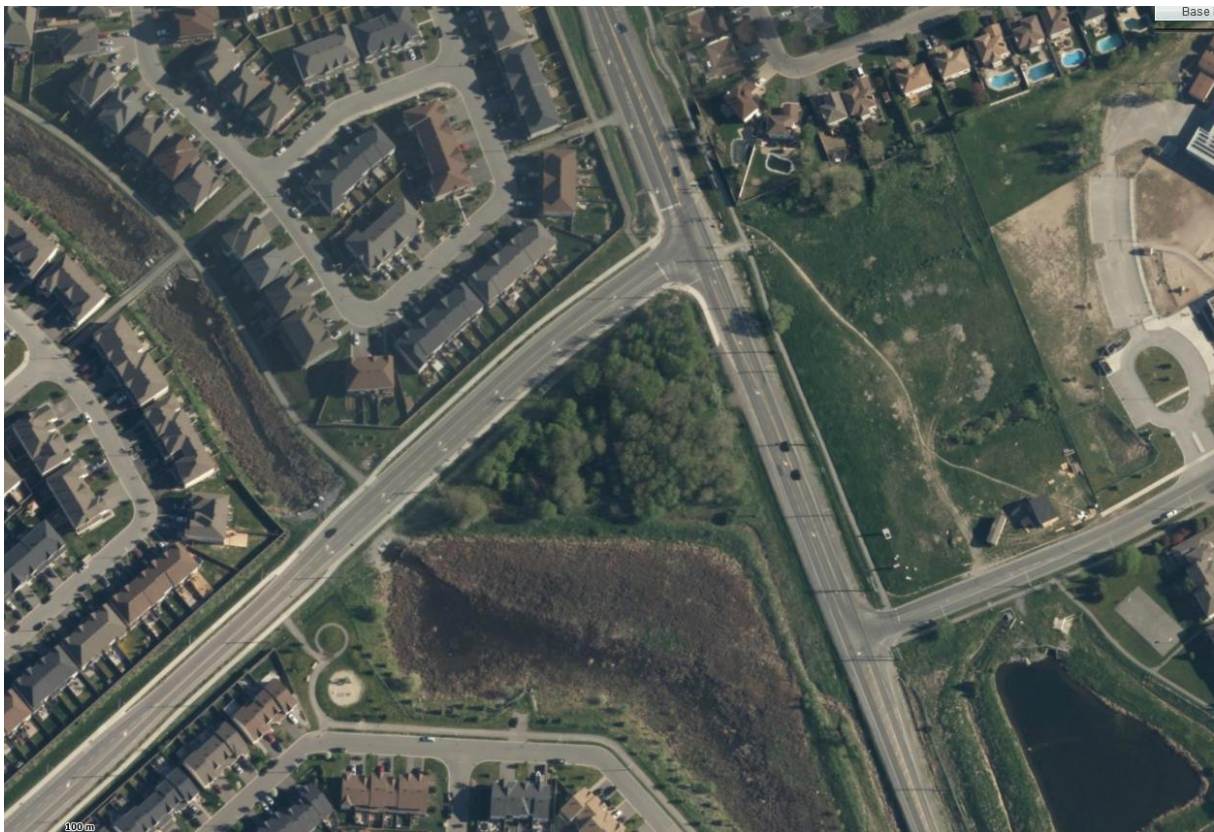


IRONCLAD DEVELOPMENTS INC

# 800 EAGLESON ROAD TRANSPORTATION IMPACT ASSESSMENT DRAFT STRATEGY REPORT







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IRONCLAD DEVELOPMENTS INC

(DRAFT)

PROJECT NO.: OUR REF. NO. 18M-00131-00  
DATE: AUGUST 24, 2018

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# 1 SCREENING FORM

The completed screening form and revised site plan are provided in **Appendix A** and **Appendix B** respectively.

## 2 DESCRIPTION OF PROPOSED DEVELOPMENT

Ironclad Developments Inc. plans to develop the greenfield property in South Kanata at the southwest corner of the Eagleson Road and Fernbank Road intersection. The property is zoned as an Arterial Mainstreet [AM] which can accommodate a broad range of uses including retail, service commercial, offices, residential, and institutional.

The proposed development includes a 6-storey rental apartment building with 143 units. The expected unit distribution is:

- 34 One Bedroom (24%)
- 81 Two Bedroom (57%)
- 28 Three Bedroom (19%)

The draft site plan (**Appendix B**) includes 89 underground vehicle parking spaces and 65 surface parking spaces available for residents. An additional 25 visitor parking spaces will be provided in the near the main entrance including three accessible spaces. Interior bicycle storage will be provided for 82 bicycles (residents only). Additional space will be allocated for limited visitor bicycle storage.

The estimated date of occupancy is Fall 2019 with construction occurring as a single phase.

Three accesses will be provided as shown in the attached site plan:

- Fernbank Road, full movement, approximately 140m west of Eagleson Road (south side)
- Eagleson Road, one-way right-out approximately 40m south of Fernbank Road (west side)
- Eagleson Road, full movement, approximately 90m south of Fernbank Road (west side)

The full movement accesses are over 70m from an existing intersection which was a requirement noted by the City of Ottawa at the pre-consultation meeting (December 12, 2017).

## 3 EXISTING CONDITIONS

### 3.1 ROADWAYS AND PEDESTRIAN / CYCLING FACILITIES

The six existing roads that our Transportation Impact Assessment will consider are Eagleson Road, Fernbank Road, Cope Drive, Bridgestone Drive, Terry Fox Drive, and Templeford Avenue / Romina Street. These roads are all under the jurisdiction of the City of Ottawa and are further described below.

**Eagleson Road** is an urban arterial road (City of Ottawa Official Plan, 2003, Volume 1, Section 7, Annex 1 Road Classification and Rights-of-Way) that runs on a north-south alignment with a posted speed limit of 60 km/h. North of Bridgestone Drive it has two lanes of traffic in each direction; south of Bridgestone Drive it has a single lane of traffic in each direction. The Official Plan reserves a 44.5 metre Right-of-Way in the study area.

**Fernank Road** is an urban arterial road that runs on an east-west alignment. It has two lanes of traffic in each direction with a posted speed of 60 km/h. The Official Plan reserves a 30.0 metre Right-of-Way in the study area.

**Cope Drive** is an urban collector road that runs on an east-west alignment. It has a single lane of traffic in each direction with a posted speed limit of 50 km/h. Cope Drive extends east of Eagleson Road as the urban collector Cadence Gate.

**Bridgestone Drive** is a major collector road that provides access through the Bridlewood-Emerald Meadows Neighbourhood. It has a single lane of traffic in each direction with a posted speed limit of 40 km/h.

**Terry Fox Drive** is an urban arterial road that runs on a north-south alignment. It has a single lane of traffic in each direction with a posted speed limit of 80 km/h.

**Templeford Avenue / Romina Street** are local roads that provide access through the residential portion of the Kanata South Business Park Neighbourhood. It is called Templeford Avenue north of Fernbank Road and Romina Street south of Fernbank Road. The speed limit is 40 km/h. Romina Street extends east of Eagleson Road as the urban collector Emerald Meadows Drive.

The existing pedestrian and cycling facilities in this area are shown in **Figure 2** and include:

Eagleson Road:

- Separated path on the east side from Bridgestone Drive north through study area
- Separated path on the west side from Fernbank Road and north by 240m to east-west path that ties into Carronbridge Circle
- Bike lane on the west side north of Cope Drive

Fernbank Road:

- Sidewalks on the north and south sides between Eagleson Road and Terry Fox Drive
- Bike lanes on the north and south side between Terry Fox Drive and Eagleson Road (**Figure 1**)

Templeford Avenue / Romina Street:

- Sidewalks on the east and west sides through study area

Terry Fox Drive:

- Separated path on the west side between Fernbank Road and Cope Drive

Cope Drive:

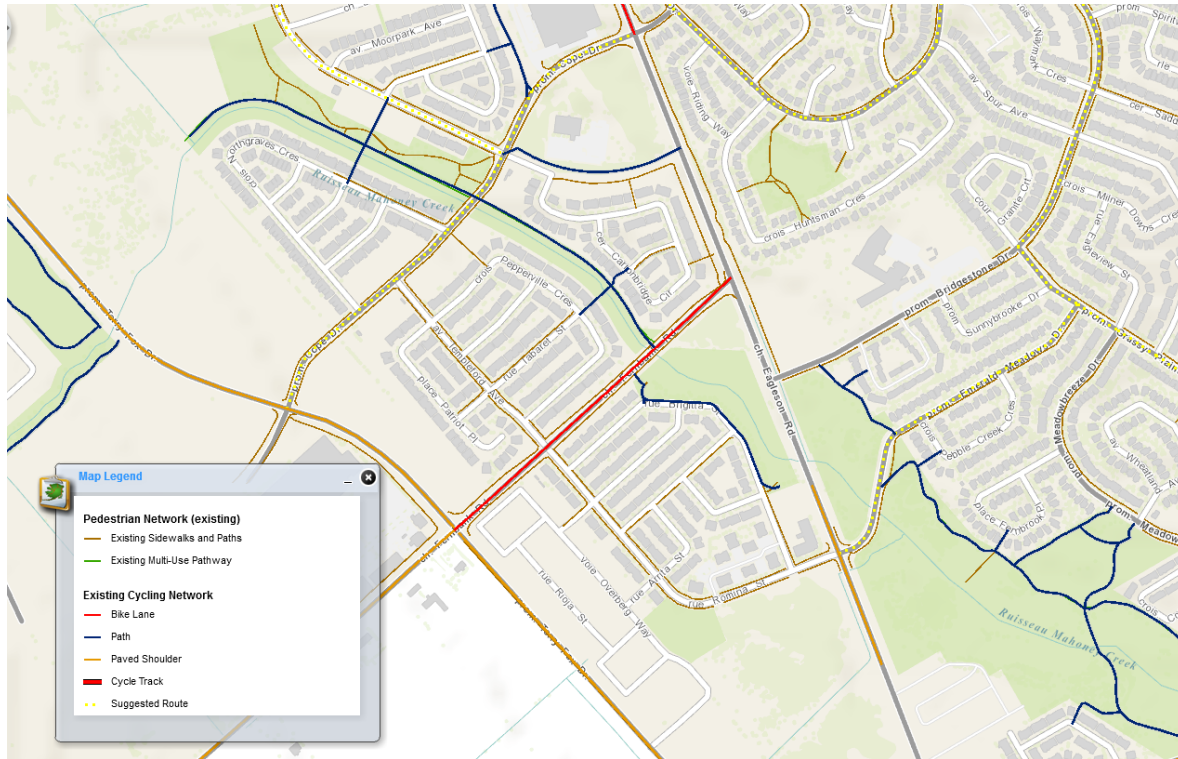
- Sidewalks on the north and south sides between Eagleson Road and Terry Fox Drive

Bridgestone Drive

- Separated path on the south side through study area



**Figure 1. Fernbank Road Bike Lane**



**Figure 2. Existing Pedestrian and Cycling Facilities**

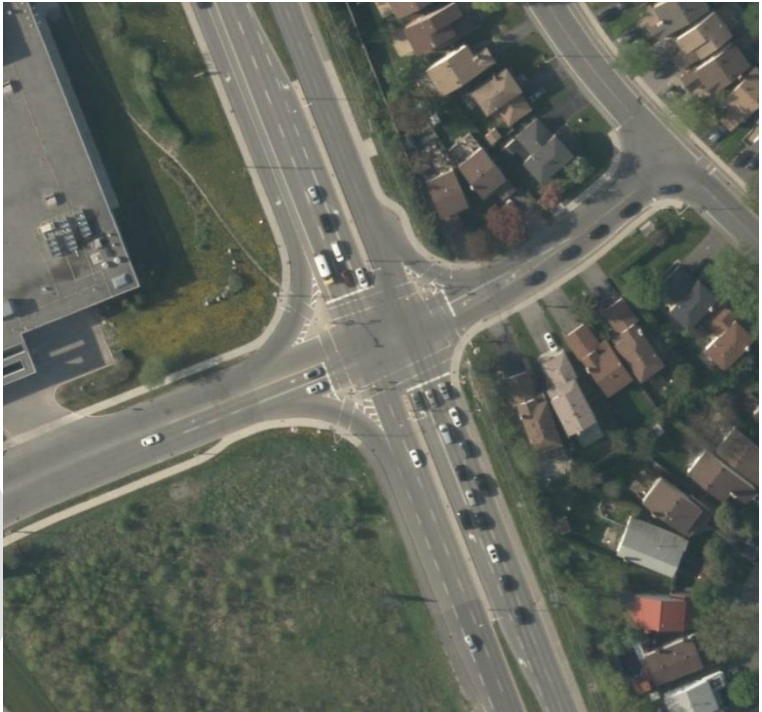
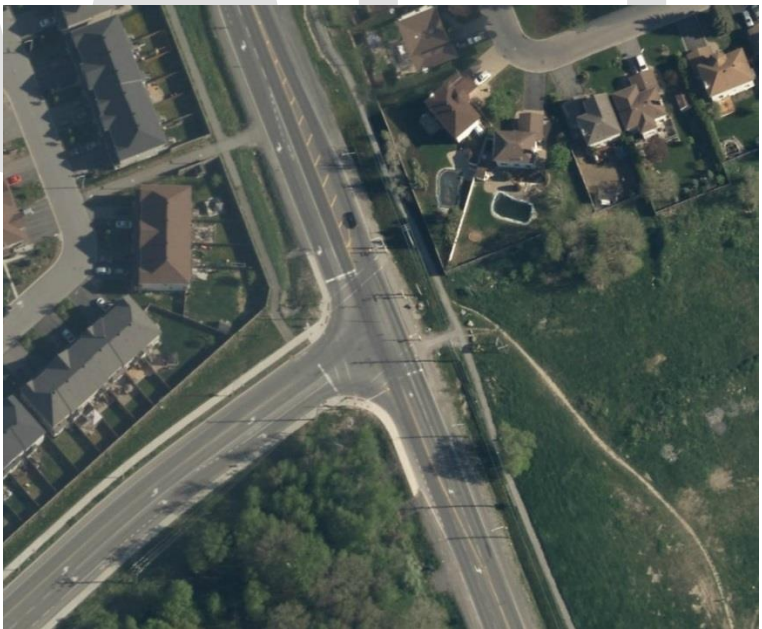
(Source: GeoOttawa)

## 3.2 INTERSECTIONS

We will consider five intersections in our Transportation Impact Assessment:

- Eagleson Road and Cope Drive
- Eagleson Road and Fernbank Road
- Eagleson Road and Bridgestone Drive
- Fernbank Road and Terry Fox Drive
- Fernbank Road and Templeford Avenue / Romina Street

**Table 1. Study Area Intersections**

INTERSECTION DESCRIPTION	LANE ARRANGEMENT
<p><b>Egleson Road and Cope Drive</b> is a signalized intersection with no turning restrictions.</p> <p>Pedestrians crossing facilities are provided on all approaches.</p> <p><u>Lane Arrangement</u>  Northbound: left, through, shared through/right  Westbound: left, shared through/right with a right channelization.  Southbound: left, two through, right with a channelization  Eastbound: left, shared through/right with a right channelization</p>	
<p><b>Egleson Road and Fernbank Road</b> is a signalized intersection with no turning restrictions.</p> <p>Pedestrians crossing facilities are provided on all approaches.</p> <p><u>Lane Arrangement</u>  Northbound: left, through  Southbound: right, through  Eastbound: left, right</p> <p>800 Eagleson Drive is located at the south-west corner of this intersection.</p>	

## INTERSECTION DESCRIPTION

## LANE ARRANGEMENT

**Eagleson Road and Bridgestone Drive** is a stop controlled intersection with no turning restrictions. The northbound and southbound traffic is free flowing through the intersection.

A north-south pedestrian crossing facility is provided on the east approach.

### Lane Arrangement

Northbound: through, right  
Westbound: left, right  
Southbound: left, through

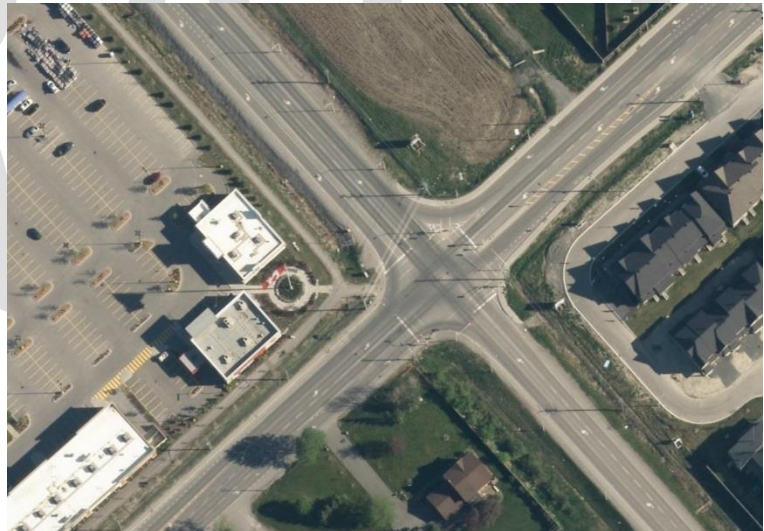


**Fernbank Road and Terry Fox Drive** is a signalized intersection with no turning restrictions.

Pedestrians crossing facilities are provided on all approaches.

### Lane Arrangement

Northbound: left, shared through/right  
Westbound: left, through, right with channelization  
Southbound: left, through, right  
Eastbound: left, through, right



## INTERSECTION DESCRIPTION

## LANE ARRANGEMENT

**Fernbank Road and Templeford Avenue / Romina Street** is a two-way stop controlled intersection with no turning restrictions.

East-west pedestrian crossing facilities are provided on the north and south approaches.

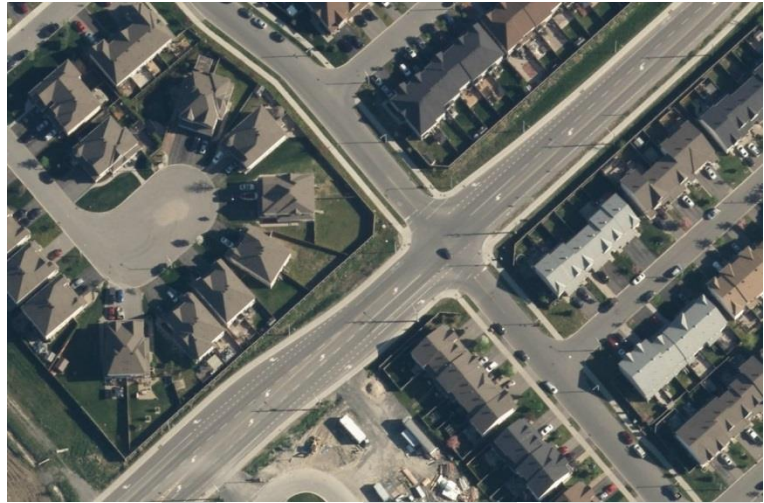
### Lane Arrangement

Northbound: shared left, through, right

Westbound: left, through, right

Southbound: shared left, through, right

Eastbound: left, through, right



## 3.3 DRIVEWAYS

There are no private driveways in close proximity to either proposed access to the 800 Eagleson development. Access to all private residences are from local streets such as Templeford Avenue, Romina Street, and Bridgestone Avenue. Photos of the existing transportation network around the accesses are shown in the following figures.



**Figure 3. Fernbank Road: east towards proposed driveway access**



**Figure 4. Fernbank Road: east from proposed driveway access**



Figure 5. Eagleson Road: south from Fernbank



Figure 6. Eagleson Road: south towards proposed access



Figure 7. Fernbank Road: eastbound right/left turn lanes

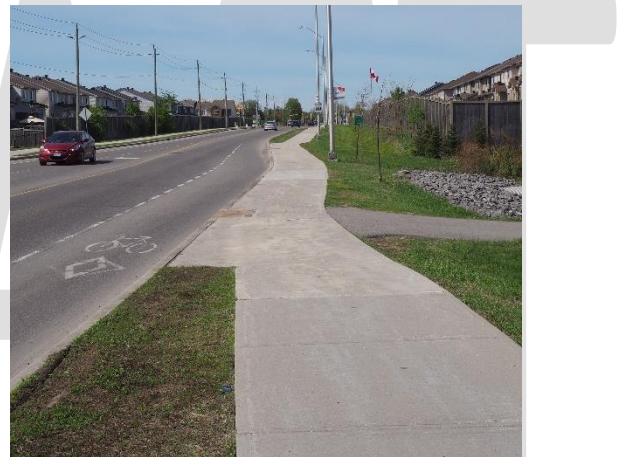


Figure 8. Fernbank Road: west towards pathway



Figure 9. Mahoney Creek (Fernbank looking south)



Figure 10. Fernbank Road: Signage

### 3.4 TRANSIT

OC Transpo provides four transit stops in close proximity to 800 Eagleson Road:

- Southbound Transit Stop 9081 on Eagleson Road south of Fernbank Road (Route 168), Adjacent to property (50m from property)
- Westbound Transit Stop 1988 on Fernbank Road west of Eagleson (Route 168), Opposite side of Fernbank Road (75m from property)
- Eastbound Transit Stop 1936 on Fernbank Road east of Templeford / Romina (Route 168, 370m from property)
- Westbound Transit Stop 1934 on Fernbank Road west of Templeford / Romina (Route 161, 168, 681, 460m from property)

The existing OC Transpo routes in this area are shown in the following figure.

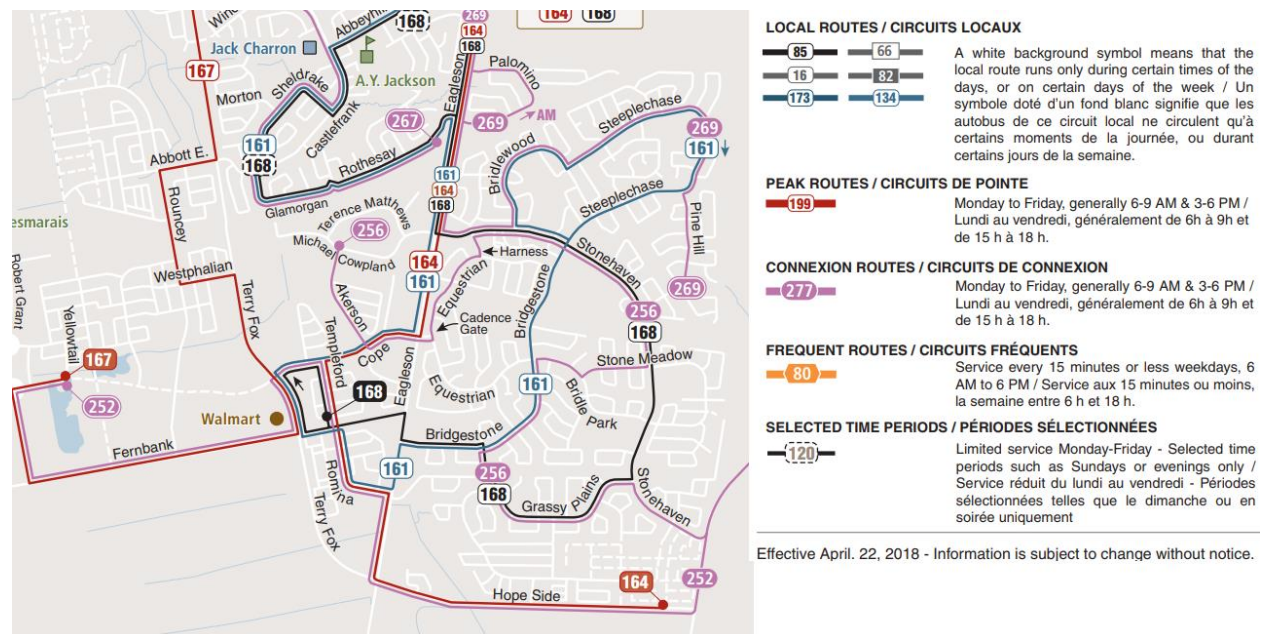


Figure 11. OC Transpo Routes

(Source: OC Transpo)

### 3.5 AREA TRAFFIC MANAGEMENT MEASURES

There are no existing area traffic management measures near either of the proposed vehicle accesses on Fernbank Road or Eagleson Road.

### 3.6 PEAK HOUR TRAVEL DEMAND

The TRANS Committee was established to co-ordinate transportation planning efforts among various planning agencies located within the National Capital Region. The most recent Origin-Destination (O-D) survey was completed by TRANS in the Fall of 2011. The proposed development is located in the Kanata / Stitsville TRANS District (800). The complete TRANS O-D results (including a map of the district area) is provided in **Appendix C**. The following table summarizes the TRANS trip data for this district..

**Table 2. Peak Hour Travel Demand by Mode**

MODE	AM PEAK (6:30AM – 9:00AM)			PM PEAK (3:30PM – 6:00PM)		
	From District	To District	Within District	From District	To District	Within District
Auto Driver	15,360	11,530	13,630	13,850	17,660	21,240
Auto Passenger	2,450	1,160	5,050	3,240	4,270	8,570
Transit	6,230	1,290	1,210	1,270	5,980	670
Bicycle	30	80	220	40	100	260
Walk	0	40	5,730	40	0	4,570
Other	1,900	1,560	4,510	520	910	2,160
<b>Total Trips</b>	<b>25,970</b>	<b>15,660</b>	<b>30,350</b>	<b>18,960</b>	<b>28,920</b>	<b>37,470</b>

*Source: TRANS 2011 O-D Survey, District 800 Kanata / Stitsville*

Based on the largely residential land uses in the general area, it is anticipated that most trips from the development will generally follow “from district” travel patterns during the AM Peak and “to district” travel patterns during the PM Peak. Considering this travel pattern, the primary travel mode is by vehicle with 75% of all travel being either as a driver or passenger). Transit accounts for 23% of existing trips, with active transportation modes (walking and cycling) accounting for less than 1% of all existing trips.

### 3.7 BOUNDARY STREET CRASH HISTORY

The boundary streets for the development are Eagleson Road and Fernbank Road. The City of Ottawa provided the most recent five years of crash history for review (January 1, 2012 through December 31, 2016). The complete crash data is provided in **Appendix D**. During the past five-year period there were three recorded crashes on Eagleson Road between Fernbank Road and Bridgestone Drive and five recorded crashes on Fernbank Road between Terry Fox Drive and Eagleson Road.

We reviewed the crash history at the five intersections in our study area. There were no trends identified at three of the intersections: Fernbank Road / Templeford Avenue / Rominia Street; Eagleson Road / Cope Drive; or Eagleson Road / Bridgeston Drive.

At the intersection of Eagleson Road and Fernbank Road there were:

- Twenty-four recorded crashes in five years including a single fatality
- The single fatality occurred at 5:35pm on Sunday October 30, 2016 with dry pavement and clear visibility. It involved a southbound motorcycle and a northbound left turning automobile.
- Twelve (50%) of the crashes were rear end
- Five (20%) of the crashes involved personal injury and eighteen (75%) were property damage only

At the intersection of Fernbank Road and Terry Fox Drive there were:

- Thirty-four recorded crashes in five years with no fatalities
- Fourteen (41%) of the crashes were rear end
- Twenty-four (70%) were during clear visibility conditions and, primarily, dry pavement conditions
- Nine (26%) of the crashes involved personal injury while the remaining were property damage only

## 4 PLANNED CONDITIONS

---

### 4.1 CHANGES TO STUDY AREA TRANSPORTATION NETWORK

The City of Ottawa's Transportation Master Plan (2013) indicates that the widening of Eagleson Road through our study area is part of the Affordable Network Phase 2 (2020-2025). The TMP does not identify specific transit improvements within the immediate study area. Also, we have not identified planned local transit improvements within the study area.

---

### 4.2 OTHER AREA DEVELOPMENTS

Two developments are listed in the City of Ottawa's Development Application Search tool that are located in our study area and could impact our Transportation Impact Assessment:

- Cope Lands (DC2-02-15-0061) for 260 residential units between Terry Fox Dr. and Eagleson Rd.
- 10 Cope Drive (D-07-12-18-0074) for a 3,620 m<sup>2</sup> grocery store and 1,982 m<sup>2</sup> of commercial retail

## 5 STUDY AREA

The limits for the Transportation Impact Assessment (TIA) study area are shown in **Figure 12** and include:

- Fernbank Road between Terry Fox Drive and Eagleson Road
- Eagleson Road between Cope Drive and Bridgestone Drive
- The five intersections described in **Section 3.2**

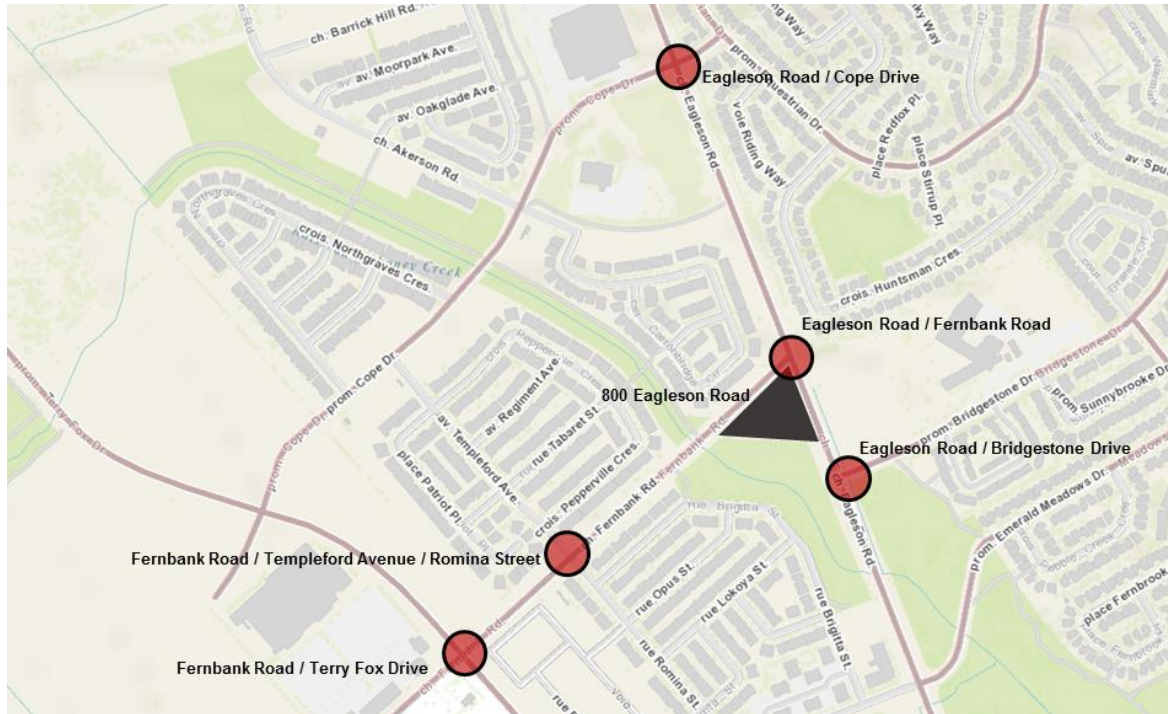


Figure 12. Study Area

## 6 TIME PERIODS

The time periods identified for the traffic analysis as part of the Transportation Impact Assessment are:

- AM Peak Hour: 8:00am to 9:00am
- PM Peak Hour: 4:30pm to 5:30pm

These are consistent with the AM and PM peak hours identified in the recent turning movement counts provided by the City of Ottawa at the intersection of Eagleson Road and Fernbank Road (April 2017).

## 7 HORIZON YEARS

The proposed development is expected to be completed within a single phase. The target year for occupancy is 2019. Our proposed horizon periods are:

- 2019: anticipated occupancy
- 2024: occupancy plus five years

## 8 EXEMPTIONS REVIEW

Based on our review of the development and network conditions, we have identified that the following elements qualify for an exemption from this Transportation Impact Assessment Study.

**Table 3. Exemptions Summary**

MODULE	ELEMENT	EXEMPTION
4.1 Development Design	4.1.2 Circulation and Access	<b>Not Exempted.</b>  This element is required for site plans.
	4.1.3 New Street Networks	<b>Exempted.</b>  This element is only required for plans of subdivision.
4.2 Parking	4.2.1 Parking Supply	<b>Not Exempted.</b>  This element is required for site plans.
	4.2.2 Spillover Parking	<b>Exempted.</b>  Adequate parking will be provided.
4.5 Transportation Demand Management	All elements	<b>Not Exempted.</b>
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	<b>Exempted.</b>  Access to this development is from urban arterial roads and not local or collector streets.
4.8 Network Concept	-	<b>Exempted.</b>  This development is not expected to generate more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by the established zoning.

## 9 DEVELOPMENT GENERATED TRAFFIC

### 9.1 TRIP GENERATION

**Base Trip Generation Rate.** The TRANS Trip Generation Study (August 2009) is the City of Ottawa's preferred source for residential trip generation rates. Table 6.3 in the TRANS Study provides the following base trip generation rates for a Mid-Rise Apartment (3-10 floors) outside the greenbelt:

- AM Base Rate: 0.29 vehicle trips per unit
- PM Base Rate: 0.37 vehicle trips per unit

**Total Development-Generated Person-Trips.** Table 3.13 in the TRANS Study identifies a 44% auto mode share in both the AM and PM peak hour for apartments outside the greenbelt. The total development-generated person-trips (**Table 4**) was estimated using the projected auto trips (base rate multiplied by total units) and the auto mode share.

**Table 4. Estimated Total Development-Generated Person-Trips**

PEAK HOUR	UNITS	BASE AUTO RATE	PROJECTED AUTO TRIPS	AUTO MODE SHARE	TOTAL PERSON TRIPS
AM	143	0.29	41	44%	94
PM		0.37	53	44%	120

**Existing Mode Share.** The existing peak hour travel demand was identified from the most recent TRANS Origin-Destination Survey (Fall 2011) and presented in the **Section 3.6**. The existing mode share is based on those values and is shown in the following table.

**Table 5. Existing Mode Share**

PEAK HOUR	AUTO DRIVER	AUTO PASSENGER	TRANSIT	BICYCLE	WALK	OTHER
AM	59%	9%	24%	0%	0%	7%
PM	61%	15%	21%	0%	0%	3%

**Future Mode Share Targets.** The mode share targets for this development take into account the development's horizon year (2024), the available travel options (three arterial roads, three transit routes, existing pedestrian and cycling infrastructure).

**Table 6. Future Mode Share Targets for the Development**

TRAVEL MODE	MODE SHARE TARGET	RATIONALE
Transit	25%	This is a small increase from the existing 2011 transit mode share of 24%. Transit stops are available within 400m of the development that provide access to the Terry Fox and Eagleson Transit Stations.
Walking	5%	Sidewalk and pathway infrastructure is available for walking. However, this is a suburban area with a variety of walkable amenities within an 800m radius (examples: Supercentre @ 600m, Superstore @ 800m, Maurice-Lapointe Public Elementary School @ 400m).
Cycling	5%	<p>This is an increase from the 2011 cycling mode share of 0%. Cycling amenities are being provided by the development (indoor bicycle storage) . However, gaps in the existing cycling network make commuter cycling in the peak periods less attractive (ie, inconsistent cycling facilities along Eagleson Road).</p> <p>There is an opportunity to improve the cycling network through the addition of a pathway along the southern boundary of the property connecting Eagleson Road with Fernbank Road.</p>
Auto Passenger	10%	This is consistent with the reported 2011 TRANS Origin-Destination Survey mode shares for the area.
Auto Driver	50%	With the opportunities available for the walking and cycling modes, the 50% share represents a slight reduction in the auto driver mode share as reported in the 2011 TRANS Origin-Destination Survey.

**Development Trips by Mode and Phase.** The proposed development will be constructed in one phase. The development trips by mode are shown in the following table.

**Table 7. Development Trips by Mode (Single Phase)**

PEAK HOUR	AUTO DRIVER	AUTO PASSENGER	TRANSIT	BICYCLE	WALK
AM	47	14	24	5	5
PM	60	18	30	6	6

**Trip Reduction Factors.** This is a greenfield development, therefore there are no existing trips to deduct. As a residential development pass-by trips are not expected to be reflected in the trip composition.

## 9.2 TRIP DISTRIBUTION

There are two proposed vehicle accesses to the development; one on Eagleson Road and one on Fernbank Road. Vehicles will approach and depart from the development following existing travel patterns. The trip distribution for the proposed development is presented as follows:

- 15% of trips are to/from the east (AM and PM)
- 60% of trips are to the north / from the south (AM)
- 25% of trips are to the south / from the north (AM)
- 35% of trips are to the north / from the south (PM)
- 50% of trips are to the south / from the north (PM)

## 9.3 TRIP ASSIGNMENT

Trips were assigned to adjacent the transportation network and have been based upon a good understanding of existing travel patterns as identified from a review of intersection turning movement counts; including those at the following locations:

- Eagleson Road and Cope Drive, Thursday December 21, 2017 (City of Ottawa)
- Eagleson Road and Fernbank Road, Tuesday April 11, 2017 (City of Ottawa)
- Eagleson Road and Eagleson Road, Thursday February 22, 2018 (WSP)
- Fernbank Road and Romina Street / Templeford Avenue, Wednesday February 28, 2018 (WSP)
- Fernbank Road and Terry Fox Drive, Tuesday July 8, 2014 (City of Ottawa)

\*(source of count)

The vehicle trip assignment for the peak hour vehicle trips are shown in the following figure.

