

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 licensed¹ or registered² 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.

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

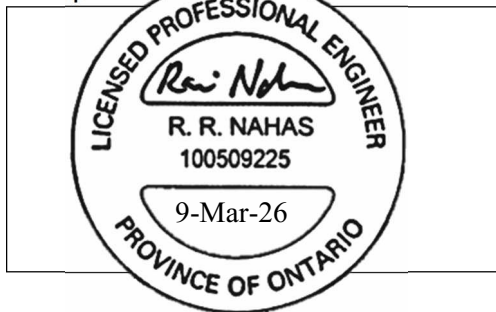
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1.0 Introduction


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**.

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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**.

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Figure 1: Transportation Context Area



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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).

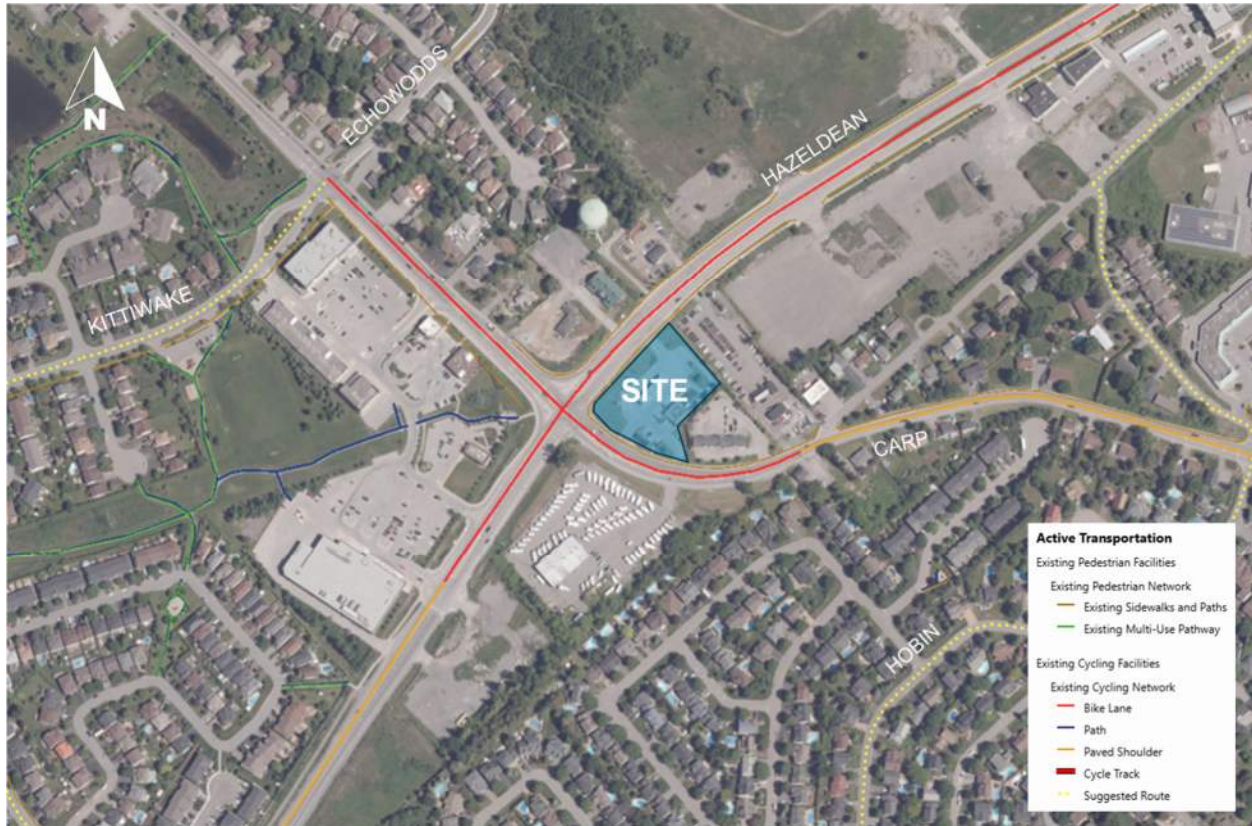
With regard to cyclists within the context area, facilities provided include painted bike lanes and paved shoulders on Hazeldean Road and Carp Road. Additionally, there are several multi-use pathways (MUPs) connecting the broader neighbourhood bounded by Hazeldean Road, Carp Road, and Rothebourne.

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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 of 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.) |

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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.

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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.

