

## Residential Development at 100 Weeping Willow, Ottawa

## Traffic Impact Assessment – Strategy Report

Homestead Land Holdings Limited

November 25, 2022



#### GHD

179 Colonnade Road South, Suite 400 Ottawa, Ontario K2E 7J4, Canada ghd.com

Last saved date	2022-11-25	
File name	RPT-11-25-2022_TIA SSF_100WEEPINGWILLOW_11229215.DOCX	
Author	Pierre-Luc Grenon	
Project manager	Vanessa Skelton	
Client name	Homestead Land Holdings Limited	
Project name	100 Weeping Willow	
Document title	Residential Development at 100 Weeping Willow, Ottawa   Traffic Impact Assessment – Strategy Report	
Revision version	Rev 04	
Project number	11229215	

#### **Document status**

Status	Revision	Author	Reviewer		Approved for issue		
Code			Name	Signature	Name	Signature	Date
Scoping	00	PL Grenon	V. Skelton		V. Skelton		06/18/2021
Forecasting	01	PL Grenon	V. Skelton		V. Skelton		08/05/2021
Strategy	02	PL Grenon	V. Skelton		V. Skelton		09/13/2021
Strategy	03	H. Baarabe	V. Skelton		V. Skelton		10/26/2022
Strategy	04	H. Baarabe	V. Skelton	Veren Stat	V. Skelton	Voren Stat	11/25/2022

#### © GHD 2022

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.



### Contents

1.	SCREENING FORM	1
2.	DESCRIPTION OF PROPOSED DEVELOPMENT	1
3.	EXISTING CONDITIONS	3
3.1	Area Multi-Modal Network	3
3.2	Intersections	5
3.3	Driveways	7
3.4	Transit	8
3.5	Peak Hour Travel Demand	9
3.6	Collision Analysis	10
4.	PLANNED CONDITIONS	10
4.1	Changes to the Area Transportation Network	10
4.2	Other Study Area Developments	11
5.	STUDY AREA	12
6.	TIME PERIODS	12
7.	HORIZON YEARS	12
8.	EXEMPTIONS REVIEW	12
9.	DEVELOPMENT-GENERATED TRAFFIC	13
9.1	Trip Generation	13
9.2	Trip distribution	14
9.3	Trip assignment	14
10.	BACKGROUND NETWORK TRAFFIC	16
10.1	Changes to the Background Transportation Network	16
10.2	General Background Growth Rates	16

10.3	Other Area Development	16
11.	DEMAND RATIONALIZATION	19
12.	DEVELOPMENT DESIGN	21
13.	PARKING	21
14.	BOUNDARY STREETS	21
15.	ACCESS INTERSECTIONS	21
16.	TRANSPORTATION DEMAND MANAGEMENT	21
16.1	Context for TDM	21
17.	NEIGHBOURHOOD TRAFFIC MANAGEMENT	22
18.	TRANSIT	22
19.	REVIEW OF NETWORK CONCEPT	22
20.	INTERSECTION DESIGN	22
20.1	Existing Intersection Operations	22
20.2	Network Intersection MMLOS	23
20.3	Future Intersection Operations - 2024	24
20.4	Future Intersection Operations- 2029	25
21.	SUMMARY OF IMPROVEMENTS INDICATED AND MODIFICATION OPTIONS	26

#### Table index

Table 1 – Intersection configuration	6
Table 2 – Existing Driveways	7
Table 3 – Other Study Area Developments	11
Table 4 – Impacted Intersections Within the Study Area	12
Table 5 – Residential Mode Share for High-Rise Housing in the Kanata / Stittsville District	13
Table 6 – Trip Generation by Mode	13
Table 7 – Level of Service	22
Table 8 – Existing intersection operations	23
Table 9 – Network Intersection MMLOS Analysis	23
Table 10 – 2024 Intersection Operations with development	24
Table 11 – 2029 Intersection Operations with development	25

#### **Figure index**

Figure 1 – Existing site and proposed plan	. 2
Figure 2 – Cycling and pedestrian facilities	. 3
Figure 3 – Road Classification	. 4
Figure 4 – Truck routes	. 5
Figure 5 – Access locations	. 7
Figure 6 – Transit facilities and bus stops	. 8
Figure 7 – Vehicular volumes at the intersections	. 9
Figure 8 – Other Study Area Developments	11
Figure 9 – Development new trips assignment	15
Figure 10 – 2024 Background Volumes without development	17
Figure 11 – 2029 Background Volumes without development	18
Figure 12 – 2024 Background Volumes with development	19
Figure 13 – 2029 Background Volumes with development	20

#### **Appendices**

- Appendix A Screening Form
- Appendix B Architectural plans
- Appendix C Bus Schedules
- Appendix D Traffic Counts
- Appendix E Collision Data
- Appendix F TDM Measures Checklist
- Appendix G Existing Intersection Operations
- Appendix H MMLOS Analysis
- Appendix I 2024 Intersection Operations with Development
- Appendix J 2029 Intersection Operations with Development
- Appendix K Comments and Responses

## 1. Screening Form

GHD prepared a Transportation Impact Assessment (TIA) to support the new residential development at 100 Weeping Willow Lane, Ottawa, Ontario. The TIA was completed according to the City of Ottawa's Transportation Impact Assessment Guidelines (2017). This study consists of the five mandatory steps which are screening, scoping, forecasting, analysis, and reporting. All steps and their respective modules are completed in sequence. The purpose of this study is to forecast the potential impacts of the new development on the existing transportation network and determine any improvements needed to mitigate these impacts. The Screening form has been prepared and is included as Appendix A. As shown in the Screening form, the Trip Generation trigger is satisfied, and the TIA study must proceed to the next step.