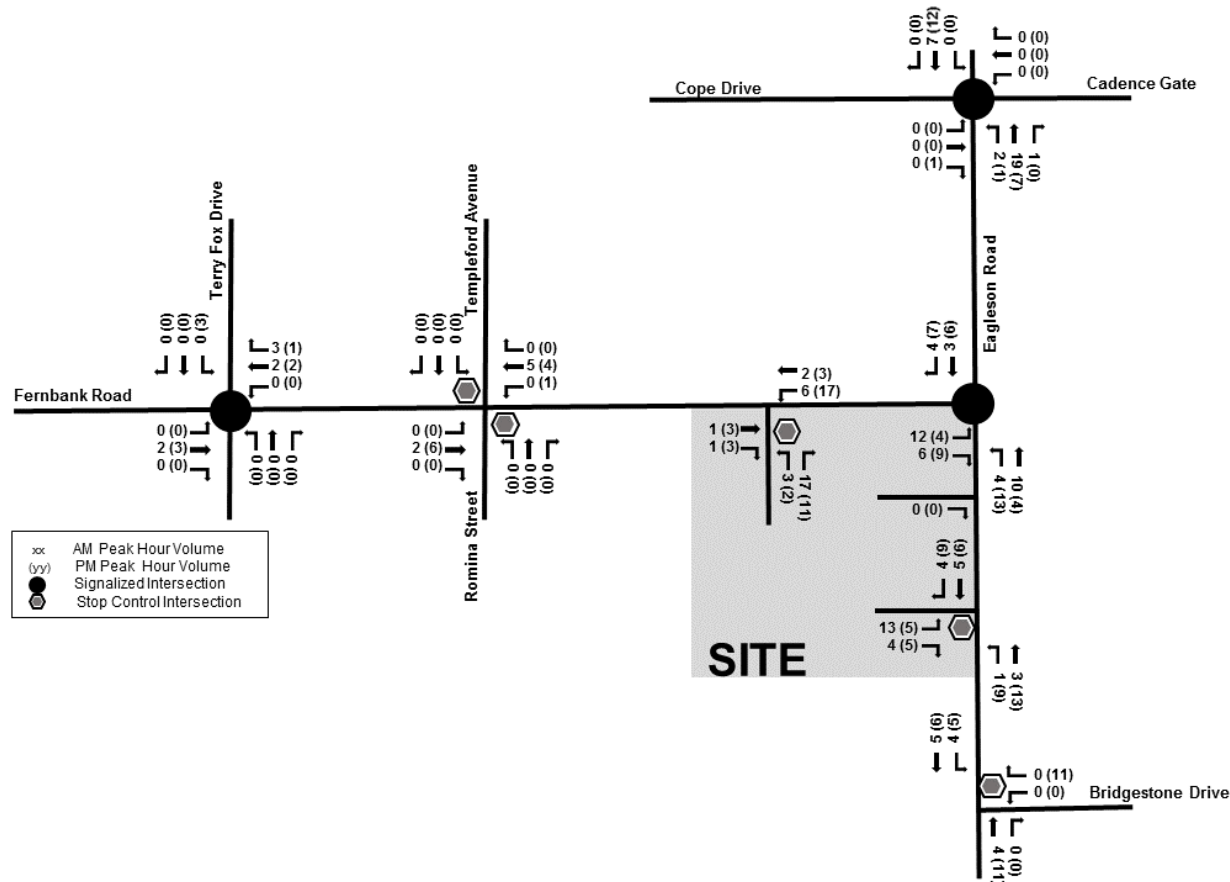


Figure 13. Trip Assignment

## 10 BACKGROUND NETWORK TRAFFIC

### 10.1 CHANGES TO THE BACKGROUND TRANSPORTATION NETWORK

The City of Ottawa's Transportation Master Plan (2013) identifies a future road widening of Eagleson Road within our study area as part of the Affordable Network Phase 2 (2020-2025). However, the Environmental Assessment process for these road improvements have not been initiated and as such are considered to be beyond the future planning horizon of this TIA (2024).

There are no other road projects identified along the border streets in our study area. Furthermore, neither the Ottawa Pedestrian Plan (2013) nor the Ottawa Cycling Plan (2013) identify connectivity or infrastructure improvements along Fernbank Road or Eagleson Road in our study area.

## 10.2 GENERAL BACKGROUND GROWTH RATES

We have selected a 1.0% annual growth rate to account for future development not currently within the development application process (**Section 10.3**). However, it is noted that the background growth rate identified as part of our review and assessment of peak hour traffic counts was an approximate -0.5% per annum for the Fernbank Road and Eagleson Road intersection (2009, 2010, 2011, and 2017). Our growth rate calculations are provided in **Appendix E**.

The existing conditions (2018) and projected future background (2019 and 2024) traffic volumes are shown in the following three figures.

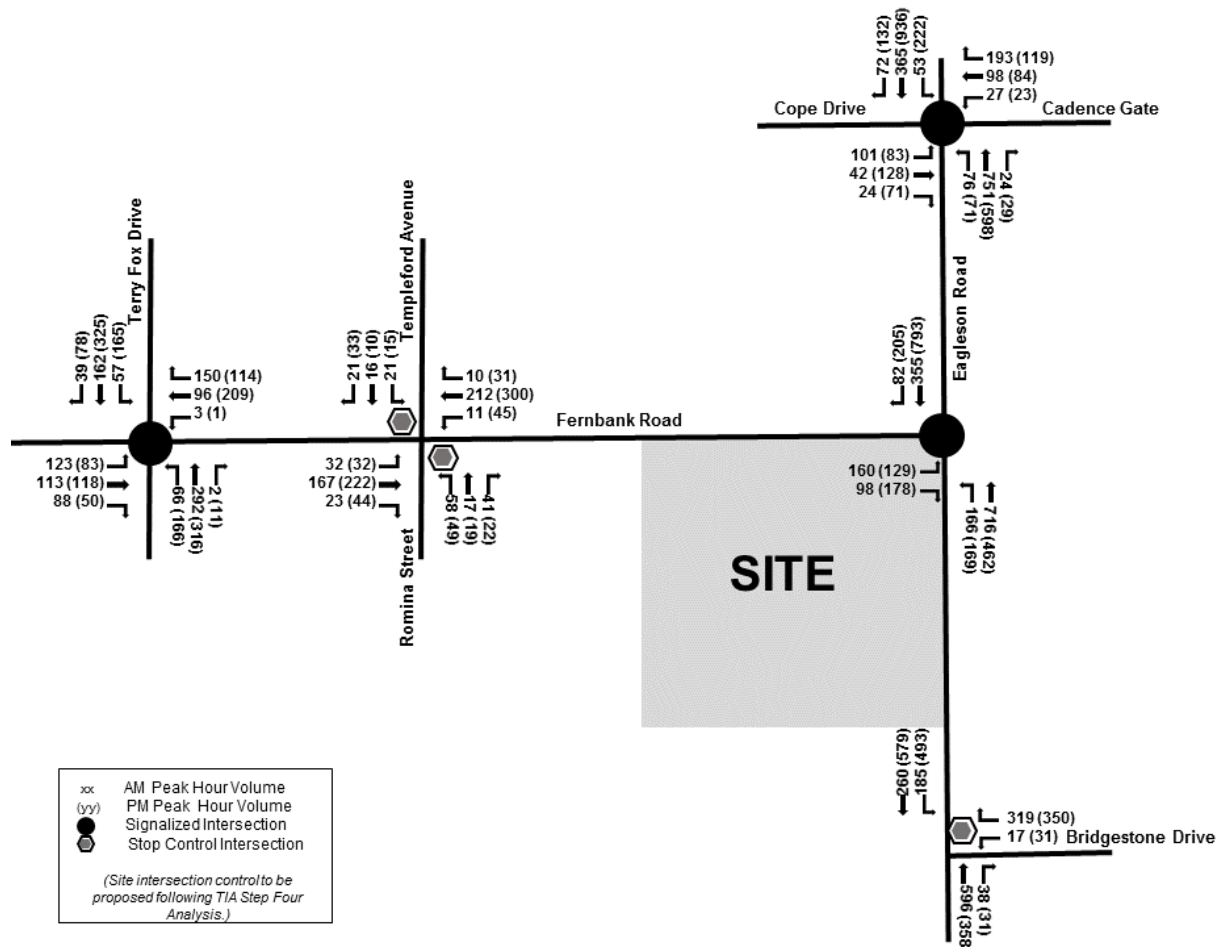


Figure 14. Existing Traffic Volumes (2018)

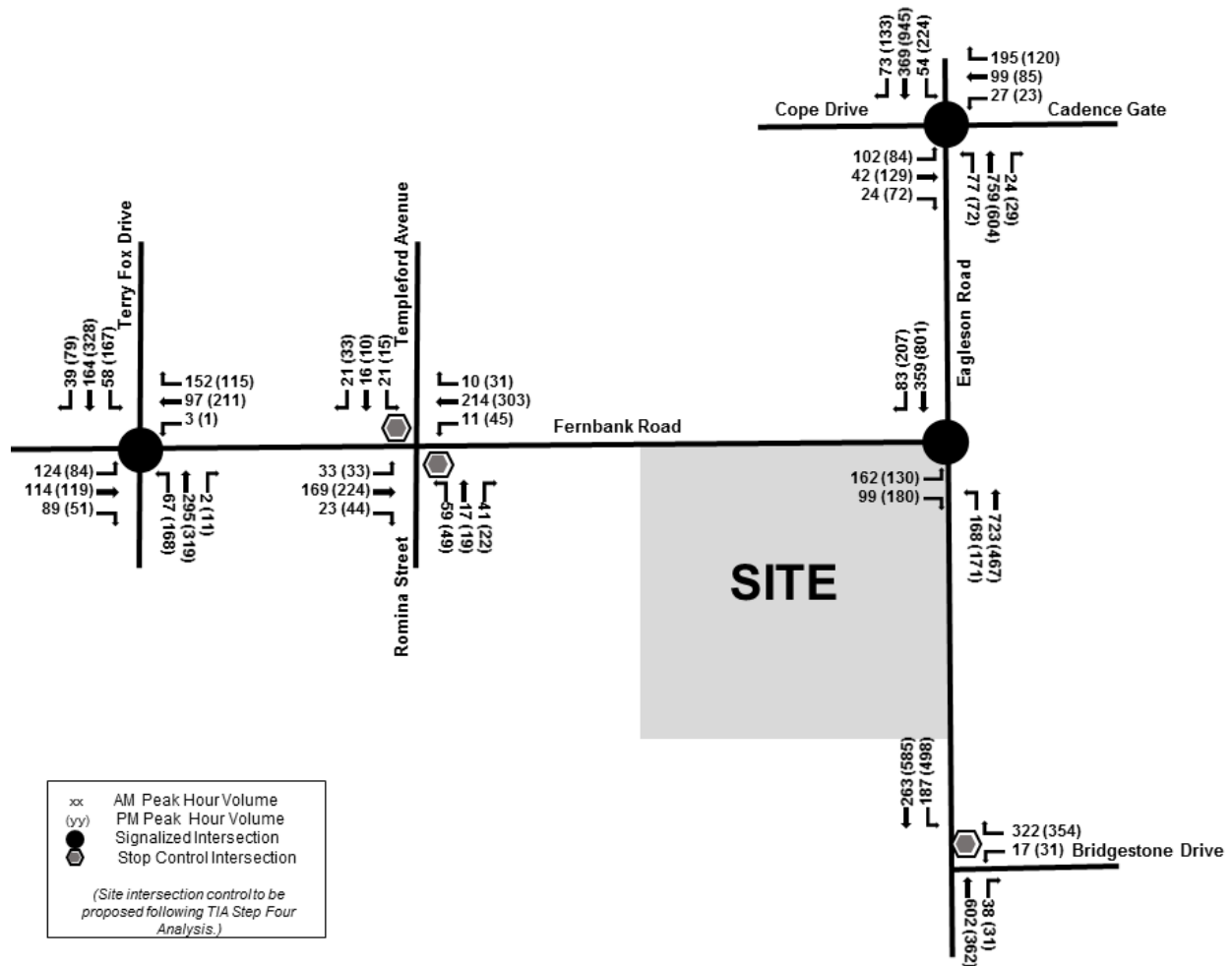


Figure 15. Background Traffic Volumes (2019)

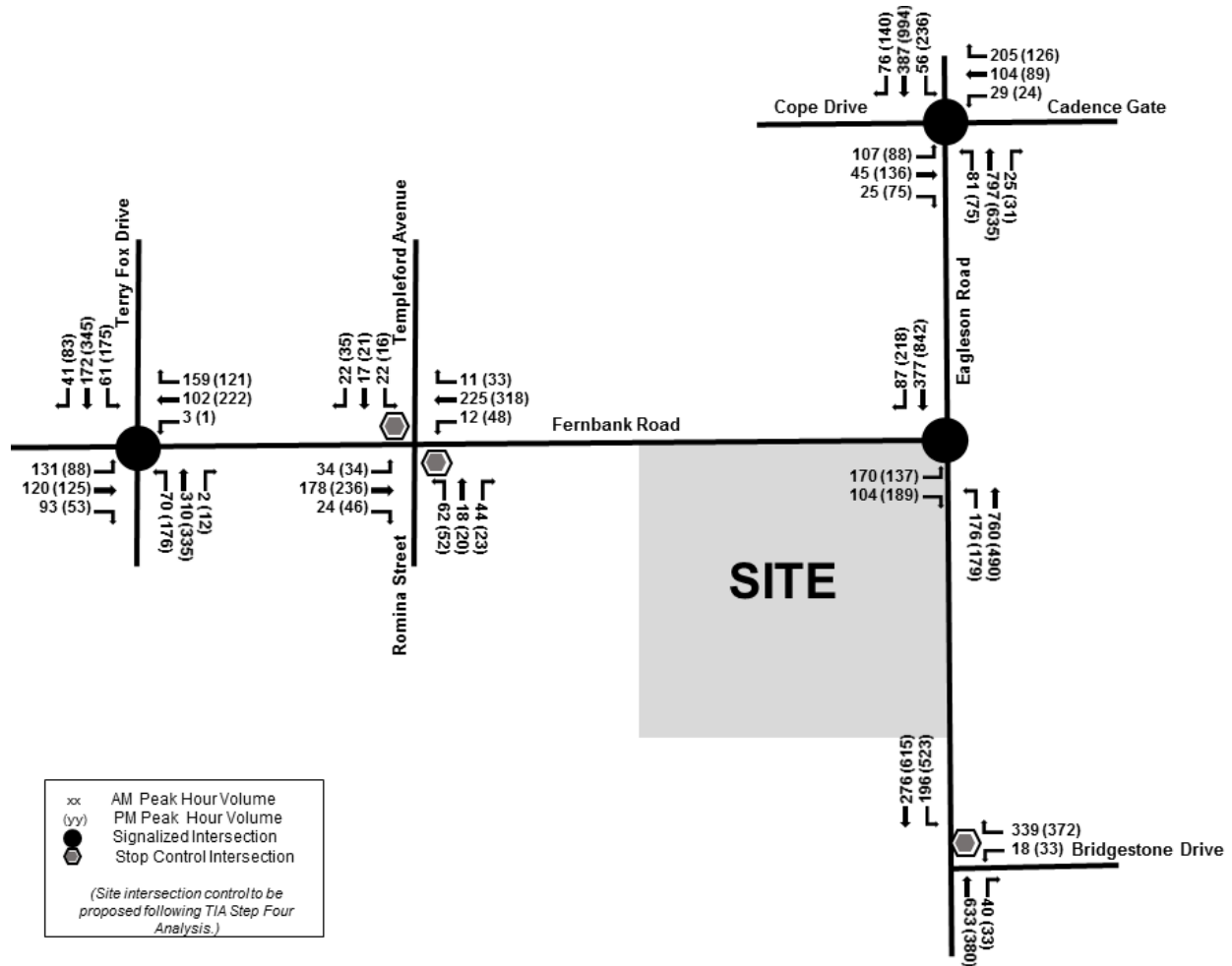


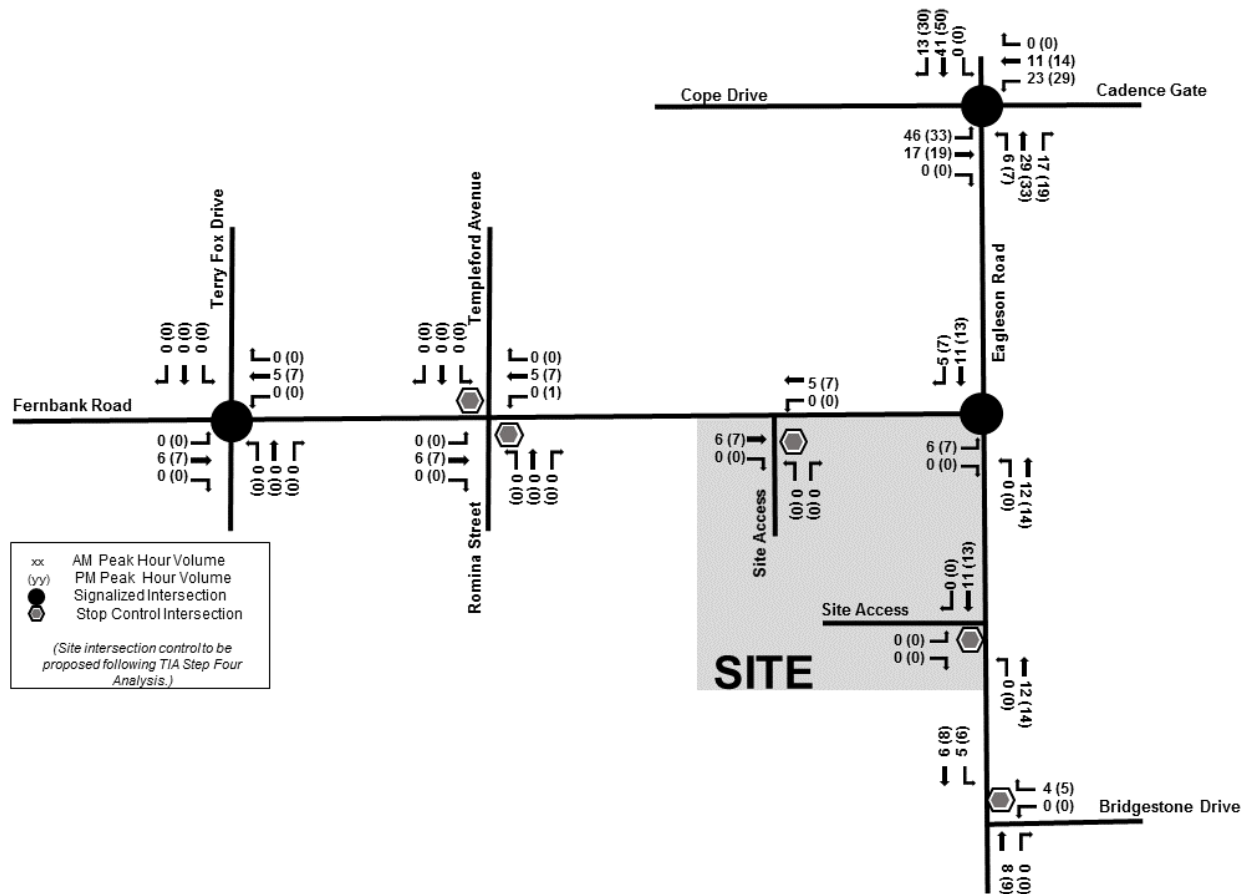
Figure 16. Background Traffic Volumes (2024)

## 10.3 OTHER AREA DEVELOPMENTS

In **Section 4** we identified two developments that could impact our Transportation Impact Assessment:

- **Cope Lands** (DC2-02-15-0061) for 260 residential units between Terry Fox Dr. and Eagleson Rd that is expected to be built out by 2020.
- **10 Cope Drive** (D07-12-18-0074) for a 5,602m<sup>2</sup> retail area with an anchor grocery store which is expected to be built by 2019.

Estimated trips for the developments were taken from their respective Transportation Impact Study. Trips from these developments were added to the 2024 planning horizon as shown in **Figure 17**.



**Figure 17. Trips Generated by Other Area Developments (2024)**

# 11 DEMAND RATIONALIZATION

## 11.1 DESCRIPTION OF CAPACITY ISSUES(S)

Total traffic volumes for the 2019 and 2024 planning horizons were estimated by:

- Applying a 1% background growth rate to the existing traffic volumes (**Section 10.2**)
- Adding trips generated by other area developments (**Section 10.3**)
- Adding trips generated by the proposed development (**Section 9.3**)

The estimated total traffic volumes are presented in the following two figures.

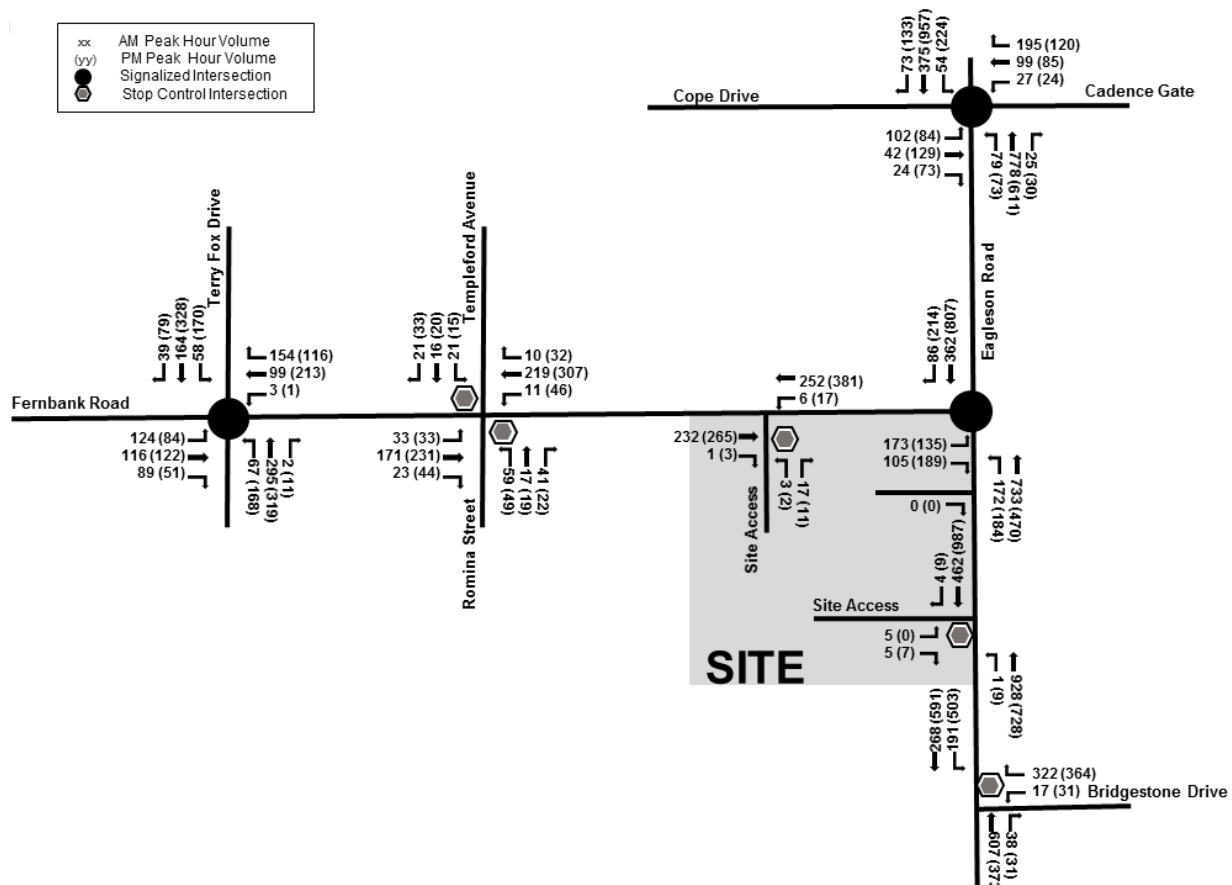
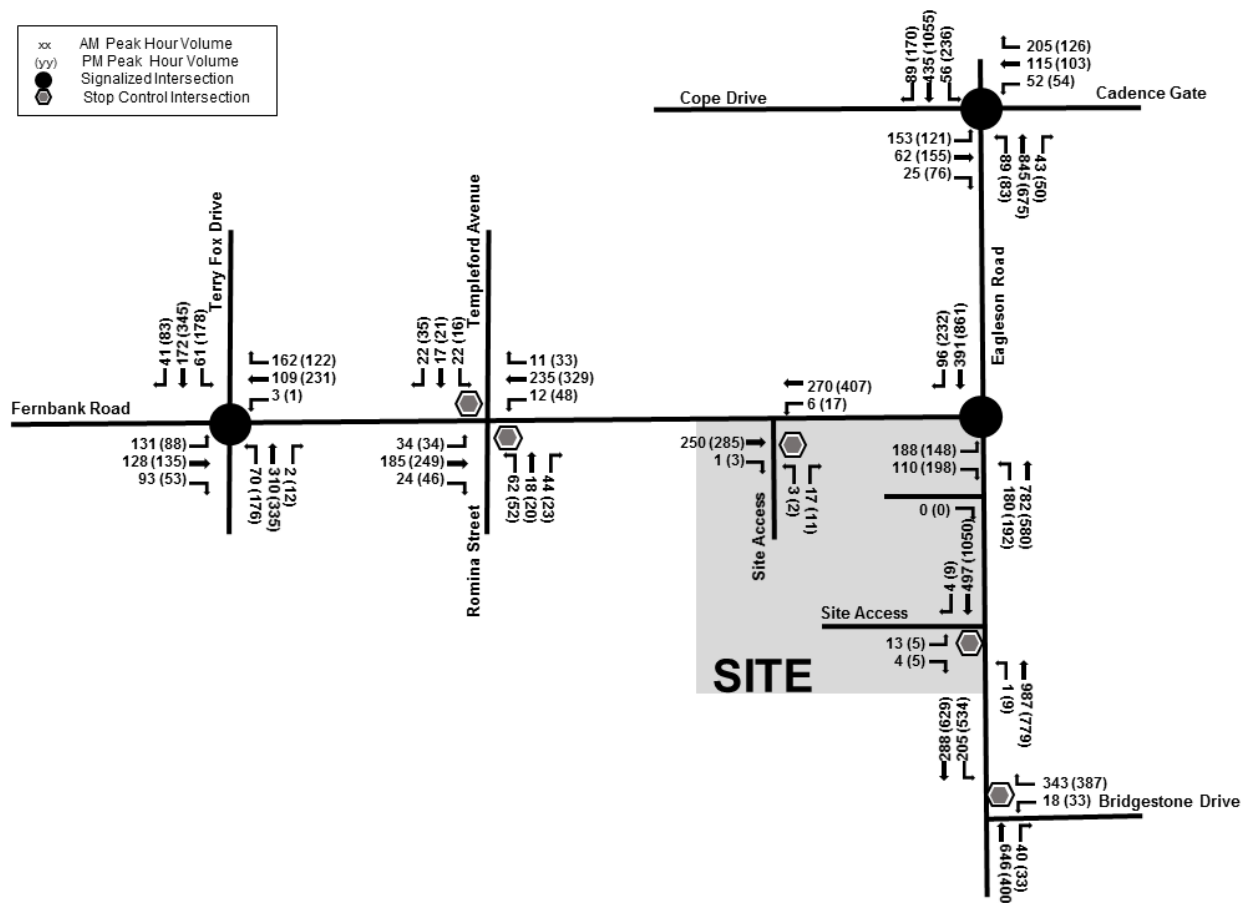


Figure 18. Total Traffic (2019)



**Figure 19. Total Traffic (2024)**

A cursory review of the results obtained from the application of Synchro (version 9) for the 2024 total traffic volumes suggest that the future auto demands will not exceed capacity within our study area. A review of the assumed lane capacities at screenline count stations in the area also support this preliminary finding. Eagleson Road (one lane) at the Fallowfield West Screenline has an approximate capacity of 1,050 vehicles per hour and Fernbank Road (one lane) at the Terry Fox Screenline has an approximate capacity of 900 vph. Future estimated total traffic volumes along Eagleson Road and Fernbank Road are below these established volume thresholds.

## 11.2 ADJUSTMENT TO DEVELOPMENT GENERATED TRAVEL DEMANDS

We have not proposed adjustments to development generated demands since the trips generated by the development are not expected to adversely impact the adjacent transportation network.

## 11.3 ADJUSTMENTS TO BACKGROUND NETWORK TRAVEL DEMANDS

We have not proposed adjustments to background network demands since as the preliminary indications are such that the existing transportation roadway network will offer an acceptable Level of Service. Furthermore, we have adopted a traffic growth rate (**Section 10.2**) of approximately 1% per annum despite having identified an approximate -0.5% reduction in area traffic based on a review of historical

traffic counts and with the understanding that a limited number of new developments have been identified for this area (**Section 10.3**) that would be responsible for generating additional traffic during our study planning horizons.

## 12 DEVELOPMENT DESIGN

### 12.1 DESIGN FOR SUSTAINABLE MODES

In accordance with the TIA Guidelines, the TDM-supportive Development Design and Infrastructure Checklist was completed to assess the opportunity to implement facilities that are supportive of sustainable modes. The completed checklist is attached as **Appendix F**.

Sustainable modes include cycling, walking, and transit. As indicated in the TDM checklist and shown on the site plan (**Appendix B**), the proposed site accommodates these modes in the following ways:

- Provision of internal sidewalks connecting the main entrance to the existing bus stops
- Walking distance less than 50m between the main entrance for all 143 units to the existing bus stop
- Eighty-two dedicated bicycle parking spaces (interior for residents and exterior for visitors)
- Opportunity for a multi-use pathway along the southern perimeter
- Provision for a raised pedestrian crosswalk through the parking lot between the potential multi-use pathway and the pedestrian sidewalk adjacent to building

No relocation of bus stop #9081 is required to accommodate the proposed site accesses.

### 12.2 CIRCULATION AND ACCESS

The proposed site plan (**Appendix B**) was developed in consultation with City of Ottawa staff. Consideration was given to providing a continuous drive aisle through the property between Fernbank Road and Eagleson Road. However, the proposed site plan provides a number of additional benefits over a continuous drive aisle, such as:

- Preventing non-residents from cutting through the site to avoid the signalized intersection at Fernbank Road and Eagleson Road
- Improving pedestrian connectivity to the rear of the site and access to the proposed pedestrian pathway along the south side of the property
- Increasing the amount of outdoor amenity space which was a comment from the Urban Design Review Panel

We assessed the site circulation using AutoTURN 10.2 to confirm suitability of the layout for a variety of design vehicles. The results are provided in the following table and the AutoTURN swept paths are provided in **Appendix G**.

**Table 8. Swept Path Assessment**

DESIGN VEHICLE	VEHICLE REPRESENTING	FINDINGS
MSU (TAC 2017)	Delivery Vehicle Moving Truck	The proposed entrance configuration accommodates the one-way movements of an MSU design vehicle without impacting any built features or parking spaces.
HSU (TAC 2017)	Municipal Services / Waste Removal	<p><b>Circulation:</b> The proposed entrance configuration on Eagleson Road can accommodate the movements of an HSU design vehicle. However, the proposed parking configuration and curbing around parking space #13 and #66 may be impacted as an HSU maneuvers from the south entrance towards the north exit.</p> <p><b>Access to Molok Waste Containers:</b> An HSU will have difficulty maneuvering to and from the waste containers without conflicting with curbs. This maneuver could require reversing which is not desirable near the full movement access.</p>
Pumper Fire Truck (NCHRP Report 659)	Fire Truck	The proposed entrance and parking configuration can accommodate the movements of a Pumper Fire Truck. However, the curbing north of the right-out exit may be impacted as a pumper truck maneuvers out of the parking lot and onto Eagleson Road.
Passenger Vehicle (TAC 2017)	Resident's vehicle	<p><b>Fernbank Entrance:</b> The proposed entrance configuration can accommodate the movements of passenger vehicles.</p> <p><b>Eagleson Entrance:</b> The proposed entrance configurations can accommodate the movements of passenger vehicles.</p> <p><b>Parking:</b> A large passenger vehicle (TAC 2017, 5.6m) will impact the north curb when driving or reversing into parking spaces 38 and 39. Mid-sized passenger vehicles (Car Park Handbook 2015, 4.8m) will need to reverse towards these spaces from the main drive aisle to park.</p>

## 12.3 NEW STREET NETWORKS

This module was exempted in the approved Transportation Impact Assessment Scoping Report submitted June 12, 2018.

## 13 PARKING

### 13.1 PARKING SUPPLY

The proposed development parking requirements, based on its location will be assessed in accordance with the Suburban Area (Area 'C') for minimum parking requirements as part of Schedule 1A to the City of Ottawa's Zoning By-Law 2008-250. The Zoning By-Law requires that a mid-rise apartment in Area 'C' provide a minimum parking rate of 1.2 spaces per dwelling (*Table 101, Row R12, Column IV*) for all dwelling units in excess of 12 (*Section 101.3.(a)*). The Zoning By-Law further requires a minimum visitor parking rate of 0.2 spaces per dwelling unit (*Table 102, Apartment Dwelling, Column III*) and a minimum bicycle parking rate of 0.5 spaces per dwelling (*Table 111A, I, b*).

The minimum parking supply requirements for this development compared with the proposed parking supply are highlighted in the following table.

**Table 9. Minimum Bylaw Requirements for Parking and Proposed Parking Supply**

TYPE	REQUIRED	CALCULATION	SITE PLAN	COMPLIANCE WITH BY-LAW
Resident	158	(143 units – 12 units) * 1.2 spaces per dwelling	136	Proposed parking is 22 spaces below minimum required by the Zoning By-Law.
Visitor	29	143 units * 0.2 spaces per dwelling	28	Proposed parking is one space below minimum required by the Zoning By-Law.
Bicycle	72	143 units * 0.5 spaces per dwelling	82	Exceeds Minimum Requirements
<b>Total</b>	<b>259</b>		<b>246</b>	

The Institute of Transportation Engineers (ITE) publication Parking Generation (3<sup>rd</sup> edition) indicates that the peak period parking demand for a low/mid-rise apartment in a suburban area can be estimated using the following fitted curve equation:

$$\text{Parked Vehicles} = 1.43 \times \text{Dwelling Units} - 46$$

This results in a peak period parking demand of 159 vehicles. This demand rate does not distinguish between resident and visitor parking. The current site plan has 164 total parking spaces which exceeds the estimated peak demand by 5 parking spaces. There may occasionally be non-recurrent spillover parking which could be accommodated on Brigatta Street.

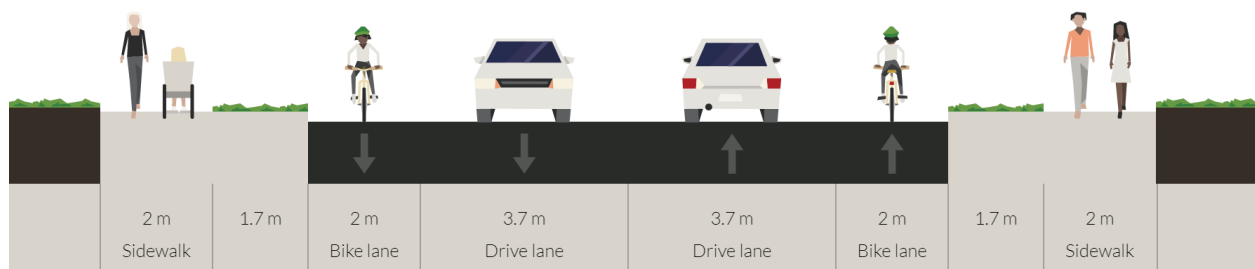
### 13.2 SPILLOVER PARKING

This module was exempted in the approved Transportation Impact Assessment Scoping Report submitted June 12, 2018.

## 14 BOUNDARY STREETS

### 14.1 FERNBANK ROAD

Fernbank Road is an arterial road with a variable right-of-way of 31.5m to 34.0m between Eagleson Road and Terry Fox Drive. The existing cross-section (**Figure 20**) includes separated sidewalks, dedicated bike lanes, and vehicle lanes. On the approach to intersections, left and right turn lanes are provided. The Fernbank Road cross-section in this area is consistent with the City's complete streets philosophy and the urban design objectives for the area by following the general format of the Current Cross-Section Standard (Bike Lanes) developed as part of the *Building Better and Smarter Suburbs* initiatives (**Appendix H**). There was no additional requirement to undertake a further review.



**Figure 20. Existing Fernbank Road Cross-Section**

### 14.2 EAGLESON ROAD

Eagleson Road is an arterial road with a protected right-of-way of 44.5m within the study area. The Site Plan (**Appendix B**) allows for a 44.5m right of way along Eagleson Road. This allowance would provide sufficient space for the City to implement any of the Arterial Road Cross-Sections developed as part of the *Building Better and Smarter Suburbs* initiative.

The existing cross-section (**Figure 21**) includes gravel shoulders and paved vehicle lanes. On the approach to intersections left turn lanes are provided. The existing Eagleson Road cross-section is therefore not consistent with the City's complete streets philosophy or the urban design objectives for the area. In accordance with the TIA guidelines, we have developed a complete street concept for this section of Eagleson Road that considers both mobility and road safety. This complete street concept could be considered as part of a larger study which would consider the feasibility of an overall widening of Eagleson Road to provide additional arterial roadway capacity serving Kanata South.



**Figure 21. Existing Eagleson Road Cross-Section**

## 14.2.1 MOBILITY

The City's Multi-Modal Level of Service (MMLOS) targets consider road classification, adjacent land-use designation, and special policy areas. The segment of Eagleson Road within the study area is identified as an Arterial Mainstreet in the City of Ottawa's Official Plan (2013), Schedule B (Urban Policy Plan). However, it is noted that roadway is located within 300m of a school and as such, the applicable MMLOS targets utilized are related to the policy area and not the specific land use designation. The resulting MMLOS targets and segment scores for the two scenarios are indicated in the table below.

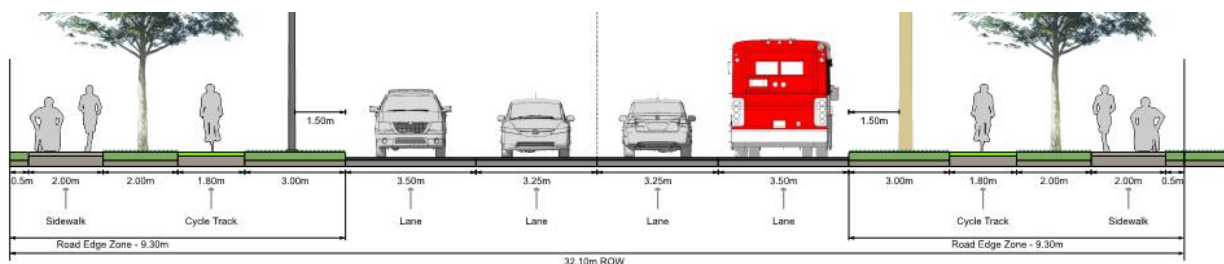
**Table 10. Segment MMLOS (2024)**

	PLOS	BLOS	TLOS	TKLOS	VLOS
<b>Target</b>	<b>A</b>	<b>C</b>	<b>D</b>	<b>D</b>	
Status Quo	<b>F</b>	<b>F</b>	D	D	VLOS Not Reported for Segments
Conceptual Complete Street	C	A	D	A	

The **Status Quo** option is based on the existing conditions remaining in place along Eagleson Road. The MMLOS was assessed as:

- No sidewalk = PLOS 'F'
- Mixed traffic for bicycles with a speed limit  $\geq 60\text{km/h}$  = BLOS 'F'
- Transit operating in mixed traffic with limited to no parking = TLOS 'D'
- Bi-directional traffic with travel lanes of 3.3m = TKLOS 'D'

The **Conceptual Complete Street** considers the City's Official Plan (which protects a 44.5m right-of-way) and the City's Transportation Master Plan (which indicates that this section of Eagleson Road is planned to be widened from two to four lanes by 2025). A complete street concept could be considered as part of a larger road widening project. Such a project might consider a road design similar to Cross-Section 2 proposed in the City of Ottawa's Arterial Road Cross-Sections. This cross-section was the basis for our assessment of the Conceptual Complete Street option and the MMLOS targets.