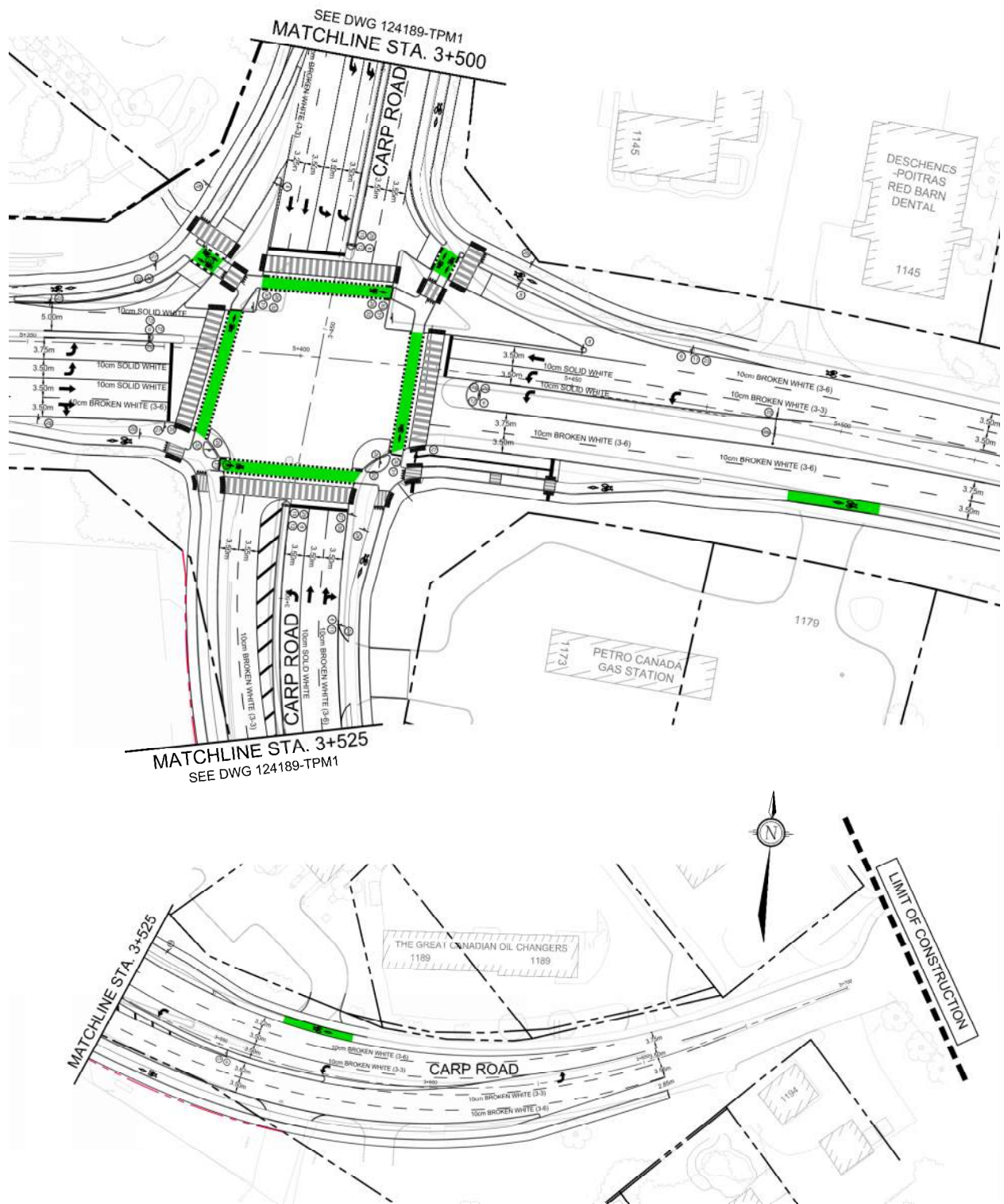
Based on the preliminary design (dated March 2026), improvements at the Carp/Hazeldean intersection include:

- 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.

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Figure 5: Hazeldean/Carp Proposed Intersection Changes



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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.

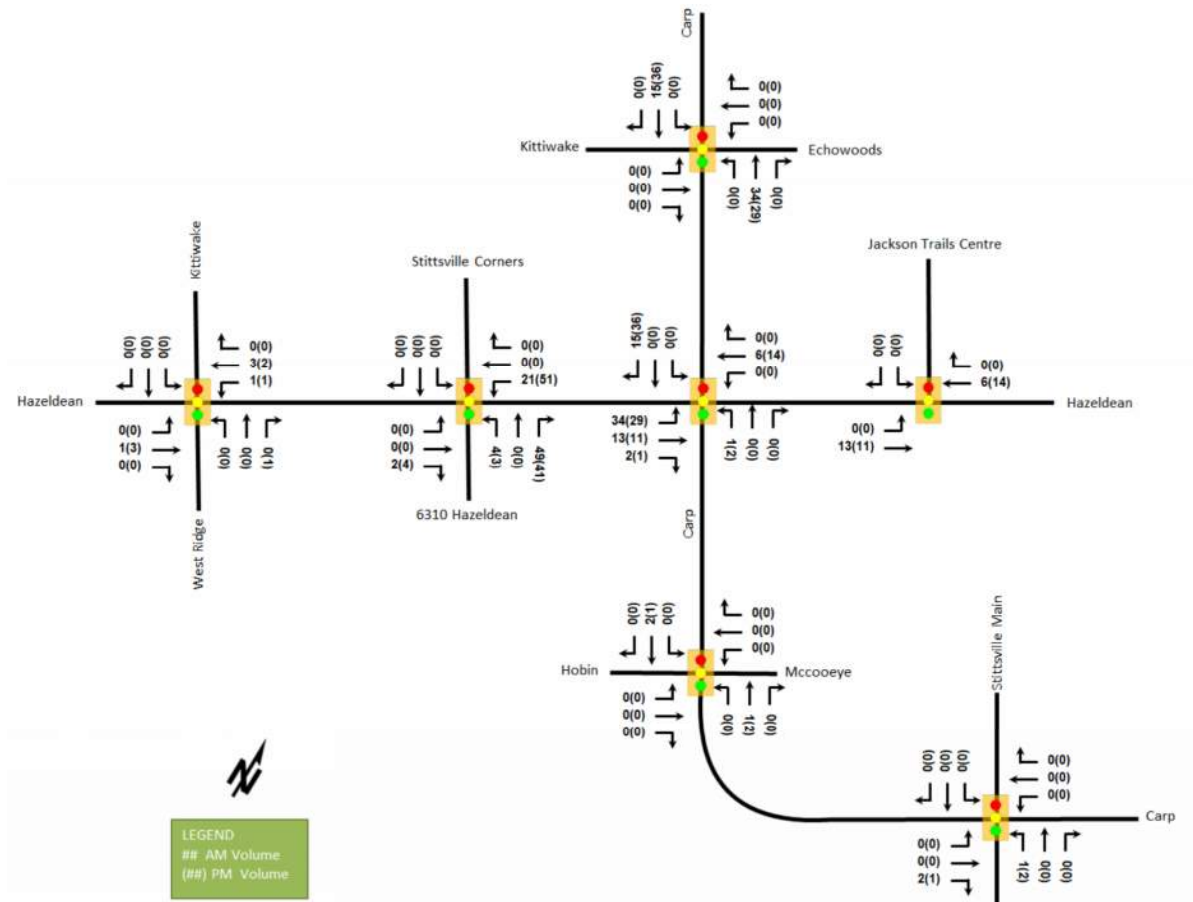
3.3.2 Other Area Development

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

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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 an intersection-based or segment-based Multi-Modal Level of Service (MMLOS) evaluation is required for the site’s boundary streets.

