serves the City of Ottawa's policies, goals, and objectives. Based on the foregoing, the proposed redevelopment located at 6250 Hazeldean Road is recommended from a transportation perspective.

J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:

Rani Nahas, P.Eng.
Transportation Engineer

Reviewed by:

David Hook, P.Eng.
Practice Lead, Transportation Planning

Disclaimer

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This report was prepared for the sole benefit and use of the named client and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited, and anyone intending to rely upon this report is advised to contact J.L. Richards & Associates Limited in order to obtain permission and to ensure that the report is suitable for their purpose.

Appendix A

Screening Form

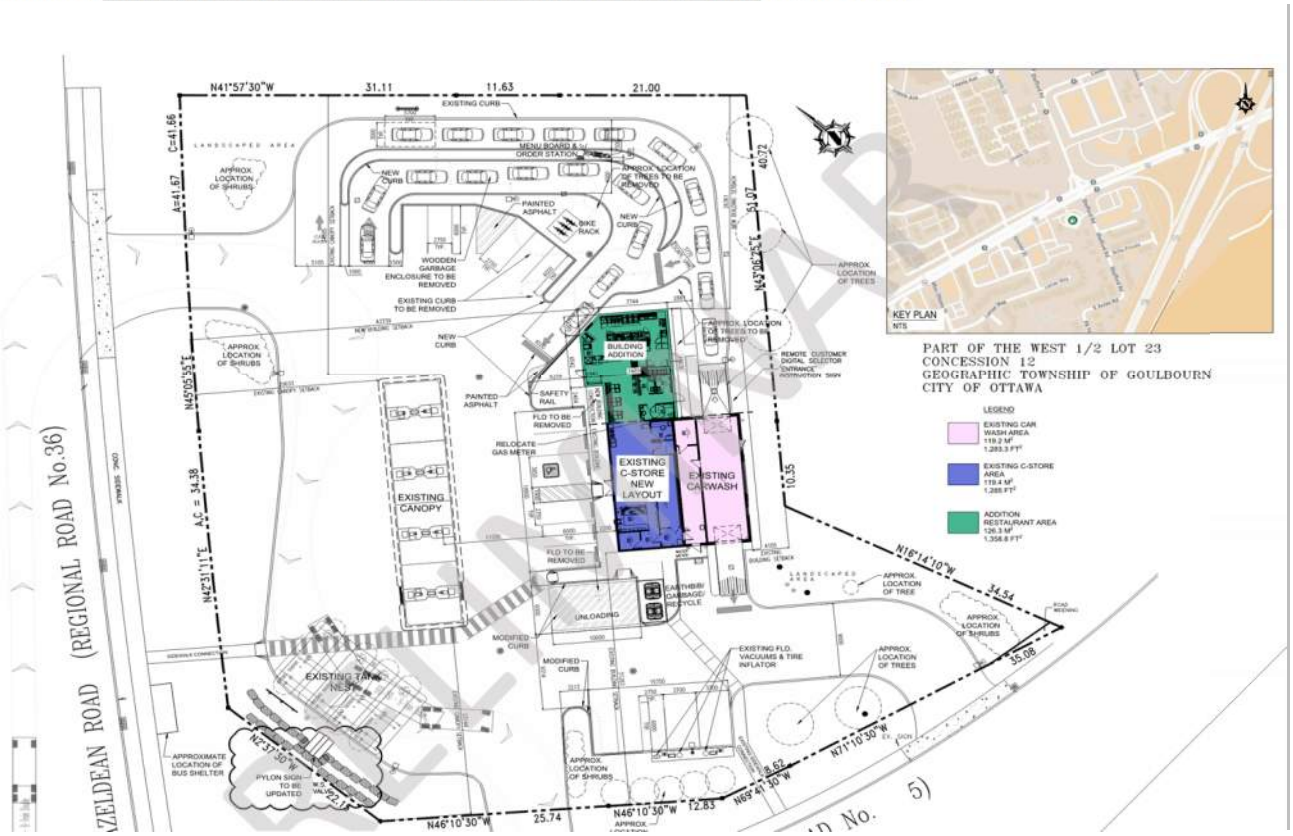
City of Ottawa 2017 TIA Guidelines Screening Form

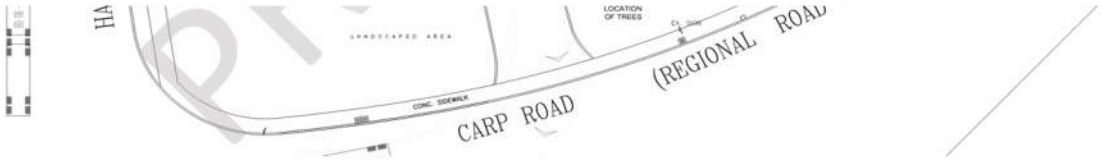
*Revised per City of Ottawa update to the TIA Guidelines, effective June 14, 2023

1. Description of Proposed Development

Municipal Address	6250 Hazeldean Road
Description of Location	The southeast corner of the Hazeldean & Carp intersection
Land Use Classification	Commercial
Development Size (units)	N/A
Development Size (m^2)	Existing: 240 sq. m (convenience store and car wash) Proposed: 365 sq. m (restaurant, convenience store, car wash)
Number of Accesses and Locations	3 existing accesses to be retained: 1 full-movement access to Hazeldean Road, 1 right-in/right-out access to Carp Road, 1 full-
Phase of Development	Single phase
Buildout Year	2027 (assumed)

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





2. Trip Gen 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 (60 person trips)	
Single-Detached[1]	60 units	
Multi-Use Family (Low-Rise)[1]	90 units	
Multi-Use Family (High-Rise)[1]	150 Units	
Office[2]	1,400 m^2	
Industrial[2]	7,000 m^2	
Fast-food restaurant or coffee shop[2]	110 m^2	✓
Destination Retail[2]	1,800 m^2	
Gas Station or convenience market[2]	90 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.*

[1] *Table 2, Table 3 & Table 4 TRANS Trip Generation Summary Report*

[2] *ITE Trip Generation Manual 11.1 Ed.*

Note that the gas station with convenience store is existing.

Based on the 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 Cross-Town Bikeways?		✓
Is the development in a Design Priority Area (DPA), Transit-oriented Development (TOD) zone or Hub?*		✓

**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.*
Hubs are identified as Protected Major Transit Station Areas (PTMSAs) and identified in Schedule C1-Protected Major Transit Station Areas (PMTSAs).

Based on the above, the Location Trigger is not satisfied.

4. Safety Triggers

	Yes	No
Are posted speed limits on a boundary street 80km/hr or greater?		✓
Are there any horizontal/vertical curvatures on a boundary street that limit 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 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?	✓	

While the accesses are within influence of a signalized intersection, they are existing and not proposed.

Based on the above, 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?	✓	

Based on the results of the TIA Screening Form, the Trip Generation and Safety Triggers are satisfied. As such, a TIA is required for the proposed development.

Appendix B

Traffic Counts

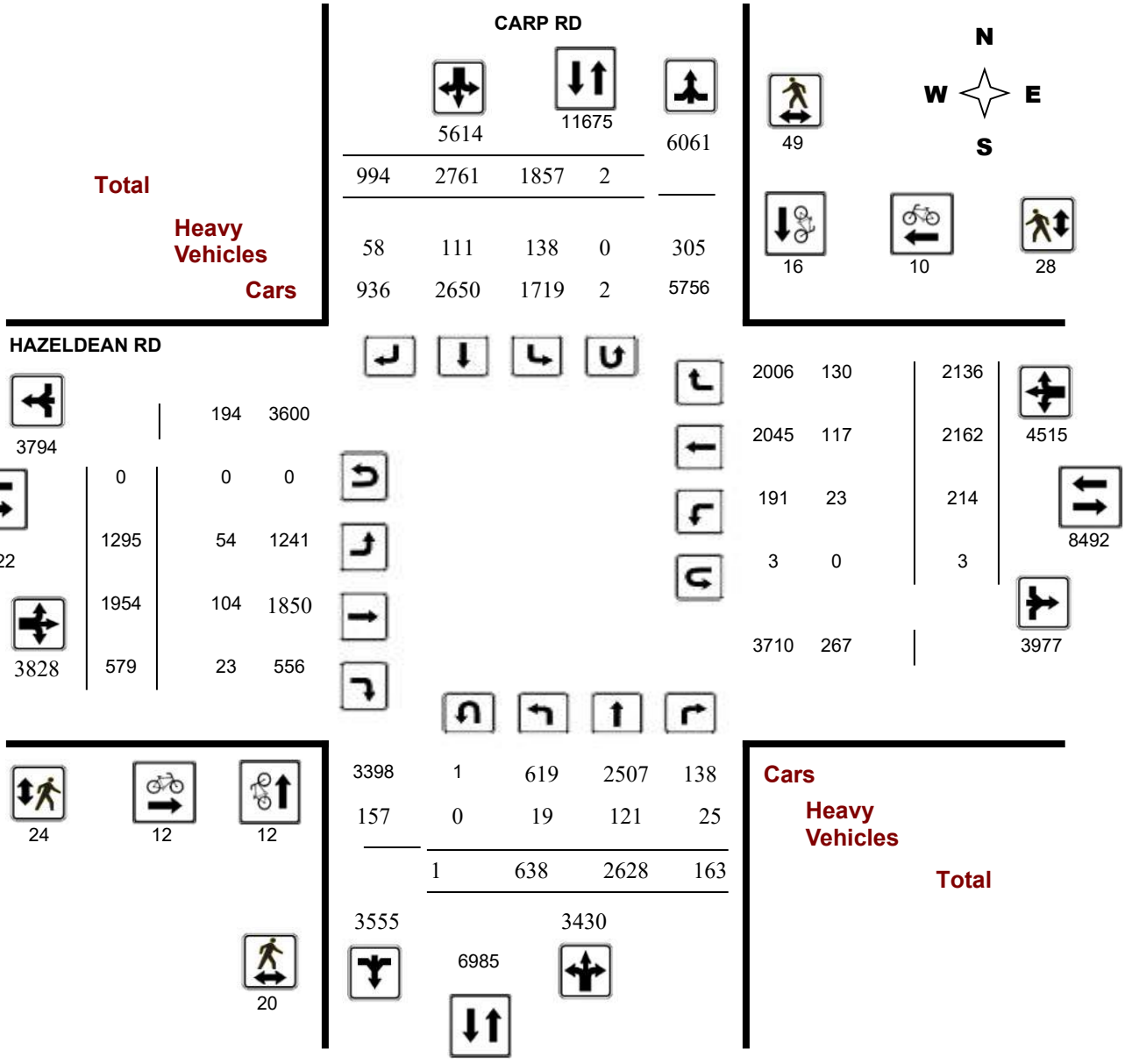
Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ HAZELDEAN RD