**Figure 22. City of Ottawa Arterial Road Concept 2 - Separated Cycle Tracks/Sidewalks**

## 14.2.2 ROAD SAFETY

Historical crash records for the study area were obtained from the City of Ottawa for the 5-years between January 2012 through December 2016. The TIA Guidelines indicate that patterns with six or more crashes should be identified. In this timeframe there were three crashes along Eagleson Road between Fernbank Road and Bridgestone Drive. Therefore, no crash reduction measures have been identified for this section of roadway.

# 15 ACCESS INTERSECTION

## 15.1 LOCATION AND DESIGN OF ACCESS

There are three access points proposed for this development and are indicated in the Site Plan (**Appendix B**); one from Fernbank Road and two from Eagleson Road.

The Fernbank Road access is proposed as a two-way, full movement access to the underground parking garage. Signage will be adopted to provide positive guidance for both residents and non-residents directing them to the appropriate access; the Eagleson Road access for the main entrance and surface parking supply and the Fernbank Road access for the underground resident parking supply.

The proposed two access points on Eagleson Road provide access to the buildings main entrance and the surface parking lot. The north access provides a one-way right-out only movement. The south access offers two-way access with full turning movements. The two access are intended to serve passenger drop off /pickup passengers while offering larger vehicles a one-way circulation through the development that does not require reversing maneuvers. As such, vehicles will enter the south access from Eagleson Road, circulate through the site, serving the front entrance, and then exit at the north right-out only access to Eagleson Road.

A design compliance check was carried out for each of the three accesses following guidelines prepared by the City of Ottawa and the Transportation Association of Canada's Geometric Design Guidelines for Canadian Roads (2017). The design compliance check is summarized in **Table 11**.

**Table 11. Access Intersection Design Elements**

DESIGN ELEMENTS	MINIMUM REQUIRED	FERNBANK ACCESS	EAGLESON NORTH ACCESS	EAGLESON SOUTH ACCESS
Access Type	-	Full Movement	Right-Out Only	Full Movement
One-way vs. Two-way	<25 vpd = one-way driveway <750 vpd = two-way driveway	>100 peak hour trips Two-way	>100 peak hour trips One-way	>100 peak hour trips Two-way

DESIGN ELEMENTS	MINIMUM REQUIRED	FERNBANK ACCESS	EAGLESON NORTH ACCESS	EAGLESON SOUTH ACCESS
Entrance Width	2.0m-7.3m (TAC 2017) 6.7m for a parking lot (Ottawa) 6.0m for parking garage (Ottawa)	8.0m	6.7m	6.7m
Right Turn Radius	3.0m – 4.5m (TAC 2017)	3.8m	10.0m	4.5m
Corner Clearance	70m to traffic signals (TAC 2017)	130m from Eagleson Road	30m from Fernbank Road	90m from Fernbank Road
Throat Length	25m (TAC 2017) 15m (Ottawa, pre-consultation meeting)	15m from west curb radii to conflict point with vehicle exiting parking structure	Exit only	12.5m from north curb radii to conflict point with vehicle reversing from stall #28
Angle of Intersection	At or near 90°	Access intersects Fernbank Road at 90°	Access intersects Eagleson Road near 90°	Access intersects Eagleson Road at 90°
Proximity to Adjacent Driveways	Restrict accesses	No private driveways along Fernbank Road between Eagleson Road and Templeford Avenue / Romina Street	No private driveways along Eagleson Road between Fernbank Road and Bridgestone Drive	No private driveways along Eagleson Road between Fernbank Road and Bridgestone Drive
Pedestrian + Cycling Crossing Considerations	Large curb return radii with narrow driveway to minimize crossing distance	10m pedestrian crossing 14m bicycle lane crossing	No existing pedestrian facilities 13.5m shoulder bicycle crossing	No existing pedestrian facilities 13.5m shoulder bicycle crossing

Generally, the proposed accesses meet the current best practices and accepted design guidance. However, there are specific areas where specific conditions limit design opportunities, as follows:

- 1 The Eagleson Road north access exceeds the maximum suggested right turn radius of 4.5m and is in closer proximity to the signalized intersection than 70m. However, a large right turn radius was provided to allow large vehicles (**Section 0**) to complete the 180° turn required to exit the right-out only access.
- 2 The distance from the nearest signalized intersection to the right-out only entrance is approximately 30m which is less than a 70m that was identified during the pre-consultation meeting with the City of Ottawa. However, given the existing and forecasted traffic volumes (**Section 9**), and the supporting traffic analysis did not identify impacts to traffic operations at the Eagleson Road / Fernbank Road intersection.
- 3 The Eagleson Road north access provides 18m between the north curb radii to the intersection of the surface drive aisles which exceeds the minimum required throat length of 15m. However, the distance from the north curb radii to a vehicle reversing from parking stall #28 is 13m; the distance to the next parking stall is 15m. Given the forecasted number of vehicles entering (<20 in the peak hour, **Section 9**) the access configuration is considered acceptable.

## 15.2 INTERSECTION CONTROL

Traffic control signal warrants were carried out in accordance with the Ontario Traffic Manual (OTM) Book 12 (2012) for both proposed accesses under the future total planning horizon. Justification 7 (future volumes) were applied and traffic signal warrants were not met. The signal warrant worksheets are provided in **Appendix I**.

## 15.3 INTERSECTION DESIGN

The City of Ottawa's MMLOS Guidelines (2015) are to be applied at signalised intersections and as such they have not been applied to the proposed site accesses.

Our assessment of the future planning horizon identified estimates for left turn movements into the development at each of the access points are represent less than 5% of the total advancing traffic volumes. The left-turn warrant charts in the MTO Design Supplement for the TAC Geometric Design Guide for Canadian Roads (June 2017, Appendix 9A) are provided for locations where the percent left-turn volume is 5% or higher. Therefore, the left-turn lanes are not required to serve either of the two site development accesses.

## 16 TRANSPORTATION DEMAND MANAGEMENT

### 16.1 CONTEXT FOR TDM

The 2011 TRANS Origin-Destination Survey estimates the percentage of trips by trip purpose (work, school, shopping, etc...) for each Traffic Assessment Zone. The 24-hour trips by trip purpose are shown in the following table. The percentages estimated for the development (rightmost column) were estimated based on existing amenities and the forecasted mode share targets (**Section 9**).

**Table 12. Twenty-Four Hour Trips by Trip Purpose**

TRIP PURPOSE	FROM DISTRICT	TO DISTRICT	WITHIN DISTRICT	DEVELOPMENT
Work or related	29%	18%	9%	25%
School	7%	3%	9%	10%
Shopping	6%	10%	14%	5%
Leisure	9%	11%	11%	10%
Medical	3%	1%	2%	2%
Pick-up / Drive Passenger	7%	6%	9%	5%
Return Home	35%	48%	41%	40%
Other	4%	4%	5%	3%
Total	100%	100%	100%	100%

### 16.2 NEED AND OPPORTUNITY

The existing road network has available capacity should the mode share targets not be met. The anticipated Vehicle Level of Service (VLOS) in the area is provided in the Multi-Modal Level of Service (MMLOS) analysis (**Section 20.2.1**).

### 16.3 TDM PROGRAM

The TDM-supportive Development Design and Infrastructure Checklist was completed to assess the opportunity to implement facilities that are supportive of sustainable modes. The completed checklist is attached to this report as **Appendix F**.

The proposed development will include the following TDM measures and amenities that will help achieve maximum benefits from a wider use of sustainable transportation modes:

- Direct connection between existing sidewalks (Fernbank Road and Eagleson Road) and interior pedestrian pathways
- Direct connection (<50m) between main entrance and existing transit stop #9081 (Route #168)

- On-site pedestrian facilities easily differentiated from vehicle areas (sidewalks and raised crosswalks)
- Lighting, landscaping, and benches along on-site pedestrian facilities
- Exterior bicycle rack under cover near main entrance for visitors
- Interior secure bicycle storage room (82 bikes) for residents

In addition to the planned TDM measures, there is an opportunity to provide a 1.8m asphalt pathway along Monahan Drain between Fernbank Road and Eagleson Road to improve the City of Ottawa's pedestrian and cyclist network connectivity within the broader area.

## 17 NEIGHBOURHOOD TRAFFIC MANAGEMENT

This module was exempted in the approved Transportation Impact Assessment Scoping Report submitted June 12, 2018.

## 18 TRANSIT

### 18.1 ROUTE CAPACITY

The City of Ottawa provided transit passenger data (September 2017) for Route #168 which services the two transit stops located in close proximity of the proposed development. The transit passenger data included average boarding, alighting, and departure load and is provided in **Table 13**. The City indicated that a 40-foot bus is the main bus type serving this route. A 40-foot bus, such as the Invero D40i, has 41 seats with standing room available.

Route #168 provides a connection between Terry Fox and Bridlewood with 30-minute service in each direction during the peak periods. The development trips by mode (**Table 7**) forecasts 14-person trips in the AM Peak Hour and 18-person trips in the PM Peak Hour. There is currently capacity to accommodate the peak hour transit trips generated by the development.

**Table 13. Existing Transit Demand (Route #168)**

STOP	AM PEAK PERIOD (6AM-9AM)			PM PEAK PERIOD (3PM-6PM)		
	Average Boarding	Average Alighting	Average Load at Departure	Average Boarding	Average Alighting	Average Load at Departure
9081 (Eagleson)	0	0	1	0	0	2
1888 (Fernbank)	0	0	1	0	4	1

## 18.2 TRANSIT PRIORITY

The existing Transit Level of Service (TLOS) is assessed in Section **20.2.1**. The results indicate that transit service is operating below the targeted TLOS based on transit delay at intersections. Changes to the signal timing plans in the area could improve the TLOS, however consideration must also be given to the number of daily transit trips through the study area.

- Eagleson Road / Cope Drive, 92 transit trips per day
- Eagleson Road / Fernbank Road, 64 transit trips per day
- Eagleson Road / Bridgestone Drive, 114 transit trips per day
- Fernbank Road / Templeford / Romina, 158 transit trips per day
- Fernbak Road / Terry Fox Drive, 142 transit trips per day

The total transit trips (ie buses traversing the intersection) for the intersection locations have reported fewer than 160 daily transit trips. Therefore, even with some transit delay at the traffic signals in the peak periods, this area is not considered a candidate for the introduction of transit priority measures.

## 19 REVIEW OF NETWORK CONCEPT

This module was exempted in the approved Transportation Impact Assessment Scoping Report submitted June 12, 2018.

## 20 INTERSECTION DESIGN

### 20.1 INTERSECTION CONTROL

The identification of appropriate intersection controls to serve future background and future total travel demands included a roundabout screening for unsignalized intersections, a traffic signal warrant assessment, and a cursory review of transit priority measures. For this assessment we reviewed the 2024 total traffic volumes which would provide the worst-case scenario in terms of area traffic demands. If warrants were met for this planning horizon, further analysis would be undertaken for earlier planning horizons / traffic scenarios to identify specific needs. However, assuming no warrant was met for the 2024 planning horizon no further assessment of scenarios would be required. A summary of the intersection control assessment is provided in **Table 14**.

The **roundabout screening** followed the siting considerations provided in the TAC Canadian Roundabout Design Guide. The roundabout screening was completed for the unsignalized intersections with consideration given to frequency and type of vehicle crashes, left turn volumes, frequency of U-turn movements, and minor road delay. Based on these criteria, none of the intersections warrant a roundabout in the future total traffic scenario.

The **traffic signal warrant** was carried out in accordance with the Ontario Traffic Manual Book 12 (2012) methodology for future projected traffic volumes (Justification 7). Based on 2024 total traffic volumes, signal warrants were not met for the unsignalized intersections analysed. The traffic signal warrant sheets are provided in **Appendix I**.

The cursory review of **transit priority measures** is provided in **Section 18.2**. The review indicated that this area is not a candidate for transit priority measures.

**Table 14. Intersection Control Summary (2024 Total)**

INTERSECTION	EXISTING CONTROL	ROUNDABOUT SCREENING	TAC SIGNAL WARRANT	ISOLATED TRANSIT PRIORITY	FUTURE CONTROL
Fernbank / Terry Fox	Traffic Signal	-	-	Not Warranted	No change
Fernbank / Templeford / Romina	Two-way Stop	Not Warranted	Not Warranted	Not Warranted	No change
Eagleson / Fernbank	Traffic Signal	-	-	Not Warranted	No change
Eagleson / Cope	Traffic Signal	-	-	Not Warranted	No change
Eagleson / Bridgestone	Two-way Stop	Not Warranted	Not Warranted	Not Warranted	No change
Site Access – Fernbank	-	Not Warranted	Not Warranted	Not Warranted	Two-way Stop
Site Access – Eagleson north	-	Not Warranted	Not Warranted	Not Warranted	Right-Out Only
Site Access – Eagleson south	-	Not Warranted	Not Warranted	Not Warranted	Two-way Stop

## 20.2 INTERSECTION DESIGN

### 20.2.1 MULTI-MODAL LEVEL OF SERVICE ANALYSIS

A Multi-Modal Level of Service (MMLOS) analysis was carried out in accordance with the methodology outlined in the City of Ottawa's MMLOS Guidelines (2015). The Guidelines state that intersection LOS measures are to be evaluated at signalized intersections. We have prepared an MMLOS analysis for the existing conditions (2018) and future total (2024) time horizon to provide a comparison between the baseline and future condition (beyond the development period).

The intersection of Eagleson / Fernbank was evaluated as an *Arterial within 300m of a school* (Maurice-Lapointe Public Elementary School) while the remaining intersections were evaluated as an *Arterial Main Street*. The corresponding LOS targets were taken from Exhibit 22 of the MMLOS Guidelines.

The MMLOS results for the existing conditions and future total conditions (**Table 15**) indicate that the pedestrian, bicycle, transit, and truck modes do not meet their target LOS. There is no change in the forecasted MMLOS between time horizons.

**Table 15. Intersection MMLOS – Existing Conditions**

		PLOS	BLOS	TLOS	TKLOS	VLOS
Time Horizon	Target	C / A*	C	D	D	D / E*
Existing (2018)	Terry Fox / Fernbank	D	F	F	F	A
	Eagleson / Fernbank	E	F	F	E	B
	Eagleson / Cope	E	F	F	E	A
Future Total (2024)	Terry Fox / Fernbank	D	F	F	F	A
	Eagleson / Fernbank	E	F	F	E	B
	Eagleson / Cope	E	F	F	E	A
* First target for Eagleson / Fernbank (Arterial within 300m of a school), second target for remaining intersections (Arterial Main Street)						

The **Pedestrian Level of Service (PLOS)** target of 'C' could be met if the signal timing was altered to reduce the average pedestrian delay from 48s to 30s or less. This could be achieved by increasing the effective walk time and/or reducing the cycle length. However, given the low pedestrian volume (observed 44 total in an 8-hour count at Eagleson / Fernbank), the current LOS is considered acceptable.

The **Bicycle Level of Service** (BLOS) target of ‘C’ could be met if separated bicycle facilities were provided on Eagleson Road and Terry Fox Drive. Arterial operating speeds and current lane configuration provide minimal opportunity BLOS improvements.

The **Transit Level of Service** (TLOS) target of ‘D’ could be met with adjustments to signal timing to reduce east / west delay by 10s. However, given the current transit service provided in this area and the general flow of traffic (north / south), the current LOS is acceptable.

The **Truck Level of Service** (TkLOS) target of ‘D’ was met for the City of Ottawa’s north/south Full Load Truck Route along Eagleson Road at Cope Road. However, the TkLOS target was not met at Eagleson Road and Fernbank Road due to the single receiving lane on the north and south departures. Improving the TkLOS could be considered as part of a broader transportation study in this area.

The **Vehicle Level of Service** (VLOS) targets of ‘D’ and ‘E’ were met.

## 20.2.2 DETAILED PERFORMANCE ANALYSIS

### METHODOLOGY

The existing and future conditions were analyzed based upon the weekday peak hour traffic volumes presented in **Section 9**. The City of Ottawa’s MMLOS Guidelines assigns the vehicle level of service (VLOS) based on ranges of volume to capacity ratio, as indicated in **Table 16**.

**Table 16. Highway Capacity Manual 2010, LOS Criteria**

VLOS	VOLUME TO CAPACITY RATIO
A	0 – 0.60
B	0.61 – 0.70
C	0.71 – 0.80
D	0.80 – 0.90
E	0.91 – 1.00
F	> 1.00

The City’s MMLOS Guidelines recommend a target VLOS of ‘E’ for the City’s Central Area, areas within 600m of a rapid transit station, or areas within 300m of a school. The Guidelines recommend a target VLOS of ‘D’ for locations that are not located in the aforementioned policy areas. Maurice-Lapointe Public Elementary School is 300m from the intersections on Eagleson Road with Fernbank Road and Bridgestone Drive. Therefore, we have assumed a target VLOS of ‘E’ for these two intersections and the Eagleson Road site access. The remaining intersections and accesses were assessed against a VLOS ‘D’.

The following sections present the results of the intersection capacity analysis. All intersections were analyzed using Synchro 9 following the analysis parameters in the TIA Guidelines. **Appendix J** contains the detailed Synchro analysis sheets.

## EXISTING CONDITIONS

The existing (2018) intersection capacity analysis results are summarized in **Table 17**. The intersections in our study area currently operate with an acceptable VLOS; with the exception of the Eagleson / Bridgestone intersection that has VLOS of 'F' during the PM peak hour.

At the Eagleson / Bridgestone intersection, the westbound left has a v/c ratio greater than 1.00 and the 31 vehicles making this turn experience high levels of delay (> 500s) resulting in a movement LOS of 'F'. The other movements at this intersection operate well below capacity.

**Table 17. Intersection Capacity Summary for Existing Conditions (2018)**

INTERSECTION	AM PEAK HOUR			PM PEAK HOUR		
	V/C RATIO	VLOS	CRITICAL MOVEMENT	V/C RATIO	VLOS	CRITICAL MOVEMENT
Fernbank / Terry Fox (signalized)	0.39	A	-	0.55	A	-
Fernbank / Templeford / Romina (stop control)	0.26	A	-	0.33	A	-
Eagleson / Fernbank (signalized)	0.67	B	-	0.74	C	-
Eagleson / Cope (signalized)	0.62	B	EBL = F	0.58	A	EBL = E
Eagleson / Bridgestone (stop control)	0.77	C	-	1.33	F	WBL = F

## FUTURE BACKGROUND CONDITIONS

The intersection VLOS and critical movements remain unchanged when compared to the existing conditions. With the exception of the Eagleson / Bridgefield intersection, background traffic operations during the 2019 planning horizon continue to operate at or below the target VLOS. The intersection capacity results are summarized in **Table 18**.

**Table 18. Intersection Capacity Summary for Future Background Conditions (2019)**

INTERSECTION	AM PEAK HOUR			PM PEAK HOUR		
	V/C RATIO	VLOS	CRITICAL MOVEMENT	V/C RATIO	VLOS	CRITICAL MOVEMENT
Fernbank / Terry Fox ( <i>signalized</i> )	0.39	A	-	0.56	A	-
Fernbank / Templeford / Romina ( <i>stop control</i> )	0.27	A	-	0.33	A	-
Egleson / Fernbank ( <i>signalized</i> )	0.68	B	-	0.75	C	-
Egleson / Cope ( <i>signalized</i> )	0.63	B	EBL = F	0.59	A	EBL = E
Egleson / Bridgestone ( <i>stop control</i> )	0.78	C	-	1.39	F	WBL = F

Background traffic operations during the 2024 planning horizon operate at or below the target VLOS; with the exception of the Eagleson / Bridgestone intersection that continues to operate with a VLOS 'F'. Incremental changes from the 2019 background scenario include:

- Eagleson / Fernbank intersection VLOS increase from 'B' to 'C' during the AM peak hour and from 'C' to 'D' in the PM peak hour
- Eagleson / Cope intersection VLOS increase from 'B' to 'C' during the AM peak hour and from 'A' to 'F' in the PM peak hour as a result of other area development (**Section 10.3**)
- Eagleson / Bridgestone intersection VLOS increase from 'C' to 'D' during the AM peak hour with a continued increase in v/c ratio in the PM peak hour (1.39 to 2.05)
- EBL movement at Eagleson and Cope increases from an 'E' to an 'F' as a result of other area development

The intersection capacity results are summarized in **Table 19**.

**Table 19. Intersection Capacity Summary for Future Background Conditions (2024)**

INTERSECTION	AM PEAK HOUR			PM PEAK HOUR		
	V/C RATIO	VLOS	CRITICAL MOVEMENT	V/C RATIO	VLOS	CRITICAL MOVEMENT
Fernbank / Terry Fox (signalized)	0.42	A	-	0.59	A	-
Fernbank / Templeford / Romina (stop control)	0.30	A	-	0.39	A	-
Egleson / Fernbank (signalized)	0.72	C	-	0.82	D	-
Egleson / Cope (signalized)	0.72	C	EBL = E	0.71	C	EBL = F
Egleson / Bridgestone (stop control)	0.88	D	-	2.05	F	WBL = F

## FUTURE TOTAL CONDITIONS

The critical movements remain unchanged when compared to the 2019 background scenario. Total traffic operations during the 2019 planning horizon continue to operate at or below the target VLOS; with the exception of the Eagleson / Bridgestone intersection that continues to operate with a VLOS 'F'.

The addition of the development accesses does not appear to impact traffic operations; all accesses operate with a VLOS 'A'. The intersection capacity results are summarized in **Table 20**.

**Table 20. Intersection Capacity Summary for Future Total Conditions (2019)**

INTERSECTION	AM PEAK HOUR			PM PEAK HOUR		
	V/C RATIO	VLOS	CRITICAL MOVEMENT	V/C RATIO	VLOS	CRITICAL MOVEMENT
Fernbank / Terry Fox (signalized)	0.39	A	-	0.56	A	-
Fernbank / Templeford / Romina (stop control)	0.27	A	-	0.34	A	-
Eagleson / Fernbank (signalized)	0.69	B	-	0.77	C	-
Eagleson / Cope (signalized)	0.63	B	EBL = F	0.59	A	EBL = E
Eagleson / Bridgestone (stop control)	0.79	C	-	1.48	F	WBL = F
Site Access 1 - Fernbank (stop control)	0.10	A	-	0.12	A	-
Site Access 2 - Eagleson (stop control)	0.30	A	-	0.65	B	-

There was minimal increase in the intersection v/c ratios from the 2024 background scenario with no changes to the VLOS experienced by drivers or to the critical movements.

The site accesses continue to operate with a VLOS 'A' and do not appear to impact traffic operations. The intersection capacity results are summarized in **Table 21**.

**Table 21. Intersection Capacity Summary for Future Total Conditions (2024)**

INTERSECTION	AM PEAK HOUR			PM PEAK HOUR		
	V/C RATIO	VLOS	CRITICAL MOVEMENT	V/C RATIO	VLOS	CRITICAL MOVEMENT
Fernbank / Terry Fox (signalized)	0.42	A	-	0.59	A	-
Fernbank / Templeford / Romina (stop control)	0.30	A	-	0.39	A	-
Eagleson / Fernbank (signalized)	0.74	C	-	0.84	D	-
Eagleson / Cope (signalized)	0.72	C	EBL = E	0.71	C	EBL = F
Eagleson / Bridgestone (stop control)	0.89	D	-	2.19	F	WBL = F
Site Access 1 - Fernbank (stop control)	0.11	A	-	0.12	A	-
Site Access 2 - Eagleson (stop control)	0.33	A	-	0.69	B	-

### 20.2.3 DESIGN ELEMENTS

The intersection capacity analysis indicates that the addition of trips generated by the proposed development at 800 Eagleson Road does not impact intersection operations in either planning horizon. Therefore, no modifications are required at the existing intersections to accommodate the development.

## 21 SUMMARY OF IMPROVEMENTS INDICATED AND MODIFICATION OPTIONS

A summary of transportation improvements proposed as part of this Transportation Impact Assessment carried out and the proposed modifications are presented as follows:

### 1. Development Design

- a) Provision for sustainable modes has been provided on-site through the provision of internal sidewalks, marked pedestrian crossings in the parking lot, provision for secure (inside) and surface bicycle parking, and direct connections and access to an existing adjacent transit stop.
- b) Design vehicles were assessed for the Site Plan and indicate that accesses accommodate these movements site without impacting on built features. Parking spaces #13 and #56 may be impacted by large vehicles (HSU and Fire Pumper Truck) circulating between the south Eagleson access and the north Eagleson access.
- c) The parking spaces west of the main building are best suited for mid-sized to small vehicles when considering ability to drive or reverse into the stalls.

**Reference: Section 12**

### 2. Parking

- d) Peak period parking demand is estimated to be 159 vehicles (ITE Parking Generation). The proposed parking of 75 below grade and 61 above grade resident parking spaces and 28 visitor parking spaces will meet the anticipated demand. Parking proposed for residents is 22 spaces below bylaw requirements and parking proposed for visitors is 1 space below bylaw requirements.

**Reference: Section 13**

### 3. Boundary Street Design

- e) The Fernbank Road cross-section adjacent to the proposed development is consistent with the City's complete streets philosophy and urban design objectives for the area.
- f) The Eagleson Road cross-section adjacent to the proposed development is not currently consistent with the City's complete streets philosophy. The future widening of Eagleson Road in this area is part of the City's 2031 Affordable Network Concept and improvements to the cross-section will be considered as part of a larger Environmental Assessment Study to determine the feasibility of providing additional arterial capacity in South Kanata.

**Reference: Section 14**

#### 4. Intersection Design

- g) Fernbank Road Access: No modifications are proposed to this two-way full movement access. Signage will be installed to provide positive wayfinding guidance to residents and non-residents when accessing the main entrance / surface parking lot from the Fernbank Road access.
- h) Egleson Road South Access: No modifications are proposed to this two-way full movement access.
- i) Egleson Road North Access: No modifications are proposed to this one-way right-out only access. It is noted that a large fire pumper truck may impact the north curb when exiting; however, an HSU is accommodated to perform the maneuver without conflict.
- j) Fernbank Road and Terry Fox Drive: No modifications are proposed. The MMLOS assessment indicates that pedestrian, bicycle, transit, and truck LOS targets are not met at this intersection. Arterial operating speeds and vehicle lane configurations provide minimal opportunity for improvements for pedestrians and cyclists. Signal timing could be adjusted to improve the TLOS as part of a larger transit study in this area.
- k) Fernbank Road and Templeford Avenue / Romina Street: No modifications are proposed.
- l) Egleson Road and Cope Drive / Cadence Gate: No modifications are proposed. The MMLOS assessment indicates that pedestrian, bicycle, transit, and truck LOS targets are not met at this intersection. Arterial operating speeds and vehicle lane configurations provide minimal opportunity for improvements for pedestrians and cyclists. Signal timing could be adjusted to improve the TLOS as part of a larger transit study in this area.
- m) Egleson Road and Fernbank Road: No modifications are proposed. The MMLOS assessment indicates that pedestrian, bicycle, transit, and truck LOS targets are not met at this intersection. Arterial operating speeds and vehicle lane configurations provide minimal opportunity for improvements for pedestrians and cyclists. Signal timing could be adjusted to improve the TLOS as part of a larger transit study in this area.
- n) Egleson Road and Bridgestone Drive: No modifications are proposed. The Synchro analysis indicates that the intersection operates with a VLOS 'F' as a result of the westbound left movement. Intersection improvements could be considered as part of a larger study determining the feasibility of widening Egleson Road to provide additional arterial capacity in South Kanata.

**Reference: Section 15 and Section 20**

#### 5. Transportation Demand Management

- o) The site plan has included facilities that are supportive of sustainable modes (pedestrian pathways, bicycle parking, direct connection to transit, lighting, landscaping, and benches) to encourage residents to shift from vehicle trips to walking, cycling, and transit trips.
- p) The existing road network has available capacity should the mode share targets not be met.

**Reference: Section 16**

## **6. Transit**

- q) The maximum average passenger load on route #168 at the existing bus stop adjacent to the development is 5 passengers in the peak periods. The #168 provides 30-minute service and can accommodate the addition of 14- and 18-person trips generated by the development in the peak hours.

**Reference: Section 18**

## **7. Summary**

Based on the results of this Transportation Impact Assessment, the proposed development by Ironclad Developments Inc. located at 800 Eagleson Road:

- a) Is appropriately designed for sustainable modes,
- b) Is aligned with the City of Ottawa's broader city-building objectives, and
- c) Can be accommodated without adverse impacts to planned transportation network and services associated with the future 2024 planning horizon.

# APPENDIX

**A**

SCREENING  
FORM

## City of Ottawa 2017 TIA Guidelines Screening Form

### 1. Description of Proposed Development

Municipal Address	800 Eagleson Road
Description of Location	Southwest corner of Eagleson / Fernbank intersection
Land Use Classification	Arterial Main Street
Development Size (units)	143 rental apartments
Development Size (m <sup>2</sup> )	Site Area: 7,284 sq.m
Number of Accesses and Locations	1 on Fernbank and 1 on Eagleson
Phase of Development	Single phase
Buildout Year	2019

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

### 2. Trip Generation Trigger

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

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

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

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

### 3. Location Triggers

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

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

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

### 4. Safety Triggers

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

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

### 5. Summary

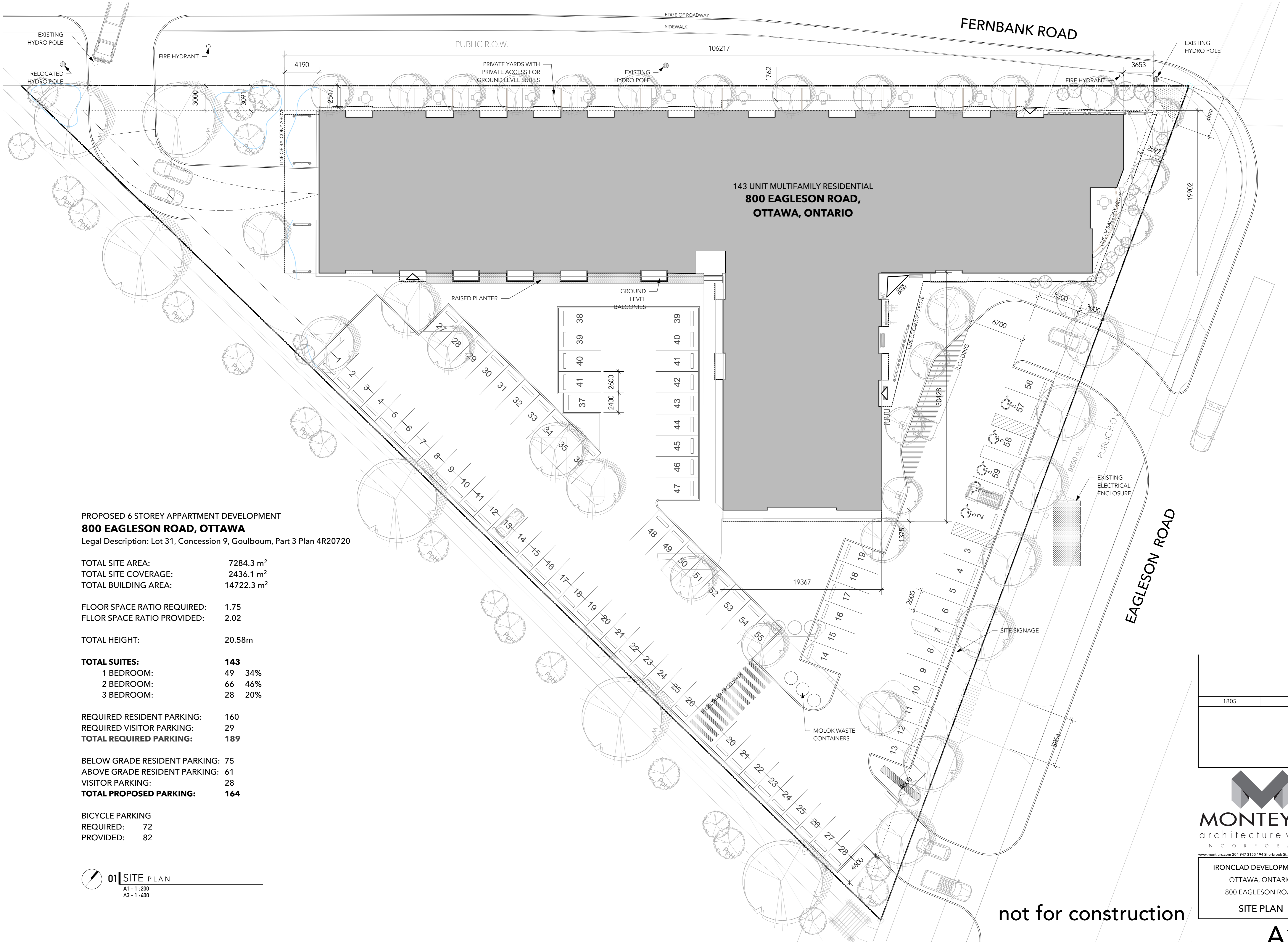
	Yes	No
Does the development satisfy the Trip Generation Trigger?	X	
Does the development satisfy the Location Trigger?	X	
Does the development satisfy the Safety Trigger?	X	

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

# APPENDIX

**B**

DRAFT SITE  
PLAN



PROPOSED 6 STOREY APPARTMENT DEVELOPMENT  
**800 EAGLESON ROAD, OTTAWA**  
Legal Description: Lot 31, Concession 9, Goulbourn, Part 3 Plan 4R20720

TOTAL SITE AREA: 7284.3 m<sup>2</sup>  
TOTAL SITE COVERAGE: 2436.1 m<sup>2</sup>  
TOTAL BUILDING AREA: 14722.3 m<sup>2</sup>

FLOOR SPACE RATIO REQUIRED: 1.75  
FLOOR SPACE RATIO PROVIDED: 2.02


TOTAL HEIGHT: 20.58m

**TOTAL SUITES:** **143**  
1 BEDROOM: 49 34%  
2 BEDROOM: 66 46%  
3 BEDROOM: 28 20%

REQUIRED RESIDENT PARKING: 160  
REQUIRED VISITOR PARKING: 29  
**TOTAL REQUIRED PARKING: 189**


BELOW GRADE RESIDENT PARKING: 75  
ABOVE GRADE RESIDENT PARKING: 61  
VISITOR PARKING: 28  
**TOTAL PROPOSED PARKING: 164**

BICYCLE PARKING  
REQUIRED: 72  
PROVIDED: 82

 **01 | SITE PLAN**  
A1 - 1 : 200  
A3 - 1 : 400

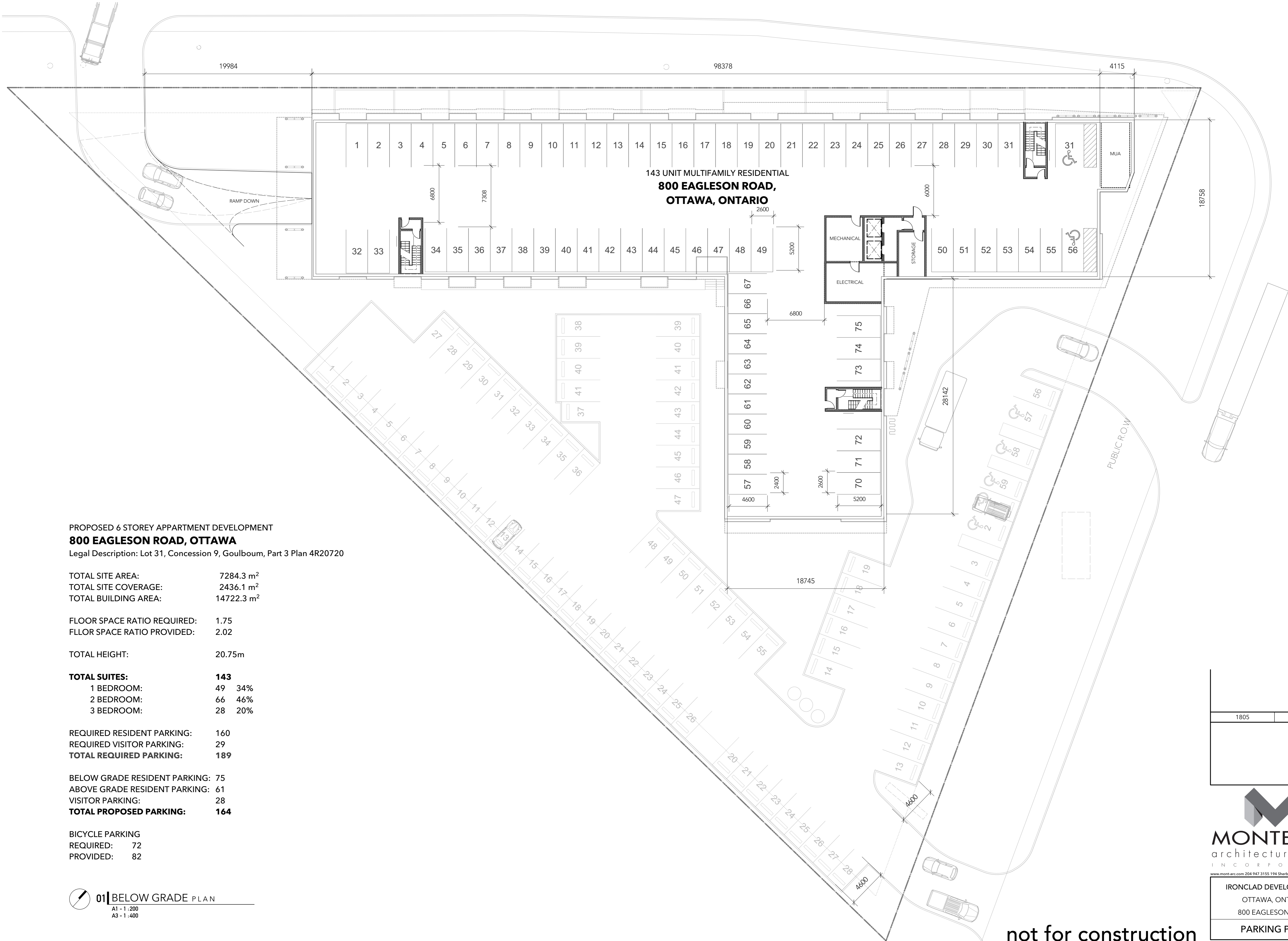
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1805