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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

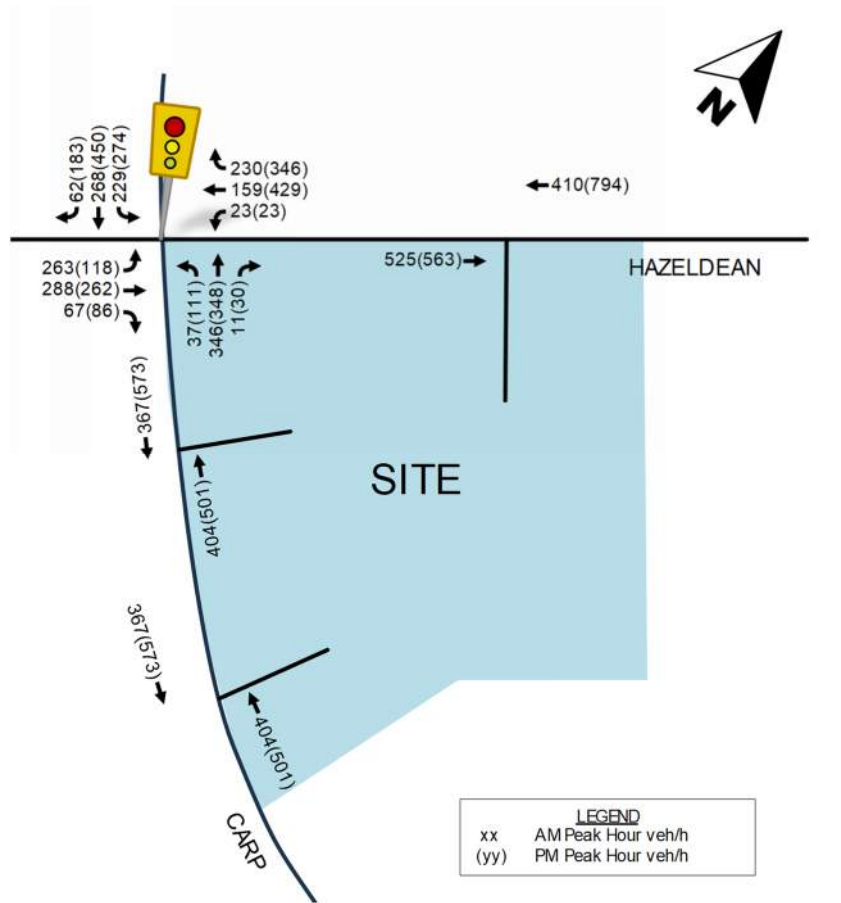
The following weekday morning and afternoon peak hour turning movement counts were obtained from the City of Ottawa:

- 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**.

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Figure 7: Existing Peak Hour Traffic Volumes



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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.

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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.

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Figure 10: Collision 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.

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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 theoretical 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 m² 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.

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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 ft ² 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**.

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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 comprised 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.

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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 |
| <i>Less Pass-by (50%)</i> | -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.

Transportation Impact Assessment (Brief) 6250 Hazeldean Road

Table 6: Module Exemption Review

| Module | Element | Exemption Criteria | Exemption Status |
|-------------------------------------|-------------------------------------|---|------------------|
| <i>Design Review</i> | | | |
| 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 |
| <i>Network Impact</i> | | | |
| 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.

Transportation Impact Assessment (Brief)

6250 Hazeldean Road

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.

Transportation Impact Assessment (Brief)

6250 Hazeldean Road

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-by-law 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.

Transportation Impact Assessment (Brief)

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- 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.

Transportation Impact Assessment (Brief)

6250 Hazeldean Road

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.

Transportation Impact Assessment (Brief) 6250 Hazeldean Road

J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:



Rani Nahas, P.Eng.
Transportation Engineer

Reviewed by:

A handwritten signature in black ink that reads "David Hook".

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

Transportation Impact Assessment (Brief)

6250 Hazeldean Road

Disclaimer

This report has been prepared by J.L. Richards & Associates Limited for Q9 Planning + Design on behalf of Suncor's exclusive use. Its discussions and conclusions are summary in nature and cannot properly be used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report is based on information, drawings, data, or reports provided by the named client, its agents, and certain other suppliers or third parties, as applicable, and relies upon the accuracy and completeness of such information. Any inaccuracy or omissions in information provided, or changes to applications, designs, or materials may have a significant impact on the accuracy, reliability, findings, or conclusions of this report.