Survey Date: Thursday, September 19, 2024
Start Time: 07:00
WO No: 42078
Device: Miovision

Full Study Diagram



Transportation Services - Traffic Services

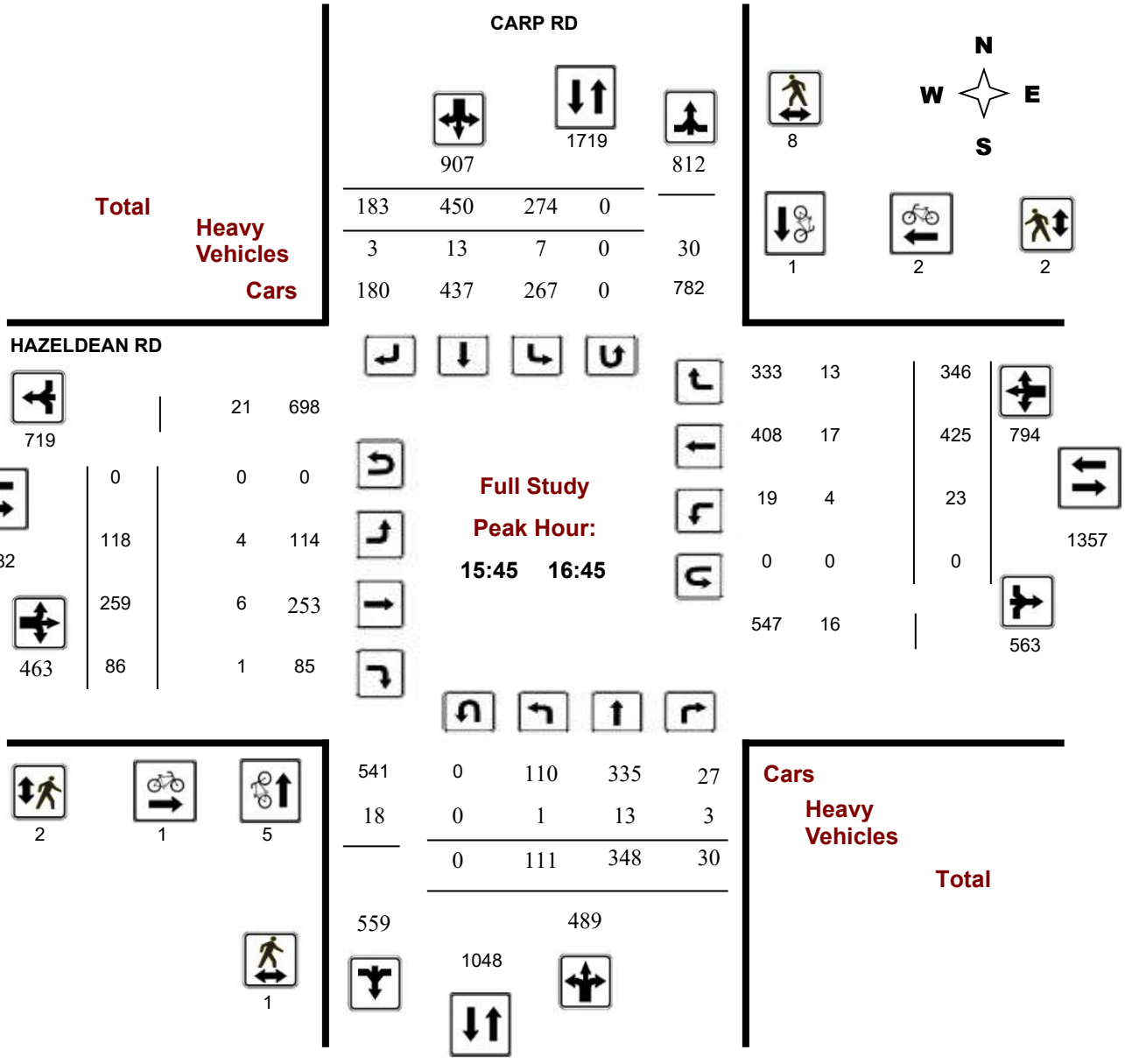
Turning Movement Count - Study Results

CARP RD @ HAZELDEAN RD

Survey Date: Thursday, September 19, 2024 **WO No:** 42078

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

Full Study Peak Hour Diagram



Transportation Services - Traffic Services

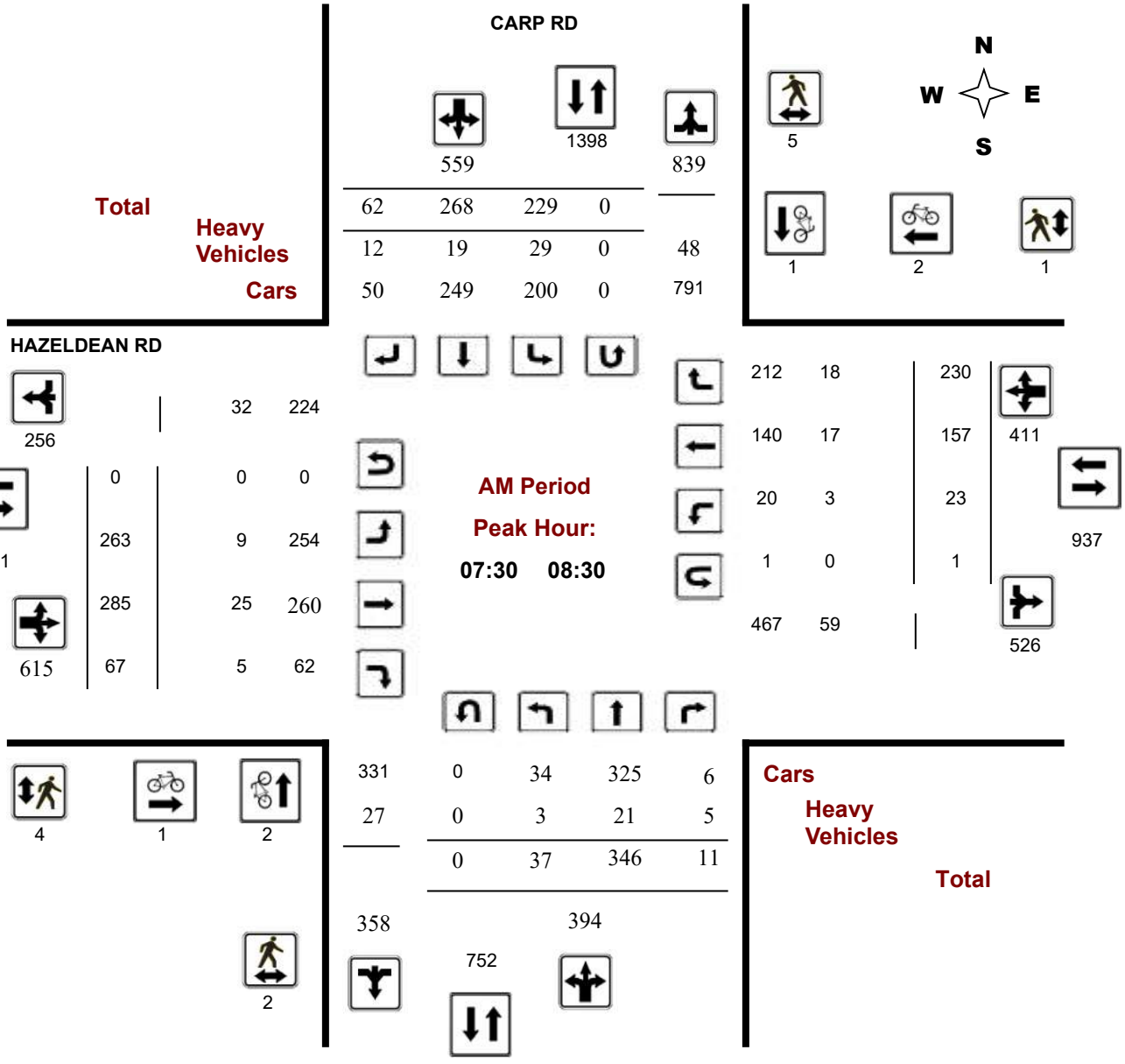
Turning Movement Count - Study Results

CARP RD @ HAZELDEAN RD

Survey Date: Thursday, September 19, 2024 **WO No:** 42078

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

AM Period Peak Hour Diagram



Transportation Services - Traffic Services

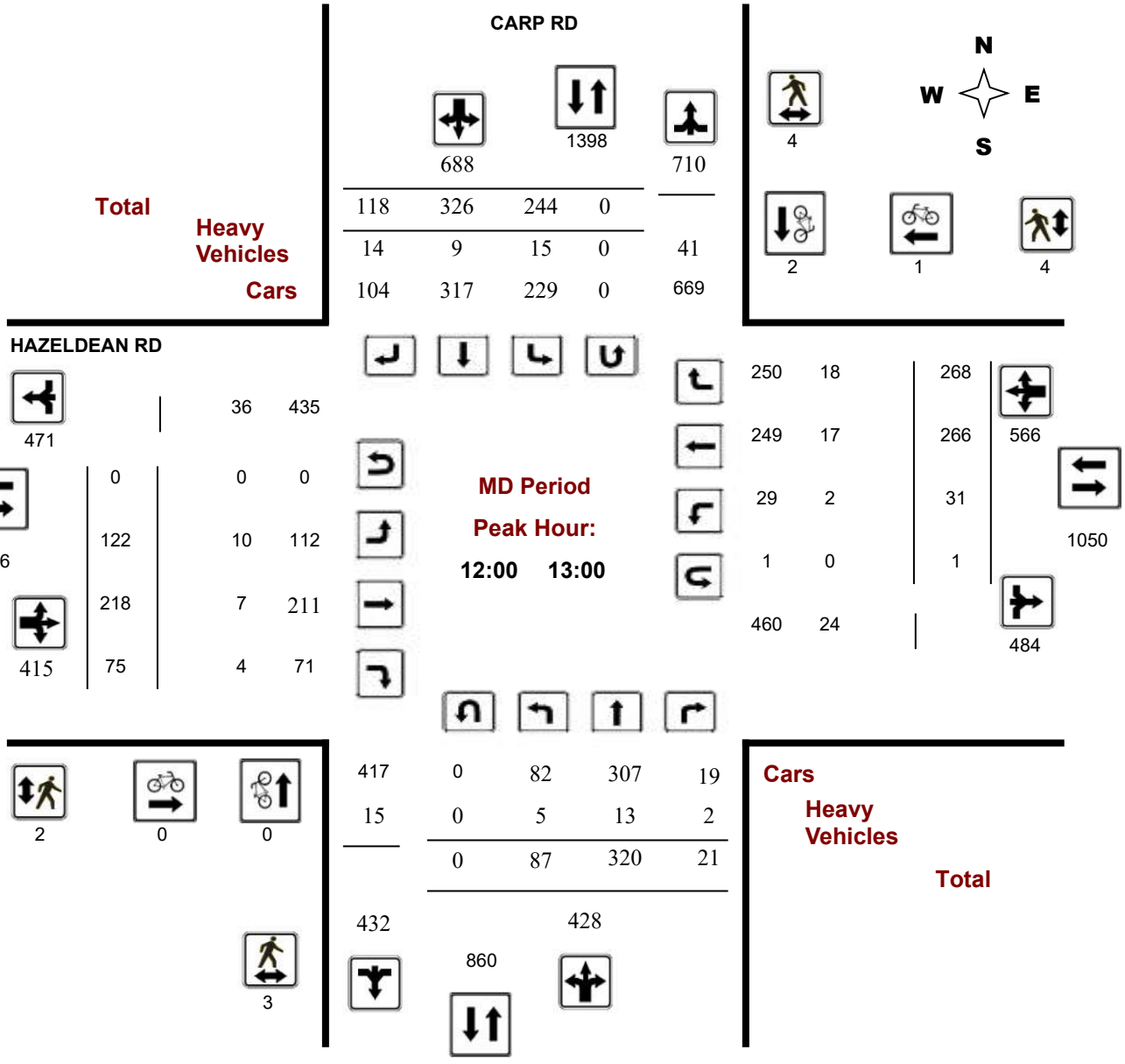
Turning Movement Count - Study Results

CARP RD @ HAZELDEAN RD

Survey Date: Thursday, September 19, 2024 **WO No:** 42078

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

MD Period Peak Hour Diagram



Transportation Services - Traffic Services

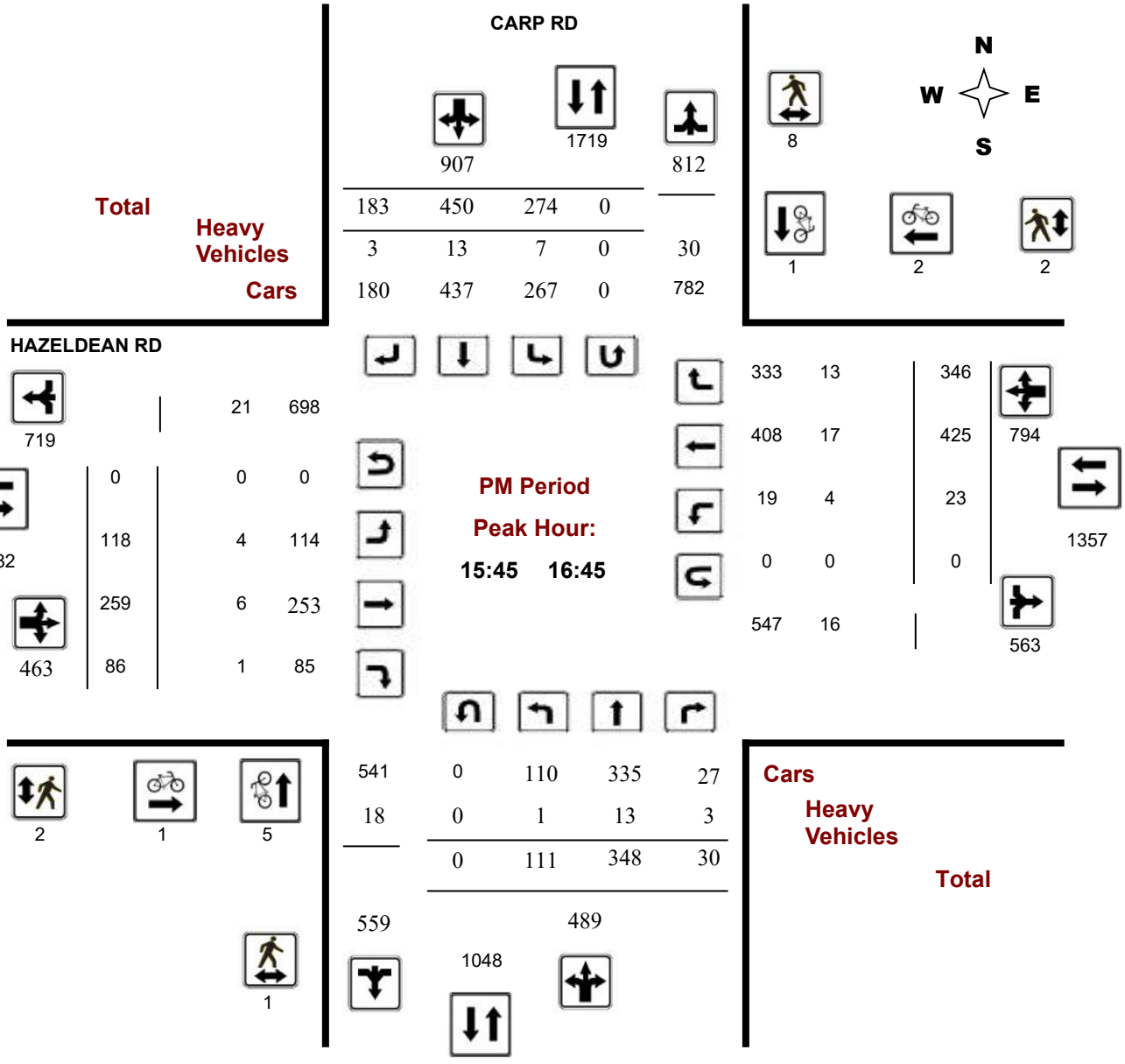
Turning Movement Count - Study Results

CARP RD @ HAZELDEAN RD

Survey Date: Thursday, September 19, 2024 **WO No:** 42078

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

PM Period Peak Hour Diagram



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ HAZELDEAN RD

Survey Date: Thursday, September 19, 2024 **WO No:** 42078

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

Full Study Summary (8 HR Standard)

Survey Date: Thursday, September 19, 2024

Total Observed U-Turns

Northbound: 1 Southbound: 2

Eastbound: 0 Westbound: 3

AADT Factor

1.00

	CARP RD								HAZELDEAN RD									