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IRONCLAD DEVELOPMENTS  
OTTAWA, ONTARIO  
800 EAGLESON ROAD  
SITE PLAN

A1.0



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01 | BELOW GRADE PLAN  
A1 - 1 : 200  
A3 - 1 : 400

not for construction

1805



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OTTAWA, ONTARIO  
800 EAGLESON ROAD

PARKING PLAN

A1.1

# APPENDIX

C

TRANS O-D  
SURVEY  
REPORT 2011  
(KANATA /  
STITSVILLE)

# Kanata - Stittsville

## Demographic Characteristics

Population	105,210	Actively Travelled	83,460
Employed Population	49,640	Number of Vehicles	64,540
Households	38,010	Area (km <sup>2</sup> )	82.6

Occupation Status (age 5+)	Male	Female	Total
Full Time Employed	24,670	19,590	44,260
Part Time Employed	1,540	3,840	5,380
Student	13,630	13,410	27,040
Retiree	6,480	8,350	14,820
Unemployed	850	940	1,790
Homemaker	160	3,310	3,470
Other	350	1,010	1,360
Total:	47,690	50,440	98,120

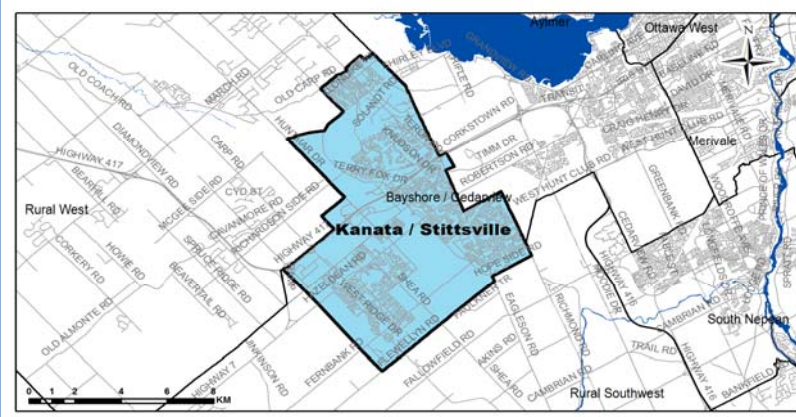
Traveller Characteristics	Male	Female	Total
Transit Pass Holders	5,940	6,920	12,860

Licensed Drivers	36,280	36,790	73,070
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Telecommuters	200	380	580
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Trips made by residents	135,300	143,330	278,630
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Selected Indicators	
Daily Trips per Person (age 5+)	2.84
Vehicles per Person	0.61
Number of Persons per Household	2.77
Daily Trips per Household	7.33
Vehicles per Household	1.70
Workers per Household	1.31
Population Density (Pop/km <sup>2</sup> )	1270

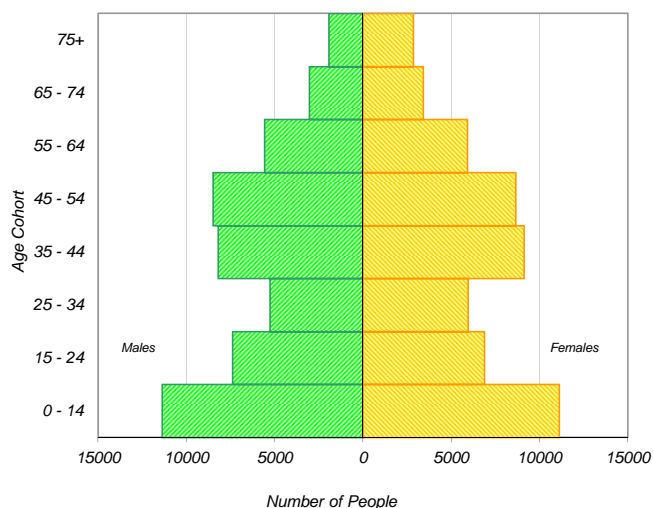


Household Size		
1 person	5,810	15%
2 persons	11,660	31%
3 persons	7,490	20%
4 persons	8,890	23%
5+ persons	4,160	11%
Total:	38,010	100%

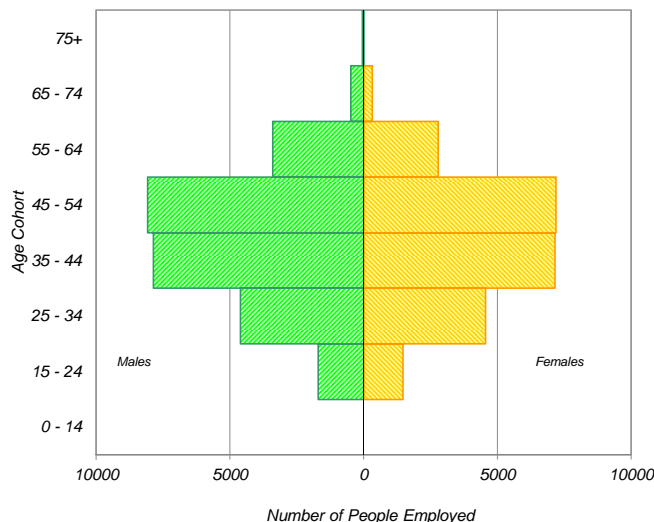
Households by Vehicle Availability		
0 vehicles	1,050	3%
1 vehicle	14,090	37%
2 vehicles	19,110	50%
3 vehicles	3,000	8%
4+ vehicles	770	2%
Total:	38,010	100%

Households by Dwelling Type		
Single-detached	21,610	57%
Semi-detached	3,890	10%
Townhouse	10,550	28%
Apartment/Condo	1,960	5%
Total:	38,010	100%

Population



Employed Population

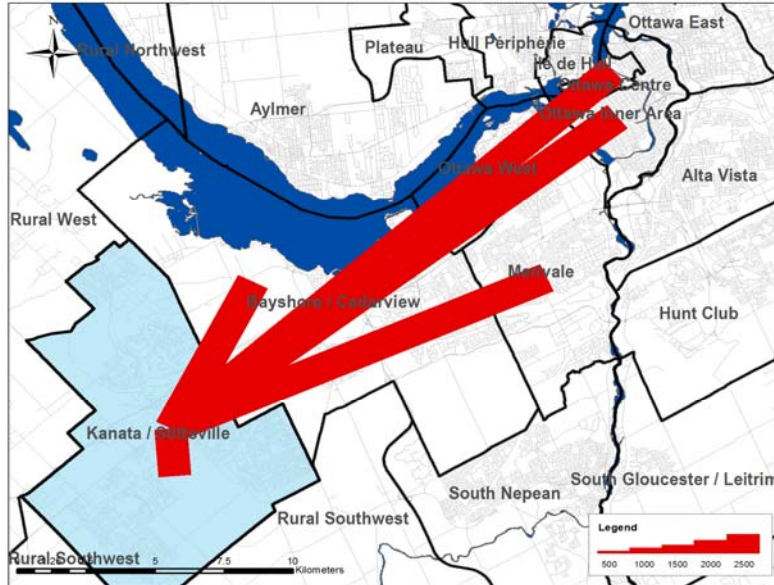


\* In 2005 data was only collected for household members aged 11+ therefore these results cannot be compared to the 2011 data.

## Travel Patterns

### Top Five Destinations of Trips from Kanata - Stittsville

#### AM Peak Period



### Summary of Trips to and from Kanata - Stittsville

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

Districts	Destinations of Trips From		Origins of Trips To	
	District	% Total	District	% Total
Ottawa Centre	4,560	8%	140	0%
Ottawa Inner Area	3,350	6%	970	2%
Ottawa East	660	1%	260	1%
Beacon Hill	280	0%	170	0%
Alta Vista	1,810	3%	660	1%
Hunt Club	490	1%	420	1%
Merivale	3,410	6%	1,200	3%
Ottawa West	2,020	4%	840	2%
Bayshore / Cedarview	5,010	9%	2,420	5%
Orléans	290	1%	500	1%
Rural East	100	0%	30	0%
Rural Southeast	50	0%	260	1%
South Gloucester / Leitrim	60	0%	140	0%
South Nepean	690	1%	1,800	4%
Rural Southwest	1,130	2%	1,850	4%
Kanata / Stittsville	30,360	54%	30,360	66%
Rural West	1,050	2%	3,250	7%
Île de Hull	670	1%	30	0%
Hull Périphérie	160	0%	30	0%
Plateau	100	0%	230	0%
Aylmer	0	0%	190	0%
Rural Northwest	20	0%	60	0%
Pointe Gatineau	20	0%	80	0%
Gatineau Est	0	0%	60	0%
Rural Northeast	30	0%	50	0%
Buckingham / Masson-Angers	30	0%	10	0%
Ontario Sub-Total:	55,320	98%	45,270	98%
Québec Sub-Total:	1,030	2%	740	2%
Total:	56,350	100%	46,010	100%

### Trips by Trip Purpose

24 Hours	From District		To District		Within District	
Work or related	27,180	29%	17,020	18%	14,550	9%
School	7,070	7%	2,500	3%	15,110	9%
Shopping	6,070	6%	9,150	10%	22,480	14%
Leisure	8,450	9%	10,590	11%	17,090	11%
Medical	2,520	3%	1,170	1%	2,660	2%
Pick-up / drive passenger	6,570	7%	5,470	6%	15,190	9%
Return Home	33,610	35%	45,620	48%	65,770	41%
Other	3,560	4%	3,590	4%	8,440	5%
Total:	95,030	100%	95,110	100%	161,290	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Work or related	18,030	69%	11,020	70%	7,430	24%
School	4,890	19%	2,280	15%	11,740	39%
Shopping	170	1%	320	2%	760	3%
Leisure	340	1%	400	3%	780	3%
Medical	330	1%	230	1%	350	1%
Pick-up / drive passenger	1,260	5%	580	4%	4,760	16%
Return Home	290	1%	380	2%	1,980	7%
Other	670	3%	430	3%	2,560	8%
Total:	25,980	100%	15,640	100%	30,360	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Work or related	390	2%	350	1%	930	2%
School	370	2%	0	0%	90	0%
Shopping	1,030	5%	1,910	7%	5,100	14%
Leisure	2,140	11%	3,080	11%	4,130	11%
Medical	230	1%	180	1%	400	1%
Pick-up / drive passenger	1,980	10%	1,980	7%	3,410	9%
Return Home	12,130	64%	20,550	71%	21,560	58%
Other	680	4%	860	3%	1,850	5%
Total:	18,950	100%	28,910	100%	37,470	100%

Peak Period (%)	Total:	% of 24 Hours	Within District (%)
24 Hours	351,430		46%
AM Peak Period	71,980	20%	42%
PM Peak Period	85,330	24%	44%

### Trips by Primary Travel Mode

24 Hours	From District		To District		Within District	
Auto Driver	63,470	67%	63,830	67%	92,190	57%
Auto Passenger	15,220	16%	14,920	16%	31,880	20%
Transit	12,200	13%	12,270	13%	4,050	3%
Bicycle	360	0%	410	0%	960	1%
Walk	40	0%	50	0%	21,080	13%
Other	3,730	4%	3,660	4%	11,130	7%
Total:	95,020	100%	95,140	100%	161,290	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Auto Driver	15,360	59%	11,530	74%	13,630	45%
Auto Passenger	2,450	9%	1,160	7%	5,050	17%
Transit	6,230	24%	1,290	8%	1,210	4%
Bicycle	30	0%	80	1%	220	1%
Walk	0	0%	40	0%	5,730	19%
Other	1,900	7%	1,560	10%	4,510	15%
Total:	25,970	100%	15,660	100%	30,350	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Auto Driver	13,850	73%	17,660	61%	21,240	57%
Auto Passenger	3,240	17%	4,270	15%	8,570	23%
Transit	1,270	7%	5,980	21%	670	2%
Bicycle	40	0%	100	0%	260	1%
Walk	40	0%	0	0%	4,570	12%
Other	520	3%	910	3%	2,160	6%
Total:	18,960	100%	28,920	100%	37,470	100%

Avg Vehicle Occupancy	From District		To District		Within District	
24 Hours	1.24		1.23		1.35	
AM Peak Period	1.16		1.10		1.37	
PM Peak Period	1.23		1.24		1.40	

Transit Modal Split	From District		To District		Within District	
24 Hours	13%		13%		3%	
AM Peak Period	26%		9%		6%	
PM Peak Period	7%		21%		2%	

# APPENDIX



**D**

CITY OF  
OTTAWA  
CRASH DATA

# Collision Main Detail Summary

OnTRAC Reporting System

FROM: 2012-01-01 TO: 2014-01-01

## BRIDGESTONE DR & EAGLESON RD

Former Municipality: Kanata

Traffic Control: Stop sign

Number of Collisions: 4

	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
1	2012-06-15	Fri	19:59	Clear	Daylight	Turning	P.D. only	V1 S V2 N	Dry Dry	Turning left Going ahead	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
2	2012-08-08	We	16:40	Rain	Daylight	Rear end	P.D. only	V1 W V2 W	Wet Wet	Slowing or Stopped	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
3	2013-02-06	We	16:40	Clear	Dusk	Rear end	P.D. only	V1 W V2 W	Dry Dry	Slowing or Stopped	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
4	2013-09-06	Fri	09:26	Clear	Daylight	Angle	P.D. only	V1 W V2 N	Dry Dry	Going ahead Going ahead	Truck - open Bicycle	Cyclist Other motor vehicle	0

## CADENCE GT & COPE DR

Former Municipality: Kanata

Traffic Control: Traffic signal

Number of Collisions: 10

	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
5	2012-01-18	We	07:35	Clear	Dawn	Other	P.D. only	V1 E V2 W	Ice Ice	Reversing Turning left	Snow plow Automobile, station	Other motor vehicle Other motor vehicle	0
6	2012-06-01	Fri	21:17	Rain	Dark	Angle	P.D. only	V1 N V2 E	Wet Wet	Going ahead Going ahead	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
7	2012-06-08	Fri	21:12	Clear	Dusk	Turning	P.D. only	V1 S V2 N	Dry Dry	Turning left Going ahead	Automobile, station Pick-up truck	Other motor vehicle Other motor vehicle	0
8	2012-10-14	Sun	18:30	Clear	Dark	Rear end	P.D. only	V1 N V2 N V3 N	Wet Wet Wet	Slowing or Slowing or Slowing or	Automobile, station Automobile, station Automobile, station	Other motor vehicle Other motor vehicle Other motor vehicle	0
9	2012-12-10	Mo	06:24	Freezin	Dark	Angle	P.D. only	V1 S V2 W	Ice Slush	Slowing or Going ahead	Pick-up truck Pick-up truck	Other motor vehicle Other motor vehicle	0

(Note: Time of Day = "00:00" represents unknown collision time)

Wednesday, February 21,

## Collision Main Detail Summary

OnTRAC Reporting System

FROM: 2012-01-01 TO: 2014-01-01

10	2013-05-12	Sun	16:45	Rain	Daylight	Angle	P.D. only	V1 E V2 S	Wet Wet	Turning right Unknown	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
11	2013-08-07	We	17:00	Rain	Daylight	Rear end	P.D. only	V1 S V2 S	Wet Wet	Going ahead Going ahead	Passenger van Pick-up truck	Other motor vehicle Other motor vehicle	0
12	2013-09-06	Fri	03:35	Clear	Dark	Single vehicle	P.D. only	V1 S	Dry	Turning right	Automobile, station	Ran off road	0
13	2013-09-22	Sun	19:03	Clear	Daylight	Angle	Non-fatal	V1 S V2 W	Dry Dry	Going ahead Going ahead	Automobile, station Passenger van	Other motor vehicle Other motor vehicle	0
14	2013-10-11	Fri	01:06	Clear	Dark	Single vehicle	P.D. only	V1 S	Dry	Turning left	Automobile, station	Curb	0

(Note: Time of Day = "00:00" represents unknown collision time)

Wednesday, February 21,

## Collision Main Detail Summary

OnTRAC Reporting System

FROM: 2012-01-01 TO: 2014-01-01

### EAGLESON RD, BRIDGESTONE DR to FERNBANK RD

Former Municipality: Kanata

Traffic Control: No control

Number of Collisions: 1

	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
1	2012-01-31	Tue	20:26	Clear	Dark	Approaching	P.D. only	V1 N V2 S	Loose snow Loose snow	Going ahead Going ahead	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0

### FERNBANK RD, EAGLESON RD to TERRY FOX RD

Former Municipality: Kanata

Traffic Control: No control

Number of Collisions: 2

	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
2	2012-09-24	Mo	11:02	Clear	Daylight	Single vehicle	P.D. only	V1 W	Dry	Reversing	Automobile, station	Unattended vehicle	0
3	2013-01-30	We	16:39	Rain	Dusk	Single vehicle	Non-fatal	V1 W	Wet	Going ahead	Automobile, station	Ran off road	0

(Note: Time of Day = "00:00" represents unknown collision time)

Wednesday, February 21,

# Collision Main Detail Summary

OnTRAC Reporting System

FROM: 2012-01-01 TO: 2014-01-01

## EAGLESON RD & FERNBANK RD

Former Municipality: Kanata

Traffic Control: Traffic signal

Number of Collisions: 10

	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
1	2012-02-25	Sat	14:11	Drifting	Daylight	Rear end	P.D. only	V1 S	Wet	Slowing or	Passenger van	Other motor vehicle	0
								V2 S	Wet	Slowing or	Passenger van	Other motor vehicle	
2	2012-06-25	Mo	15:35	Rain	Daylight	Rear end	P.D. only	V1 S	Wet	Going ahead	Automobile, station	Other motor vehicle	0
								V2 S	Wet	Slowing or	Automobile, station	Other motor vehicle	
								V3 S	Wet	Stopped	Pick-up truck	Other motor vehicle	
3	2012-07-13	Fri	12:51	Clear	Daylight	Single vehicle	P.D. only	V1 N	Dry	Going ahead	Truck - closed	Pole (utility, tower)	0
4	2012-10-23	Tue	16:53	Clear	Daylight	Turning	Non-fatal	V1 N	Dry	Turning left	Pick-up truck	Other motor vehicle	0
								V2 S	Dry	Going ahead	Automobile, station	Other motor vehicle	
5	2013-01-05	Sat	18:28	Clear	Dark	Single vehicle	P.D. only	V1 E	Dry	Going ahead	Passenger van	Ran off road	0
6	2013-03-13	We	15:48	Clear	Daylight	Angle	P.D. only	V1 E	Dry	Turning right	Pick-up truck	Other motor vehicle	0
								V2 S	Dry	Going ahead	Automobile, station	Other motor vehicle	
								V3 N	Dry	Turning left	Pick-up truck	Other motor vehicle	
7	2013-06-16	Sun	14:30	Rain	Daylight	Rear end	P.D. only	V1 E	Wet	Slowing or	Pick-up truck	Other motor vehicle	0
								V2 E	Wet	Turning right	Passenger van	Other motor vehicle	
8	2013-07-06	Sat	12:33	Clear	Daylight	Turning	Non-fatal	V1 N	Dry	Turning left	Pick-up truck	Other motor vehicle	0
								V2 S	Dry	Going ahead	Automobile, station	Other motor vehicle	
9	2013-08-26	Mo	19:39	Clear	Dusk	Rear end	P.D. only	V1 S	Wet	Going ahead	Automobile, station	Other motor vehicle	0
								V2 S	Wet	Stopped	Automobile, station	Other motor vehicle	
10	2013-12-18	We	17:18	Clear	Dark	Rear end	P.D. only	V1 S	Wet	Going ahead	Automobile, station	Other motor vehicle	0
								V2 S	Wet	Slowing or	Automobile, station	Other motor vehicle	

## FERNBANK RD & TERRY FOX DR

Former Municipality: Goulbourn

Traffic Control: Traffic signal

Number of Collisions: 19

	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
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(Note: Time of Day = "00:00" represents unknown collision time)

Wednesday, February 21,

Page 1 of 3

## Collision Main Detail Summary

OnTRAC Reporting System

FROM: 2012-01-01

TO: 2014-01-01

11	2012-05-01	Tue	17:10	Clear	Daylight	Rear end	Non-fatal	V1 W V2 W	Dry Dry	Slowing or Stopped	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
12	2012-09-19	We	18:30	Clear	Daylight	Rear end	P.D. only	V1 N V2 N	Dry Dry	Going ahead Stopped	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
13	2012-09-29	Sat	17:42	Clear	Daylight	Turning	P.D. only	V1 S V2 N	Dry Dry	Turning left Going ahead	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
14	2012-10-06	Sat	10:22	Clear	Daylight	Rear end	P.D. only	V1 S V2 S V3 S	Dry Dry Dry	Going ahead Stopped Stopped	Pick-up truck Automobile, station Automobile, station	Other motor vehicle Other motor vehicle Other motor vehicle	0
15	2012-10-18	Thu	07:45	Clear	Daylight	Rear end	P.D. only	V1 E V2 E	Dry Dry	Going ahead Turning right	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
16	2012-11-11	Sun	08:50	Rain	Daylight	Turning	P.D. only	V1 E V2 W	Wet Wet	Turning left Going ahead	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
17	2012-11-18	Sun	12:13	Clear	Daylight	Angle	Non-fatal	V1 E V2 N	Dry Dry	Going ahead Going ahead	Pick-up truck Pick-up truck	Other motor vehicle Other motor vehicle	0
18	2012-11-26	Mo	18:45	Clear	Dark	Rear end	Non-fatal	V1 S V2 S	Ice Ice	Slowing or Slowing or	Passenger van Automobile, station	Other motor vehicle Other motor vehicle	0
19	2012-12-02	Sun	23:45	Rain	Dark	Single vehicle	P.D. only	V1 S	Wet	Turning left	Automobile, station	Curb	0
20	2012-12-06	Thu	07:42	Clear	Dawn	Rear end	P.D. only	V1 W V2 W	Dry Dry	Slowing or Stopped	Automobile, station Pick-up truck	Other motor vehicle Other motor vehicle	0
21	2013-01-23	We	08:15	Clear	Daylight	Rear end	P.D. only	V1 E V2 E	Dry Dry	Turning right Turning right	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
22	2013-05-30	Thu	17:15	Clear	Daylight	Rear end	P.D. only	V1 N V2 N	Dry Dry	Slowing or Stopped	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0
23	2013-06-02	Sun	12:45	Clear	Daylight	Turning	P.D. only	V1 S V2 N	Dry Dry	Turning left Going ahead	Passenger van Passenger van	Other motor vehicle Other motor vehicle	0
24	2013-07-21	Sun	16:40	Clear	Daylight	Angle	Non-fatal	V1 S V2 E	Dry Dry	Going ahead Going ahead	Automobile, station Pick-up truck	Other motor vehicle Other motor vehicle	0

(Note: Time of Day = "00:00" represents unknown collision time)

Wednesday, February 21,

Page 2 of 3

## Collision Main Detail Summary

OnTRAC Reporting System

FROM: 2012-01-01 TO: 2014-01-01

25	2013-09-14	Sat	18:04	Clear	Daylight	Rear end	P.D. only	V1 N V2 N	Dry Dry	Going ahead Stopped	Pick-up truck Automobile, station	Other motor vehicle Other motor vehicle	0
26	2013-09-16	Mo	10:23	Clear	Daylight	Angle	Non-fatal	V1 S V2 E	Dry Dry	Going ahead Going ahead	Pick-up truck Automobile, station	Other motor vehicle Other motor vehicle	0
27	2013-10-25	Fri	18:10	Clear	Dark	Turning	P.D. only	V1 E V2 W	Dry Dry	Turning left Going ahead	Automobile, station Pick-up truck	Other motor vehicle Other motor vehicle	0
28	2013-11-29	Fri	15:26	Clear	Daylight	Angle	P.D. only	V1 N V2 E	Dry Dry	Going ahead Going ahead	Pick-up truck Automobile, station	Other motor vehicle Other motor vehicle	0
29	2013-12-05	Thu	13:16	Clear	Daylight	Sideswipe	P.D. only	V1 S V2 S	Wet Wet	Overtaking Going ahead	Unknown Pick-up truck	Other motor vehicle Other motor vehicle	0

(Note: Time of Day = "00:00" represents unknown collision time)

Wednesday, February 21,

Page 3 of 3

## Collision Main Detail Summary

OnTRAC Reporting System

FROM: 2012-01-01 TO: 2014-01-01

### FERNBANK RD & TEMPLEFORD AVE

Former Municipality: Goulbourn

Traffic Control: Stop sign

Number of Collisions: 1

	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
1	2013-11-15	Fri	16:04	Clear	Daylight	Angle	P.D. only	V1 N V2 W	Dry Dry	Going ahead Going ahead	School bus Automobile, station	Other motor vehicle Other motor vehicle	0

(Note: Time of Day = "00:00" represents unknown collision time)

Wednesday, February 21,

Page 1 of 1



# City Operations - Transportation Services

## Collision Details Report - Public Version

**From:** January 1, 2014 **To:** December 31, 2016

**Location:** EAGLESON RD btwn Continuation of EAGLESON RD & FERNBANK RD

**Traffic Control:** No control

**Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Jan-15, Wed,05:50	Clear	SMV other	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Curb	



# City Operations - Transportation Services

## Collision Details Report - Public Version

**From:** January 1, 2014 **To:** December 31, 2016

**Location:** EAGLESON RD btwn FERNBANK RD & BRIDGESTONE DR

**Traffic Control:** No control

**Total Collisions:** 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2015-Jul-09, Thu,08:59	Clear	Turning movement	P.D. only	Dry	South	Making "U" turn	Passenger van	Other motor vehicle	
					South	Overtaking	Pick-up truck	Other motor vehicle	
2016-May-25, Wed,16:03	Clear	Rear end	Non-fatal injury	Dry	North	Slowing or stopping	Pick-up truck	Other motor vehicle	
					North	Stopped	Pick-up truck	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	



# City Operations - Transportation Services

## Collision Details Report - Public Version

**From:** January 1, 2014 **To:** December 31, 2016

**Location:** EAGLESON RD @ FERNBANK RD

**Traffic Control:** Traffic signal

**Total Collisions:** 14

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Jan-25, Sat,09:43	Drifting Snow	Angle	Non-fatal injury	Loose snow	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2014-Jan-24, Fri,17:15	Clear	Rear end	P.D. only	Ice	South	Slowing or stopping	Pick-up truck	Other motor vehicle	
					South	Stopped	Passenger van	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Apr-01, Tue,07:44	Clear	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Truck - open	Other motor vehicle	
2014-Jul-21, Mon,15:15	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Pick-up truck	Other motor vehicle	

2014-Jul-16, Wed,02:25	Clear	SMV other	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Ran off road
2014-Jul-07, Mon,07:24	Rain	Turning movement	P.D. only	Wet	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Jun-24, Wed,11:32	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Stopped	Pick-up truck	Other motor vehicle
2015-Feb-14, Sat,13:40	Clear	Angle	P.D. only	Wet	South	Turning right	Snow plow	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2015-Jan-14, Wed,17:24	Clear	Turning movement	Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Feb-14, Sat,11:04	Snow	Rear end	P.D. only	Slush	East	Turning left	Automobile, station wagon	Other motor vehicle
					East	Turning left	Passenger van	Other motor vehicle
2016-Feb-19, Fri,10:21	Snow	Angle	P.D. only	Loose snow	East	Turning right	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Oct-30, Sun,17:35	Clear	Turning movement	Fatal injury	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle

					South	Going ahead	Motorcycle	Other motor vehicle
2015-Nov-20, Fri,16:53	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle
2016-Jul-30, Sat,14:41	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle

**Location:** TERRY FOX DR @ FERNBANK RD

**Traffic Control:** Traffic signal

**Total Collisions:** 15

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Jan-04, Sat,10:16	Clear	Angle	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Jun-18, Wed,07:09	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Truck - dump	Other motor vehicle	
2014-Nov-13, Thu,10:30	Clear	Other	P.D. only	Dry	North	Reversing	Truck - closed	Other motor vehicle	
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2014-Oct-28, Tue,10:45	Clear	Angle	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	

2014-Dec-18, Thu,13:46	Clear	Rear end	Non-fatal injury	Dry	West	Turning right	Pick-up truck	Other motor vehicle	
					West	Turning right	Pick-up truck	Other motor vehicle	
2015-Mar-03, Tue,18:31	Snow	Rear end	P.D. only	Loose snow	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					North	Slowing or stopping	Pick-up truck	Other motor vehicle	
2015-May-06, Wed,19:38	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Bicycle	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Cyclist	
2015-Sep-13, Sun,16:48	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Pick-up truck	Other motor vehicle	
2015-Aug-26, Wed,17:32	Rain	Rear end	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2016-May-23, Mon,18:34	Clear	SMV other	Non-fatal injury	Dry	North	Pulling onto shoulder or toward curb	Automobile, station wagon	Curb	1
2015-Nov-25, Wed,13:51	Clear	Sideswipe	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle	
					East	Turning right	Truck and trailer	Other motor vehicle	
2015-Nov-19, Thu,19:52	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	

					South	Overtaking	Automobile, station wagon	Other motor vehicle
2016-Aug-07, Sun,20:15	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Passenger van	Other motor vehicle
2016-Jul-14, Thu,11:00	Rain	Angle	P.D. only	Wet	South	Turning right	Automobile, station wagon	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle
2016-Jul-28, Thu,19:10	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle



# City Operations - Transportation Services

## Collision Details Report - Public Version

**From:** January 1, 2014 **To:** December 31, 2016

**Location:** FERNBANK RD @ ROMINA ST

**Traffic Control:** Stop sign

**Total Collisions:** 4

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Jan-11, Sat,13:54	Freezing Rain	Rear end	P.D. only	Ice	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Jan-23, Thu,10:51	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Passenger van	Other motor vehicle	
2015-Jun-30, Tue,15:02	Clear	Angle	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Feb-16, Tue,13:00	Snow	Angle	P.D. only	Packed snow	South	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	



# City Operations - Transportation Services

## Collision Details Report - Public Version

**From:** January 1, 2014 **To:** December 31, 2016

**Location:** FERNBANK RD btwn TERRY FOX DR & Continuation of FERNBANK RD

**Traffic Control:** No control

**Total Collisions:** 3

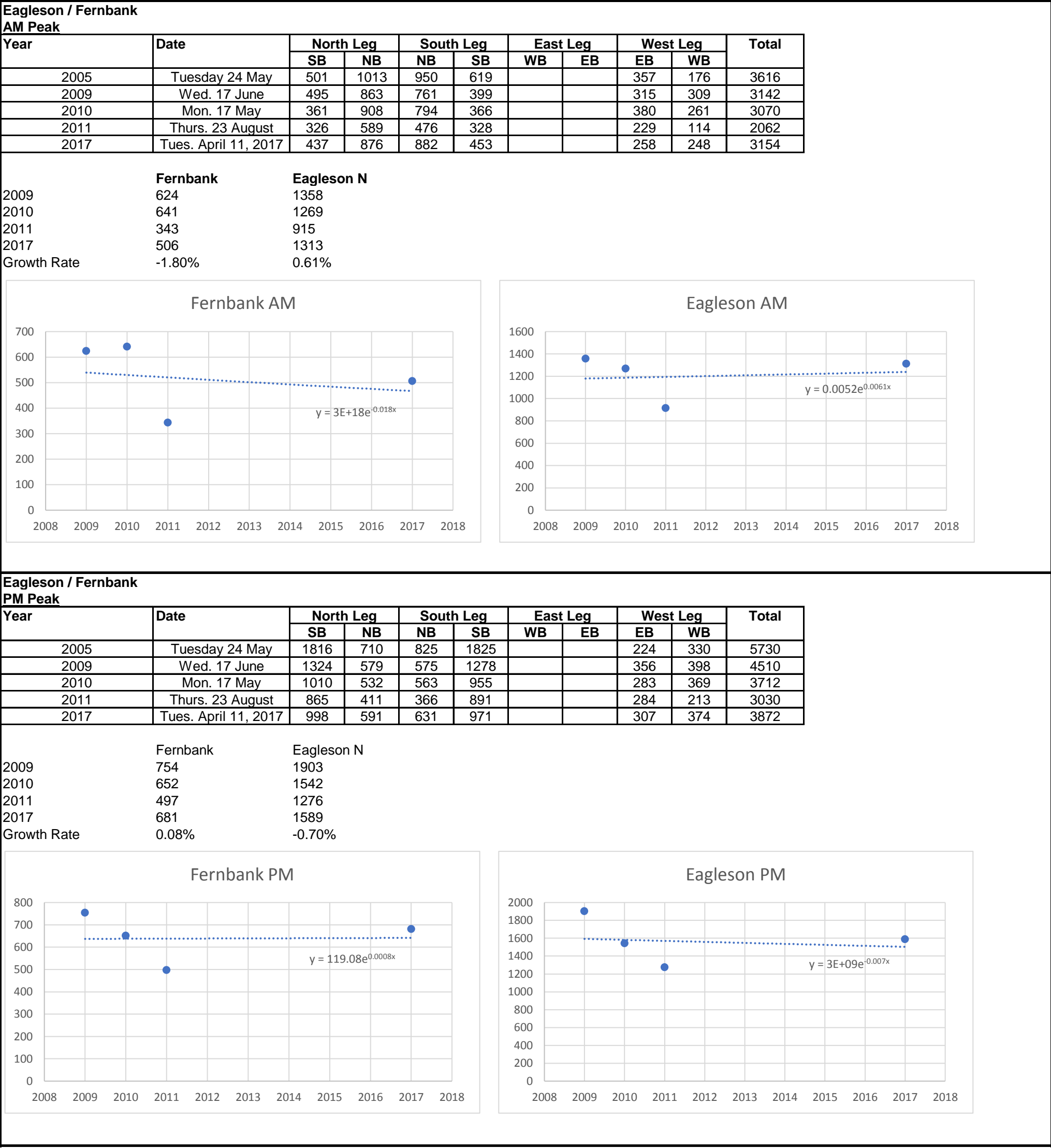
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Jul-21, Mon, 17:44	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Pick-up truck	Other motor vehicle	
					East	Stopped	Passenger van	Other motor vehicle	
					East	Stopped	Pick-up truck	Other motor vehicle	
2016-Apr-22, Fri, 20:11	Clear	SMV other	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Animal - wild	
2016-Aug-09, Tue, 11:50	Clear	SMV other	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Animal - wild	

# APPENDIX



# E

GROWTH  
RATE  
CALCULATION



# APPENDIX

**F**

TDM  
CHECKLIST

## 800 Eagleson Road

### **TDM-Supportive Development Design and Infrastructure Checklist:** *Residential Developments (multi-family or condominium)*

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

<b>TDM-supportive design &amp; infrastructure measures:</b> <i>Residential developments</i>		<b>Check if completed &amp; add descriptions, explanations or plan/drawing references</b>
<b>1. WALKING &amp; CYCLING: ROUTES</b>		
<b>1.1 Building location &amp; access points</b>		
<b>BASIC</b>	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"/> Some parking spaces are located adjacent to Eagleson Road. There is a dedicated pedestrian connection from existing concrete sidewalk to building entrance.
<b>BASIC</b>	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	<input checked="" type="checkbox"/> Direct connections between Eagleson Road sidewalk and main building entrance and transit stop #9081.
<b>BASIC</b>	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"/> Mid-rise apartment with windows on all faces.
<b>1.2 Facilities for walking &amp; cycling</b>		
<b>REQUIRED</b>	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"/> Main entrance less than 50m to transit stop #9081. Route #168 provides hourly service to the Eagleson and Terry Fox transit stations.
<b>REQUIRED</b>	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	<input checked="" type="checkbox"/> Direct connections (<50m) between main building entrance and sidewalk on Eagleson Road.