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Appendix A

Screening Form

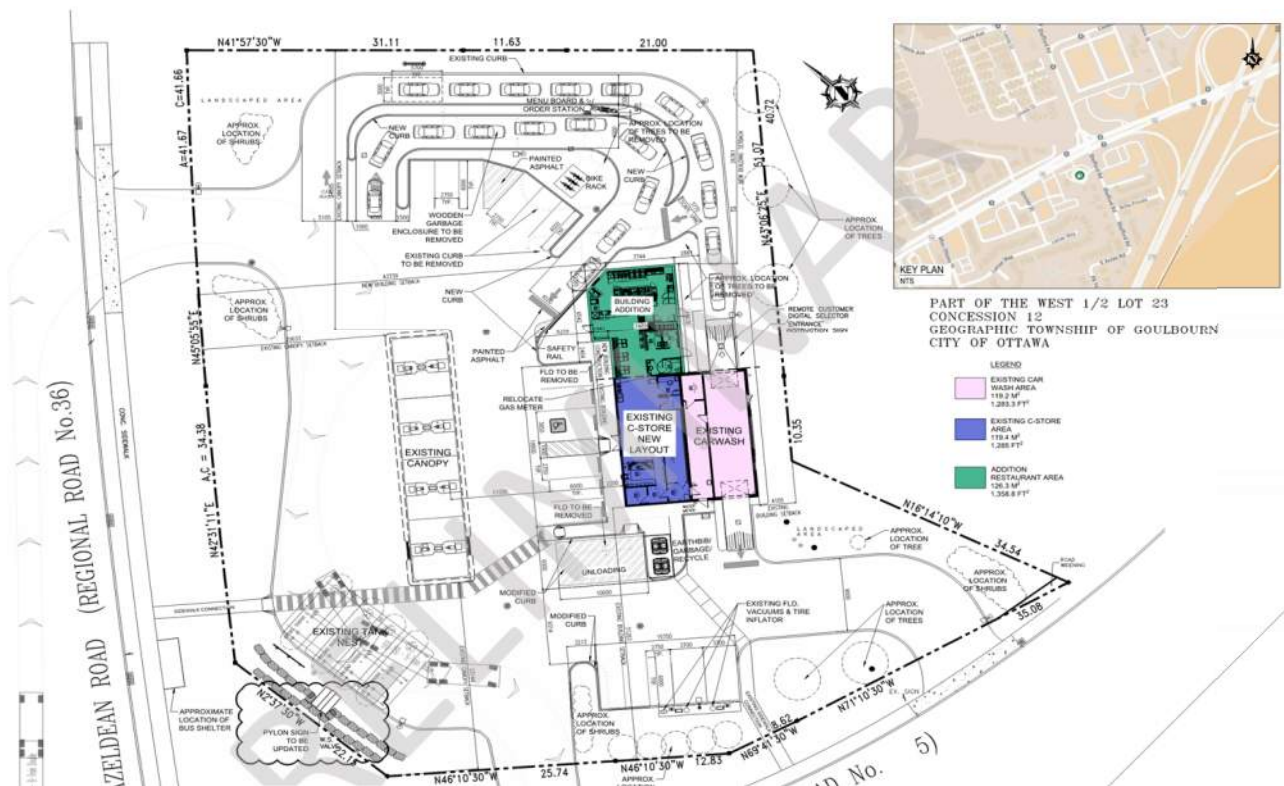
City of Ottawa 2017 TIA Guidelines Screening Form

*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 (PMTSAs) 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

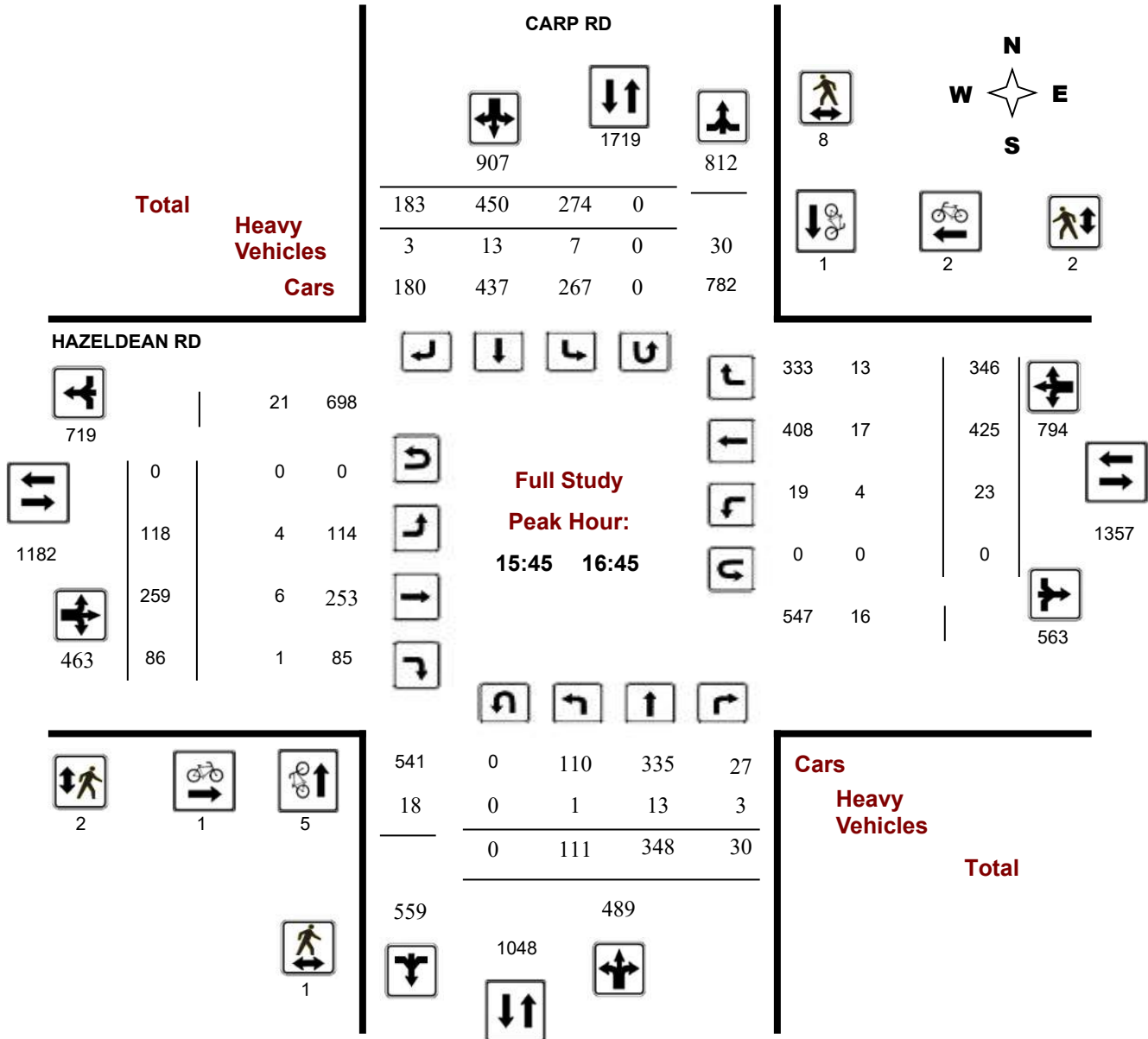
Survey Date: Thursday, September 19, 2024