	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	29	354	13	**396**	217	231	66	**514**	**910**	292	259	38	**589**	17	119	218	**354**	**943**	**1853**
08:00 09:00	43	353	8	**404**	179	274	65	**518**	**922**	208	246	77	**531**	17	176	232	**425**	**956**	**1878**
09:00 10:00	52	327	28	**407**	191	286	69	**546**	**953**	167	206	69	**442**	30	183	232	**445**	**887**	**1840**
11:30 12:30	86	315	15	**416**	240	331	101	**672**	**1088**	138	230	64	**432**	30	261	238	**529**	**961**	**2049**
12:30 13:30	87	321	22	**430**	232	321	115	**668**	**1098**	107	190	82	**379**	31	264	290	**585**	**964**	**2062**
15:00 16:00	114	316	34	**464**	258	420	179	**857**	**1321**	124	279	83	**486**	28	392	322	**742**	**1228**	**2549**
16:00 17:00	108	341	23	**472**	280	443	204	**927**	**1399**	138	257	74	**469**	24	408	333	**765**	**1234**	**2633**
17:00 18:00	119	301	20	**440**	260	455	195	**910**	**1350**	121	287	92	**500**	37	359	271	**667**	**1167**	**2517**
Sub Total	638	2628	163	**3429**	1857	2761	994	**5612**	**9041**	1295	1954	579	**3828**	214	2162	2136	**4512**	**8340**	**17381**
U Turns				**1**				**2**	**3**				**0**				**3**	**3**	**6**
Total	638	2628	163	**3430**	1857	2761	994	**5614**	**9044**	1295	1954	579	**3828**	214	2162	2136	**4515**	**8343**	**17387**
EQ 12Hr	887	3653	227	**4768**	2581	3838	1382	**7803**	**12571**	1800	2716	805	**5321**	297	3005	2969	**6276**	**11597**	**24168**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	887	3653	227	**4768**	2581	5028	1810	**7803**	**12571**	1800	2716	805	**5321**	297	3005	2969	**6276**	**11597**	**24168**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**1.00**					
AVG 24Hr	1162	4785	297	**6246**	3381	6587	2371	**10222**	**16468**	2358	3558	1055	**6971**	389	3937	3889	**8222**	**15192**	**31660**
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 @ HAZELDEAN RD