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
	weather protection through canopies, colonnades, and other design elements wherever possible ( <i>see Official Plan policy 4.3.12</i> )	
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 ( <i>see Official Plan policy 4.3.10</i> )	<input checked="" type="checkbox"/> Sidewalks to be constructed of concrete to differentiate pedestrian areas from vehicle areas. Marked pedestrian crossing provided at Eagleson access. Depressed sidewalk provided at Fernbank access. Potential to provide a 1.8m asphalt pathway along Monahan Drain.
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 ( <i>see Official Plan policy 4.3.10</i> )	<input checked="" type="checkbox"/> Accessible access from accessible parking spaces to sidewalk going to main building access.
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 ( <i>see Official Plan policy 4.3.11</i> )	<input checked="" type="checkbox"/> Potential for a 1.8m asphalt pathway along Monahan Drain (south perimeter of property) to improve pedestrian and cyclist network connectivity in the area.
BASIC	1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	<input checked="" type="checkbox"/> On-site pedestrian sidewalks connect directly to transit stop #9081.
BASIC	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	<input checked="" type="checkbox"/> Transit stop #9081 is within 50m from the main entrance.
BASIC	1.2.8 Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	<input checked="" type="checkbox"/> Potential for a 1.8m asphalt pathway along Monahan Drain (south perimeter of property) to improve pedestrian and cyclist network connectivity in the area.
<b>1.3 Amenities for walking &amp; cycling</b>		
BASIC	1.3.1 Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	<input checked="" type="checkbox"/> Amenity spaces provided; including small seating spaces, bench seating under cover, trees, trellis archway features, etc...
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)	N/A

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
<b>2. WALKING &amp; CYCLING: END-OF-TRIP FACILITIES</b>		
<b>2.1 Bicycle parking</b>		
REQUIRED	2.1.1 Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible (see <i>Official Plan policy 4.3.6</i> )	<input checked="" type="checkbox"/> Exterior bike rack under cover (11 bikes) near main entrance and interior bike storage (82 bikes).
REQUIRED	2.1.2 Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas (see <i>Zoning By-law Section 111</i> )	<input checked="" type="checkbox"/>
REQUIRED	2.1.3 Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored (see <i>Zoning By-law Section 111</i> )	
BASIC	2.1.4 Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	
<b>2.2 Secure bicycle parking</b>		
REQUIRED	2.2.1 Where more than 50 bicycle parking spaces are provided for a single residential 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 checked="" type="checkbox"/> Site can accommodate 82 bicycles within the main building.
BETTER	2.2.2 Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	<input checked="" type="checkbox"/>
<b>2.3 Bicycle repair station</b>		
BETTER	2.3.1 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 checked="" type="checkbox"/>
<b>3. TRANSIT</b>		
<b>3.1 Customer amenities</b>		
BASIC	3.1.1 Provide shelters, lighting and benches at any on-site transit stops	There are no on-site transit stops proposed
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	Sufficient space in public ROW for shelter.
BETTER	3.1.3 Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	There are no on-site transit stops proposed

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
<b>4. RIDESHARING</b>		
<b>4.1 Pick-up &amp; drop-off facilities</b>		
<b>BASIC</b>	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 checked="" type="checkbox"/>
<b>5. CARSHARING &amp; BIKESHARING</b>		
<b>5.1 Carshare parking spaces</b>		
<b>BETTER</b>	5.1.1 Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses (see <i>Zoning By-law Section 94</i> )	AM Zone
<b>5.2 Bikeshare station location</b>		
<b>BETTER</b>	5.2.1 Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	<input checked="" type="checkbox"/>
<b>6. PARKING</b>		
<b>6.1 Number of parking spaces</b>		
<b>REQUIRED</b>	6.1.1 Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	<input checked="" type="checkbox"/> The proposed number of parking spaces will meet the anticipated demand; however, a parking variance is required.
<b>BASIC</b>	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 checked="" type="checkbox"/> 28 visitor spaces available. No off-site parking available in area.
<b>BASIC</b>	6.1.3 Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly (see <i>Zoning By-law Section 104</i> )	Single use.
<b>BETTER</b>	6.1.4 Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking (see <i>Zoning By-law Section 111</i> )	
<b>6.2 Separate long-term &amp; short-term parking areas</b>		
<b>BETTER</b>	6.2.1 Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	

# APPENDIX

**G**

SWEPT PATH  
FIGURES





800 EAGLESON ROAD TRANSPORTATION IMPACT ASSESSMENT  
APPENDIX G: SWEEPED PATH FIGURES

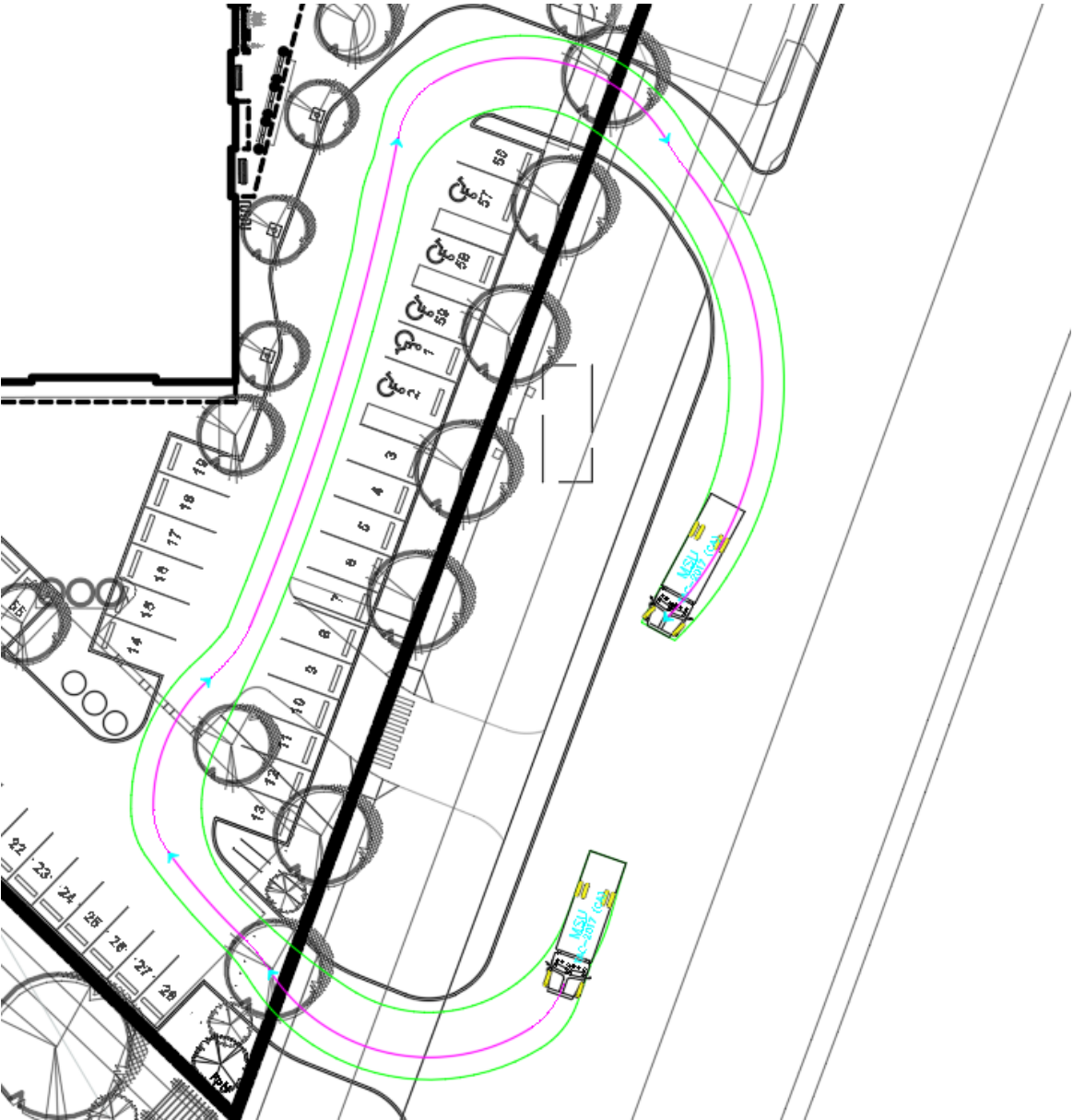


Figure 1. MSU Circulating Through Site

Suite 300  
2611 Queensview Drive  
Ottawa, ON, Canada K2B 8K2

T: +1 613 829-2800  
F: +1 613 829-8299  
wsp.com

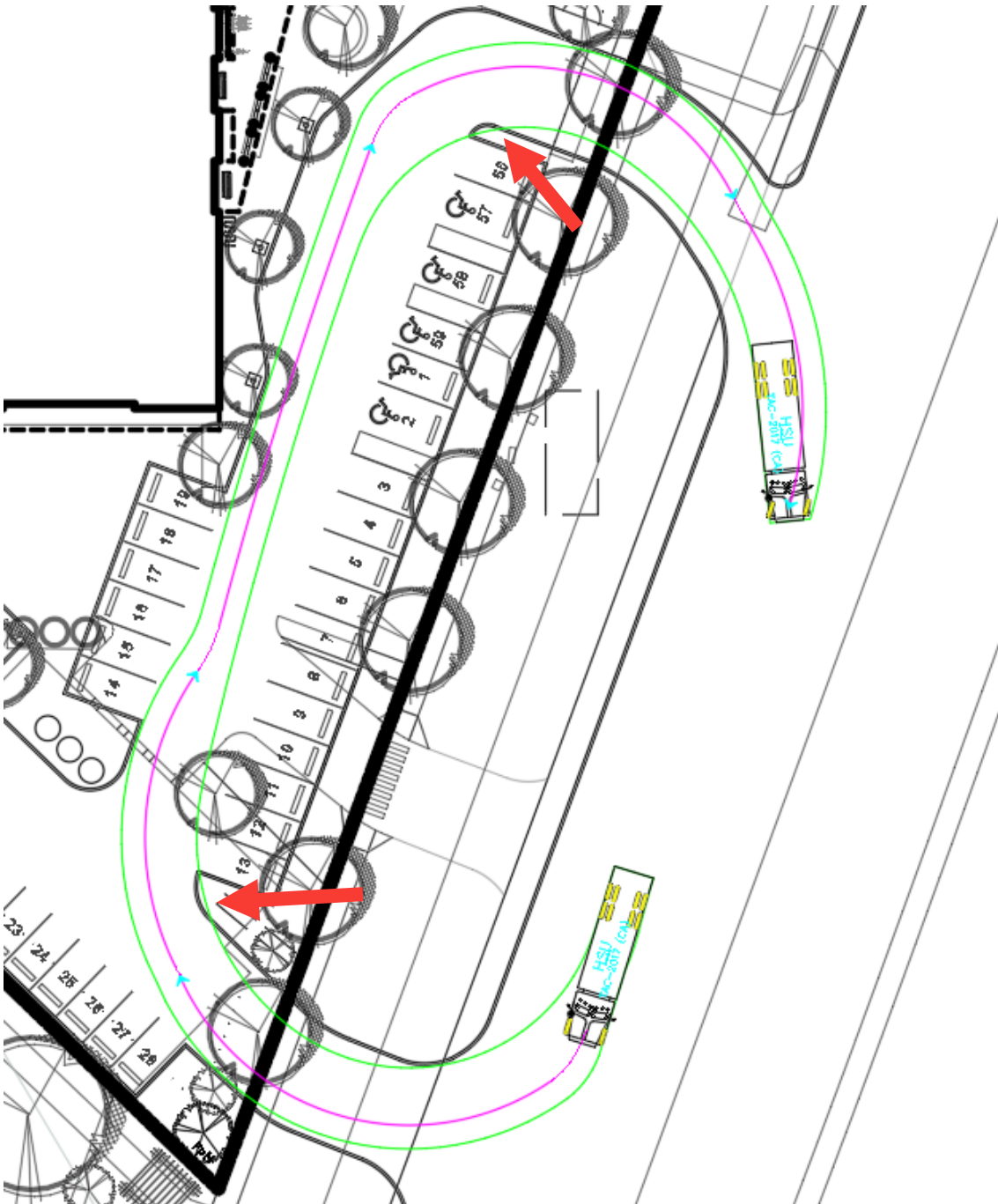


Figure 2. HSU Circulating Through Site

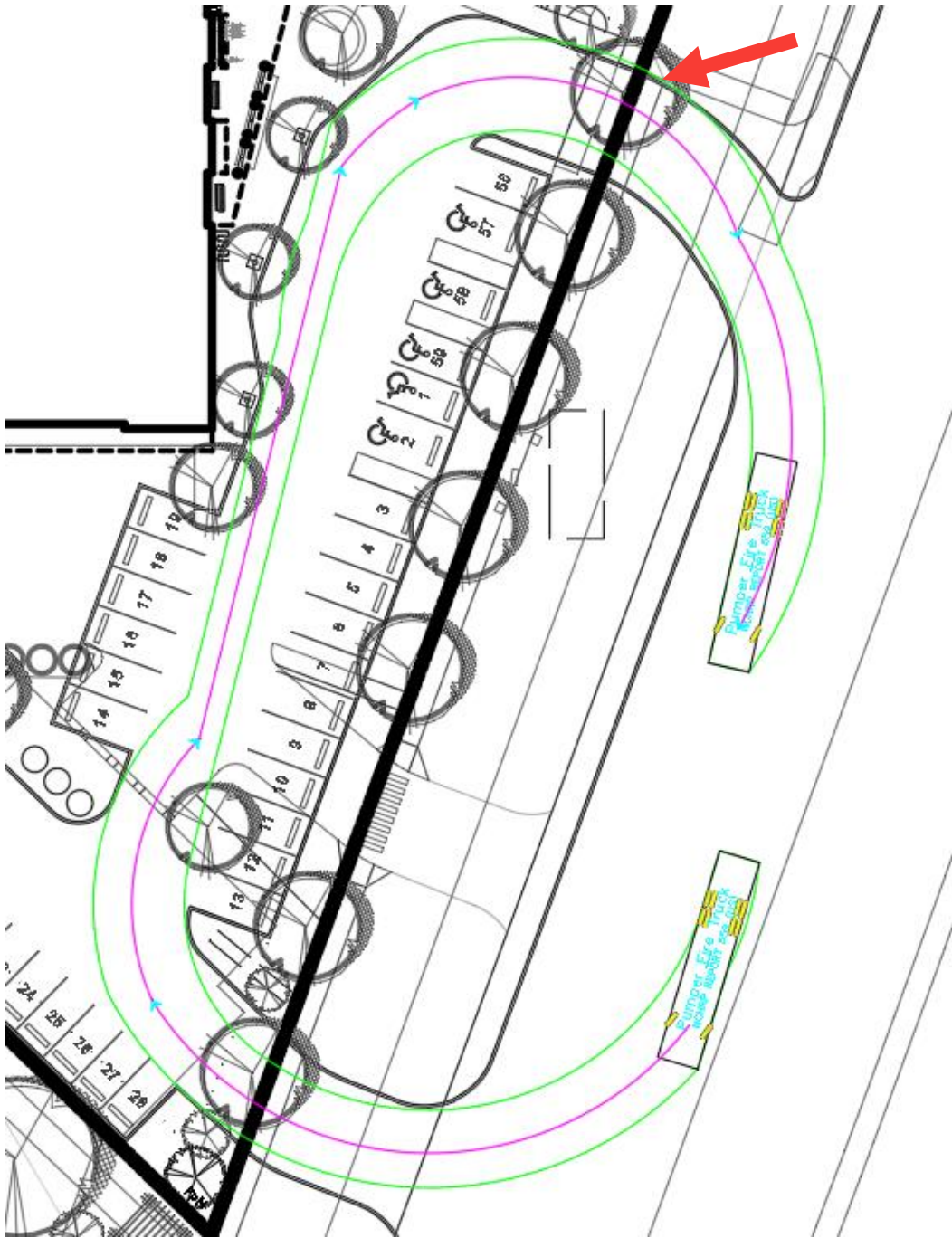


Figure 3. Fire Pumper Truck Circulating Through Site

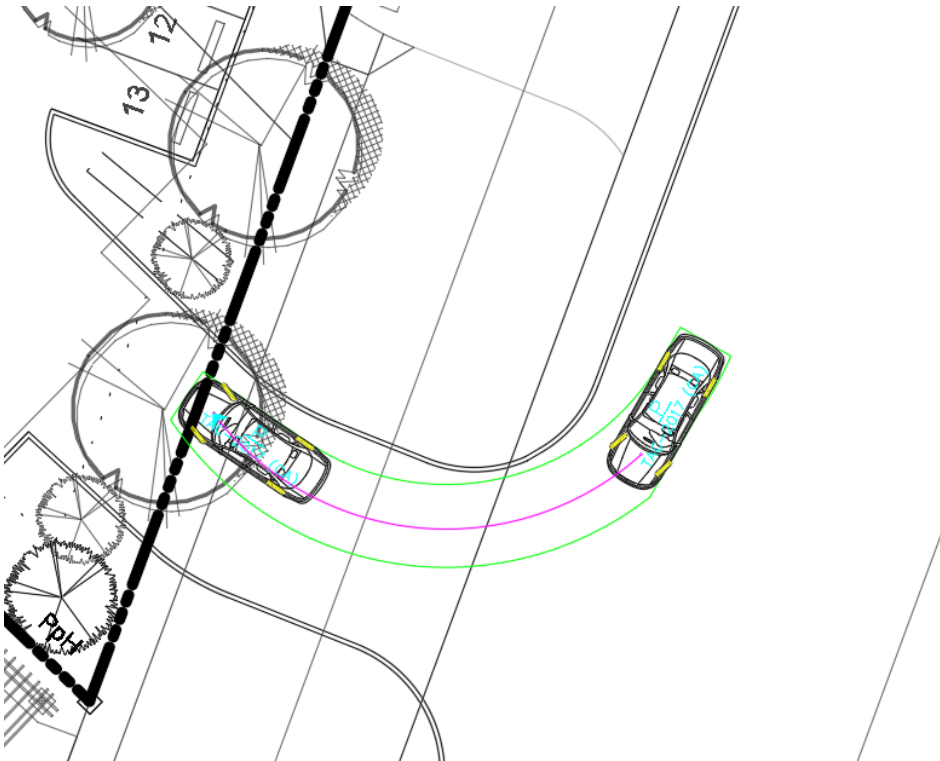


Figure 4. Full Size Passenger Vehicle (5.6m length) Entering from Eagleson Road

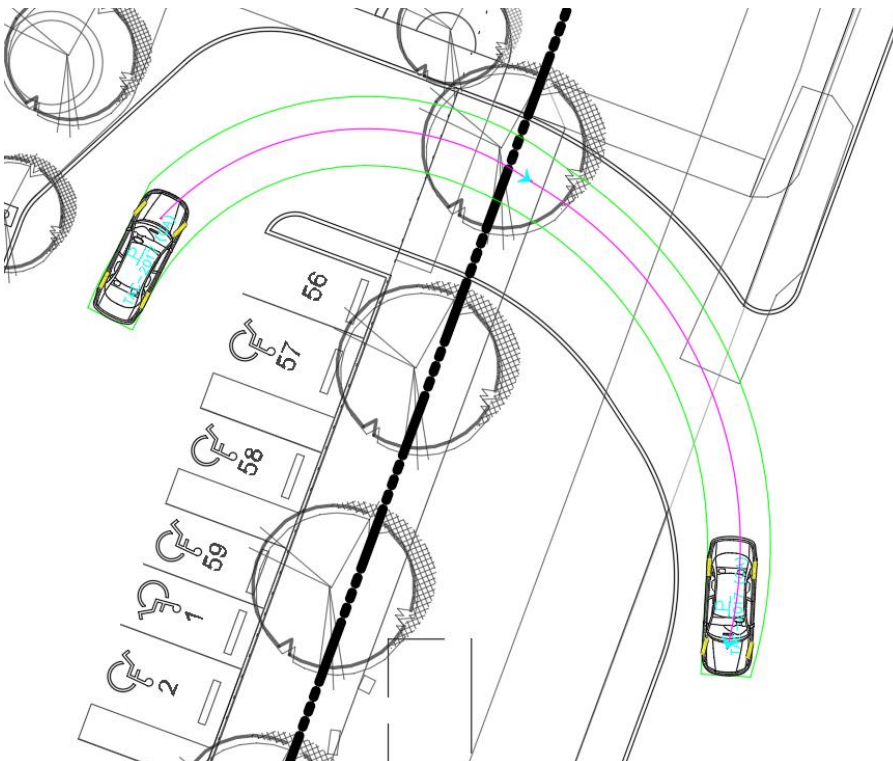


Figure 5. Full Size Passenger Vehicle (5.6m length) Exiting onto Eagleson Road

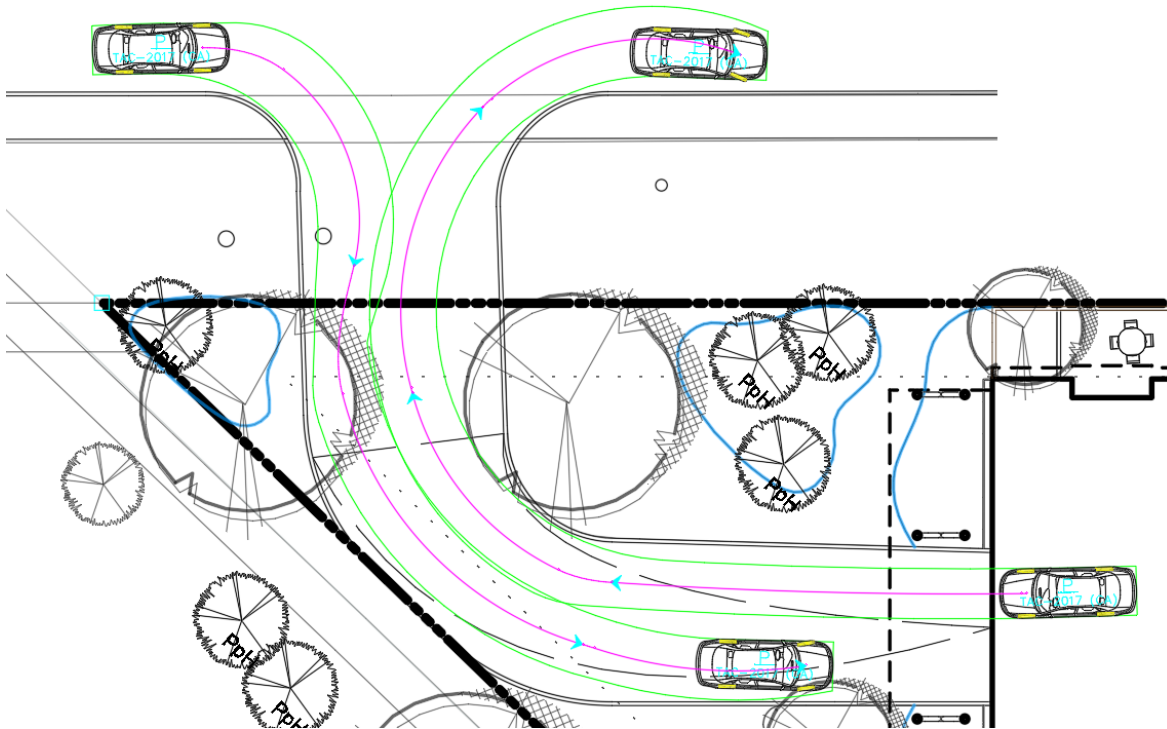


Figure 6. Full Size Passenger Vehicle (5.6m length) Entering and Exiting from / onto Fernbank Road

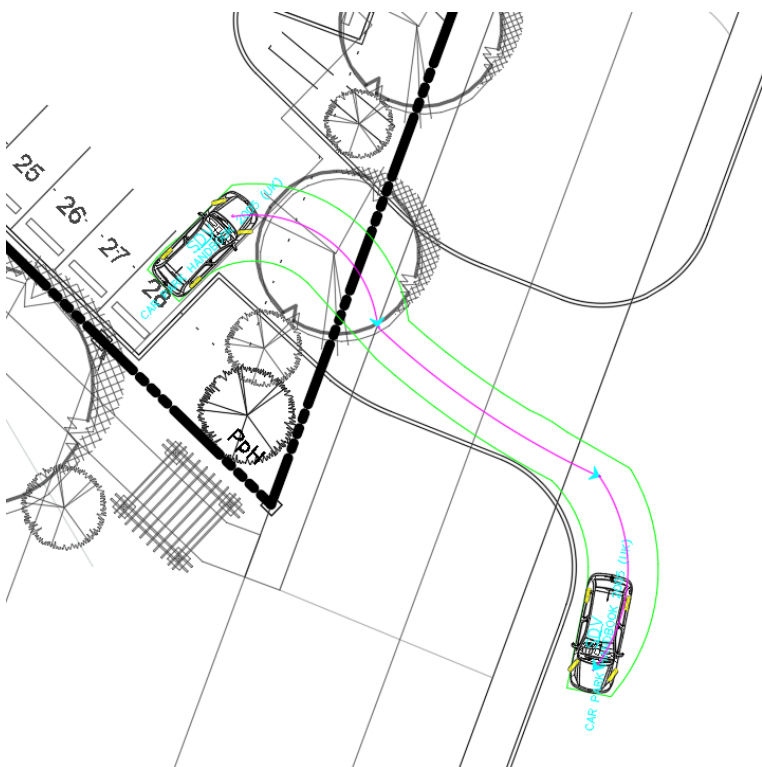


Figure 7. Mid Size Passenger Vehicle (4.8m length) Exiting onto Eagleson Road from Parking Stall #28

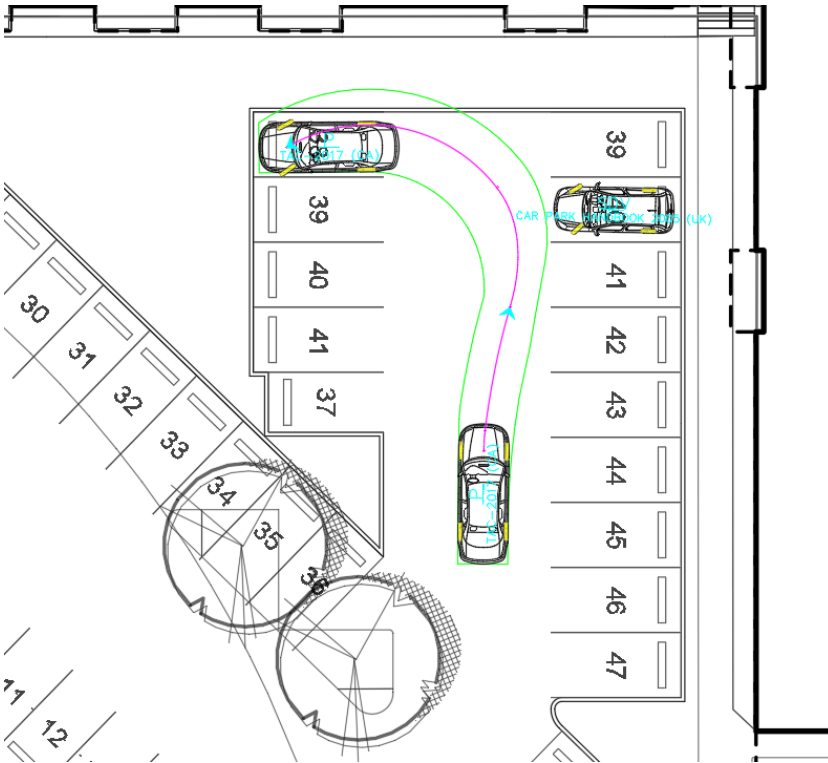


Figure 8. Full Size Passenger Vehicle (5.6m length) Accessing Parking Stall #38

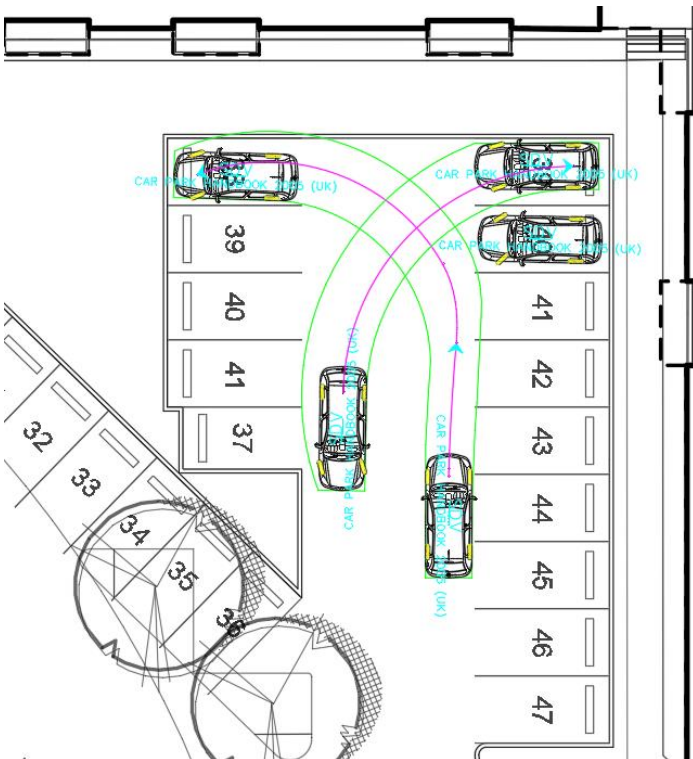



Figure 9. Mid Size Passenger Vehicle (4.8m length) Accessing Parking Stall #38 (drive in) and #39 (reverse in)

# APPENDIX

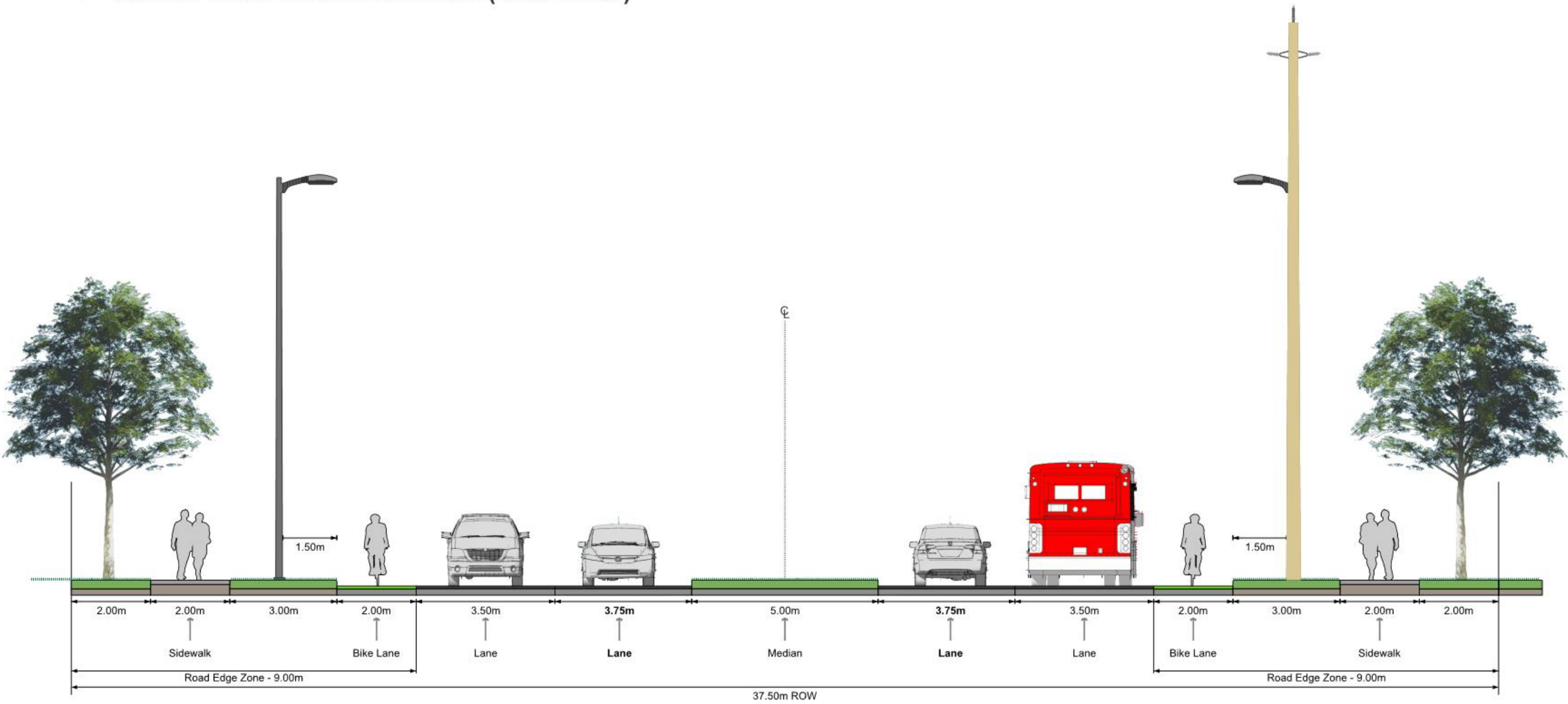


# H

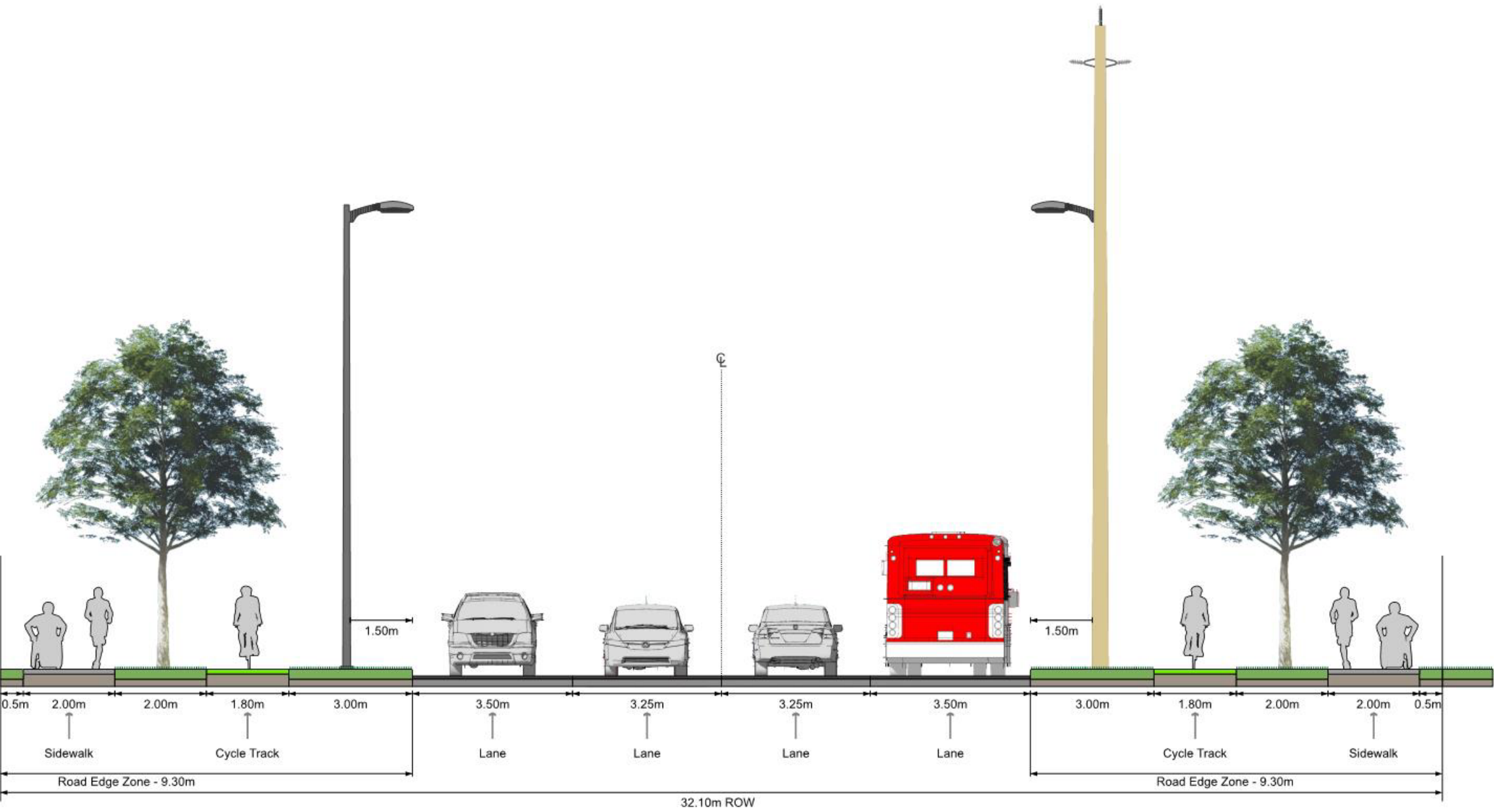
CURRENT  
CROSS-  
SECTION  
STANDARD

Document 1: Arterial Road Cross-Sections

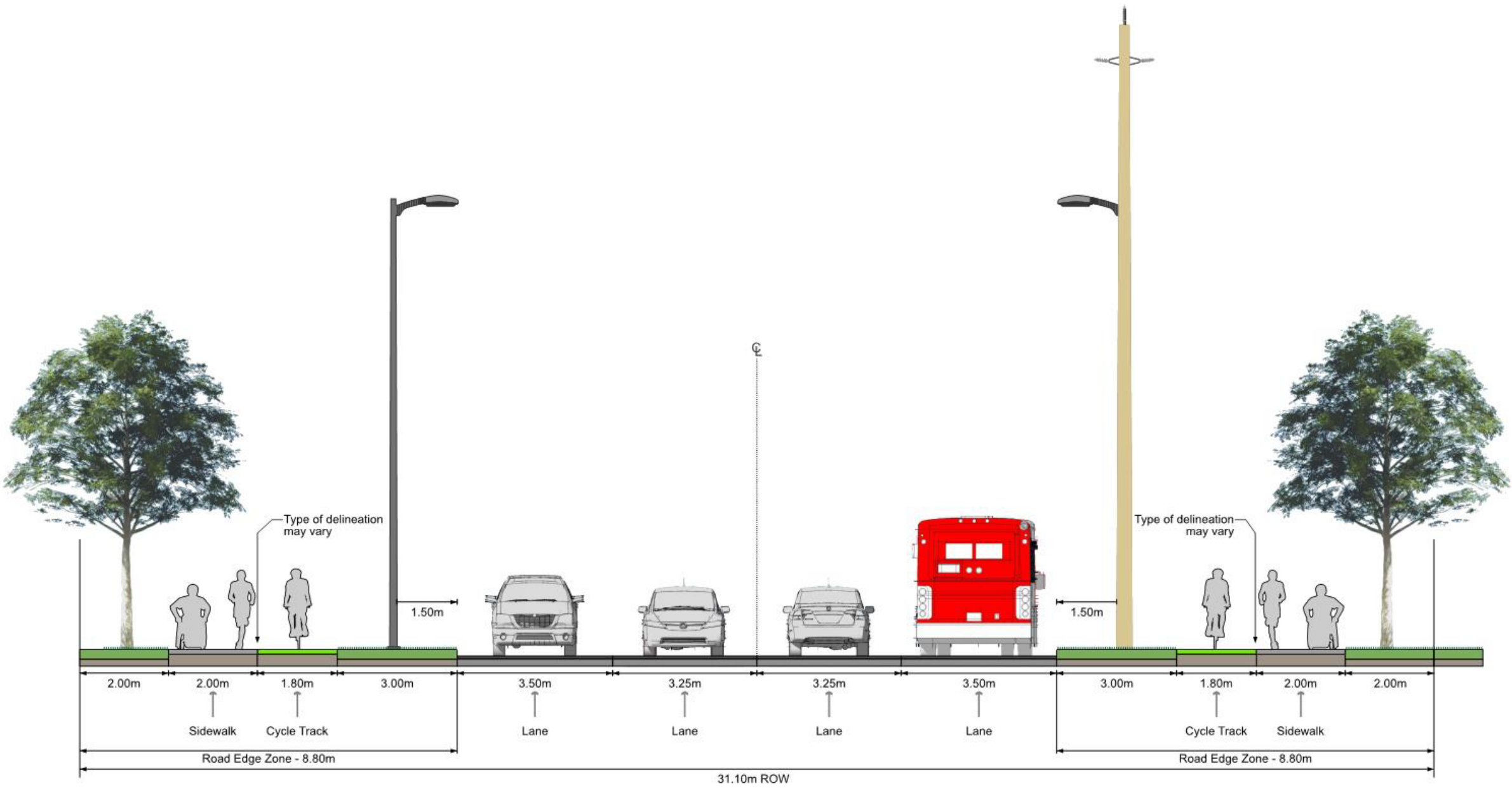
1 - Current Cross-Section Standard (Bike Lanes)