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

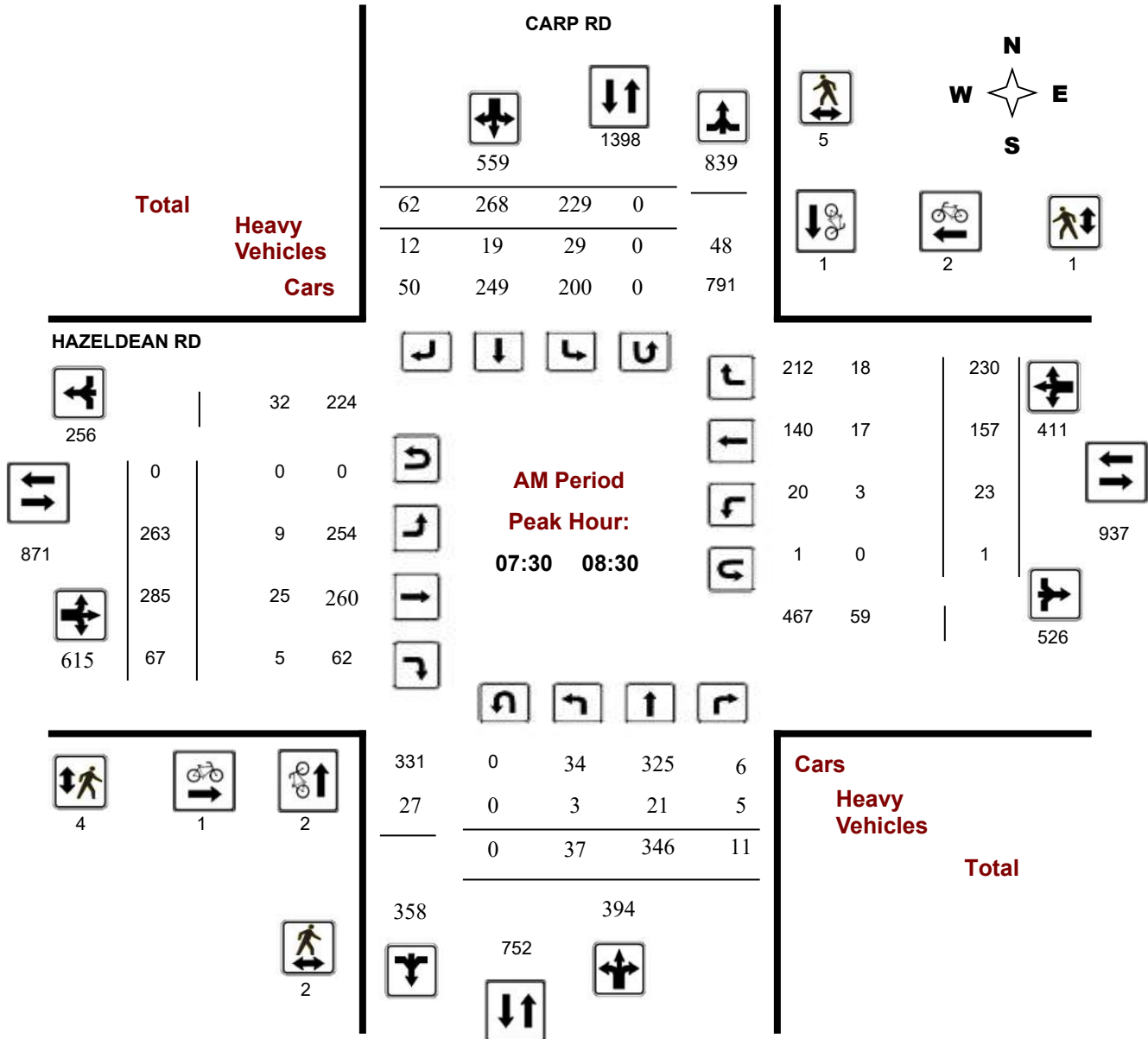
Survey Date: Thursday, September 19, 2024