Survey Date: Thursday, September 19, 2024 **WO No:** 42078

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

Full Study 15 Minute Increments

		CARP RD									HAZELDEAN RD									
		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	83	4	92	41	42	20	103	195	67	46	8	121	2	20	52	74	195	390
07:15	07:30	5	119	3	127	45	58	14	117	244	73	54	6	133	2	30	48	80	213	457
07:30	07:45	9	76	5	90	60	67	18	145	235	75	94	15	184	6	24	62	93	277	512
08:15	08:30	8	98	1	107	46	64	16	126	233	54	59	18	131	8	46	55	109	240	473
07:45	08:00	10	76	1	87	71	64	14	149	236	77	65	9	151	7	45	56	108	259	495
08:00	08:15	10	96	4	110	52	73	14	139	249	57	67	25	149	2	42	57	101	250	499
08:30	08:45	12	84	3	99	41	60	18	119	218	45	67	17	129	2	42	60	104	233	451
08:45	09:00	13	75	0	88	40	77	17	134	222	52	53	17	122	5	46	60	111	233	455
09:00	09:15	13	88	6	107	53	62	19	134	241	45	59	23	127	6	52	56	114	241	482
09:15	09:30	18	86	7	111	62	84	19	165	276	48	55	16	119	8	35	63	106	225	501
09:30	09:45	13	99	9	121	36	66	14	116	237	40	37	9	86	7	49	57	113	199	436
09:45	10:00	8	54	6	68	40	74	17	131	199	34	55	21	110	9	47	56	112	222	421
11:30	11:45	24	74	4	102	52	87	15	154	256	31	61	19	111	9	67	57	133	244	500
12:45	13:00	21	63	4	88	67	82	30	179	267	24	46	27	97	8	66	79	154	251	518
13:00	13:15	19	78	6	103	56	76	33	166	269	30	41	22	93	7	50	71	128	221	490
13:15	13:30	25	77	4	106	55	78	28	161	267	27	45	14	86	9	82	75	166	252	519
15:00	15:15	22	77	9	109	61	102	44	207	316	38	76	22	136	7	82	62	152	288	604
15:30	15:45	33	85	8	126	68	107	50	225	351	26	59	14	99	6	105	68	179	278	629
15:45	16:00	36	86	11	133	68	114	38	220	353	30	69	27	126	3	114	89	206	332	685
17:30	17:45	24	83	3	110	64	128	47	239	349	24	73	24	121	10	87	63	160	281	630
17:45	18:00	32	61	6	99	65	94	49	209	308	30	57	22	109	6	93	78	177	286	594
16:15	16:30	16	89	6	111	76	121	58	255	366	29	61	16	106	7	114	80	201	307	673
11:45	12:00	18	87	2	107	65	85	22	172	279	35	55	16	106	5	60	57	122	228	507
12:00	12:15	20	79	5	104	68	78	33	179	283	31	51	14	96	10	76	65	151	247	530
12:15	12:30	24	75	4	103	55	81	31	167	270	41	63	15	119	6	58	59	123	242	512
12:30	12:45	22	103	8	133	54	85	24	163	296	26	58	19	103	7	66	65	138	241	537
15:15	15:30	23	68	6	97	61	97	47	205	302	30	75	20	125	12	91	103	206	331	633
16:00	16:15	34	99	11	144	59	100	41	200	344	29	58	23	110	5	107	97	209	319	663
16:30	16:45	25	74	2	101	71	115	46	232	333	30	71	20	121	8	90	80	178	299	632
16:45	17:00	33	79	4	116	74	107	59	240	356	50	67	15	132	4	97	76	177	309	665
17:00	17:15	27	79	8	114	66	115	54	235	349	29	68	20	117	11	86	55	152	269	618
17:15	17:30	36	78	3	117	65	118	45	228	345	38	89	26	153	10	93	75	178	331	676
Total:		638	2628	163	3430	1857	2761	994	5614	9044	1295	1954	579	3828	214	2162	2136	4515	8343	17,387

Note: U-Turns are included in Totals, cyclist volume is not included in totals. For cycliste volumes reffer to Cyclist Volume report.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ HAZELDEAN RD

Survey Date: Thursday, September 19, 2024 **WO No:** 42078

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

Full Study Cyclist Volume

Time Period		CARP RD			HAZELDEAN RD			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	1	1	0	0	0	1
07:15	07:30	0	1	1	0	0	0	1
07:30	07:45	2	0	2	0	0	0	2
08:15	08:30	0	0	0	0	0	0	0
07:45	08:00	0	1	1	1	1	2	3
08:00	08:15	0	0	0	0	1	1	1
08:30	08:45	0	1	1	1	0	1	2
08:45	09:00	0	1	1	0	0	0	1
09:00	09:15	0	0	0	0	0	0	0
09:15	09:30	0	0	0	0	0	0	0
09:30	09:45	0	0	0	0	0	0	0
09:45	10:00	0	0	0	0	0	0	0
11:30	11:45	1	0	1	0	1	1	2
12:45	13:00	0	1	1	0	0	0	1
13:00	13:15	0	1	1	2	0	2	3
13:15	13:30	0	0	0	0	0	0	0
15:00	15:15	2	0	2	0	0	0	2
15:30	15:45	0	0	0	0	0	0	0
15:45	16:00	5	0	5	0	1	1	6
17:30	17:45	0	0	0	2	2	4	4
17:45	18:00	0	2	2	1	0	1	3
16:15	16:30	0	1	1	1	0	1	2
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	1	1	1
12:30	12:45	0	1	1	0	0	0	1
15:15	15:30	0	0	0	1	0	1	1
16:00	16:15	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	1	1	1
16:45	17:00	1	1	2	2	1	3	5
17:00	17:15	0	2	2	1	1	2	4
17:15	17:30	1	2	3	0	0	0	3
Total		12	16	**28**	12	10	22	50

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ HAZELDEAN RD

Survey Date: Thursday, September 19, 2024 **WO No:** 42078

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

Full Study Pedestrian Volume

	CARP RD			HAZELDEAN RD			
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	1	**1**	0	0	**0**	**1**
07:15 07:30	0	1	**1**	0	1	**1**	**2**
07:30 07:45	0	2	**2**	0	0	**0**	**2**
08:15 08:30	0	1	**1**	1	1	**2**	**3**
07:45 08:00	1	2	**3**	1	0	**1**	**4**
08:00 08:15	1	0	**1**	2	0	**2**	**3**
08:30 08:45	0	0	**0**	0	0	**0**	**0**
08:45 09:00	1	1	**2**	1	0	**1**	**3**
09:00 09:15	1	2	**3**	0	1	**1**	**4**
09:15 09:30	0	0	**0**	0	0	**0**	**0**
09:30 09:45	3	3	**6**	5	1	**6**	**12**
09:45 10:00	0	0	**0**	0	0	**0**	**0**
11:30 11:45	1	0	**1**	1	0	**1**	**2**
12:45 13:00	2	0	**2**	1	0	**1**	**3**
13:00 13:15	0	1	**1**	0	0	**0**	**1**
13:15 13:30	0	1	**1**	1	1	**2**	**3**
15:00 15:15	1	5	**6**	0	0	**0**	**6**
15:30 15:45	0	0	**0**	0	3	**3**	**3**
15:45 16:00	0	3	**3**	0	1	**1**	**4**
17:30 17:45	1	1	**2**	0	1	**1**	**3**
17:45 18:00	1	1	**2**	0	0	**0**	**2**
16:15 16:30	0	2	**2**	0	1	**1**	**3**
11:45 12:00	1	0	**1**	3	3	**6**	**7**
12:00 12:15	0	3	**3**	0	2	**2**	**5**
12:15 12:30	1	0	**1**	1	1	**2**	**3**
12:30 12:45	0	1	**1**	0	1	**1**	**2**
15:15 15:30	1	1	**2**	0	1	**1**	**3**
16:00 16:15	1	0	**1**	1	0	**1**	**2**
16:30 16:45	0	3	**3**	1	0	**1**	**4**
16:45 17:00	1	2	**3**	1	4	**5**	**8**
17:00 17:15	2	12	**14**	2	3	**5**	**19**
17:15 17:30	0	0	**0**	2	2	**4**	**4**
Total	20	49	**69**	24	28	**52**	**121**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ HAZELDEAN RD