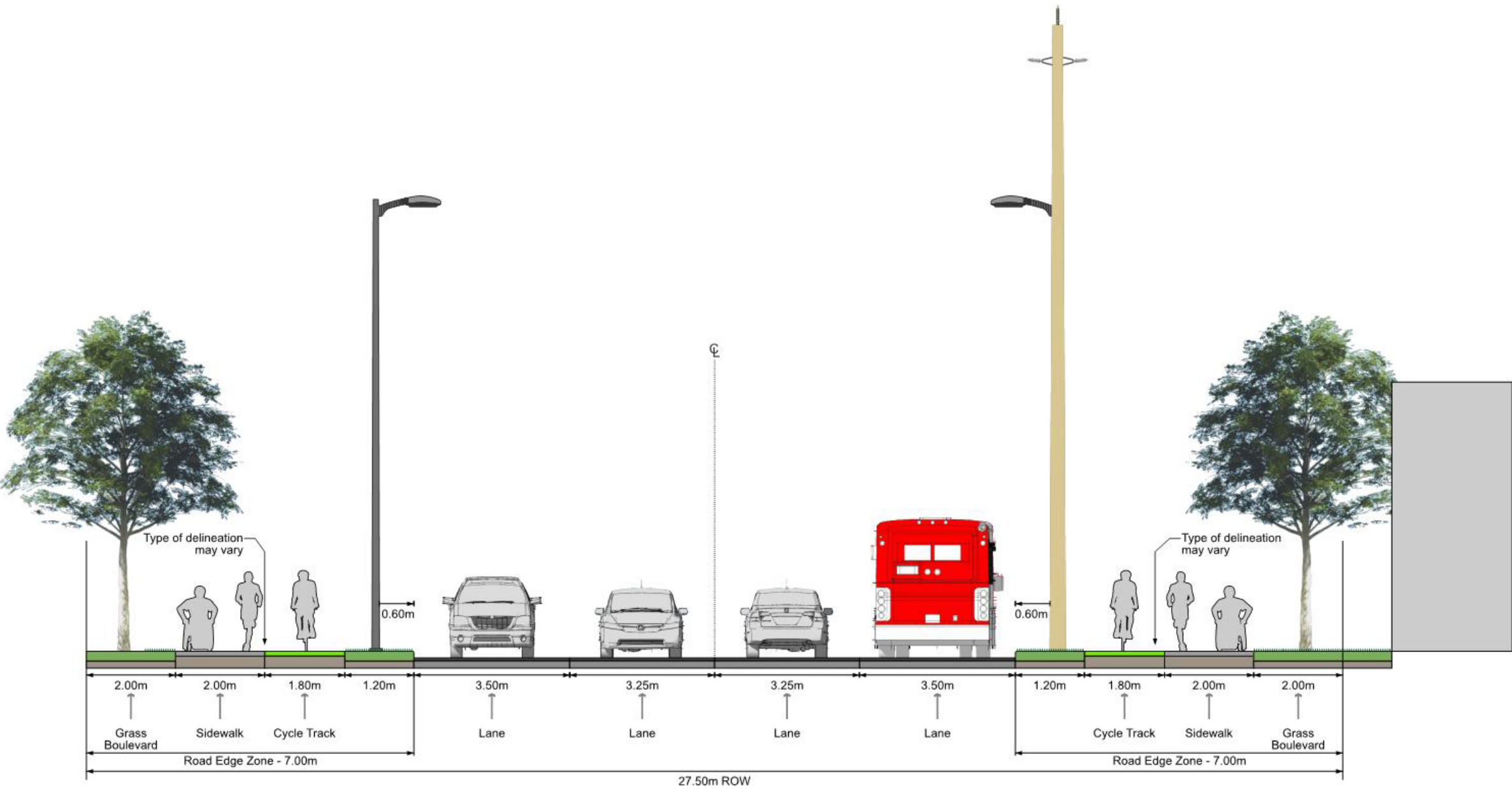
2 - Separated Cycle Tracks/Sidewalks



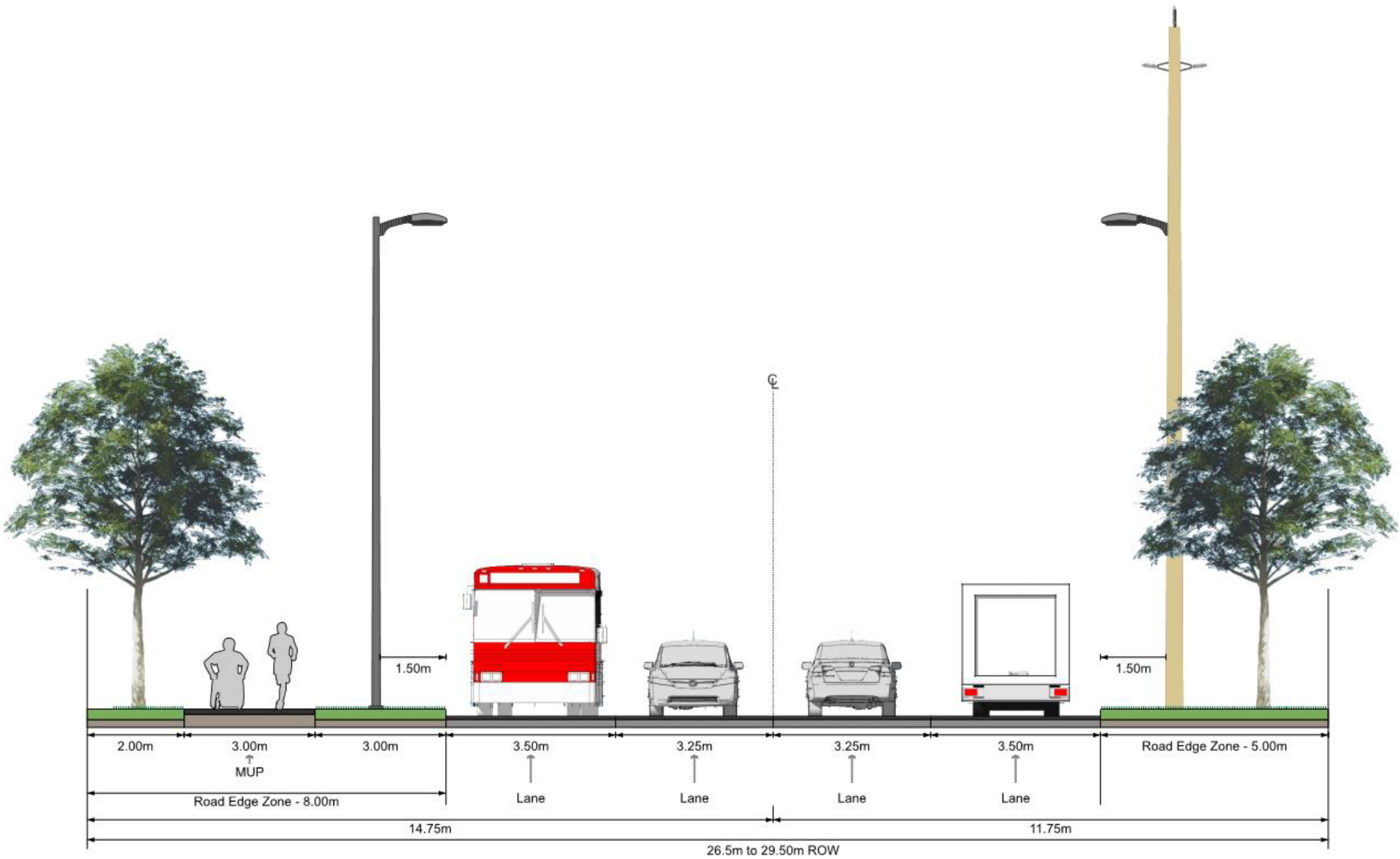
3 - Combined Cycle Tracks/Sidewalks



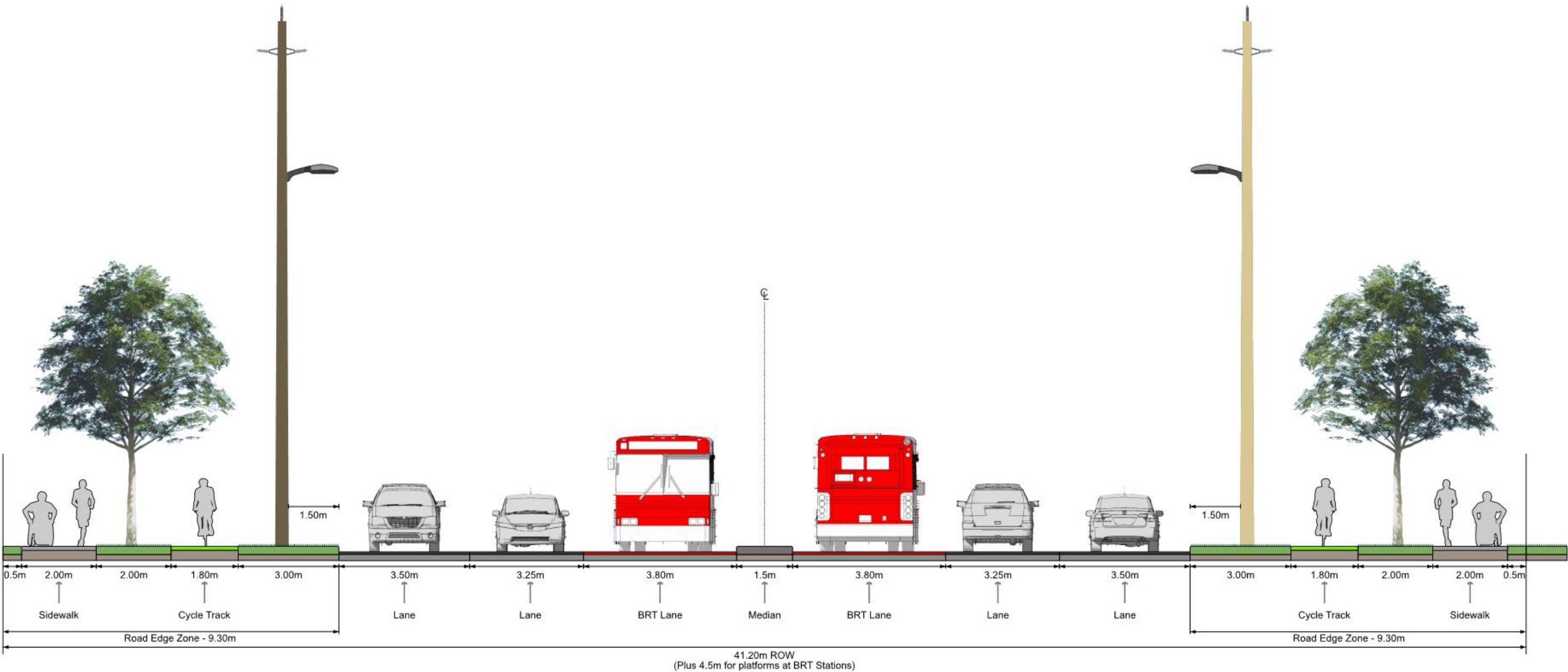
4 - Cycle Tracks, Narrow Boulevard



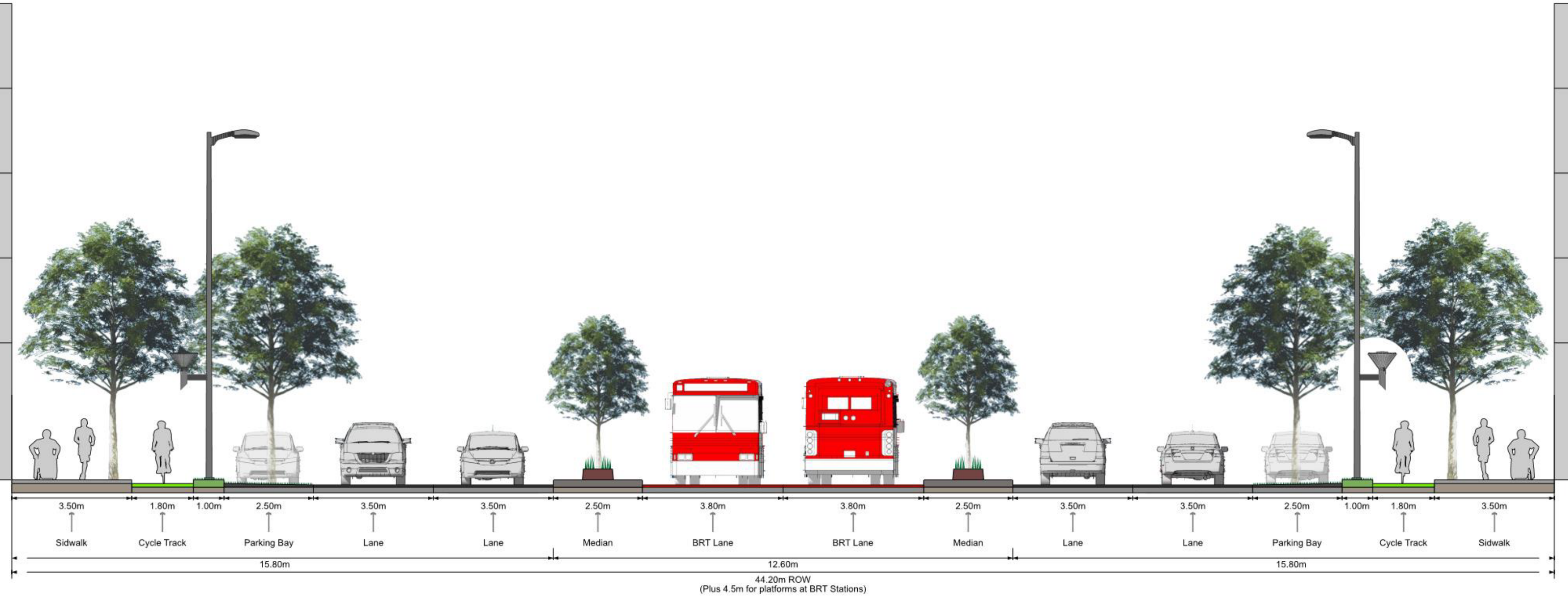
5 - Multi-Use Pathway



6 - BRT Lanes, Single Median, Combined Cycle Tracks/Sidewalks



7 - BRT Lanes, Double Medians, Separated Cycle Track, On-street Parking



# APPENDIX



## SIGNAL WARRANTS

SCENARIO	Future Total	YEAR	2024
MAJOR ROAD	Fernbank Road	MINOR ROAD	Templeford / Romina
FLOW TYPE	Restricted	ROAD TYPE	1 Lane
NEW ROAD / INT.	No	"T" INT.	No

JUSTIFICATION 7	MINIMUM REQUIREMENT		AHV	COMPLIANCE	
	FLOW	ADJ. FLOW		%	OVERALL %
1A - All Approaches	470	565	398	71%	61%
1B - Minor Road	120	145	88	61%	
2A - Major Road	480	575	310	54%	54%
2B - Crossing Major Road	50	60	48	79%	

SCENARIO	Future Total	YEAR	2024
MAJOR ROAD	Eagleson Road	MINOR ROAD	Bridgestone Drive
FLOW TYPE	Restricted	ROAD TYPE	1 Lane
NEW ROAD / INT.	No	"T" INT.	Yes

JUSTIFICATION 7	MINIMUM REQUIREMENT		AHV	COMPLIANCE	
	FLOW	ADJ. FLOW		%	OVERALL %
1A - All Approaches	470	565	889	157%	91%
1B - Minor Road	120	215	195	91%	
2A - Major Road	480	575	694	121%	21%
2B - Crossing Major Road	50	60	13	21%	

SCENARIO	Future Total	YEAR	2024
MAJOR ROAD	Fernbank Road	MINOR ROAD	Site Access 1
FLOW TYPE	Restricted	ROAD TYPE	1 Lane
NEW ROAD / INT.	Yes	"T" INT.	Yes

JUSTIFICATION	MINIMUM REQUIREMENT			COMPLIANCE	
	FLOW	ADJ. FLOW	AHV	%	OVERALL %
1A - All Approaches	470	705	318	45%	3%
1B - Minor Road	120	270	8	3%	
2A - Major Road	480	720	310	43%	2%
2B - Crossing Major Road	50	75	1	2%	

SCENARIO	Future Total	YEAR	2024
MAJOR ROAD	Eagleson Road	MINOR ROAD	Site Access 2
FLOW TYPE	Restricted	ROAD TYPE	1 Lane
NEW ROAD / INT.	Yes	"T" INT.	Yes

JUSTIFICATION	MINIMUM REQUIREMENT			COMPLIANCE	
	FLOW	ADJ. FLOW	AHV	%	OVERALL %
1A - All Approaches	470	705	841	119%	3%
1B - Minor Road	120	270	7	3%	
2A - Major Road	480	720	834	116%	6%
2B - Crossing Major Road	50	75	5	6%	

# APPENDIX

**J**
























SYNCHRO  
RESULTS

# HCM Signalized Intersection Capacity Analysis

## 4: Fernbank Road & Terry Fox Drive

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	57	162	39	66	292	2	123	113	88	3	96	150
Future Volume (vph)	57	162	39	66	292	2	123	113	88	3	96	150
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2	6.2	6.2	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1702	1698	1391	1613	1681		1657	1782	1485	1699	1748	1530
Flt Permitted	0.53	1.00	1.00	0.64	1.00		0.44	1.00	1.00	0.68	1.00	1.00
Satd. Flow (perm)	958	1698	1391	1093	1681		769	1782	1485	1209	1748	1530
Peak-hour factor, PHF	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)	63	180	43	73	324	2	137	126	98	3	107	167
RTOR Reduction (vph)	0	0	19	0	0	0	0	0	68	0	0	147
Lane Group Flow (vph)	63	180	24	73	326	0	137	126	30	3	107	20
Confl. Peds. (#/hr)	3						3			3		
Heavy Vehicles (%)	0%	6%	10%	6%	7%	0%	3%	1%	3%	0%	3%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6			2		7	4			8	
Permitted Phases	6		6	2			4		4	8		8
Actuated Green, G (s)	50.4	50.4	50.4	50.4	50.4		27.2	27.2	27.2	10.9	10.9	10.9
Effective Green, g (s)	50.4	50.4	50.4	50.4	50.4		27.2	27.2	27.2	10.9	10.9	10.9
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.56		0.30	0.30	0.30	0.12	0.12	0.12
Clearance Time (s)	6.2	6.2	6.2	6.2	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	536	950	778	612	941		333	538	448	146	211	185
v/s Ratio Prot		0.11			c0.19		c0.05	0.07			0.06	
v/s Ratio Perm	0.07		0.02	0.07			c0.08		0.02	0.00		0.01
v/c Ratio	0.12	0.19	0.03	0.12	0.35		0.41	0.23	0.07	0.02	0.51	0.11
Uniform Delay, d1	9.3	9.7	8.9	9.3	10.8		24.1	23.6	22.4	34.8	37.0	35.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.4	0.1	0.4	1.0		0.8	0.2	0.1	0.1	1.9	0.3
Delay (s)	9.8	10.2	8.9	9.7	11.8		24.9	23.8	22.4	34.9	38.9	35.5
Level of Service	A	B	A	A	B		C	C	C	C	D	D
Approach Delay (s)		9.9			11.4			23.9			36.8	
Approach LOS		A			B			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			19.8			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)			18.5			
Intersection Capacity Utilization			49.9%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 8: Fernbank Road & Eagleson Road

800 Eagleson Road TIA

08/23/2018






















						
Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	166	716	355	82	160	98
Future Volume (vph)	166	716	355	82	160	98
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1689	1748	1698	1500	1710	1430
Flt Permitted	0.44	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	780	1748	1698	1500	1710	1430
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	184	796	394	91	178	109
RTOR Reduction (vph)	0	0	0	36	0	92
Lane Group Flow (vph)	184	796	394	55	178	17
Confl. Peds. (#/hr)	6					
Heavy Vehicles (%)	1%	3%	6%	2%	0%	7%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	81.3	81.3	66.1	66.1	16.7	16.7
Effective Green, g (s)	81.3	81.3	66.1	66.1	16.7	16.7
Actuated g/C Ratio	0.74	0.74	0.60	0.60	0.15	0.15
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	652	1291	1020	901	259	217
v/s Ratio Prot	0.02	c0.46	0.23		c0.10	
v/s Ratio Perm	0.18			0.04		0.01
v/c Ratio	0.28	0.62	0.39	0.06	0.69	0.08
Uniform Delay, d1	5.1	6.9	11.4	9.1	44.2	40.0
Progression Factor	1.00	1.00	0.74	1.12	1.00	1.00
Incremental Delay, d2	0.2	2.2	1.1	0.1	7.4	0.2
Delay (s)	5.3	9.1	9.5	10.3	51.5	40.2
Level of Service	A	A	A	B	D	D
Approach Delay (s)		8.4	9.7		47.2	
Approach LOS		A	A		D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay		15.1		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.67				
Actuated Cycle Length (s)		110.0		Sum of lost time (s)		18.0
Intersection Capacity Utilization		59.1%		ICU Level of Service		B
Analysis Period (min)		15				
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 13: Eagleson Road & Cope Drive/Cadence Gate

800 Eagleson Road TIA

08/23/2018





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	42	24	27	98	193	76	751	24	53	365	72
Future Volume (vph)	101	42	24	27	98	193	76	751	24	53	365	72
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.90		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1597	1574		1704	1570		1660	3360		1643	3288	1443
Flt Permitted	0.27	1.00		0.71	1.00		0.51	1.00		0.28	1.00	1.00
Satd. Flow (perm)	451	1574		1272	1570		885	3360		481	3288	1443
Peak-hour factor, PHF	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)	112	47	27	30	109	214	84	834	27	59	406	80
RTOR Reduction (vph)	0	21	0	0	72	0	0	2	0	0	0	35
Lane Group Flow (vph)	112	53	0	30	251	0	84	859	0	59	406	45
Confl. Peds. (#/hr)	1		2	2		1			3	3		
Heavy Vehicles (%)	7%	2%	17%	0%	1%	3%	3%	1%	8%	4%	4%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	23.6	23.6		23.6	23.6		68.3	62.4		67.5	62.0	62.0
Effective Green, g (s)	23.6	23.6		23.6	23.6		68.3	62.4		67.5	62.0	62.0
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.62	0.57		0.61	0.56	0.56
Clearance Time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	96	337		272	336		591	1906		353	1853	813
v/s Ratio Prot		0.03			0.16		0.01	c0.26		c0.01	0.12	
v/s Ratio Perm	c0.25			0.02			0.08			0.09		0.03
v/c Ratio	1.17	0.16		0.11	0.75		0.14	0.45		0.17	0.22	0.06
Uniform Delay, d1	43.2	35.1		34.8	40.4		8.3	13.8		9.0	11.9	10.8
Progression Factor	1.00	1.00		1.00	1.00		1.48	1.37		1.00	1.00	1.00
Incremental Delay, d2	143.6	0.2		0.2	8.7		0.1	0.6		0.2	0.3	0.1
Delay (s)	186.8	35.3		34.9	49.1		12.4	19.6		9.2	12.2	10.9
Level of Service	F	D		C	D		B	B		A	B	B
Approach Delay (s)		126.5			47.9			19.0			11.7	
Approach LOS		F			D			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			31.9			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)				18.5		
Intersection Capacity Utilization			71.7%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis

## 1: Fernbank Road & Romina Street/Templeford Avenue

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	21	16	21	58	17	41	32	167	23	11	212	10
Future Volume (Veh/h)	21	16	21	58	17	41	32	167	23	11	212	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	23	18	23	64	19	46	36	186	26	12	236	11
Pedestrians		1			1			2			1	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)								218				
pX, platoon unblocked												
vC, conflicting volume	576	546	239	553	531	188	248			213		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	576	546	239	553	531	188	248			213		
tC, single (s)	7.3	6.8	6.2	7.2	6.7	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.2	3.3	3.6	4.2	3.3	2.3			2.2		
p0 queue free %	94	95	97	84	95	95	97			99		
cM capacity (veh/h)	358	399	803	392	408	853	1277			1368		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2	SW 3				
Volume Total	64	129	36	186	26	12	236	11				
Volume Left	23	64	36	0	0	12	0	0				
Volume Right	23	46	0	0	26	0	0	11				
cSH	463	489	1277	1700	1700	1368	1700	1700				
Volume to Capacity	0.14	0.26	0.03	0.11	0.02	0.01	0.14	0.01				
Queue Length 95th (m)	3.8	8.4	0.7	0.0	0.0	0.2	0.0	0.0				
Control Delay (s)	14.0	15.0	7.9	0.0	0.0	7.7	0.0	0.0				
Lane LOS	B	B	A			A						
Approach Delay (s)	14.0	15.0	1.1			0.4						
Approach LOS	B	B										
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			35.6%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 11: Eagleson Road & Bridgestone Drive

800 Eagleson Road TIA

08/23/2018
























						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	319	596	38	185	260
Future Volume (Veh/h)	17	319	596	38	185	260
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	354	662	42	206	289
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						186
pX, platoon unblocked						
vC, conflicting volume	1363	662			704	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1363	662			704	
tC, single (s)	6.7	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.8	3.3			2.3	
p0 queue free %	83	23			76	
cM capacity (veh/h)	109	462			871	
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	19	354	662	42	206	289
Volume Left	19	0	0	0	206	0
Volume Right	0	354	0	42	0	0
cSH	109	462	1700	1700	871	1700
Volume to Capacity	0.17	0.77	0.39	0.02	0.24	0.17
Queue Length 95th (m)	4.8	52.9	0.0	0.0	7.4	0.0
Control Delay (s)	44.9	34.1	0.0	0.0	10.4	0.0
Lane LOS	E	D			B	
Approach Delay (s)	34.6		0.0		4.3	
Approach LOS	D					
Intersection Summary						
Average Delay			9.6			
Intersection Capacity Utilization			60.6%		ICU Level of Service	B
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

## 4: Fernbank Road & Terry Fox Drive

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	165	325	78	166	316	11	83	118	50	1	209	114
Future Volume (vph)	165	325	78	166	316	11	83	118	50	1	209	114
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2	6.2	6.5	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1701	1731	1515	1693	1719		1613	1765	1471	1686	1800	1515
Flt Permitted	0.54	1.00	1.00	0.38	1.00		0.31	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	975	1731	1515	675	1719		525	1765	1471	1195	1800	1515
Peak-hour factor, PHF	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)	183	361	87	184	351	12	92	131	56	1	232	127
RTOR Reduction (vph)	0	0	50	0	1	0	0	0	40	0	0	104
Lane Group Flow (vph)	183	361	37	184	362	0	92	131	16	1	232	23
Confl. Peds. (#/hr)	3									6		
Heavy Vehicles (%)	0%	4%	1%	1%	4%	9%	6%	2%	4%	0%	0%	1%
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		7	4			8	
Permitted Phases	6		6	2			4		4	8		8
Actuated Green, G (s)	42.0	42.0	42.0	58.7	58.7		28.9	28.9	28.9	18.1	18.1	18.1
Effective Green, g (s)	42.0	42.0	42.0	58.7	58.7		28.9	28.9	28.9	18.1	18.1	18.1
Actuated g/C Ratio	0.42	0.42	0.42	0.59	0.59		0.29	0.29	0.29	0.18	0.18	0.18
Clearance Time (s)	6.2	6.2	6.2	6.5	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	409	727	636	500	1009		202	510	425	216	325	274
v/s Ratio Prot		c0.21		0.04	c0.21		c0.02	0.07			c0.13	
v/s Ratio Perm	0.19		0.02	0.18			0.11		0.01	0.00		0.02
v/c Ratio	0.45	0.50	0.06	0.37	0.36		0.46	0.26	0.04	0.00	0.71	0.08
Uniform Delay, d1	20.7	21.3	17.2	10.9	10.8		27.6	27.3	25.6	33.6	38.5	34.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	2.4	0.2	0.5	1.0		1.6	0.3	0.0	0.0	7.2	0.1
Delay (s)	24.2	23.7	17.4	11.4	11.8		29.2	27.6	25.6	33.6	45.8	34.2
Level of Service	C	C	B	B	B		C	C	C	C	D	C
Approach Delay (s)		23.0			11.7			27.7			41.6	
Approach LOS		C			B			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			24.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			25.0			
Intersection Capacity Utilization			65.1%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 8: Fernbank Road

800 Eagleson Road TIA

08/23/2018











						
Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	169	462	793	205	129	178
Future Volume (vph)	169	462	793	205	129	178
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1644	1782	1765	1515	1676	1500
Flt Permitted	0.17	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	303	1782	1765	1515	1676	1500
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	188	513	881	228	143	198
RTOR Reduction (vph)	0	0	0	75	0	173
Lane Group Flow (vph)	188	513	881	153	143	25
Confl. Peds. (#/hr)	2				1	
Heavy Vehicles (%)	4%	1%	2%	1%	2%	2%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	92.6	92.6	77.9	77.9	15.4	15.4
Effective Green, g (s)	92.6	92.6	77.9	77.9	15.4	15.4
Actuated g/C Ratio	0.77	0.77	0.65	0.65	0.13	0.13
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	331	1375	1145	983	215	192
v/s Ratio Prot	c0.04	0.29	c0.50		c0.09	
v/s Ratio Perm	0.40			0.10		0.02
v/c Ratio	0.57	0.37	0.77	0.16	0.67	0.13
Uniform Delay, d1	13.5	4.4	14.8	8.2	49.8	46.4
Progression Factor	1.00	1.00	0.78	0.17	1.00	1.00
Incremental Delay, d2	2.2	0.8	4.5	0.3	7.5	0.3
Delay (s)	15.8	5.2	16.1	1.7	57.4	46.7
Level of Service	B	A	B	A	E	D
Approach Delay (s)		8.0	13.1		51.2	
Approach LOS		A	B		D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay		17.5		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.74				
Actuated Cycle Length (s)		120.0		Sum of lost time (s)		18.0
Intersection Capacity Utilization		76.5%		ICU Level of Service		D
Analysis Period (min)		15				
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

800 Eagleson Road TIA

13:

08/23/2018





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	128	71	23	84	119	71	598	29	222	936	132
Future Volume (vph)	83	128	71	23	84	119	71	598	29	222	936	132
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00		0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.91		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1619	1703		1696	1588		1691	3364		1705	3386	1471
Flt Permitted	0.37	1.00		0.38	1.00		0.24	1.00		0.33	1.00	1.00
Satd. Flow (perm)	629	1703		678	1588		435	3364		586	3386	1471
Peak-hour factor, PHF	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)	92	142	79	26	93	132	79	664	32	247	1040	147
RTOR Reduction (vph)	0	19	0	0	50	0	0	2	0	0	0	54
Lane Group Flow (vph)	92	202	0	26	175	0	79	694	0	247	1040	93
Confl. Peds. (#/hr)	5			7			9			13		
Heavy Vehicles (%)	5%	0%	0%	0%	1%	5%	1%	1%	0%	0%	1%	4%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	19.5	19.5		19.5	19.5		76.7	70.7		87.3	76.0	76.0
Effective Green, g (s)	19.5	19.5		19.5	19.5		76.7	70.7		87.3	76.0	76.0
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.64	0.59		0.73	0.63	0.63
Clearance Time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	102	276		110	258		340	1981		531	2144	931
v/s Ratio Prot		0.12			0.11		0.01	0.21		c0.04	c0.31	
v/s Ratio Perm	c0.15			0.04			0.14			0.29		0.06
v/c Ratio	0.90	0.73		0.24	0.68		0.23	0.35		0.47	0.49	0.10
Uniform Delay, d1	49.3	47.8		43.8	47.3		8.5	12.8		6.1	11.6	8.6
Progression Factor	1.00	1.00		1.00	1.00		0.87	0.81		1.00	1.00	1.00
Incremental Delay, d2	58.6	9.6		1.1	6.9		0.3	0.5		0.6	0.8	0.2
Delay (s)	107.9	57.3		44.9	54.2		7.7	10.8		6.8	12.4	8.8
Level of Service	F	E		D	D		A	B		A	B	A
Approach Delay (s)		72.2			53.2			10.5			11.1	
Approach LOS		E			D			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		21.6					HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio		0.58										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)			18.5		
Intersection Capacity Utilization		69.5%					ICU Level of Service			C		
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis

## 1: Fernbank Road & Romina Street/Templeford Avenue

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	15	20	33	49	19	22	32	222	44	45	300	31
Future Volume (Veh/h)	15	20	33	49	19	22	32	222	44	45	300	31
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	22	37	54	21	24	36	247	49	50	333	34
Pedestrians		3			2			2			2	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)								218				
pX, platoon unblocked	0.99	0.99		0.99	0.99	0.99				0.99		
vC, conflicting volume	792	806	338	804	791	251	370			298		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	787	802	338	800	787	244	370			291		
tC, single (s)	7.2	6.6	6.2	7.2	6.8	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.3	3.6	4.2	3.3	2.2			2.2		
p0 queue free %	93	92	95	78	92	97	97			96		
cM capacity (veh/h)	253	284	706	247	274	781	1197			1261		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2	SW 3				
Volume Total	76	99	36	247	49	50	333	34				
Volume Left	17	54	36	0	0	50	0	0				
Volume Right	37	24	0	0	49	0	0	34				
cSH	386	304	1197	1700	1700	1261	1700	1700				
Volume to Capacity	0.20	0.33	0.03	0.15	0.03	0.04	0.20	0.02				
Queue Length 95th (m)	5.8	11.0	0.7	0.0	0.0	1.0	0.0	0.0				
Control Delay (s)	16.6	22.5	8.1	0.0	0.0	8.0	0.0	0.0				
Lane LOS	C	C	A			A						
Approach Delay (s)	16.6	22.5	0.9			1.0						
Approach LOS	C	C										
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			41.5%	ICU Level of Service					A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 11: Bridgestone Drive

800 Eagleson Road TIA

08/23/2018
























						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	31	350	358	31	493	579
Future Volume (Veh/h)	31	350	358	31	493	579
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	34	389	398	34	548	643
Pedestrians	8					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						186
pX, platoon unblocked						
vC, conflicting volume	2145	406			440	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2145	406			440	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	0	39			51	
cM capacity (veh/h)	26	643			1118	
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	34	389	398	34	548	643
Volume Left	34	0	0	0	548	0
Volume Right	0	389	0	34	0	0
cSH	26	643	1700	1700	1118	1700
Volume to Capacity	1.33	0.61	0.23	0.02	0.49	0.38
Queue Length 95th (m)	33.1	32.6	0.0	0.0	22.2	0.0
Control Delay (s)	518.5	18.8	0.0	0.0	11.3	0.0
Lane LOS	F	C			B	
Approach Delay (s)	59.0		0.0		5.2	
Approach LOS	F					
Intersection Summary						
Average Delay			15.2			
Intersection Capacity Utilization			62.1%		ICU Level of Service	B
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

## 4: Fernbank Road & Terry Fox Drive

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	58	164	39	67	295	2	124	114	89	3	97	152
Future Volume (vph)	58	164	39	67	295	2	124	114	89	3	97	152
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2	6.2	6.2	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1702	1698	1391	1613	1681		1657	1782	1485	1699	1748	1530
Flt Permitted	0.53	1.00	1.00	0.64	1.00		0.44	1.00	1.00	0.68	1.00	1.00
Satd. Flow (perm)	952	1698	1391	1091	1681		768	1782	1485	1208	1748	1530
Peak-hour factor, PHF	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)	64	182	43	74	328	2	138	127	99	3	108	169
RTOR Reduction (vph)	0	0	19	0	0	0	0	0	69	0	0	149
Lane Group Flow (vph)	64	182	24	74	330	0	138	127	30	3	108	20
Confl. Peds. (#/hr)	3						3			3		
Heavy Vehicles (%)	0%	6%	10%	6%	7%	0%	3%	1%	3%	0%	3%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6			2		7	4			8	
Permitted Phases	6		6	2			4		4	8		8
Actuated Green, G (s)	50.4	50.4	50.4	50.4	50.4		27.2	27.2	27.2	10.9	10.9	10.9
Effective Green, g (s)	50.4	50.4	50.4	50.4	50.4		27.2	27.2	27.2	10.9	10.9	10.9
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.56		0.30	0.30	0.30	0.12	0.12	0.12
Clearance Time (s)	6.2	6.2	6.2	6.2	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	533	950	778	610	941		332	538	448	146	211	185
v/s Ratio Prot		0.11			c0.20		c0.05	0.07			c0.06	
v/s Ratio Perm	0.07		0.02	0.07			0.08		0.02	0.00		0.01
v/c Ratio	0.12	0.19	0.03	0.12	0.35		0.42	0.24	0.07	0.02	0.51	0.11
Uniform Delay, d1	9.3	9.8	8.9	9.3	10.8		24.1	23.6	22.4	34.8	37.1	35.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.4	0.1	0.4	1.0		0.8	0.2	0.1	0.1	2.1	0.3
Delay (s)	9.8	10.2	8.9	9.8	11.9		25.0	23.8	22.4	34.9	39.1	35.5
Level of Service	A	B	A	A	B		C	C	C	C	D	D
Approach Delay (s)		9.9			11.5			23.9			36.9	
Approach LOS		A			B			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			19.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)			18.5			
Intersection Capacity Utilization			50.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 8: Fernbank Road & Eagleson Road