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

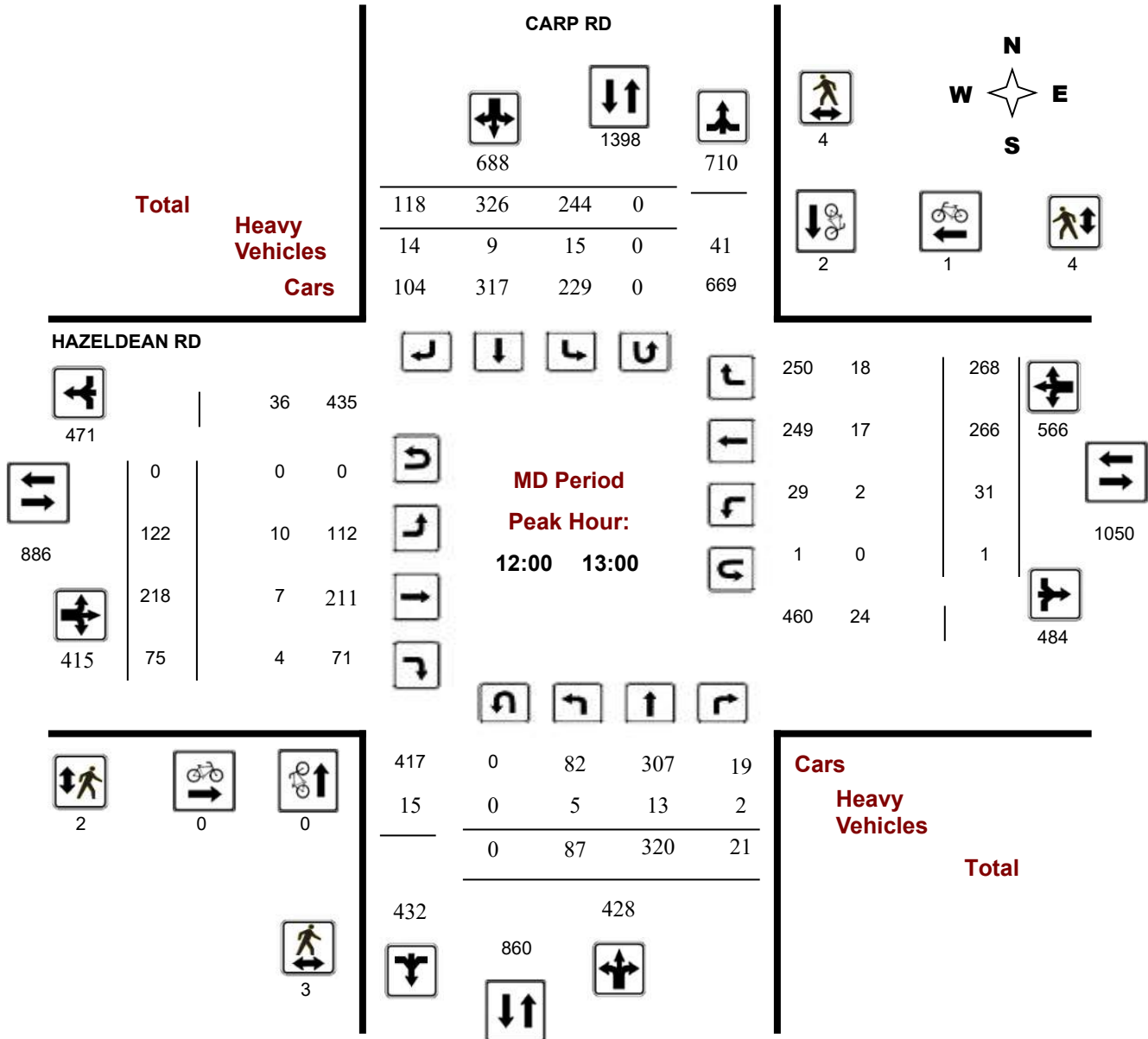
Survey Date: Thursday, September 19, 2024

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

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

| Period | CARP RD | | | | | | | | | HAZELDEAN RD | | | | | | | | | Grand Total | |
|---|------------|------|-----|------------|------|------|---------|-----------|--------|--------------|-----------|------|--------|--------|---------|------|------|-------|-------------|--|
| | Northbound | | | Southbound | | | STR TOT | Eastbound | | | Westbound | | | WB TOT | STR TOT | | | | | |
| | LT | ST | RT | NB TOT | LT | ST | | RT | SB TOT | LT | ST | RT | EB TOT | | | LT | ST | RT | | |
| 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 cyclist volumes refer 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 | | | Grand Total |
|--------------|------------|------------|--------------|--------------|-----------|--------------|-------------|
| | Northbound | Southbound | Street Total | Eastbound | Westbound | Street 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 | Northbound | | | N TOT | Southbound | | | S TOT | STR TOT | Eastbound | | | E TOT | Westbound | | | W TOT | STR TOT | Grand Total |
|-------------|------------|-----|----|----------|------------|-----|----|----------|------------|-----------|-----|----|----------|-----------|-----|-----|----------|------------|----------------|
| | LT | ST | RT | | LT | ST | RT | | | LT | ST | RT | | LT | ST | RT | | | |
| 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

CARP RD

HAZELDEAN RD

| Time Period | | Northbound U-Turn Total | Southbound U-Turn Total | Eastbound U-Turn Total | Westbound U-Turn Total | Total |
|-------------|-------|----------------------------|----------------------------|---------------------------|---------------------------|-------|
| 07:00 | 07:15 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 07:30 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 07:45 | 0 | 0 | 0 | 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 |
| 03 - P.D. only | 0 | 1 | 31 | 5 | 11 | 0 | 7 | 2 | 57 |
| 02 - Non-fatal injury | 0 | 0 | 3 | 1 | 3 | 0 | 0 | 0 | 7 |
| 01 - Fatal injury | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 1 | 35 | 6 | 14 | 0 | 7 | 2 | 65 |
| | #7 or 0% | #6 or 2% | #1 or 54% | #4 or 9% | #2 or 22% | #7 or 0% | #3 or 11% | #5 or 3% | |

2%
88%
11%
0%
98%

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 |
| 02 - Non-fatal injury | 0 | 0 | 2 | 1 | 3 | 0 | 0 | 0 | 6 |
| 01 - Fatal injury | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 1 | 34 | 6 | 12 | 0 | 4 | 2 | 59 |
| | 0% | 2% | 58% | 10% | 20% | 0% | 7% | 3% | |