Survey Date: Thursday, September 19, 2024 **WO No:** 42078

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

Full Study Heavy Vehicles

		CARP RD									HAZELDEAN RD									
		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	3	1	**4**	11	4	3	**18**	**22**	2	5	1	**8**	1	3	3	**7**	**15**	**37**
07:15	07:30	1	4	2	**7**	11	9	0	**20**	**27**	1	4	0	**5**	0	10	1	**11**	**16**	**43**
07:30	07:45	0	5	3	**8**	7	5	4	**16**	**24**	1	12	1	**14**	1	2	3	**6**	**20**	**44**
08:15	08:30	0	4	0	**4**	7	4	3	**14**	**18**	3	6	0	**9**	1	2	6	**9**	**18**	**36**
07:45	08:00	1	7	1	**9**	9	2	3	**14**	**23**	2	2	2	**6**	0	7	4	**11**	**17**	**40**
08:00	08:15	2	5	1	**8**	6	8	2	**16**	**24**	3	5	2	**10**	1	6	5	**12**	**22**	**46**
08:30	08:45	0	5	2	**7**	4	5	0	**9**	**16**	2	5	2	**9**	0	4	7	**11**	**20**	**36**
08:45	09:00	0	5	0	**5**	5	1	3	**9**	**14**	1	7	2	**10**	2	3	4	**9**	**19**	**33**
09:00	09:15	1	4	1	**6**	4	2	1	**7**	**13**	2	2	2	**6**	1	5	4	**10**	**16**	**29**
09:15	09:30	2	9	1	**12**	1	5	2	**8**	**20**	2	4	1	**7**	0	4	8	**12**	**19**	**39**
09:30	09:45	1	4	2	**7**	3	2	3	**8**	**15**	1	4	2	**7**	1	6	4	**11**	**18**	**33**
09:45	10:00	1	5	0	**6**	3	2	1	**6**	**12**	2	5	0	**7**	0	6	4	**10**	**17**	**29**
11:30	11:45	0	5	1	**6**	5	8	1	**14**	**20**	6	1	0	**7**	0	3	5	**8**	**15**	**35**
12:45	13:00	1	1	0	**2**	4	3	5	**12**	**14**	0	3	4	**7**	0	5	3	**8**	**15**	**29**
13:00	13:15	0	5	1	**6**	9	0	1	**10**	**16**	2	3	0	**5**	2	4	2	**8**	**13**	**29**
13:15	13:30	0	4	0	**4**	5	9	2	**16**	**20**	1	4	0	**5**	0	1	9	**10**	**15**	**35**
15:00	15:15	0	1	0	**1**	8	1	4	**13**	**14**	2	4	1	**7**	1	3	3	**7**	**14**	**28**
15:30	15:45	0	4	1	**5**	2	4	3	**9**	**14**	0	5	1	**6**	0	4	5	**9**	**15**	**29**
15:45	16:00	1	2	1	**4**	4	4	1	**9**	**13**	0	3	1	**4**	0	5	3	**8**	**12**	**25**
17:30	17:45	0	2	0	**2**	0	2	1	**3**	**5**	2	1	0	**3**	2	1	1	**4**	**7**	**12**
17:45	18:00	1	2	1	**4**	1	0	0	**1**	**5**	0	0	0	**0**	1	0	1	**2**	**2**	**7**
16:15	16:30	0	1	0	**1**	1	5	1	**7**	**8**	2	1	0	**3**	3	3	5	**11**	**14**	**22**
11:45	12:00	2	4	0	**6**	6	3	2	**11**	**17**	0	2	0	**2**	1	3	5	**9**	**11**	**28**
12:00	12:15	1	5	1	**7**	7	4	5	**16**	**23**	1	0	0	**1**	1	7	5	**13**	**14**	**37**
12:15	12:30	1	1	0	**2**	2	1	3	**6**	**8**	4	2	0	**6**	0	3	4	**7**	**13**	**21**
12:30	12:45	2	6	1	**9**	2	1	1	**4**	**13**	5	2	0	**7**	1	2	6	**9**	**16**	**29**
15:15	15:30	0	0	0	**0**	3	6	1	**10**	**10**	3	5	0	**8**	0	4	6	**10**	**18**	**28**
16:00	16:15	0	5	2	**7**	0	2	0	**2**	**9**	2	0	0	**2**	0	6	1	**7**	**9**	**18**
16:30	16:45	0	5	0	**5**	2	2	1	**5**	**10**	0	2	0	**2**	1	3	4	**8**	**10**	**20**
16:45	17:00	1	2	1	**4**	2	3	0	**5**	**9**	1	2	0	**3**	1	1	4	**6**	**9**	**18**
17:00	17:15	0	3	1	**4**	2	3	1	**6**	**10**	0	2	1	**3**	1	1	3	**5**	**8**	**18**
17:15	17:30	0	3	0	**3**	2	1	0	**3**	**6**	1	1	0	**2**	0	0	2	**2**	**4**	**10**
Total:	None	19	121	25	**165**	138	111	58	**307**	**472**	54	104	23	**181**	23	117	130	**270**	**451**	**923**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARP RD @ HAZELDEAN RD

Survey Date: Thursday, September 19, 2024 **WO No:** 42078

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

Full Study 15 Minute U-Turn Total

Time Period		CARP RD Northbound U-Turn Total	CARP RD Southbound U-Turn Total	HAZELDEAN RD Eastbound U-Turn Total	HAZELDEAN RD 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	1	1
08:15	08:30	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	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
12:45	13:00	0	0	0	1	1
13:00	13:15	0	1	0	0	1
13:15	13:30	0	0	0	0	0
15:00	15:15	1	0	0	1	2
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	1	0	0	1
16:15	16:30	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
15:15	15:30	0	0	0	0	0
16:00	16:15	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
Total		1	2	0	3	6

Appendix C

Collision Data

Total Area

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total	
04 - Non-reportable	0	0	1	0	0	0	0	0	1	2%
03 - P.D. only	0	1	31	5	11	0	7	2	57	88%
02 - Non-fatal injury	0	0	3	1	3	0	0	0	7	11%
01 - Fatal injury	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**1**	**35**	**6**	**14**	**0**	**7**	**2**	**65**	98%
	#7 or 0%	#6 or 2%	#1 or 54%	#4 or 9%	#2 or 22%	#7 or 0%	#3 or 11%	#5 or 3%		

CARP RD @ HAZELDEAN RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2019-2024	59	n/a	2190	**n/a**

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total	
04 - Non-reportable	0	0	1	0	0	0	0	0	1	
03 - P.D. only	0	1	31	5	9	0	4	2	52	88%
02 - Non-fatal injury	0	0	2	1	3	0	0	0	6	10%
01 - Fatal injury	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**1**	**34**	**6**	**12**	**0**	**4**	**2**	**59**	98%
	0%	2%	58%	10%	20%	0%	7%	3%		

CARP RD btwn HAZELDEAN RD & NEIL AVE

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2019-2024	4	n/a	2190	**n/a**

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total	
04 - Non-reportable	0	0	0	0	0	0	0	0	0	
03 - P.D. only	0	0	0	0	0	0	3	0	3	75%
02 - Non-fatal injury	0	0	1	0	0	0	0	0	1	25%
01 - Fatal injury	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**4**	100%
	0%	0%	25%	0%	0%	0%	75%	0%		

HAZELDEAN RD btwn 195 W OF CARP RD & CARP RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2019-2024	1	n/a	2190	**n/a**

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total	
04 - Non-reportable	0	0	0	0	0	0	0	0	0	
03 - P.D. only	0	0	0	0	1	0	0	0	1	100%
02 - Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
01 - Fatal injury	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	100%
	0%	0%	0%	0%	100%	0%	0%	0%		

HAZELDEAN RD btwn CARP RD & 250 W OF STITTSVILLE MAIN ST

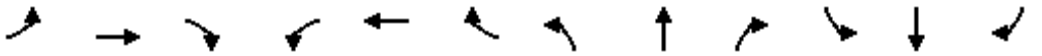
Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2019-2024	1	n/a	2190	**n/a**

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total	
04 - Non-reportable	0	0	0	0	0	0	0	0	0	
03 - P.D. only	0	0	0	0	1	0	0	0	1	100%
02 - Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
01 - Fatal injury	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	100%
	0%	0%	0%	0%	100%	0%	0%	0%		