800 Eagleson Road TIA

08/23/2018






















						
Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	168	723	359	83	162	99
Future Volume (vph)	168	723	359	83	162	99
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1689	1748	1698	1500	1710	1430
Flt Permitted	0.43	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	773	1748	1698	1500	1710	1430
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	187	803	399	92	180	110
RTOR Reduction (vph)	0	0	0	37	0	93
Lane Group Flow (vph)	187	803	399	55	180	17
Confl. Peds. (#/hr)	6					
Heavy Vehicles (%)	1%	3%	6%	2%	0%	7%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	81.2	81.2	65.9	65.9	16.8	16.8
Effective Green, g (s)	81.2	81.2	65.9	65.9	16.8	16.8
Actuated g/C Ratio	0.74	0.74	0.60	0.60	0.15	0.15
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	648	1290	1017	898	261	218
v/s Ratio Prot	0.02	c0.46	0.23		c0.11	
v/s Ratio Perm	0.19			0.04		0.01
v/c Ratio	0.29	0.62	0.39	0.06	0.69	0.08
Uniform Delay, d1	5.1	7.0	11.6	9.2	44.1	40.0
Progression Factor	1.00	1.00	0.74	1.11	1.00	1.00
Incremental Delay, d2	0.2	2.3	1.1	0.1	7.4	0.2
Delay (s)	5.4	9.2	9.6	10.4	51.5	40.1
Level of Service	A	A	A	B	D	D
Approach Delay (s)		8.5	9.8		47.2	
Approach LOS		A	A		D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay		15.2		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.68				
Actuated Cycle Length (s)		110.0		Sum of lost time (s)		18.0
Intersection Capacity Utilization		59.6%		ICU Level of Service		B
Analysis Period (min)		15				
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 13: Eagleson Road & Cope Drive/Cadence Gate

800 Eagleson Road TIA

08/23/2018





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	42	24	27	99	195	77	759	24	54	369	73
Future Volume (vph)	102	42	24	27	99	195	77	759	24	54	369	73
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.90		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1597	1574		1704	1569		1660	3360		1643	3288	1443
Flt Permitted	0.27	1.00		0.71	1.00		0.50	1.00		0.27	1.00	1.00
Satd. Flow (perm)	447	1574		1272	1569		881	3360		472	3288	1443
Peak-hour factor, PHF	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)	113	47	27	30	110	217	86	843	27	60	410	81
RTOR Reduction (vph)	0	21	0	0	73	0	0	2	0	0	0	36
Lane Group Flow (vph)	113	53	0	30	254	0	86	868	0	60	410	45
Confl. Peds. (#/hr)	1		2	2		1			3	3		
Heavy Vehicles (%)	7%	2%	17%	0%	1%	3%	3%	1%	8%	4%	4%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	23.9	23.9		23.9	23.9		67.9	62.0		67.3	61.7	61.7
Effective Green, g (s)	23.9	23.9		23.9	23.9		67.9	62.0		67.3	61.7	61.7
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.62	0.56		0.61	0.56	0.56
Clearance Time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	97	341		276	340		585	1893		348	1844	809
v/s Ratio Prot		0.03			0.16		0.01	c0.26		c0.01	0.12	
v/s Ratio Perm	c0.25			0.02			0.08			0.10		0.03
v/c Ratio	1.16	0.16		0.11	0.75		0.15	0.46		0.17	0.22	0.06
Uniform Delay, d1	43.0	34.9		34.5	40.2		8.5	14.1		9.1	12.1	10.9
Progression Factor	1.00	1.00		1.00	1.00		1.48	1.37		1.00	1.00	1.00
Incremental Delay, d2	142.5	0.2		0.2	8.7		0.1	0.7		0.2	0.3	0.1
Delay (s)	185.5	35.1		34.7	48.9		12.7	20.0		9.4	12.4	11.1
Level of Service	F	D		C	D		B	B		A	B	B
Approach Delay (s)		126.0			47.7			19.3			11.9	
Approach LOS		F			D			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			32.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)				18.5		
Intersection Capacity Utilization			72.1%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis

## 1: Fernbank Road & Romina Street/Templeford Avenue

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	21	16	21	59	17	41	33	169	23	11	214	10
Future Volume (Veh/h)	21	16	21	59	17	41	33	169	23	11	214	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	23	18	23	66	19	46	37	188	26	12	238	11
Pedestrians		1			1			2			1	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)								218				
pX, platoon unblocked												
vC, conflicting volume	582	552	241	559	537	190	250			215		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	582	552	241	559	537	190	250			215		
tC, single (s)	7.3	6.8	6.2	7.2	6.7	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.2	3.3	3.6	4.2	3.3	2.3			2.2		
p0 queue free %	93	95	97	83	95	95	97			99		
cM capacity (veh/h)	354	395	801	388	404	850	1275			1366		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2	SW 3				
Volume Total	64	131	37	188	26	12	238	11				
Volume Left	23	66	37	0	0	12	0	0				
Volume Right	23	46	0	0	26	0	0	11				
cSH	459	483	1275	1700	1700	1366	1700	1700				
Volume to Capacity	0.14	0.27	0.03	0.11	0.02	0.01	0.14	0.01				
Queue Length 95th (m)	3.8	8.7	0.7	0.0	0.0	0.2	0.0	0.0				
Control Delay (s)	14.1	15.2	7.9	0.0	0.0	7.7	0.0	0.0				
Lane LOS	B	C	A			A						
Approach Delay (s)	14.1	15.2	1.2			0.4						
Approach LOS	B	C										
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			35.8%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 11: Eagleson Road & Bridgestone Drive

800 Eagleson Road TIA

08/23/2018
























						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	322	602	38	187	263
Future Volume (Veh/h)	17	322	602	38	187	263
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	358	669	42	208	292
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						186
pX, platoon unblocked						
vC, conflicting volume	1377	669			711	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1377	669			711	
tC, single (s)	6.7	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.8	3.3			2.3	
p0 queue free %	82	22			76	
cM capacity (veh/h)	106	458			866	
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	19	358	669	42	208	292
Volume Left	19	0	0	0	208	0
Volume Right	0	358	0	42	0	0
cSH	106	458	1700	1700	866	1700
Volume to Capacity	0.18	0.78	0.39	0.02	0.24	0.17
Queue Length 95th (m)	5.0	55.4	0.0	0.0	7.5	0.0
Control Delay (s)	46.2	35.8	0.0	0.0	10.5	0.0
Lane LOS	E	E			B	
Approach Delay (s)	36.3		0.0		4.4	
Approach LOS	E					
Intersection Summary						
Average Delay			10.0			
Intersection Capacity Utilization			61.2%		ICU Level of Service	B
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

## 4: Fernbank Road & Terry Fox Drive

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	167	328	79	168	319	11	84	119	51	1	211	115
Future Volume (vph)	167	328	79	168	319	11	84	119	51	1	211	115
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2	6.2	6.5	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1701	1731	1515	1693	1720		1613	1765	1471	1686	1800	1515
Flt Permitted	0.54	1.00	1.00	0.38	1.00		0.31	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	973	1731	1515	669	1720		522	1765	1471	1194	1800	1515
Peak-hour factor, PHF	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)	186	364	88	187	354	12	93	132	57	1	234	128
RTOR Reduction (vph)	0	0	51	0	1	0	0	0	40	0	0	105
Lane Group Flow (vph)	186	364	37	187	365	0	93	132	17	1	234	23
Confl. Peds. (#/hr)	3									6		
Heavy Vehicles (%)	0%	4%	1%	1%	4%	9%	6%	2%	4%	0%	0%	1%
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		7	4			8	
Permitted Phases	6		6	2			4		4	8		8
Actuated Green, G (s)	41.9	41.9	41.9	58.6	58.6		29.0	29.0	29.0	18.2	18.2	18.2
Effective Green, g (s)	41.9	41.9	41.9	58.6	58.6		29.0	29.0	29.0	18.2	18.2	18.2
Actuated g/C Ratio	0.42	0.42	0.42	0.59	0.59		0.29	0.29	0.29	0.18	0.18	0.18
Clearance Time (s)	6.2	6.2	6.2	6.5	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	407	725	634	496	1007		202	511	426	217	327	275
v/s Ratio Prot		c0.21		0.04	c0.21		c0.02	0.07			c0.13	
v/s Ratio Perm	0.19		0.02	0.18			0.11		0.01	0.00		0.02
v/c Ratio	0.46	0.50	0.06	0.38	0.36		0.46	0.26	0.04	0.00	0.72	0.08
Uniform Delay, d1	20.9	21.4	17.3	11.0	10.9		27.6	27.2	25.5	33.5	38.5	34.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.7	2.5	0.2	0.5	1.0		1.7	0.3	0.0	0.0	7.3	0.1
Delay (s)	24.5	23.9	17.5	11.5	11.9		29.2	27.5	25.5	33.5	45.7	34.1
Level of Service	C	C	B	B	B		C	C	C	C	D	C
Approach Delay (s)		23.2			11.8			27.7			41.6	
Approach LOS		C			B			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			24.1			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			25.0			
Intersection Capacity Utilization			65.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 8: Fernbank Road & Eagleson Road

800 Eagleson Road TIA

08/23/2018






















						
Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	171	467	801	207	130	180
Future Volume (vph)	171	467	801	207	130	180
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1644	1782	1765	1515	1676	1500
Flt Permitted	0.17	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	291	1782	1765	1515	1676	1500
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	190	519	890	230	144	200
RTOR Reduction (vph)	0	0	0	75	0	174
Lane Group Flow (vph)	190	519	890	155	144	26
Confl. Peds. (#/hr)	2				1	
Heavy Vehicles (%)	4%	1%	2%	1%	2%	2%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	92.5	92.5	77.6	77.6	15.5	15.5
Effective Green, g (s)	92.5	92.5	77.6	77.6	15.5	15.5
Actuated g/C Ratio	0.77	0.77	0.65	0.65	0.13	0.13
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	324	1373	1141	979	216	193
v/s Ratio Prot	c0.04	0.29	c0.50		c0.09	
v/s Ratio Perm	0.41			0.10		0.02
v/c Ratio	0.59	0.38	0.78	0.16	0.67	0.13
Uniform Delay, d1	14.2	4.4	15.1	8.3	49.8	46.3
Progression Factor	1.00	1.00	0.78	0.17	1.00	1.00
Incremental Delay, d2	2.7	0.8	4.8	0.3	7.6	0.3
Delay (s)	16.9	5.2	16.6	1.7	57.3	46.6
Level of Service	B	A	B	A	E	D
Approach Delay (s)		8.4	13.6		51.1	
Approach LOS		A	B		D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay		17.8		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.75				
Actuated Cycle Length (s)		120.0		Sum of lost time (s)		18.0
Intersection Capacity Utilization		77.1%		ICU Level of Service		D
Analysis Period (min)		15				
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 13: Eagleson Road & Cope Drive/Cadence Gate

800 Eagleson Road TIA

08/23/2018





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	129	72	23	85	120	72	604	29	224	945	133
Future Volume (vph)	84	129	72	23	85	120	72	604	29	224	945	133
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00		0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.91		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1619	1703		1696	1589		1691	3365		1705	3386	1471
Flt Permitted	0.37	1.00		0.38	1.00		0.24	1.00		0.32	1.00	1.00
Satd. Flow (perm)	626	1703		674	1589		428	3365		579	3386	1471
Peak-hour factor, PHF	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)	93	143	80	26	94	133	80	671	32	249	1050	148
RTOR Reduction (vph)	0	20	0	0	50	0	0	2	0	0	0	55
Lane Group Flow (vph)	93	203	0	26	177	0	80	701	0	249	1050	93
Confl. Peds. (#/hr)	5			7			9			13		
Heavy Vehicles (%)	5%	0%	0%	0%	1%	5%	1%	1%	0%	0%	1%	4%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	19.7	19.7		19.7	19.7		76.5	70.4		87.1	75.7	75.7
Effective Green, g (s)	19.7	19.7		19.7	19.7		76.5	70.4		87.1	75.7	75.7
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.64	0.59		0.73	0.63	0.63
Clearance Time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	102	279		110	260		337	1974		527	2136	927
v/s Ratio Prot		0.12			0.11		0.01	0.21		c0.04	c0.31	
v/s Ratio Perm	c0.15			0.04			0.14			0.30		0.06
v/c Ratio	0.91	0.73		0.24	0.68		0.24	0.36		0.47	0.49	0.10
Uniform Delay, d1	49.3	47.6		43.6	47.2		8.6	12.9		6.2	11.9	8.7
Progression Factor	1.00	1.00		1.00	1.00		0.87	0.81		1.00	1.00	1.00
Incremental Delay, d2	61.3	9.1		1.1	7.1		0.3	0.5		0.7	0.8	0.2
Delay (s)	110.6	56.7		44.7	54.3		7.9	10.9		6.9	12.7	8.9
Level of Service	F	E		D	D		A	B		A	B	A
Approach Delay (s)		72.6			53.3			10.6			11.3	
Approach LOS		E			D			B			B	
Intersection Summary												
HCM 2000 Control Delay	21.8			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.59											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			18.5					
Intersection Capacity Utilization	70.0%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis

## 1: Fernbank Road & Romina Street/Templeford Avenue

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	15	20	33	49	19	22	33	224	44	46	303	31
Future Volume (Veh/h)	15	20	33	49	19	22	33	224	44	46	303	31
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	22	37	54	21	24	37	249	49	51	337	34
Pedestrians		3			2			2			2	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)								218				
pX, platoon unblocked	0.99	0.99		0.99	0.99	0.99				0.99		
vC, conflicting volume	802	816	342	814	801	253	374			300		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	796	811	342	809	796	244	374			291		
tC, single (s)	7.2	6.6	6.2	7.2	6.8	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.3	3.6	4.2	3.3	2.2			2.2		
p0 queue free %	93	92	95	78	92	97	97			96		
cM capacity (veh/h)	249	280	702	243	270	779	1193			1259		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2	SW 3				
Volume Total	76	99	37	249	49	51	337	34				
Volume Left	17	54	37	0	0	51	0	0				
Volume Right	37	24	0	0	49	0	0	34				
cSH	381	299	1193	1700	1700	1259	1700	1700				
Volume to Capacity	0.20	0.33	0.03	0.15	0.03	0.04	0.20	0.02				
Queue Length 95th (m)	5.9	11.2	0.8	0.0	0.0	1.0	0.0	0.0				
Control Delay (s)	16.8	22.9	8.1	0.0	0.0	8.0	0.0	0.0				
Lane LOS	C	C	A			A						
Approach Delay (s)	16.8	22.9	0.9			1.0						
Approach LOS	C	C										
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			41.6%			ICU Level of Service			A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 11: Eagleson Road & Bridgestone Drive

800 Eagleson Road TIA

08/23/2018
























						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	31	354	362	31	498	585
Future Volume (Veh/h)	31	354	362	31	498	585
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	34	393	402	34	553	650
Pedestrians	8					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						186
pX, platoon unblocked						
vC, conflicting volume	2166	410			444	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2166	410			444	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	0	39			50	
cM capacity (veh/h)	25	639			1114	
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	34	393	402	34	553	650
Volume Left	34	0	0	0	553	0
Volume Right	0	393	0	34	0	0
cSH	25	639	1700	1700	1114	1700
Volume to Capacity	1.39	0.61	0.24	0.02	0.50	0.38
Queue Length 95th (m)	33.7	33.7	0.0	0.0	22.7	0.0
Control Delay (s)	553.6	19.2	0.0	0.0	11.4	0.0
Lane LOS	F	C			B	
Approach Delay (s)	61.7		0.0		5.2	
Approach LOS	F					
Intersection Summary						
Average Delay			15.8			
Intersection Capacity Utilization			62.6%		ICU Level of Service	B
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

## 4: Fernbank Road & Terry Fox Drive

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	61	172	41	70	310	2	131	126	93	3	107	162
Future Volume (vph)	61	172	41	70	310	2	131	126	93	3	107	162
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2	6.2	6.2	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	1698	1391	1613	1681		1657	1782	1485	1699	1748	1530
Flt Permitted	0.52	1.00	1.00	0.64	1.00		0.44	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	924	1698	1391	1082	1681		775	1782	1485	1194	1748	1530
Peak-hour factor, PHF	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)	68	191	46	78	344	2	146	140	103	3	119	180
RTOR Reduction (vph)	0	0	21	0	0	0	0	0	71	0	0	157
Lane Group Flow (vph)	68	191	25	78	346	0	146	140	32	3	119	23
Confl. Peds. (#/hr)	3						3			3		
Heavy Vehicles (%)	0%	6%	10%	6%	7%	0%	3%	1%	3%	0%	3%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6			2		7	4			8	
Permitted Phases	6		6	2			4		4	8		8
Actuated Green, G (s)	49.7	49.7	49.7	49.7	49.7		27.9	27.9	27.9	11.5	11.5	11.5
Effective Green, g (s)	49.7	49.7	49.7	49.7	49.7		27.9	27.9	27.9	11.5	11.5	11.5
Actuated g/C Ratio	0.55	0.55	0.55	0.55	0.55		0.31	0.31	0.31	0.13	0.13	0.13
Clearance Time (s)	6.2	6.2	6.2	6.2	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	510	937	768	597	928		341	552	460	152	223	195
v/s Ratio Prot		0.11			c0.21		c0.05	0.08			c0.07	
v/s Ratio Perm	0.07		0.02	0.07			0.08		0.02	0.00		0.02
v/c Ratio	0.13	0.20	0.03	0.13	0.37		0.43	0.25	0.07	0.02	0.53	0.12
Uniform Delay, d1	9.7	10.2	9.2	9.7	11.4		23.7	23.3	21.9	34.3	36.7	34.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.5	0.1	0.5	1.1		0.9	0.2	0.1	0.1	2.4	0.3
Delay (s)	10.3	10.7	9.3	10.2	12.5		24.6	23.5	22.0	34.4	39.2	35.0
Level of Service	B	B	A	B	B		C	C	C	C	D	D
Approach Delay (s)		10.4			12.1			23.5			36.7	
Approach LOS		B			B			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			20.1			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)			18.5			
Intersection Capacity Utilization			51.3%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 8: Fernbank Road & Eagleson Road

800 Eagleson Road TIA

08/23/2018

						
Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	176	772	388	92	176	104
Future Volume (vph)	176	772	388	92	176	104
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1689	1748	1698	1500	1710	1430
Flt Permitted	0.41	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	725	1748	1698	1500	1710	1430
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	196	858	431	102	196	116
RTOR Reduction (vph)	0	0	0	42	0	97
Lane Group Flow (vph)	196	858	431	60	196	19
Confl. Peds. (#/hr)	6					
Heavy Vehicles (%)	1%	3%	6%	2%	0%	7%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	80.2	80.2	64.5	64.5	17.8	17.8
Effective Green, g (s)	80.2	80.2	64.5	64.5	17.8	17.8
Actuated g/C Ratio	0.73	0.73	0.59	0.59	0.16	0.16
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	613	1274	995	879	276	231
v/s Ratio Prot	0.03	c0.49	0.25		c0.11	
v/s Ratio Perm	0.20			0.04		0.01
v/c Ratio	0.32	0.67	0.43	0.07	0.71	0.08
Uniform Delay, d1	5.8	7.9	12.6	9.8	43.7	39.2
Progression Factor	1.00	1.00	0.50	0.75	1.00	1.00
Incremental Delay, d2	0.3	2.9	1.3	0.1	8.3	0.2
Delay (s)	6.1	10.8	7.7	7.5	52.0	39.3
Level of Service	A	B	A	A	D	D
Approach Delay (s)		9.9	7.6		47.3	
Approach LOS		A	A		D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay		15.4		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.72				
Actuated Cycle Length (s)		110.0		Sum of lost time (s)		18.0
Intersection Capacity Utilization		63.2%		ICU Level of Service		B
Analysis Period (min)		15				
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 13: Eagleson Road & Cope Drive/Cadence Gate

800 Eagleson Road TIA

08/23/2018





















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	62	25	52	115	205	87	826	42	56	428	89
Future Volume (vph)	153	62	25	52	115	205	87	826	42	56	428	89
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.90		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1597	1612		1705	1577		1660	3345		1644	3288	1443
Flt Permitted	0.34	1.00		0.69	1.00		0.44	1.00		0.21	1.00	1.00
Satd. Flow (perm)	576	1612		1246	1577		763	3345		362	3288	1443
Peak-hour factor, PHF	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)	170	69	28	58	128	228	97	918	47	62	476	99
RTOR Reduction (vph)	0	13	0	0	59	0	0	3	0	0	0	53
Lane Group Flow (vph)	170	84	0	58	297	0	97	962	0	62	476	46
Confl. Peds. (#/hr)	1		2	2		1			3	3		
Heavy Vehicles (%)	7%	2%	17%	0%	1%	3%	3%	1%	8%	4%	4%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	33.2	33.2		33.2	33.2		59.6	52.8		57.0	51.5	51.5
Effective Green, g (s)	33.2	33.2		33.2	33.2		59.6	52.8		57.0	51.5	51.5
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.54	0.48		0.52	0.47	0.47
Clearance Time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	173	486		376	475		468	1605		251	1539	675
v/s Ratio Prot		0.05			0.19		c0.01	c0.29		0.01	0.14	
v/s Ratio Perm	c0.29			0.05			0.10			0.12		0.03
v/c Ratio	0.98	0.17		0.15	0.63		0.21	0.60		0.25	0.31	0.07
Uniform Delay, d1	38.1	28.3		28.1	33.1		12.4	20.9		14.5	18.2	16.1
Progression Factor	1.00	1.00		1.00	1.00		1.37	1.28		1.00	1.00	1.00
Incremental Delay, d2	62.9	0.2		0.2	2.6		0.2	1.3		0.5	0.5	0.2
Delay (s)	101.1	28.5		28.3	35.6		17.1	28.1		15.0	18.7	16.3
Level of Service	F	C		C	D		B	C		B	B	B
Approach Delay (s)		74.7			34.6			27.1			18.0	
Approach LOS		E			C			C			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			31.3				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)			18.5		
Intersection Capacity Utilization			79.2%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis

## 1: Fernbank Road & Romina Street/Templeford Avenue

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	22	17	22	62	18	44	34	184	24	12	230	11
Future Volume (Veh/h)	22	17	22	62	18	44	34	184	24	12	230	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	24	19	24	69	20	49	38	204	27	13	256	12
Pedestrians		1			1			2			1	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)								218				
pX, platoon unblocked												
vC, conflicting volume	623	591	259	598	576	206	269			232		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	623	591	259	598	576	206	269			232		
tC, single (s)	7.3	6.8	6.2	7.2	6.7	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.2	3.3	3.6	4.2	3.3	2.3			2.2		
p0 queue free %	93	95	97	81	95	94	97			99		
cM capacity (veh/h)	328	374	783	362	383	833	1254			1346		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2	SW 3				
Volume Total	67	138	38	204	27	13	256	12				
Volume Left	24	69	38	0	0	13	0	0				
Volume Right	24	49	0	0	27	0	0	12				
cSH	433	458	1254	1700	1700	1346	1700	1700				
Volume to Capacity	0.15	0.30	0.03	0.12	0.02	0.01	0.15	0.01				
Queue Length 95th (m)	4.3	10.0	0.7	0.0	0.0	0.2	0.0	0.0				
Control Delay (s)	14.8	16.2	8.0	0.0	0.0	7.7	0.0	0.0				
Lane LOS	B	C	A			A						
Approach Delay (s)	14.8	16.2	1.1			0.4						
Approach LOS	B	C										
Intersection Summary												
Average Delay			4.8									
Intersection Capacity Utilization			37.3%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 11: Eagleson Road & Bridgestone Drive

800 Eagleson Road TIA

08/23/2018
























						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	343	641	40	201	282
Future Volume (Veh/h)	18	343	641	40	201	282
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	20	381	712	44	223	313
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						186
pX, platoon unblocked						
vC, conflicting volume	1471	712			756	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1471	712			756	
tC, single (s)	6.7	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.8	3.3			2.3	
p0 queue free %	78	12			73	
cM capacity (veh/h)	89	432			833	
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	20	381	712	44	223	313
Volume Left	20	0	0	0	223	0
Volume Right	0	381	0	44	0	0
cSH	89	432	1700	1700	833	1700
Volume to Capacity	0.22	0.88	0.42	0.03	0.27	0.18
Queue Length 95th (m)	6.4	73.3	0.0	0.0	8.7	0.0
Control Delay (s)	56.7	49.9	0.0	0.0	10.9	0.0
Lane LOS	F	E			B	
Approach Delay (s)	50.3		0.0		4.5	
Approach LOS	F					
Intersection Summary						
Average Delay			13.3			
Intersection Capacity Utilization			64.7%		ICU Level of Service	C
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

## 4: Fernbank Road & Terry Fox Drive

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	176	335	12	175	345	12	88	132	53	1	229	121
Future Volume (vph)	176	335	12	175	345	12	88	132	53	1	229	121
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2	6.2	6.5	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1702	1731	1515	1693	1720		1613	1765	1471	1687	1800	1515
Flt Permitted	0.53	1.00	1.00	0.36	1.00		0.29	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	947	1731	1515	643	1720		493	1765	1471	1178	1800	1515
Peak-hour factor, PHF	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)	196	372	13	194	383	13	98	147	59	1	254	134
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	41	0	0	108
Lane Group Flow (vph)	196	372	5	194	395	0	98	147	18	1	254	26
Confl. Peds. (#/hr)	3									6		
Heavy Vehicles (%)	0%	4%	1%	1%	4%	9%	6%	2%	4%	0%	0%	1%
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		7	4			8	
Permitted Phases	6		6	2			4		4	8		8
Actuated Green, G (s)	40.8	40.8	40.8	57.5	57.5		30.1	30.1	30.1	19.3	19.3	19.3
Effective Green, g (s)	40.8	40.8	40.8	57.5	57.5		30.1	30.1	30.1	19.3	19.3	19.3
Actuated g/C Ratio	0.41	0.41	0.41	0.58	0.58		0.30	0.30	0.30	0.19	0.19	0.19
Clearance Time (s)	6.2	6.2	6.2	6.5	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	386	706	618	476	989		201	531	442	227	347	292
v/s Ratio Prot		c0.21		0.04	c0.23		c0.02	0.08			c0.14	
v/s Ratio Perm	0.21		0.00	0.19			0.12		0.01	0.00		0.02
v/c Ratio	0.51	0.53	0.01	0.41	0.40		0.49	0.28	0.04	0.00	0.73	0.09
Uniform Delay, d1	22.1	22.3	17.6	11.7	11.7		27.0	26.7	24.7	32.6	37.9	33.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.7	2.8	0.0	0.6	1.2		1.9	0.3	0.0	0.0	7.7	0.1
Delay (s)	26.8	25.1	17.6	12.3	12.9		28.8	26.9	24.8	32.6	45.7	33.3
Level of Service	C	C	B	B	B		C	C	C	C	D	C
Approach Delay (s)		25.5			12.7			27.1			41.4	
Approach LOS		C			B			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			25.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			25.0			
Intersection Capacity Utilization			68.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 8: Fernbank Road & Eagleson Road

800 Eagleson Road TIA

08/23/2018






















						
Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	179	504	855	225	144	189
Future Volume (vph)	179	504	855	225	144	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1644	1782	1765	1515	1676	1500
Flt Permitted	0.12	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	212	1782	1765	1515	1676	1500
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	199	560	950	250	160	210
RTOR Reduction (vph)	0	0	0	81	0	181
Lane Group Flow (vph)	199	560	950	169	160	29
Confl. Peds. (#/hr)	2				1	
Heavy Vehicles (%)	4%	1%	2%	1%	2%	2%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	91.7	91.7	75.4	75.4	16.3	16.3
Effective Green, g (s)	91.7	91.7	75.4	75.4	16.3	16.3
Actuated g/C Ratio	0.76	0.76	0.63	0.63	0.14	0.14
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	284	1361	1109	951	227	203
v/s Ratio Prot	c0.06	0.31	c0.54		c0.10	
v/s Ratio Perm	0.47			0.11		0.02
v/c Ratio	0.70	0.41	0.86	0.18	0.70	0.14
Uniform Delay, d1	20.1	4.9	17.9	9.3	49.6	45.7
Progression Factor	1.00	1.00	0.87	0.18	1.00	1.00
Incremental Delay, d2	7.6	0.9	7.2	0.3	9.5	0.3
Delay (s)	27.7	5.8	22.9	2.0	59.1	46.0
Level of Service	C	A	C	A	E	D
Approach Delay (s)		11.5	18.5		51.7	
Approach LOS		B	B		D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay		21.5		HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio		0.82				
Actuated Cycle Length (s)		120.0		Sum of lost time (s)		18.0
Intersection Capacity Utilization		81.4%		ICU Level of Service		D
Analysis Period (min)		15				
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 13: Eagleson Road & Cope Drive/Cadence Gate

800 Eagleson Road TIA

08/23/2018





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	155	75	53	103	126	82	668	50	236	1044	170
Future Volume (vph)	121	155	75	53	103	126	82	668	50	236	1044	170
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00		0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.92		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1620	1712		1697	1600		1692	3353		1707	3386	1471
Flt Permitted	0.38	1.00		0.38	1.00		0.19	1.00		0.26	1.00	1.00
Satd. Flow (perm)	650	1712		678	1600		340	3353		476	3386	1471
Peak-hour factor, PHF	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)	134	172	83	59	114	140	91	742	56	262	1160	189
RTOR Reduction (vph)	0	16	0	0	41	0	0	4	0	0	0	79
Lane Group Flow (vph)	134	239	0	59	213	0	91	794	0	262	1160	110
Confl. Peds. (#/hr)	5			7			9			13		
Heavy Vehicles (%)	5%	0%	0%	0%	1%	5%	1%	1%	0%	0%	1%	4%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	24.9	24.9		24.9	24.9		70.7	63.8		82.5	69.7	69.7
Effective Green, g (s)	24.9	24.9		24.9	24.9		70.7	63.8		82.5	69.7	69.7
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.59	0.53		0.69	0.58	0.58
Clearance Time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	134	355		140	332		278	1782		458	1966	854
v/s Ratio Prot		0.14			0.13		0.02	0.24		c0.06	c0.34	
v/s Ratio Perm	c0.21			0.09			0.17			0.33		0.07
v/c Ratio	1.00	0.67		0.42	0.64		0.33	0.45		0.57	0.59	0.13
Uniform Delay, d1	47.6	43.8		41.3	43.5		11.7	17.2		9.0	16.0	11.4
Progression Factor	1.00	1.00		1.00	1.00		0.90	0.85		1.00	1.00	1.00
Incremental Delay, d2	77.7	5.0		2.0	4.2		0.7	0.8		1.7	1.3	0.3
Delay (s)	125.3	48.8		43.3	47.7		11.2	15.4		10.7	17.3	11.7
Level of Service	F	D		D	D		B	B		B	B	B
Approach Delay (s)		75.1			46.8			15.0			15.6	
Approach LOS		E			D			B			B	
Intersection Summary												
HCM 2000 Control Delay	25.7			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.71											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			18.5					
Intersection Capacity Utilization	77.0%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis

## 1: Fernbank Road & Romina Street/Templeford Avenue

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	16	21	35	52	20	23	34	243	46	48	325	33
Future Volume (Veh/h)	16	21	35	52	20	23	34	243	46	48	325	33
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	23	39	58	22	26	38	270	51	53	361	37
Pedestrians		3			2			2			2	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)								218				
pX, platoon unblocked	0.98	0.98		0.98	0.98	0.98				0.98		
vC, conflicting volume	855	869	366	868	855	274	401			323		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	840	854	366	853	840	246	401			296		
tC, single (s)	7.2	6.6	6.2	7.2	6.8	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.3	3.6	4.2	3.3	2.2			2.2		
p0 queue free %	92	91	94	74	91	97	97			96		
cM capacity (veh/h)	225	259	681	220	249	766	1166			1235		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2	SW 3				
Volume Total	80	106	38	270	51	53	361	37				
Volume Left	18	58	38	0	0	53	0	0				
Volume Right	39	26	0	0	51	0	0	37				
cSH	354	274	1166	1700	1700	1235	1700	1700				
Volume to Capacity	0.23	0.39	0.03	0.16	0.03	0.04	0.21	0.02				
Queue Length 95th (m)	6.8	14.0	0.8	0.0	0.0	1.1	0.0	0.0				
Control Delay (s)	18.1	26.2	8.2	0.0	0.0	8.0	0.0	0.0				
Lane LOS	C	D	A			A						
Approach Delay (s)	18.1	26.2	0.9			0.9						
Approach LOS	C	D										
Intersection Summary												
Average Delay			5.0									
Intersection Capacity Utilization			43.5%	ICU Level of Service					A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 11: Eagleson Road & Bridgestone Drive

800 Eagleson Road TIA

08/23/2018
























						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	33	377	389	33	529	623
Future Volume (Veh/h)	33	377	389	33	529	623
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	37	419	432	37	588	692
Pedestrians	8					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						186
pX, platoon unblocked						
vC, conflicting volume	2308	440			477	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2308	440			477	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	0	32			46	
cM capacity (veh/h)	18	615			1083	
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	37	419	432	37	588	692
Volume Left	37	0	0	0	588	0
Volume Right	0	419	0	37	0	0
cSH	18	615	1700	1700	1083	1700
Volume to Capacity	2.05	0.68	0.25	0.02	0.54	0.41
Queue Length 95th (m)	40.7	42.2	0.0	0.0	27.0	0.0
Control Delay (s)	930.6	22.4	0.0	0.0	12.2	0.0
Lane LOS	F	C			B	
Approach Delay (s)	96.1		0.0		5.6	
Approach LOS	F					
Intersection Summary						
Average Delay			23.1			
Intersection Capacity Utilization			65.9%		ICU Level of Service	C
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

## 4: Fernbank Road & Terry Fox Drive

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	58	164	39	67	295	2	124	116	89	3	99	154
Future Volume (vph)	58	164	39	67	295	2	124	116	89	3	99	154
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2	6.2	6.2	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	1698	1391	1613	1681		1657	1782	1485	1699	1748	1530
Flt Permitted	0.53	1.00	1.00	0.64	1.00		0.44	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	952	1698	1391	1091	1681		770	1782	1485	1206	1748	1530
Peak-hour factor, PHF	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)	64	182	43	74	328	2	138	129	99	3	110	171
RTOR Reduction (vph)	0	0	19	0	0	0	0	0	69	0	0	150
Lane Group Flow (vph)	64	182	24	74	330	0	138	129	30	3	110	21
Confl. Peds. (#/hr)	3						3			3		
Heavy Vehicles (%)	0%	6%	10%	6%	7%	0%	3%	1%	3%	0%	3%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6			2		7	4			8	
Permitted Phases	6		6	2			4		4	8		8
Actuated Green, G (s)	50.3	50.3	50.3	50.3	50.3		27.3	27.3	27.3	11.0	11.0	11.0
Effective Green, g (s)	50.3	50.3	50.3	50.3	50.3		27.3	27.3	27.3	11.0	11.0	11.0
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.56		0.30	0.30	0.30	0.12	0.12	0.12
Clearance Time (s)	6.2	6.2	6.2	6.2	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	532	948	777	609	939		334	540	450	147	213	187
v/s Ratio Prot		0.11			c0.20		c0.05	0.07			c0.06	
v/s Ratio Perm	0.07		0.02	0.07			0.08		0.02	0.00		0.01
v/c Ratio	0.12	0.19	0.03	0.12	0.35		0.41	0.24	0.07	0.02	0.52	0.11
Uniform Delay, d1	9.4	9.8	8.9	9.4	10.9		24.1	23.5	22.3	34.8	37.0	35.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.5	0.1	0.4	1.0		0.8	0.2	0.1	0.1	2.1	0.3
Delay (s)	9.8	10.3	9.0	9.8	11.9		24.9	23.8	22.4	34.8	39.1	35.4
Level of Service	A	B	A	A	B		C	C	C	C	D	D
Approach Delay (s)		10.0			11.5			23.8			36.8	
Approach LOS		A			B			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			19.9			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)			18.5			
Intersection Capacity Utilization			50.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 8: Fernbank Road & Eagleson Road

800 Eagleson Road TIA

08/23/2018






















						
Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	172	733	362	86	173	105
Future Volume (vph)	172	733	362	86	173	105
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1689	1748	1698	1500	1710	1430
Flt Permitted	0.43	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	764	1748	1698	1500	1710	1430
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	191	814	402	96	192	117
RTOR Reduction (vph)	0	0	0	39	0	98
Lane Group Flow (vph)	191	814	402	57	192	19
Confl. Peds. (#/hr)	6					
Heavy Vehicles (%)	1%	3%	6%	2%	0%	7%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	80.5	80.5	65.0	65.0	17.5	17.5
Effective Green, g (s)	80.5	80.5	65.0	65.0	17.5	17.5
Actuated g/C Ratio	0.73	0.73	0.59	0.59	0.16	0.16
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	638	1279	1003	886	272	227
v/s Ratio Prot	0.03	c0.47	0.24		c0.11	
v/s Ratio Perm	0.19			0.04		0.01
v/c Ratio	0.30	0.64	0.40	0.06	0.71	0.08
Uniform Delay, d1	5.4	7.4	12.1	9.6	43.8	39.4
Progression Factor	1.00	1.00	0.76	1.25	1.00	1.00
Incremental Delay, d2	0.3	2.4	1.2	0.1	8.1	0.2
Delay (s)	5.7	9.8	10.3	12.1	51.9	39.6
Level of Service	A	A	B	B	D	D
Approach Delay (s)		9.0	10.6		47.2	
Approach LOS		A	B		D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			16.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.69			
Actuated Cycle Length (s)			110.0		Sum of lost time (s)	18.0
Intersection Capacity Utilization			60.8%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 13: Eagleson Road & Cope Drive/Cadence Gate