88%
10%
0%
98%

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 |
| 02 - Non-fatal injury | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 01 - Fatal injury | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 4 |
| | 0% | 0% | 25% | 0% | 0% | 0% | 75% | 0% | |

75%
25%
0%
100%

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 |
| 02 - Non-fatal injury | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01 - Fatal injury | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| | 0% | 0% | 0% | 0% | 100% | 0% | 0% | 0% | |

100%
0%
0%
100%

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 |
| 02 - Non-fatal injury | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01 - Fatal injury | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| | 0% | 0% | 0% | 0% | 100% | 0% | 0% | 0% | |

100%
0%
0%
100%

| X_Coordinate | Y_Coordinate | ID | Geo_ID | Accident_Year | Accident_Date | Location | Classification_Of_Accident | Initial_Impact_Type | Road_1_Surfac | Environment | 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 sign | 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 snow | 05 - Drifting | Sn07 - Dark | 01 - Traffic sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 2 | | |
| 348804.577 | 5014360.433 | 2021-59794 | 86 | 2021 | 2021-08-09 | CARP RD @ HAZELDEAN RD | 03 - P.D. only | 03 - Rear end | 01 - Dry | 01 - Clear | 01 - Daylight | 01 - Traffic sign | 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 sign | 2 | | |
| 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 2 | | |
| 348804.577 | 5014360.433 | 2020-45506 | 86 | 2020 | 2020-01-03 | CARP RD @ HAZELDEAN RD | 03 - P.D. only | 03 - Rear end | 04 - Sideswipe | 01 - Dry | 01 - Clear | 01 - Daylight | 01 - Traffic sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 snow | 03 - Snow | 03 - Dawn | 01 - Traffic sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 R01 | 01 - Daylight | 01 - Traffic sign | 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 sign | 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 sign | 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 sign | 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 sign | 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, s05 | 05 - Dusk | 01 - Traffic sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 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 sign | 2 | | |
| 348795.105 | 5014355.436 | 2024-105474 | 86 | 2024 | 2024-03-28 | CARP RD @ HAZELDEAN RD | 04 - Non-reportable | 03 - Rear end | 01 - Dry | 01 - Clear | 01 - Daylight | 01 - Traffic sign | 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

1: Carp & Hazeldean
Existing AM

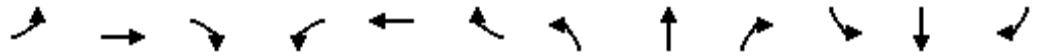
Baseline
Default

| 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 | | 19 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | | | | 6 |
| Detector Phase | 7 | 4 | | 8 | 8 | 8 | 5 | 2 | | 19 | 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 | | |

1: Carp & Hazeldean
Existing AM

Baseline
Default

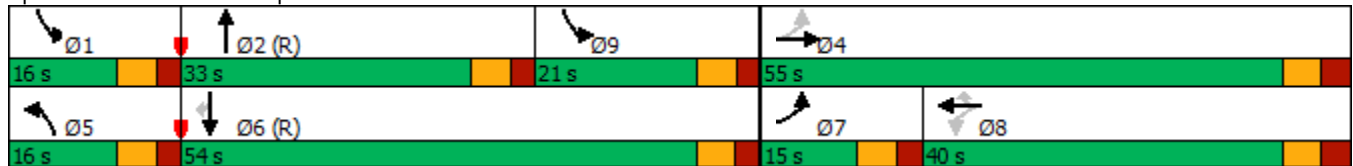


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|--------|-------|-----|------|------|------|------|------|-----|------|-------|------|
| LOS | D | C | | D | E | A | E | D | | C | C | A |
| Approach Delay | | 36.8 | | | 30.2 | | | 45.1 | | | 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.

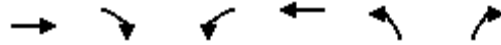
Splits and Phases: 1: Carp & Hazeldean



| 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 | | |

2: Site & Hazeldean
Existing AM

Baseline
Default



| 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% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

3: Carp & North Access
Existing AM

Baseline
Default



| 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 |
| Frnt | | | | | | |
| 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% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

4: Carp & South Access
Existing AM

Baseline
Default


























| 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 |
| Fr | | | | | | |
| 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

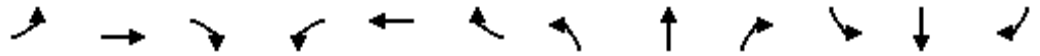
| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 22.6% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

1: Carp & Hazeldean
Existing PM

| |  |  |  |  |  |  |  |  |  |  |  |  |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |
| Fr _t | | 0.963 | | | | 0.850 | | 0.988 | | | | 0.850 |
| Fl _t Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 3408 | 0 | 1770 | 1863 | 1583 | 1770 | 3497 | 0 | 1770 | 1863 | 1583 |
| Fl _t 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 |

1: Carp & Hazeldean

Existing PM



| 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%

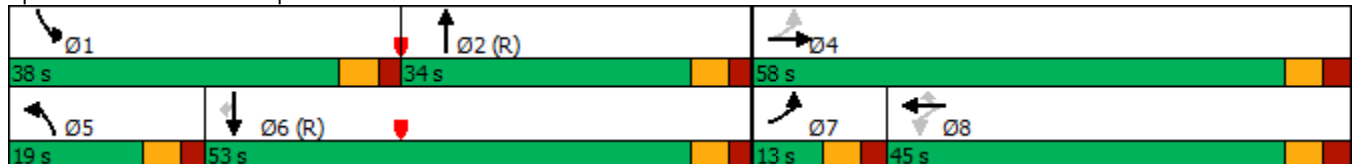
ICU Level of Service D

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



2: Site & Hazeldean Existing PM

| |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|
| 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 |
| Fr | | | | | | |
| 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 | | | | | |

3: Carp & North Access
Existing PM



| 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 |
| Fr | | | | | | |
| 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% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

4: Carp & South Access
Existing PM



| 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 |
| Fr | | | | | | |
| 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% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

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 | | | | | | |
| 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 |

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

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

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

⁴Enter 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.