X_Coordinate	Y_Coordinate	ID	Geo_ID	Accident_Year	Accident_Date	Location	Classification_Of_Accident	Initial_Impact_Type	Road_1_Surfac	Environment_C	Light	Traffic_Control	Num_of_vehicle	Num_of_pedest
348805.0189	5014360.289	2022--75314	86	2022	2022-11-17	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	02 - Wet	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.7016	5014361.216	2022--74593	86	2022	2022-11-19	CARP RD @ HAZELDEAN RD	03 - P.D. only	05 - Turning movement	03 - Loose snov	05 - Drifting Sn	07 - Dark	01 - Traffic signa	2	
348804.7429	5014360.597	2022--70410	86	2022	2022-06-21	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	02 - Wet	02 - Rain	01 - Daylight	01 - Traffic signa	2	
348804.7037	5014360.906	2022--75877	86	2022	2022-12-12	CARP RD @ HAZELDEAN RD	03 - P.D. only	05 - Turning movement	01 - Dry	01 - Clear	07 - Dark	01 - Traffic signa	2	
348804.5939	5014360.442	2022--65351	86	2022	2022-01-06	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.5771	5014360.433	2024--113522	86	2024	2024-11-25	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	02 - Wet	02 - Rain	07 - Dark	01 - Traffic signa	2	
348804.5771	5014360.433	2024--108490	86	2024	2024-07-02	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.5772	5014360.432	2024--101426	86	2024	2024-01-12	CARP RD @ HAZELDEAN RD	02 - Non-fatal injury	05 - Turning movement	02 - Wet	01 - Clear	07 - Dark	01 - Traffic signa	2	
348804.577	5014360.433	2021--59954	86	2021	2021-08-09	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2021--60231	86	2021	2021-08-23	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	3	
348804.577	5014360.433	2021--61900	86	2021	2021-10-24	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2021--56463	86	2021	2021-02-16	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	05 - Packed snc	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2024--114042	86	2024	2024-12-06	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2021--61145	86	2021	2021-09-25	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2022--68483	86	2022	2022-04-11	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2020--46682	86	2020	2020-01-28	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	02 - Wet	01 - Clear	03 - Dawn	01 - Traffic signa	2	
348804.577	5014360.433	2021--59845	86	2021	2021-08-05	CARP RD @ HAZELDEAN RD	03 - P.D. only	04 - Sideswipe	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2019--33879	86	2019	2019-04-28	CARP RD @ HAZELDEAN RD	03 - P.D. only	07 - SMV other	02 - Wet	01 - Clear	07 - Dark	01 - Traffic signa	1	
348804.577	5014360.433	2024--108828	86	2024	2024-07-12	CARP RD @ HAZELDEAN RD	03 - P.D. only	05 - Turning movement	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2024--102272	86	2024	2024-12-17	CARP RD @ HAZELDEAN RD	03 - P.D. only	07 - SMV other	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	4	
348804.577	5014360.433	2021--61089	86	2021	2021-09-23	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	02 - Wet	02 - Rain	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2020--45506	86	2020	2020-01-03	CARP RD @ HAZELDEAN RD	03 - P.D. only	04 - Sideswipe	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2021--61833	86	2021	2021-10-21	CARP RD @ HAZELDEAN RD	03 - P.D. only	05 - Turning movement	02 - Wet	02 - Rain	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2019--34515	86	2019	2019-05-17	CARP RD @ HAZELDEAN RD	03 - P.D. only	02 - Angle	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2021--60540	86	2021	2021-09-01	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2024--104523	86	2024	2024-02-25	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	07 - Dark	01 - Traffic signa	2	
348804.577	5014360.433	2021--60326	86	2021	2021-08-26	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2022--72832	86	2022	2022-09-15	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2021--56401	86	2021	2021-02-13	CARP RD @ HAZELDEAN RD	03 - P.D. only	99 - Other	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2020--52806	86	2020	2020-11-07	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2024--111171	86	2024	2024-09-25	CARP RD @ HAZELDEAN RD	03 - P.D. only	05 - Turning movement	02 - Wet	02 - Rain	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2020--52226	86	2020	2020-10-13	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	02 - Wet	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2021--55711	86	2021	2021-01-13	CARP RD @ HAZELDEAN RD	03 - P.D. only	04 - Sideswipe	02 - Wet	03 - Snow	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2021--61336	86	2021	2021-10-01	CARP RD @ HAZELDEAN RD	02 - Non-fatal injury	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	3	
348804.577	5014360.433	2019--30091	86	2019	2019-01-23	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	03 - Loose snov	03 - Snow	03 - Dawn	01 - Traffic signa	2	
348804.577	5014360.433	2022--68642	86	2022	2022-04-19	CARP RD @ HAZELDEAN RD	02 - Non-fatal injury	03 - Rear end	02 - Wet	02 - Rain	01 - Daylight	01 - Traffic signa	3	
348804.577	5014360.433	2020--47917	86	2020	2020-02-24	CARP RD @ HAZELDEAN RD	03 - P.D. only	05 - Turning movement	01 - Dry	01 - Clear	07 - Dark	01 - Traffic signa	2	
348804.577	5014360.433	2020--48535	86	2020	2020-03-09	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2019--38005	86	2019	2019-08-23	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2019--33640	86	2019	2019-04-20	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	02 - Wet	02 - Rain	01 - Daylight	01 - Traffic signa	3	
348804.577	5014360.433	2021--57850	86	2021	2021-04-25	CARP RD @ HAZELDEAN RD	03 - P.D. only	04 - Sideswipe	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2020--49791	86	2020	2020-06-17	CARP RD @ HAZELDEAN RD	02 - Non-fatal injury	05 - Turning movement	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2024--114396	86	2024	2024-12-14	CARP RD @ HAZELDEAN RD	03 - P.D. only	05 - Turning movement	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2024--108735	86	2024	2024-07-09	CARP RD @ HAZELDEAN RD	03 - P.D. only	04 - Sideswipe	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2024--102465	86	2024	2024-01-04	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.577	5014360.433	2019--43379	86	2019	2019-12-31	CARP RD @ HAZELDEAN RD	03 - P.D. only	07 - SMV other	06 - Ice	04 - Freezing R	01 - Daylight	01 - Traffic signa	1	
348804.5769	5014360.433	2024--106852	86	2024	2024-05-11	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	02 - Wet	02 - Rain	01 - Daylight	01 - Traffic signa	2	
348804.5769	5014360.433	2024--109492	86	2024	2024-08-01	CARP RD @ HAZELDEAN RD	03 - P.D. only	05 - Turning movement	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.5769	5014360.433	2024--114663	86	2024	2024-12-21	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.5769	5014360.433	2024--112952	86	2024	2024-11-11	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	02 - Wet	02 - Rain	01 - Daylight	01 - Traffic signa	2	
348804.5767	5014360.433	2024--111644	86	2024	2024-10-08	CARP RD @ HAZELDEAN RD	03 - P.D. only	05 - Turning movement	01 - Dry	07 - Fog, mist, s	05 - Dusk	01 - Traffic signa	2	
348804.5764	5014360.433	2024--101552	86	2024	2024-09-26	CARP RD @ HAZELDEAN RD	02 - Non-fatal injury	05 - Turning movement	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.5428	5014360.473	2022--68865	86	2022	2022-04-28	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348804.5107	5014360.457	2022--67858	86	2022	2022-03-16	CARP RD @ HAZELDEAN RD	03 - P.D. only	07 - SMV other	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	1	
348804.277	5014360.533	2022--73244	86	2022	2022-09-27	CARP RD @ HAZELDEAN RD	02 - Non-fatal injury	04 - Sideswipe	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348803.9304	5014360.359	2024--107659	86	2024	2024-06-05	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348803.3476	5014360.08	2022--68164	86	2022	2022-03-30	CARP RD @ HAZELDEAN RD	03 - P.D. only	99 - Other	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348803.0011	5014359.887	2024--107952	86	2024	2024-06-14	CARP RD @ HAZELDEAN RD	03 - P.D. only	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348795.105	5014355.436	2024--105474		2024	2024-03-28	CARP RD @ HAZELDEAN RD	04 - Non-reportable	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	01 - Traffic signa	2	
348900.3902	5014305.412	2021--59427	__3Z092P	2021	2021-07-18	CARP RD btwn HAZELDEAN RD & NEIL AVE	03 - P.D. only	07 - SMV other	01 - Dry	01 - Clear	01 - Daylight	10 - No control	1	
348917.4155	5014302.8	2022--75806	__3Z092P	2022	2022-12-08	CARP RD btwn HAZELDEAN RD & NEIL AVE	03 - P.D. only	07 - SMV other	02 - Wet	02 - Rain	07 - Dark	10 - No control	1	
348920.7905	5014302.282	2019--35193	__3Z092P	2019	2019-06-05	CARP RD btwn HAZELDEAN RD & NEIL AVE	02 - Non-fatal injury	03 - Rear end	01 - Dry	01 - Clear	01 - Daylight	10 - No control	2	
348996.3829	5014315.83	2021--60439	__3Z092P	2021	2021-08-30	CARP RD btwn HAZELDEAN RD & NEIL AVE	03 - P.D. only	07 - SMV other	01 - Dry	01 - Clear	01 - Daylight	10 - No control	1	
348799.5996	5014353.11	2024--112794	__3Z092OB	2024	2024-11-06	HAZELDEAN RD btwn 195 W OF CARP RD & CARP RD	03 - P.D. only	05 - Turning movement	01 - Dry	01 - Clear	05 - Dusk	10 - No control	2	
348859.4053	5014423.254	2021--60508	__5FCFM5A	2021	2021-09-02	HAZELDEAN RD btwn CARP RD & 250 W OF STITTSVILLE MAIN ST	03 - P.D. only	05 - Turning movement	01 - Dry	01 - Clear	01 - Daylight	10 - No control	2	