800 Eagleson Road TIA

08/23/2018





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	42	24	27	99	195	79	778	25	54	375	73
Future Volume (vph)	102	42	24	27	99	195	79	778	25	54	375	73
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.90		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1597	1574		1704	1569		1660	3360		1644	3288	1443
Flt Permitted	0.27	1.00		0.71	1.00		0.50	1.00		0.26	1.00	1.00
Satd. Flow (perm)	447	1574		1272	1569		873	3360		457	3288	1443
Peak-hour factor, PHF	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)	113	47	27	30	110	217	88	864	28	60	417	81
RTOR Reduction (vph)	0	21	0	0	73	0	0	2	0	0	0	36
Lane Group Flow (vph)	113	53	0	30	254	0	88	890	0	60	417	45
Confl. Peds. (#/hr)	1		2	2		1			3	3		
Heavy Vehicles (%)	7%	2%	17%	0%	1%	3%	3%	1%	8%	4%	4%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	23.9	23.9		23.9	23.9		67.9	62.0		67.3	61.7	61.7
Effective Green, g (s)	23.9	23.9		23.9	23.9		67.9	62.0		67.3	61.7	61.7
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.62	0.56		0.61	0.56	0.56
Clearance Time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	97	341		276	340		581	1893		340	1844	809
v/s Ratio Prot		0.03			0.16		0.01	c0.26		c0.01	0.13	
v/s Ratio Perm	c0.25			0.02			0.09			0.10		0.03
v/c Ratio	1.16	0.16		0.11	0.75		0.15	0.47		0.18	0.23	0.06
Uniform Delay, d1	43.0	34.9		34.5	40.2		8.5	14.2		9.2	12.1	10.9
Progression Factor	1.00	1.00		1.00	1.00		1.45	1.36		1.00	1.00	1.00
Incremental Delay, d2	142.5	0.2		0.2	8.7		0.1	0.7		0.2	0.3	0.1
Delay (s)	185.5	35.1		34.7	48.9		12.4	20.0		9.4	12.4	11.1
Level of Service	F	D		C	D		B	C		A	B	B
Approach Delay (s)		126.0			47.7			19.4			11.9	
Approach LOS		F			D			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			31.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)				18.5		
Intersection Capacity Utilization			72.7%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis

## 1: Fernbank Road & Romina Street/Templeford Avenue

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	21	16	21	59	17	41	33	171	23	11	219	10
Future Volume (Veh/h)	21	16	21	59	17	41	33	171	23	11	219	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	23	18	23	66	19	46	37	190	26	12	243	11
Pedestrians		1			1			2			1	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)								218				
pX, platoon unblocked												
vC, conflicting volume	588	559	246	566	544	192	255			217		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	588	559	246	566	544	192	255			217		
tC, single (s)	7.3	6.8	6.2	7.2	6.7	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.2	3.3	3.6	4.2	3.3	2.3			2.2		
p0 queue free %	93	95	97	83	95	95	97			99		
cM capacity (veh/h)	350	391	796	384	401	848	1269			1364		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2	SW 3				
Volume Total	64	131	37	190	26	12	243	11				
Volume Left	23	66	37	0	0	12	0	0				
Volume Right	23	46	0	0	26	0	0	11				
cSH	455	479	1269	1700	1700	1364	1700	1700				
Volume to Capacity	0.14	0.27	0.03	0.11	0.02	0.01	0.14	0.01				
Queue Length 95th (m)	3.9	8.8	0.7	0.0	0.0	0.2	0.0	0.0				
Control Delay (s)	14.2	15.3	7.9	0.0	0.0	7.7	0.0	0.0				
Lane LOS	B	C	A			A						
Approach Delay (s)	14.2	15.3	1.2			0.3						
Approach LOS	B	C										
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			36.1%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 11: Eagleson Road & Bridgestone Drive

800 Eagleson Road TIA










08/23/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	322	607	38	191	268
Future Volume (Veh/h)	17	322	607	38	191	268
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	358	674	42	212	298
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						186
pX, platoon unblocked						
vC, conflicting volume	1396	674			716	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1396	674			716	
tC, single (s)	6.7	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.8	3.3			2.3	
p0 queue free %	81	21			75	
cM capacity (veh/h)	102	455			862	
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	19	358	674	42	212	298
Volume Left	19	0	0	0	212	0
Volume Right	0	358	0	42	0	0
cSH	102	455	1700	1700	862	1700
Volume to Capacity	0.19	0.79	0.40	0.02	0.25	0.18
Queue Length 95th (m)	5.1	56.2	0.0	0.0	7.7	0.0
Control Delay (s)	48.0	36.5	0.0	0.0	10.5	0.0
Lane LOS	E	E			B	
Approach Delay (s)	37.1		0.0		4.4	
Approach LOS	E					
Intersection Summary						
Average Delay			10.1			
Intersection Capacity Utilization			61.4%		ICU Level of Service	B
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 16: Fernbank Road & Site Access 1

800 Eagleson Road TIA  
08/23/2018

						
Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (veh/h)	3	17	232	1	6	252
Future Volume (Veh/h)	3	17	232	1	6	252
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	3	19	258	1	7	280
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						145
pX, platoon unblocked						
vC, conflicting volume	552	130			259	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	552	130			259	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	98			99	
cM capacity (veh/h)	461	896			1303	
Direction, Lane #	NW 1	NE 1	NE 2	SW 1		
Volume Total	22	172	87	287		
Volume Left	3	0	0	7		
Volume Right	19	0	1	0		
cSH	794	1700	1700	1303		
Volume to Capacity	0.03	0.10	0.05	0.01		
Queue Length 95th (m)	0.7	0.0	0.0	0.1		
Control Delay (s)	9.7	0.0	0.0	0.2		
Lane LOS	A			A		
Approach Delay (s)	9.7	0.0		0.2		
Approach LOS	A					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			29.1%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 18: Eagleson Road & Site Access 2

800 Eagleson Road TIA

08/23/2018


























Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	4	1	928	462	4
Future Volume (Veh/h)	13	4	1	928	462	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	14	4	1	1031	513	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)					94	
pX, platoon unblocked	0.88	0.88	0.88			
vC, conflicting volume	1548	515	517			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1555	375	377			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	99	100			
cM capacity (veh/h)	109	588	1034			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	18	1032	517			
Volume Left	14	1	0			
Volume Right	4	0	4			
cSH	133	1034	1700			
Volume to Capacity	0.14	0.00	0.30			
Queue Length 95th (m)	3.6	0.0	0.0			
Control Delay (s)	36.3	0.0	0.0			
Lane LOS	E	A				
Approach Delay (s)	36.3	0.0	0.0			
Approach LOS	E					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			62.4%	ICU Level of Service		B
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

## 4: Fernbank Road & Terry Fox Drive













08/23/2018

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	170	328	79	167	319	11	84	122	51	1	213	116
Future Volume (vph)	170	328	79	167	319	11	84	122	51	1	213	116
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2	6.2	6.5	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1701	1731	1515	1693	1720		1613	1765	1471	1686	1800	1515
Flt Permitted	0.54	1.00	1.00	0.37	1.00		0.31	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	973	1731	1515	666	1720		518	1765	1471	1189	1800	1515
Peak-hour factor, PHF	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)	189	364	88	186	354	12	93	136	57	1	237	129
RTOR Reduction (vph)	0	0	51	0	1	0	0	0	40	0	0	105
Lane Group Flow (vph)	189	364	37	186	365	0	93	136	17	1	237	24
Confl. Peds. (#/hr)	3									6		
Heavy Vehicles (%)	0%	4%	1%	1%	4%	9%	6%	2%	4%	0%	0%	1%
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		7	4			8	
Permitted Phases	6		6	2			4		4	8		8
Actuated Green, G (s)	41.7	41.7	41.7	58.4	58.4		29.2	29.2	29.2	18.4	18.4	18.4
Effective Green, g (s)	41.7	41.7	41.7	58.4	58.4		29.2	29.2	29.2	18.4	18.4	18.4
Actuated g/C Ratio	0.42	0.42	0.42	0.58	0.58		0.29	0.29	0.29	0.18	0.18	0.18
Clearance Time (s)	6.2	6.2	6.2	6.5	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	405	721	631	493	1004		202	515	429	218	331	278
v/s Ratio Prot		c0.21		0.04	c0.21		c0.02	0.08			c0.13	
v/s Ratio Perm	0.19		0.02	0.18			0.11		0.01	0.00		0.02
v/c Ratio	0.47	0.50	0.06	0.38	0.36		0.46	0.26	0.04	0.00	0.72	0.09
Uniform Delay, d1	21.1	21.5	17.4	11.1	11.0		27.4	27.2	25.4	33.3	38.3	33.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.8	2.5	0.2	0.5	1.0		1.7	0.3	0.0	0.0	7.2	0.1
Delay (s)	24.9	24.0	17.6	11.6	12.0		29.1	27.4	25.4	33.3	45.5	34.0
Level of Service	C	C	B	B	B		C	C	C	C	D	C
Approach Delay (s)		23.4			11.9			27.6			41.4	
Approach LOS		C			B			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			24.2			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			25.0			
Intersection Capacity Utilization			65.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 8: Fernbank Road & Eagleson Road






















08/23/2018

						
Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	184	470	807	214	135	189
Future Volume (vph)	184	470	807	214	135	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1644	1782	1765	1515	1676	1500
Flt Permitted	0.16	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	276	1782	1765	1515	1676	1500
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	204	522	897	238	150	210
RTOR Reduction (vph)	0	0	0	79	0	182
Lane Group Flow (vph)	204	522	897	159	150	28
Confl. Peds. (#/hr)	2				1	
Heavy Vehicles (%)	4%	1%	2%	1%	2%	2%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	92.2	92.2	76.7	76.7	15.8	15.8
Effective Green, g (s)	92.2	92.2	76.7	76.7	15.8	15.8
Actuated g/C Ratio	0.77	0.77	0.64	0.64	0.13	0.13
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	320	1369	1128	968	220	197
v/s Ratio Prot	c0.05	0.29	c0.51		c0.09	
v/s Ratio Perm	0.44			0.10		0.02
v/c Ratio	0.64	0.38	0.80	0.16	0.68	0.14
Uniform Delay, d1	15.6	4.6	15.9	8.7	49.7	46.1
Progression Factor	1.00	1.00	0.76	0.17	1.00	1.00
Incremental Delay, d2	4.1	0.8	5.2	0.3	8.4	0.3
Delay (s)	19.8	5.4	17.4	1.8	58.1	46.4
Level of Service	B	A	B	A	E	D
Approach Delay (s)		9.4	14.1		51.3	
Approach LOS		A	B		D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay		18.6		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.77				
Actuated Cycle Length (s)		120.0		Sum of lost time (s)		18.0
Intersection Capacity Utilization		78.5%		ICU Level of Service		D
Analysis Period (min)		15				
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 13: Eagleson Road & Cope Drive/Cadence Gate





















08/23/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	129	73	24	85	120	73	611	30	224	957	133
Future Volume (vph)	84	129	73	24	85	120	73	611	30	224	957	133
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00		0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.91		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1619	1702		1696	1589		1691	3364		1705	3386	1471
Flt Permitted	0.37	1.00		0.38	1.00		0.24	1.00		0.32	1.00	1.00
Satd. Flow (perm)	626	1702		670	1589		420	3364		572	3386	1471
Peak-hour factor, PHF	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)	93	143	81	27	94	133	81	679	33	249	1063	148
RTOR Reduction (vph)	0	20	0	0	50	0	0	2	0	0	0	55
Lane Group Flow (vph)	93	204	0	27	177	0	81	710	0	249	1063	93
Confl. Peds. (#/hr)	5			7			9			13		
Heavy Vehicles (%)	5%	0%	0%	0%	1%	5%	1%	1%	0%	0%	1%	4%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	19.7	19.7		19.7	19.7		76.5	70.4		87.1	75.7	75.7
Effective Green, g (s)	19.7	19.7		19.7	19.7		76.5	70.4		87.1	75.7	75.7
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.64	0.59		0.73	0.63	0.63
Clearance Time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	102	279		109	260		332	1973		522	2136	927
v/s Ratio Prot		0.12			0.11		0.01	0.21		c0.05	c0.31	
v/s Ratio Perm	c0.15			0.04			0.14			0.30		0.06
v/c Ratio	0.91	0.73		0.25	0.68		0.24	0.36		0.48	0.50	0.10
Uniform Delay, d1	49.3	47.6		43.7	47.2		8.7	13.0		6.3	11.9	8.7
Progression Factor	1.00	1.00		1.00	1.00		0.86	0.81		1.00	1.00	1.00
Incremental Delay, d2	61.3	9.5		1.2	7.1		0.4	0.5		0.7	0.8	0.2
Delay (s)	110.6	57.1		44.9	54.3		7.9	11.0		7.0	12.8	8.9
Level of Service	F	E		D	D		A	B		A	B	A
Approach Delay (s)		72.8			53.3			10.6			11.4	
Approach LOS		E			D			B			B	
Intersection Summary												
HCM 2000 Control Delay	21.8			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.59											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			18.5					
Intersection Capacity Utilization	70.4%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis

## 1: Fernbank Road & Romina Street/Templeford Avenue













08/23/2018

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	15	20	33	49	19	22	33	231	44	46	307	32
Future Volume (Veh/h)	15	20	33	49	19	22	33	231	44	46	307	32
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	22	37	54	21	24	37	257	49	51	341	36
Pedestrians		3			2			2			2	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)								218				
pX, platoon unblocked	0.99	0.99		0.99	0.99	0.99				0.99		
vC, conflicting volume	814	828	346	826	815	261	380			308		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	806	821	346	819	808	247	380			295		
tC, single (s)	7.2	6.6	6.2	7.2	6.8	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.3	3.6	4.2	3.3	2.2			2.2		
p0 queue free %	93	92	95	77	92	97	97			96		
cM capacity (veh/h)	243	275	699	238	265	773	1187			1251		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2	SW 3				
Volume Total	76	99	37	257	49	51	341	36				
Volume Left	17	54	37	0	0	51	0	0				
Volume Right	37	24	0	0	49	0	0	36				
cSH	375	293	1187	1700	1700	1251	1700	1700				
Volume to Capacity	0.20	0.34	0.03	0.15	0.03	0.04	0.20	0.02				
Queue Length 95th (m)	6.0	11.5	0.8	0.0	0.0	1.0	0.0	0.0				
Control Delay (s)	17.0	23.4	8.1	0.0	0.0	8.0	0.0	0.0				
Lane LOS	C	C	A			A						
Approach Delay (s)	17.0	23.4	0.9			1.0						
Approach LOS	C	C										
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			41.9%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 11: Eagleson Road & Bridgestone Drive










08/23/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	31	364	373	31	503	591
Future Volume (Veh/h)	31	364	373	31	503	591
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	34	404	414	34	559	657
Pedestrians	8					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						186
pX, platoon unblocked						
vC, conflicting volume	2197	422			456	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2197	422			456	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	0	36			49	
cM capacity (veh/h)	23	630			1103	
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	34	404	414	34	559	657
Volume Left	34	0	0	0	559	0
Volume Right	0	404	0	34	0	0
cSH	23	630	1700	1700	1103	1700
Volume to Capacity	1.48	0.64	0.24	0.02	0.51	0.39
Queue Length 95th (m)	34.6	36.9	0.0	0.0	23.6	0.0
Control Delay (s)	611.7	20.4	0.0	0.0	11.6	0.0
Lane LOS	F	C			B	
Approach Delay (s)	66.3		0.0		5.3	
Approach LOS	F					
Intersection Summary						
Average Delay			16.9			
Intersection Capacity Utilization			63.5%		ICU Level of Service	B
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 16: Fernbank Road & Site Access 1

08/23/2018

						
Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (veh/h)	2	11	265	3	17	381
Future Volume (Veh/h)	2	11	265	3	17	381
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	12	294	3	19	423
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						143
pX, platoon unblocked						
vC, conflicting volume	756	148			297	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	756	148			297	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			98	
cM capacity (veh/h)	339	871			1261	
Direction, Lane #	NW 1	NE 1	NE 2	SW 1		
Volume Total	14	196	101	442		
Volume Left	2	0	0	19		
Volume Right	12	0	3	0		
cSH	711	1700	1700	1261		
Volume to Capacity	0.02	0.12	0.06	0.02		
Queue Length 95th (m)	0.5	0.0	0.0	0.4		
Control Delay (s)	10.2	0.0	0.0	0.5		
Lane LOS	B			A		
Approach Delay (s)	10.2	0.0		0.5		
Approach LOS	B					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			43.3%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 17: Eagleson Road & Site Access 2

08/23/2018


























Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	5	9	728	987	9
Future Volume (Veh/h)	5	5	9	728	987	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	6	10	809	1097	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)					92	
pX, platoon unblocked	0.61	0.61	0.61			
vC, conflicting volume	1931	1102	1107			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2212	842	851			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	79	97	98			
cM capacity (veh/h)	29	220	477			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	12	819	1107			
Volume Left	6	10	0			
Volume Right	6	0	10			
cSH	51	477	1700			
Volume to Capacity	0.24	0.02	0.65			
Queue Length 95th (m)	6.4	0.5	0.0			
Control Delay (s)	96.7	0.7	0.0			
Lane LOS	F	A				
Approach Delay (s)	96.7	0.7	0.0			
Approach LOS	F					
Intersection Summary						
Average Delay		0.9				
Intersection Capacity Utilization		65.4%		ICU Level of Service		C
Analysis Period (min)		15				

# HCM Signalized Intersection Capacity Analysis

## 4: Fernbank Road & Terry Fox Drive

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	61	172	41	70	310	2	131	128	93	3	109	162
Future Volume (vph)	61	172	41	70	310	2	131	128	93	3	109	162
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2	6.2	6.2	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	1698	1391	1613	1681		1657	1782	1485	1699	1748	1530
Flt Permitted	0.52	1.00	1.00	0.64	1.00		0.45	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	923	1698	1391	1082	1681		776	1782	1485	1192	1748	1530
Peak-hour factor, PHF	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)	68	191	46	78	344	2	146	142	103	3	121	180
RTOR Reduction (vph)	0	0	21	0	0	0	0	0	71	0	0	157
Lane Group Flow (vph)	68	191	25	78	346	0	146	142	32	3	121	23
Confl. Peds. (#/hr)	3						3			3		
Heavy Vehicles (%)	0%	6%	10%	6%	7%	0%	3%	1%	3%	0%	3%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6			2		7	4			8	
Permitted Phases	6		6	2			4		4	8		8
Actuated Green, G (s)	49.6	49.6	49.6	49.6	49.6		28.0	28.0	28.0	11.6	11.6	11.6
Effective Green, g (s)	49.6	49.6	49.6	49.6	49.6		28.0	28.0	28.0	11.6	11.6	11.6
Actuated g/C Ratio	0.55	0.55	0.55	0.55	0.55		0.31	0.31	0.31	0.13	0.13	0.13
Clearance Time (s)	6.2	6.2	6.2	6.2	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	508	935	766	596	926		342	554	462	153	225	197
v/s Ratio Prot		0.11			c0.21		c0.05	0.08			c0.07	
v/s Ratio Perm	0.07		0.02	0.07			0.08		0.02	0.00		0.02
v/c Ratio	0.13	0.20	0.03	0.13	0.37		0.43	0.26	0.07	0.02	0.54	0.12
Uniform Delay, d1	9.8	10.2	9.2	9.8	11.4		23.7	23.2	21.8	34.2	36.7	34.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.5	0.1	0.5	1.2		0.9	0.2	0.1	0.1	2.5	0.3
Delay (s)	10.3	10.7	9.3	10.2	12.6		24.5	23.5	21.9	34.3	39.2	34.9
Level of Service	B	B	A	B	B		C	C	C	C	D	C
Approach Delay (s)		10.4			12.1			23.4			36.6	
Approach LOS		B			B			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			20.1			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)			18.5			
Intersection Capacity Utilization			51.3%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 8: Fernbank Road & Eagleson Road

800 Eagleson Road TIA

08/23/2018






















						
Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	180	782	391	96	188	110
Future Volume (vph)	180	782	391	96	188	110
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1690	1748	1698	1500	1710	1430
Flt Permitted	0.40	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	714	1748	1698	1500	1710	1430
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	200	869	434	107	209	122
RTOR Reduction (vph)	0	0	0	45	0	101
Lane Group Flow (vph)	200	869	434	62	209	21
Confl. Peds. (#/hr)	6					
Heavy Vehicles (%)	1%	3%	6%	2%	0%	7%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	79.3	79.3	63.4	63.4	18.7	18.7
Effective Green, g (s)	79.3	79.3	63.4	63.4	18.7	18.7
Actuated g/C Ratio	0.72	0.72	0.58	0.58	0.17	0.17
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	602	1260	978	864	290	243
v/s Ratio Prot	0.03	c0.50	0.26		c0.12	
v/s Ratio Perm	0.21			0.04		0.01
v/c Ratio	0.33	0.69	0.44	0.07	0.72	0.09
Uniform Delay, d1	6.1	8.5	13.3	10.3	43.2	38.4
Progression Factor	1.00	1.00	0.53	0.87	1.00	1.00
Incremental Delay, d2	0.3	3.1	1.4	0.2	8.5	0.2
Delay (s)	6.5	11.6	8.4	9.1	51.7	38.6
Level of Service	A	B	A	A	D	D
Approach Delay (s)		10.7	8.6		46.9	
Approach LOS		B	A		D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			16.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.74			
Actuated Cycle Length (s)			110.0		Sum of lost time (s)	18.0
Intersection Capacity Utilization			64.4%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 13: Eagleson Road & Cope Drive/Cadence Gate

800 Eagleson Road TIA

08/23/2018





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	62	25	52	115	205	89	845	43	56	435	89
Future Volume (vph)	153	62	25	52	115	205	89	845	43	56	435	89
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.90		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1597	1612		1705	1577		1660	3345		1644	3288	1443
Flt Permitted	0.34	1.00		0.69	1.00		0.43	1.00		0.20	1.00	1.00
Satd. Flow (perm)	576	1612		1246	1577		755	3345		347	3288	1443
Peak-hour factor, PHF	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)	170	69	28	58	128	228	99	939	48	62	483	99
RTOR Reduction (vph)	0	13	0	0	59	0	0	3	0	0	0	53
Lane Group Flow (vph)	170	84	0	58	297	0	99	984	0	62	483	46
Confl. Peds. (#/hr)	1		2	2		1			3	3		
Heavy Vehicles (%)	7%	2%	17%	0%	1%	3%	3%	1%	8%	4%	4%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	33.2	33.2		33.2	33.2		59.6	52.8		57.0	51.5	51.5
Effective Green, g (s)	33.2	33.2		33.2	33.2		59.6	52.8		57.0	51.5	51.5
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.54	0.48		0.52	0.47	0.47
Clearance Time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	173	486		376	475		465	1605		244	1539	675
v/s Ratio Prot		0.05			0.19		c0.01	c0.29		0.01	0.15	
v/s Ratio Perm	c0.29			0.05			0.10			0.12		0.03
v/c Ratio	0.98	0.17		0.15	0.63		0.21	0.61		0.25	0.31	0.07
Uniform Delay, d1	38.1	28.3		28.1	33.1		12.4	21.1		14.6	18.2	16.1
Progression Factor	1.00	1.00		1.00	1.00		1.34	1.28		1.00	1.00	1.00
Incremental Delay, d2	62.9	0.2		0.2	2.6		0.2	1.3		0.6	0.5	0.2
Delay (s)	101.1	28.5		28.3	35.6		16.9	28.3		15.1	18.8	16.3
Level of Service	F	C		C	D		B	C		B	B	B
Approach Delay (s)		74.7			34.6			27.2			18.0	
Approach LOS		E			C			C			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			31.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)				18.5		
Intersection Capacity Utilization			79.8%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis

## 1: Fernbank Road & Romina Street/Templeford Avenue

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	22	17	22	62	18	44	34	185	24	12	235	11
Future Volume (Veh/h)	22	17	22	62	18	44	34	185	24	12	235	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	24	19	24	69	20	49	38	206	27	13	261	12
Pedestrians		1			1			2			1	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)								218				
pX, platoon unblocked												
vC, conflicting volume	630	598	264	606	583	208	274			234		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	630	598	264	606	583	208	274			234		
tC, single (s)	7.3	6.8	6.2	7.2	6.7	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.2	3.3	3.6	4.2	3.3	2.3			2.2		
p0 queue free %	93	95	97	81	95	94	97			99		
cM capacity (veh/h)	324	370	778	358	379	831	1249			1344		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2	SW 3				
Volume Total	67	138	38	206	27	13	261	12				
Volume Left	24	69	38	0	0	13	0	0				
Volume Right	24	49	0	0	27	0	0	12				
cSH	429	453	1249	1700	1700	1344	1700	1700				
Volume to Capacity	0.16	0.30	0.03	0.12	0.02	0.01	0.15	0.01				
Queue Length 95th (m)	4.4	10.2	0.8	0.0	0.0	0.2	0.0	0.0				
Control Delay (s)	14.9	16.4	8.0	0.0	0.0	7.7	0.0	0.0				
Lane LOS	B	C	A			A						
Approach Delay (s)	14.9	16.4	1.1			0.4						
Approach LOS	B	C										
Intersection Summary												
Average Delay			4.8									
Intersection Capacity Utilization			37.6%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 11: Eagleson Road & Bridgestone Drive

800 Eagleson Road TIA










08/23/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	343	646	40	205	288
Future Volume (Veh/h)	18	343	646	40	205	288
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	20	381	718	44	228	320
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						186
pX, platoon unblocked						
vC, conflicting volume	1494	718			762	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1494	718			762	
tC, single (s)	6.7	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.8	3.3			2.3	
p0 queue free %	77	11			72	
cM capacity (veh/h)	85	429			828	
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	20	381	718	44	228	320
Volume Left	20	0	0	0	228	0
Volume Right	0	381	0	44	0	0
cSH	85	429	1700	1700	828	1700
Volume to Capacity	0.23	0.89	0.42	0.03	0.28	0.19
Queue Length 95th (m)	6.7	74.6	0.0	0.0	9.0	0.0
Control Delay (s)	59.7	51.4	0.0	0.0	11.0	0.0
Lane LOS	F	F			B	
Approach Delay (s)	51.8		0.0		4.6	
Approach LOS	F					
Intersection Summary						
Average Delay			13.6			
Intersection Capacity Utilization			65.0%		ICU Level of Service	C
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 16: Fernbank Road & Site Access 1

800 Eagleson Road TIA  
08/23/2018

						
Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (veh/h)	3	17	250	1	6	270
Future Volume (Veh/h)	3	17	250	1	6	270
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	3	19	278	1	7	300
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						145
pX, platoon unblocked						
vC, conflicting volume	592	140			279	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	592	140			279	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	98			99	
cM capacity (veh/h)	435	883			1281	
Direction, Lane #	NW 1	NE 1	NE 2	SW 1		
Volume Total	22	185	94	307		
Volume Left	3	0	0	7		
Volume Right	19	0	1	0		
cSH	774	1700	1700	1281		
Volume to Capacity	0.03	0.11	0.06	0.01		
Queue Length 95th (m)	0.7	0.0	0.0	0.1		
Control Delay (s)	9.8	0.0	0.0	0.2		
Lane LOS	A			A		
Approach Delay (s)	9.8	0.0		0.2		
Approach LOS	A					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			30.1%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis 18: Eagleson Road & Site Access 2

800 Eagleson Road TIA  
08/23/2018


























Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	4	1	987	497	4
Future Volume (Veh/h)	13	4	1	987	497	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	14	4	1	1097	552	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)					94	
pX, platoon unblocked	0.86	0.86	0.86			
vC, conflicting volume	1653	554	556			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1679	395	397			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	84	99	100			
cM capacity (veh/h)	89	560	994			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	18	1098	556			
Volume Left	14	1	0			
Volume Right	4	0	4			
cSH	110	994	1700			
Volume to Capacity	0.16	0.00	0.33			
Queue Length 95th (m)	4.5	0.0	0.0			
Control Delay (s)	44.1	0.0	0.0			
Lane LOS	E	A				
Approach Delay (s)	44.1	0.0	0.0			
Approach LOS	E					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			65.7%	ICU Level of Service		C
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

## 4: Fernbank Road & Terry Fox Drive

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	176	335	12	178	345	12	88	135	53	1	231	122
Future Volume (vph)	176	335	12	178	345	12	88	135	53	1	231	122
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2	6.2	6.5	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1702	1731	1515	1693	1720		1613	1765	1471	1687	1800	1515
Flt Permitted	0.53	1.00	1.00	0.36	1.00		0.29	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	947	1731	1515	639	1720		489	1765	1471	1175	1800	1515
Peak-hour factor, PHF	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)	196	372	13	198	383	13	98	150	59	1	257	136
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	41	0	0	109
Lane Group Flow (vph)	196	372	5	198	395	0	98	150	18	1	257	27
Confl. Peds. (#/hr)	3									6		
Heavy Vehicles (%)	0%	4%	1%	1%	4%	9%	6%	2%	4%	0%	0%	1%
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		6		5	2		7	4			8	
Permitted Phases	6		6	2			4		4	8		8
Actuated Green, G (s)	40.5	40.5	40.5	57.3	57.3		30.3	30.3	30.3	19.5	19.5	19.5
Effective Green, g (s)	40.5	40.5	40.5	57.3	57.3		30.3	30.3	30.3	19.5	19.5	19.5
Actuated g/C Ratio	0.40	0.40	0.40	0.57	0.57		0.30	0.30	0.30	0.20	0.20	0.20
Clearance Time (s)	6.2	6.2	6.2	6.5	6.2		6.1	6.2	6.2	6.2	6.2	6.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	383	701	613	474	985		200	534	445	229	351	295
v/s Ratio Prot		c0.21		0.04	c0.23		c0.02	0.09			c0.14	
v/s Ratio Perm	0.21		0.00	0.20			0.12		0.01	0.00		0.02
v/c Ratio	0.51	0.53	0.01	0.42	0.40		0.49	0.28	0.04	0.00	0.73	0.09
Uniform Delay, d1	22.3	22.5	17.8	11.9	11.8		26.8	26.6	24.6	32.4	37.8	33.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.8	2.9	0.0	0.6	1.2		1.9	0.3	0.0	0.0	7.7	0.1
Delay (s)	27.1	25.4	17.8	12.5	13.1		28.7	26.8	24.6	32.4	45.5	33.1
Level of Service	C	C	B	B	B		C	C	C	C	D	C
Approach Delay (s)		25.8			12.9			27.0			41.2	
Approach LOS		C			B			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			25.1			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			25.0			
Intersection Capacity Utilization			68.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 8: Fernbank Road & Eagleson Road

800 Eagleson Road TIA

08/23/2018






















						
Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	192	508	861	232	148	198
Future Volume (vph)	192	508	861	232	148	198
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1644	1782	1765	1515	1676	1500
Flt Permitted	0.11	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	192	1782	1765	1515	1676	1500
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	213	564	957	258	164	220
RTOR Reduction (vph)	0	0	0	85	0	190
Lane Group Flow (vph)	213	564	957	173	164	30
Confl. Peds. (#/hr)	2				1	
Heavy Vehicles (%)	4%	1%	2%	1%	2%	2%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	91.5	91.5	74.3	74.3	16.5	16.5
Effective Green, g (s)	91.5	91.5	74.3	74.3	16.5	16.5
Actuated g/C Ratio	0.76	0.76	0.62	0.62	0.14	0.14
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	281	1358	1092	938	230	206
v/s Ratio Prot	c0.07	0.32	c0.54		c0.10	
v/s Ratio Perm	0.51			0.11		0.02
v/c Ratio	0.76	0.42	0.88	0.18	0.71	0.15
Uniform Delay, d1	24.4	5.0	19.0	9.8	49.5	45.6
Progression Factor	1.00	1.00	0.86	0.22	1.00	1.00
Incremental Delay, d2	11.1	0.9	8.3	0.4	10.0	0.3
Delay (s)	35.5	5.9	24.6	2.5	59.5	45.9
Level of Service	D	A	C	A	E	D
Approach Delay (s)		14.0	19.9		51.7	
Approach LOS		B	B		D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay		23.1		HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio		0.84				
Actuated Cycle Length (s)		120.0		Sum of lost time (s)		18.0
Intersection Capacity Utilization		82.7%		ICU Level of Service		E
Analysis Period (min)		15				
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 13: Eagleson Road & Cope Drive/Cadence Gate

800 Eagleson Road TIA

08/23/2018





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	155	76	54	103	126	83	675	50	236	1055	170
Future Volume (vph)	121	155	76	54	103	126	83	675	50	236	1055	170
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00		0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.92		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1620	1711		1698	1600		1692	3353		1707	3386	1471
Flt Permitted	0.38	1.00		0.38	1.00		0.19	1.00		0.26	1.00	1.00
Satd. Flow (perm)	650	1711		674	1600		333	3353		469	3386	1471
Peak-hour factor, PHF	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)	134	172	84	60	114	140	92	750	56	262	1172	189
RTOR Reduction (vph)	0	17	0	0	41	0	0	4	0	0	0	79
Lane Group Flow (vph)	134	239	0	60	213	0	92	802	0	262	1172	110
Confl. Peds. (#/hr)	5			7			9			13		
Heavy Vehicles (%)	5%	0%	0%	0%	1%	5%	1%	1%	0%	0%	1%	4%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	24.9	24.9		24.9	24.9		70.7	63.7		82.5	69.6	69.6
Effective Green, g (s)	24.9	24.9		24.9	24.9		70.7	63.7		82.5	69.6	69.6
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.59	0.53		0.69	0.58	0.58
Clearance Time (s)	6.5	6.5		6.5	6.5		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	134	355		139	332		275	1779		455	1963	853
v/s Ratio Prot		0.14			0.13		0.02	0.24		c0.06	c0.35	
v/s Ratio Perm	c0.21			0.09			0.18			0.33		0.07
v/c Ratio	1.00	0.67		0.43	0.64		0.33	0.45		0.58	0.60	0.13
Uniform Delay, d1	47.6	43.8		41.4	43.5		11.8	17.4		9.1	16.2	11.4
Progression Factor	1.00	1.00		1.00	1.00		0.91	0.85		1.00	1.00	1.00
Incremental Delay, d2	77.7	5.0		2.1	4.2		0.7	0.8		1.8	1.3	0.3
Delay (s)	125.3	48.8		43.5	47.7		11.4	15.5		10.8	17.5	11.7
Level of Service	F	D		D	D		B	B		B	B	B
Approach Delay (s)		75.1			46.9			15.1			15.8	
Approach LOS		E			D			B			B	
Intersection Summary												
HCM 2000 Control Delay	25.8			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.71											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			18.5					
Intersection Capacity Utilization	77.4%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis

## 1: Fernbank Road & Romina Street/Templeford Avenue

800 Eagleson Road TIA

08/23/2018













												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	16	21	35	52	20	23	34	249	46	48	329	33
Future Volume (Veh/h)	16	21	35	52	20	23	34	249	46	48	329	33
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	23	39	58	22	26	38	277	51	53	366	37
Pedestrians		3			2			2			2	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)								218				
pX, platoon unblocked	0.97	0.97		0.97	0.97	0.97				0.97		
vC, conflicting volume	867	881	371	880	867	281	406			330		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	849	864	371	862	849	247	406			297		
tC, single (s)	7.2	6.6	6.2	7.2	6.8	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.3	3.6	4.2	3.3	2.2			2.2		
p0 queue free %	92	91	94	73	91	97	97			96		
cM capacity (veh/h)	220	254	676	215	245	761	1161			1228		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2	SW 3				
Volume Total	80	106	38	277	51	53	366	37				
Volume Left	18	58	38	0	0	53	0	0				
Volume Right	39	26	0	0	51	0	0	37				
cSH	348	269	1161	1700	1700	1228	1700	1700				
Volume to Capacity	0.23	0.39	0.03	0.16	0.03	0.04	0.22	0.02				
Queue Length 95th (m)	7.0	14.3	0.8	0.0	0.0	1.1	0.0	0.0				
Control Delay (s)	18.4	26.8	8.2	0.0	0.0	8.1	0.0	0.0				
Lane LOS	C	D	A			A						
Approach Delay (s)	18.4	26.8	0.9			0.9						
Approach LOS	C	D										
Intersection Summary												
Average Delay			5.0									
Intersection Capacity Utilization			43.7%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 11: Eagleson Road & Bridgestone Drive

800 Eagleson Road TIA










08/23/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	33	387	400	33	534	629
Future Volume (Veh/h)	33	387	400	33	534	629
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	37	430	444	37	593	699
Pedestrians	8					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						186
pX, platoon unblocked						
vC, conflicting volume	2337	452			489	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2337	452			489	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	0	29			45	
cM capacity (veh/h)	17	606			1072	
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	37	430	444	37	593	699
Volume Left	37	0	0	0	593	0
Volume Right	0	430	0	37	0	0
cSH	17	606	1700	1700	1072	1700
Volume to Capacity	2.19	0.71	0.26	0.02	0.55	0.41
Queue Length 95th (m)	41.5	46.5	0.0	0.0	28.1	0.0
Control Delay (s)	1016.2	24.2	0.0	0.0	12.4	0.0
Lane LOS	F	C			B	
Approach Delay (s)	102.8		0.0		5.7	
Approach LOS	F					
Intersection Summary						
Average Delay			24.7			
Intersection Capacity Utilization			66.8%		ICU Level of Service	C
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 16: Fernbank Road & Site Access 1

800 Eagleson Road TIA  
08/23/2018










						
Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (veh/h)	2	11	285	3	17	407
Future Volume (Veh/h)	2	11	285	3	17	407
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	12	317	3	19	452
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						143
pX, platoon unblocked						
vC, conflicting volume	808	160			320	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	808	160			320	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			98	
cM capacity (veh/h)	314	857			1237	
Direction, Lane #	NW 1	NE 1	NE 2	SW 1		
Volume Total	14	211	109	471		
Volume Left	2	0	0	19		
Volume Right	12	0	3	0		
cSH	687	1700	1700	1237		
Volume to Capacity	0.02	0.12	0.06	0.02		
Queue Length 95th (m)	0.5	0.0	0.0	0.4		
Control Delay (s)	10.4	0.0	0.0	0.5		
Lane LOS	B			A		
Approach Delay (s)	10.4	0.0		0.5		
Approach LOS	B					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			45.4%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 17: Eagleson Road & Site Access 2

800 Eagleson Road TIA

08/23/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	5	9	779	1050	9
Future Volume (Veh/h)	5	5	9	779	1050	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	6	10	866	1167	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)					92	
pX, platoon unblocked	0.51	0.51	0.51			
vC, conflicting volume	2058	1172	1177			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2587	861	871			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	57	97	97			
cM capacity (veh/h)	14	182	397			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	12	876	1177			
Volume Left	6	10	0			
Volume Right	6	0	10			
cSH	26	397	1700			
Volume to Capacity	0.46	0.03	0.69			
Queue Length 95th (m)	11.4	0.6	0.0			
Control Delay (s)	231.5	0.9	0.0			
Lane LOS	F	A				
Approach Delay (s)	231.5	0.9	0.0			
Approach LOS	F					
Intersection Summary						
Average Delay		1.7				
Intersection Capacity Utilization		68.9%		ICU Level of Service		C
Analysis Period (min)		15				