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

⁶Person-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 |

¹Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A
²Person-Trips
³Total 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 |

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

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

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

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

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

⁶Person-Trips

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

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| | |
|-------------------------|---------------------|
| 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 |

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

²Person-Trips

³Total 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: <i>Non-residential developments</i> | | 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 |
| | | <input checked="" type="checkbox"/> 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 | |
| | | <input type="checkbox"/> |
| 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 | |
| | | <input type="checkbox"/> |
| 2.2 Bicycle skills training | | |
| <i>Commuter travel</i> | | |
| BETTER | ★ | 2.2.1 Offer on-site cycling courses for commuters, or subsidize off-site courses |
| | | <input type="checkbox"/> |
| 2.3 Valet bike parking | | |
| <i>Visitor travel</i> | | |
| BETTER | 2.3.1 Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games) | |
| | | <input type="checkbox"/> |

| TDM measures: <i>Non-residential developments</i> | | Check if proposed & add descriptions |
|---|---|--------------------------------------|
| 3. TRANSIT | | |
| 3.1 Transit information | | |
| BASIC | 3.1.1 Display relevant transit schedules and route maps at entrances | <input type="checkbox"/> |
| BASIC | 3.1.2 Provide online links to OC Transpo and STO information | <input type="checkbox"/> |
| BETTER | 3.1.3 Provide real-time arrival information display at entrances | <input type="checkbox"/> |
| 3.2 Transit fare incentives | | |
| <i>Commuter travel</i> | | |
| BETTER | 3.2.1 Offer preloaded PRESTO cards to encourage commuters to use transit | <input type="checkbox"/> |
| BETTER ★ | 3.2.2 Subsidize or reimburse monthly transit pass purchases by employees | <input type="checkbox"/> |
| <i>Visitor travel</i> | | |
| BETTER | 3.2.3 Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games) | <input type="checkbox"/> |
| 3.3 Enhanced public transit service | | |
| <i>Commuter travel</i> | | |
| BETTER | 3.3.1 Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends) | <input type="checkbox"/> |
| <i>Visitor travel</i> | | |
| BETTER | 3.3.2 Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games) | <input type="checkbox"/> |
| 3.4 Private transit service | | |
| <i>Commuter travel</i> | | |
| 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) | <input type="checkbox"/> |
| <i>Visitor travel</i> | | |
| 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) | <input type="checkbox"/> |

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

| TDM measures: <i>Non-residential developments</i> | | Check if proposed & add descriptions |
|---|---|--|
| 7. TDM MARKETING & COMMUNICATIONS | | |
| 7.1 Multimodal travel information | | |
| <i>Commuter travel</i> | | |
| BASIC ★ | 7.1.1 Provide a multimodal travel option information package to new/relocating employees and students | <input checked="" type="checkbox"/> Provided in on-boarding package |
| <i>Visitor travel</i> | | |
| BETTER ★ | 7.1.2 Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games) | <input type="checkbox"/> |
| 7.2 Personalized trip planning | | |
| <i>Commuter travel</i> | | |
| BETTER ★ | 7.2.1 Offer personalized trip planning to new/relocating employees | <input checked="" type="checkbox"/> Provided in on-boarding package and by manager |
| 7.3 Promotions | | |
| <i>Commuter travel</i> | | |
| BETTER | 7.3.1 Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes | <input type="checkbox"/> |
| 8. OTHER INCENTIVES & AMENITIES | | |
| 8.1 Emergency ride home | | |
| <i>Commuter travel</i> | | |
| BETTER ★ | 8.1.1 Provide emergency ride home service to non-driving commuters | <input type="checkbox"/> |
| 8.2 Alternative work arrangements | | |
| <i>Commuter travel</i> | | |
| BASIC ★ | 8.2.1 Encourage flexible work hours | <input type="checkbox"/> |
| BETTER | 8.2.2 Encourage compressed workweeks | <input type="checkbox"/> |
| BETTER ★ | 8.2.3 Encourage telework | <input type="checkbox"/> |
| 8.3 Local business travel options | | |
| <i>Commuter travel</i> | | |
| BASIC ★ | 8.3.1 Provide local business travel options that minimize the need for employees to bring a personal car to work | <input checked="" type="checkbox"/> Provided in on-boarding package and by manager |
| 8.4 Commuter incentives | | |
| <i>Commuter travel</i> | | |
| BETTER | 8.4.1 Offer employees a taxable, mode-neutral commuting allowance | <input type="checkbox"/> |
| 8.5 On-site amenities | | |
| <i>Commuter travel</i> | | |
| BETTER | 8.5.1 Provide on-site amenities/services to minimize mid-day or mid-commute errands | <input checked="" type="checkbox"/> 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: <i>Non-residential developments</i> | | Check if completed & add descriptions, explanations or plan/drawing references |
|---|---|--|
| 1. WALKING & CYCLING: ROUTES | | |
| 1.1 Building location & access points | | |
| BASIC | 1.1.1 Locate building close to the street, and do not locate parking areas between the street and building entrances | <input checked="" type="checkbox"/> |
| BASIC | 1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations | <input checked="" type="checkbox"/> |
| BASIC | 1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort | <input checked="" type="checkbox"/> |
| 1.2 Facilities for walking & cycling | | |
| REQUIRED | 1.2.1 Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations (<i>see Official Plan policy 4.3.3</i>) | <input checked="" type="checkbox"/> |
| REQUIRED | 1.2.2 Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible (<i>see Official Plan policy 4.3.12</i>) | <input checked="" type="checkbox"/> |

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

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

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

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

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