Appendix D

Existing Synchro Output



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	263	288	67	23	159	230	37	346	11	229	268	62
Future Volume (vph)	263	288	67	23	159	230	37	346	11	229	268	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0		0.0	55.0		0.0	45.0		0.0	75.0		0.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.972				0.850		0.995				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3440	0	1770	1863	1583	1770	3522	0	1770	1863	1583
Flt Permitted	0.361			0.519			0.950			0.950		
Satd. Flow (perm)	672	3440	0	967	1863	1583	1770	3522	0	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26				256		2				138
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		165.2			88.9			72.3			164.7	
Travel Time (s)		9.9			5.3			4.3			9.9	
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
Adj. Flow (vph)	292	320	74	26	177	256	41	384	12	254	298	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	292	394	0	26	177	256	41	396	0	254	298	69
Turn Type	pm+pt	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4			8		5	2		1 9	6	
Permitted Phases	4			8		8						6
Detector Phase	7	4		8	8	8	5	2		1 9	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0			5.0	5.0
Minimum Split (s)	11.2	39.6		39.6	39.6	39.6	11.0	32.1			32.1	32.1
Total Split (s)	15.0	55.0		40.0	40.0	40.0	16.0	33.0			54.0	54.0
Total Split (%)	12.0%	44.0%		32.0%	32.0%	32.0%	12.8%	26.4%			43.2%	43.2%
Maximum Green (s)	8.8	48.4		33.4	33.4	33.4	10.0	26.9			47.9	47.9
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.7	3.7			3.7	3.7
All-Red Time (s)	2.5	2.9		2.9	2.9	2.9	2.3	2.4			2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)	6.2	6.6		6.6	6.6	6.6	6.0	6.1			6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag			Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes			Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	3.0
Recall Mode	None	None		None	None	None	None	C-Min			C-Min	C-Min
Walk Time (s)		7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)		26.0		26.0	26.0	26.0		19.0			19.0	19.0
Pedestrian Calls (#/hr)		5		5	5	5		5			5	5
Act Effct Green (s)	43.0	42.6		19.1	19.1	19.1	8.1	30.9		26.8	57.8	57.8
Actuated g/C Ratio	0.34	0.34		0.15	0.15	0.15	0.06	0.25		0.21	0.46	0.46
v/c Ratio	0.76	0.33		0.18	0.62	0.56	0.36	0.45		0.67	0.35	0.09
Control Delay	47.7	28.7		44.9	57.8	9.6	63.9	43.1		34.7	25.1	0.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	47.7	28.7		44.9	57.8	9.6	63.9	43.1		34.7	25.1	0.2

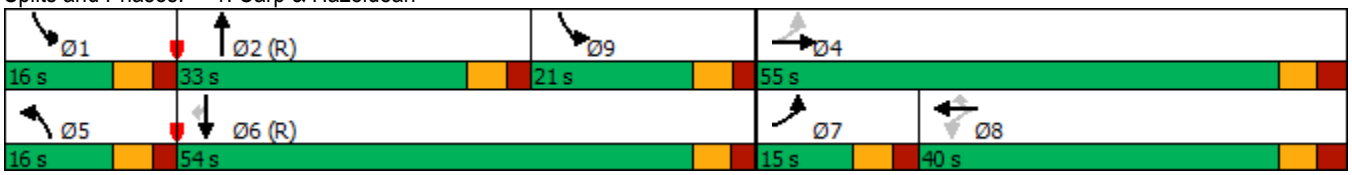
Lane Group	Ø1	Ø9
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Storage Length (m)		
Storage Lanes		
Taper Length (m)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (k/h)		
Link Distance (m)		
Travel Time (s)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	9
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	5.0	5.0
Minimum Split (s)	11.0	11.0
Total Split (s)	16.0	21.0
Total Split (%)	13%	17%
Maximum Green (s)	10.0	15.0
Yellow Time (s)	3.7	3.7
All-Red Time (s)	2.3	2.3
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Walk Time (s)		
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	C		D	E	A	E	D		C	C	A
Approach Delay		36.8			30.2			45.1			26.3	
Approach LOS		D			C			D			C	
Queue Length 50th (m)	58.3	36.4		6.1	44.3	0.0	10.3	47.1		33.1	51.0	0.0
Queue Length 95th (m)	#101.1	47.2		13.1	59.0	20.6	22.4	65.3		54.1	81.9	0.0
Internal Link Dist (m)		141.2			64.9			48.3			140.7	
Turn Bay Length (m)	90.0			55.0			45.0			75.0		
Base Capacity (vph)	383	1347		258	497	610	142	880		400	861	806
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.76	0.29		0.10	0.36	0.42	0.29	0.45		0.64	0.35	0.09

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 114 (91%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 34.1 Intersection LOS: C
Intersection Capacity Utilization 66.3% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Carp & Hazeldean



Lane Group	Ø1	Ø9
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	525	0	0	410	0	0
Future Volume (vph)	525	0	0	410	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	1863	0
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	1863	0
Link Speed (k/h)	60			60	50	
Link Distance (m)	88.9			80.4	61.1	
Travel Time (s)	5.3			4.8	4.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	583	0	0	456	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	583	0	0	456	0	0
Sign Control	Free			Free	Stop	

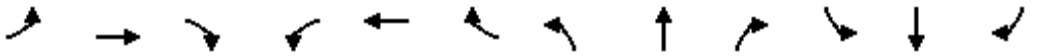
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 17.8%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	404	0	0	367
Future Volume (vph)	0	0	404	0	0	367
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	3539	0	0	1863
Flt Permitted						
Satd. Flow (perm)	0	1863	3539	0	0	1863
Link Speed (k/h)	50		60			60
Link Distance (m)	52.9		52.3			72.3
Travel Time (s)	3.8		3.1			4.3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	449	0	0	408
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	449	0	0	408
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 22.6%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	404	0	0	367
Future Volume (vph)	0	0	404	0	0	367
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	3539	0	0	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	3539	0	0	1863
Link Speed (k/h)	50		60			60
Link Distance (m)	53.8		109.7			52.3
Travel Time (s)	3.9		6.6			3.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	449	0	0	408
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	449	0	0	408
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 22.6%		ICU Level of Service A	
Analysis Period (min) 15			



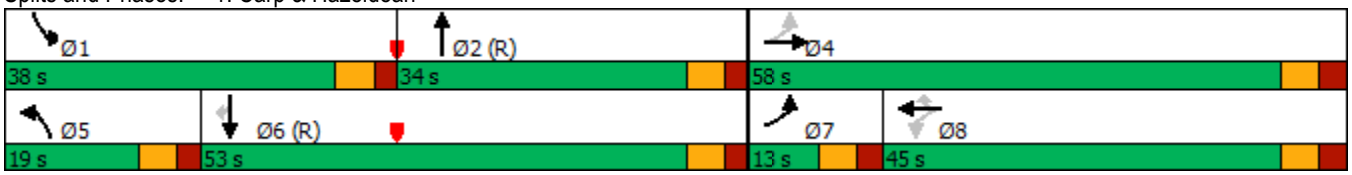
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	262	86	23	429	346	111	348	30	274	450	183
Future Volume (vph)	118	262	86	23	429	346	111	348	30	274	450	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0		0.0	55.0		0.0	45.0		0.0	75.0		0.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.963				0.850		0.988				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3408	0	1770	1863	1583	1770	3497	0	1770	1863	1583
Flt Permitted	0.105			0.523			0.950			0.950		
Satd. Flow (perm)	196	3408	0	974	1863	1583	1770	3497	0	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		41				348		6				193
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		165.2			88.9			72.3			164.7	
Travel Time (s)		9.9			5.3			4.3			9.9	
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
Adj. Flow (vph)	131	291	96	26	477	384	123	387	33	304	500	203
Shared Lane Traffic (%)												
Lane Group Flow (vph)	131	387	0	26	477	384	123	420	0	304	500	203
Turn Type	pm+pt	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Detector Phase	7	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.2	39.6		39.6	39.6	39.6	11.0	32.1		11.0	32.1	32.1
Total Split (s)	13.0	58.0		45.0	45.0	45.0	19.0	34.0		38.0	53.0	53.0
Total Split (%)	10.0%	44.6%		34.6%	34.6%	34.6%	14.6%	26.2%		29.2%	40.8%	40.8%
Maximum Green (s)	6.8	51.4		38.4	38.4	38.4	13.0	27.9		32.0	46.9	46.9
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.5	2.9		2.9	2.9	2.9	2.3	2.4		2.3	2.4	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.6		6.6	6.6	6.6	6.0	6.1		6.0	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	C-Min
Walk Time (s)		7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)		26.0		26.0	26.0	26.0		19.0			19.0	19.0
Pedestrian Calls (#/hr)		5		5	5	5		5			5	5
Act Effct Green (s)	53.1	52.7		36.3	36.3	36.3	12.1	31.9		26.7	46.5	46.5
Actuated g/C Ratio	0.41	0.41		0.28	0.28	0.28	0.09	0.25		0.21	0.36	0.36
v/c Ratio	0.64	0.28		0.10	0.92	0.55	0.75	0.49		0.84	0.75	0.29
Control Delay	41.8	23.4		34.6	69.1	8.7	83.5	45.1		69.2	45.8	5.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	41.8	23.4		34.6	69.1	8.7	83.5	45.1		69.2	45.8	5.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	C		C	E	A	F	D		E	D	A
Approach Delay		28.1			41.9			53.8			44.8	
Approach LOS		C			D			D			D	
Queue Length 50th (m)	20.8	30.1		5.1	122.1	7.0	32.6	53.6		78.7	126.2	1.9
Queue Length 95th (m)	#51.9	45.4		12.8	#181.4	35.2	#60.8	70.4		109.1	161.2	18.3
Internal Link Dist (m)		141.2			64.9			48.3			140.7	
Turn Bay Length (m)	90.0			55.0			45.0			75.0		
Base Capacity (vph)	204	1435		287	550	712	177	875		435	699	714
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.64	0.27		0.09	0.87	0.54	0.69	0.48		0.70	0.72	0.28

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 129 (99%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 42.7 Intersection LOS: D
Intersection Capacity Utilization 79.7% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Carp & Hazeldean



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	563	0	0	794	0	0
Future Volume (vph)	563	0	0	794	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	1863	0
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	1863	0
Link Speed (k/h)	60			60	50	
Link Distance (m)	88.9			80.4	61.1	
Travel Time (s)	5.3			4.8	4.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	626	0	0	882	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	626	0	0	882	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 25.3%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	501	0	0	573
Future Volume (vph)	0	0	501	0	0	573
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	3539	0	0	1863
Flt Permitted						
Satd. Flow (perm)	0	1863	3539	0	0	1863
Link Speed (k/h)	50		60			60
Link Distance (m)	52.9		52.3			72.3
Travel Time (s)	3.8		3.1			4.3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	557	0	0	637
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	557	0	0	637
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.5%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	501	0	0	573
Future Volume (vph)	0	0	501	0	0	573
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	3539	0	0	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	3539	0	0	1863
Link Speed (k/h)	50		60			60
Link Distance (m)	53.8		109.7			52.3
Travel Time (s)	3.9		6.6			3.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	557	0	0	637
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	557	0	0	637
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.5%		ICU Level of Service A	
Analysis Period (min) 15			

Appendix E

NCHRP 684 Internal Trip Capture
Estimation Tool

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	6250 Hazeldean Road TIA	**Organization:**	JLR
Project Location:	Ottawa, ON	**Performed By:**	R. Nahas
Scenario Description:	Projected Trip Generation	**Date:**	2026-02-13
Analysis Year:	Build-Out	**Checked By:**	D. Hook
Analysis Period:	**AM Street Peak Hour**	**Date:**	2026-02-13

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				171	87	84
Restaurant				55	28	27
Cinema/Entertainment				0		
Residential				0		
Hotel				0		
All Other Land Uses[2]				0		
				226	115	111

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail	1.15	5%	5%	1.15	5%	5%
Restaurant	1.15	5%	10%	1.15	5%	10%
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		13	0	0	0
Restaurant	0	4		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	260	132	128
Internal Capture Percentage	13%	13%	13%
External Vehicle-Trips[5]	175	89	86
External Transit-Trips[6]	11	6	5
External Non-Motorized Trips[6]	14	7	7

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	4%	13%
Restaurant	41%	13%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	6250 Hazeldean Road TIA
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.15	87	100	1.15	84	97
Restaurant	1.15	28	32	1.15	27	31
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	0	0	1.00	0	0
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	28		13	0	14	0
Restaurant	10	4		0	1	1
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		32	7	0	0	0
Retail	0		16	0	0	0
Restaurant	0	8		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	17	6	0		0
Hotel	0	4	2	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	4	96	100	75	5	5
Restaurant	13	19	32	14	1	2
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	13	84	97	66	4	4
Restaurant	4	27	31	20	1	3
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:		**Organization:**	
Project Location:		**Performed By:**	
Scenario Description:		**Date:**	
Analysis Year:		**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				212	105	107
Restaurant				37	27	25
Cinema/Entertainment				0		
Residential				0		
Hotel				0		
All Other Land Uses[2]				0		
				249	132	132

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail	1.15	5%	5%	1.15	5%	5%
Restaurant	1.15	5%	10%	1.15	5%	10%
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		9	0	0	0
Restaurant	0	12		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	304	152	152
Internal Capture Percentage	14%	14%	14%
External Vehicle-Trips[5]	204	103	101
External Transit-Trips[6]	13	6	7
External Non-Motorized Trips[6]	15	7	8

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	10%	7%
Restaurant	29%	41%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	0
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.15	105	121	1.15	107	123
Restaurant	1.15	27	31	1.15	25	29
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	0	0	1.00	0	0
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	2		36	5	32	6
Restaurant	1	12		2	5	2
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		10	1	0	0	0
Retail	0		9	0	0	0
Restaurant	0	61		0	0	0
Cinema/Entertainment	0	5	1		0	0
Residential	0	12	4	0		0
Hotel	0	2	2	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	12	109	121	86	5	5
Restaurant	9	22	31	17	1	2
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	9	114	123	89	6	6
Restaurant	12	17	29	12	1	2
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

Appendix F

TDM Checklists

TDM Measures Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

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: *Non-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	☑ Suncor assigned 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	☐
		2.2 Bicycle skills training	
		Commuter travel	
BETTER ★	2.2.1	Offer on-site cycling courses for commuters, or subsidize off-site courses	☐
		2.3 Valet bike parking	
		Visitor travel	
BETTER	2.3.1	Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	☐

			TDM measures: *Non-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	☐
BASIC		3.1.2	Provide online links to OC Transpo and STO information	☐
BETTER		3.1.3	Provide real-time arrival information display at entrances	☐
		3.2	**Transit fare incentives**	
			Commuter travel	
BETTER		3.2.1	Offer preloaded PRESTO cards to encourage commuters to use transit	☐
BETTER	★	3.2.2	Subsidize or reimburse monthly transit pass purchases by employees	☐
			Visitor travel	
BETTER		3.2.3	Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	☐
		3.3	**Enhanced public transit service**	
			Commuter travel	
BETTER		3.3.1	Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	☐
			Visitor travel	
BETTER		3.3.2	Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	☐
		3.4	**Private transit service**	
			Commuter travel	
BETTER		3.4.1	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	☐
			Visitor travel	
BETTER		3.4.2	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	☐

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		4.	**RIDESHARING**	
		4.1	**Ridematching service**	
			Commuter travel	
BASIC	★	4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	☐
		4.2	**Carpool parking price incentives**	
			Commuter travel	
BETTER		4.2.1	Provide discounts on parking costs for registered carpools	☐
		4.3	**Vanpool service**	
			Commuter travel	
BETTER		4.3.1	Provide a vanpooling service for long-distance commuters	☐
		5.	**CARSHARING & BIKESHARING**	
		5.1	**Bikeshare stations & memberships**	
BETTER		5.1.1	Contract with provider to install on-site bikeshare station for use by commuters and visitors	☐
			Commuter travel	
BETTER		5.1.2	Provide employees with bikeshare memberships for local business travel	☐
		5.2	**Carshare vehicles & memberships**	
			Commuter travel	
BETTER		5.2.1	Contract with provider to install on-site carshare vehicles and promote their use by tenants	☐
BETTER		5.2.2	Provide employees with carshare memberships for local business travel	☐
		6.	**PARKING**	
		6.1	**Priced parking**	
			Commuter travel	
BASIC	★	6.1.1	Charge for long-term parking (daily, weekly, monthly)	☐
BASIC		6.1.2	Unbundle parking cost from lease rates at multi-tenant sites	☐
			Visitor travel	
BETTER		6.1.3	Charge for short-term parking (hourly)	☐

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		7.	**TDM MARKETING & COMMUNICATIONS**	
		7.1	**Multimodal travel information**	
			Commuter travel	
BASIC	★	7.1.1	Provide a multimodal travel option information package to new/relocating employees and students	☑ Provided in on-boarding package
			Visitor travel	
BETTER	★	7.1.2	Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	☐
		7.2	**Personalized trip planning**	
			Commuter travel	
BETTER	★	7.2.1	Offer personalized trip planning to new/relocating employees	☑ Provided in on-boarding package and by manager
		7.3	**Promotions**	
			Commuter travel	
BETTER		7.3.1	Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	☐
		8.	**OTHER INCENTIVES & AMENITIES**	
		8.1	**Emergency ride home**	
			Commuter travel	
BETTER	★	8.1.1	Provide emergency ride home service to non-driving commuters	☐
		8.2	**Alternative work arrangements**	
			Commuter travel	
BASIC	★	8.2.1	Encourage flexible work hours	☐
BETTER		8.2.2	Encourage compressed workweeks	☐
BETTER	★	8.2.3	Encourage telework	☐
		8.3	**Local business travel options**	
			Commuter travel	
BASIC	★	8.3.1	Provide local business travel options that minimize the need for employees to bring a personal car to work	☑ Provided in on-boarding package and by manager
		8.4	**Commuter incentives**	
			Commuter travel	
BETTER		8.4.1	Offer employees a taxable, mode-neutral commuting allowance	☐
		8.5	**On-site amenities**	
			Commuter travel	
BETTER		8.5.1	Provide on-site amenities/services to minimize mid-day or mid-commute errands	☑ Provides discounts for on-site amenities

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

Legend

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

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

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

	TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2. WALKING & CYCLING: END-OF-TRIP FACILITIES	
	2.1 Bicycle parking	
REQUIRED	2.1.1 Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☐
REQUIRED	2.1.2 Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☐
REQUIRED	2.1.3 Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☐
BASIC	2.1.4 Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☐
BETTER	2.1.5 Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☐
	2.2 Secure bicycle parking	
REQUIRED	2.2.1 Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☐
BETTER	2.2.2 Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☐
	2.3 Shower & change facilities	
BASIC	2.3.1 Provide shower and change facilities for the use of active commuters	☐
BETTER	2.3.2 In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☐
	2.4 Bicycle repair station	
BETTER	2.4.1 Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐

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

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

Ottawa
343 Preston Street
Tower II, Suite 1000
Ottawa ON Canada
K1S 1N4
613-728-3571
ottawa@jlrichards.ca

Kingston
203-863 Princess Street
Kingston ON Canada
K7L 5N4
613-544-1424
kingston@jlrichards.ca

Sudbury
314 Countryside Drive
Sudbury ON Canada
P3E 6G2
705-522-8174
sudbury@jlrichards.ca

Timmins
834 Mountjoy Street South
Timmins ON Canada
P4N 7C5
705-360-1899
timmins@jlrichards.ca

North Bay
122 Main Street West, Suite 3
North Bay ON Canada
P1B 2T5
705-495-7597
northbay@jlrichards.ca

Guelph
107-450 Speedvale Avenue West
Guelph ON Canada
N1H 7Y6
519-763-0713
guelph@jlrichards.ca

London
380 Wellington Street
Tower B, 7th Floor
London ON Canada
N6A 5B5
226-700-5127
london@jlrichards.ca

J.L.Richards
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