## 2. Description of Proposed Development

The proposed development is located on the corner of Weeping Willow Lane (formerly Varley Lane) and Varley Drive with a civic address of 100 Weeping Willow Lane. The development will be built next to an existing apartment building.

The subject lands are designated General Urban Area in the City's Official Plan and are zoned R5A [1533] H(30) S331 and R5A [1533] H(20) S331. Pursuant to Schedule B5 of the City of Ottawa's Draft Official Plan, the subject lands are identified within the Suburban Transect and Neighbourhood Designation.

The proposed development involves constructing a 9-storey residential building on the land south-east of the intersection. A full-movement access will be provided to the surface and underground parking lots from Weeping Willow Lane. The existing accesses on Weeping Willow Lane will be used for the development. The western access will be approximately 10 meters farther from the intersection of Varley Drive than in the existing conditions and the existing parking in front of the existing apartment building will be optimized to improve vehicle circulation patterns.

Pedestrians can access the building using a north-facing entrance or a south-facing entrance. Sidewalks are planned along Weeping Willow Lane and south of the development to connect with the existing sidewalk on Varley Drive. The proposed development is not within a Design Priority Area.

The building will contain 142 residential units and provide 199 parking spaces with 142 underground spaces and 57 spaces at ground level. The construction is planned to start in 2022 and will be completed by the end of the year 2024 with occupancy starting in 2023. Figure 1 shows the existing site and proposed plan. The architectural plans are provided in Appendix B.



## 3. Existing Conditions

#### 3.1 Area Multi-Modal Network

Teron Road is a north-south major collector road with one lane per direction and a posted speed limit of 50 km/hr. There are bike lanes in both directions as shown in Figure 2.

Varley Drive is a north-south collector road with one lane per direction and a posted speed limit of 40 km/hr. There is a multi-use path on the east side of the road to the south of Weeping Willow Lane.

Weeping Willow Lane is a U-shaped local street that gives access to the residents from Varley Drive. It has one lane per direction with perpendicular parking. There is no sidewalk.

Beaverbrook Road is an east-west collector road with one lane per direction. The posted speed limit is 40 km/hr and there is a sidewalk on the north side of the road. There are cycling lanes along the road in the vicinity of the intersection with Varley Drive and a bike path that crosses Beaverbrook Road approximately 80m east of Varley Drive.

There are no traffic management measures existing in the study area. The road classification is shown in Figure 3. There are no truck routes in the study area as shown on Figure 4.



Figure 2 – Cycling and pedestrian facilities

Source: geoOttawa

Figure 3 – Road Classification



Source: geoOttawa

Figure 4 – Truck routes



#### 3.2 Intersections

Varley Drive / Weeping Willow Lane is controlled with a stop sign for westbound vehicles. All the approaches have only one lane that is shared for all movements.

Varley Drive / Beaverbrook Road is controlled by a stop sign for all approaches. All the approaches have only one lane that is shared for all movements.

Teron Road / Beaverbrook Road is controlled by traffic signals. All approaches have a left turn lane and a lane for the through and right movements.

The intersection configurations are shown in Table 1.

#### Table 1 – Intersection configuration

	Geometry	Control		
Varley Drive / Weeping Willow Lane				
<b>Northbound</b> Varley Drive	Ŷ	None		
Southbound Varley Drive	Ŷ	None		
Westbound Weeping Willow Lane	Ŷ	STOP		
Va	arley Drive / Beaverbrook F	Road		
<b>Northbound</b> Varley Drive	Ŷ	STOP		
Southbound Varley Drive	Ŷ	STOP		
Eastbound Beaverbrook Road	Ŷ	STOP		
Westbound Beaverbrook Road	Ŷ	STOP		
Т	eron Road / Beaverbrook R	load		
<b>Northbound</b> Teron Road	うた			
Southbound Teron Road	h			
Eastbound Beaverbrook Road	うた			
Westbound Beaverbrook Road	ዀ			

#### 3.3 Driveways

Two existing driveways will provide vehicular access to the site. The locations of driveways in the study area are summarized in Table 2.

ID	Land use	Location
1	Residential (proposed development main access)	Weeping Willow Lane – South side
2	Residential (proposed development secondary access)	Weeping Willow Lane – South side
3	Individual house	Varley Drive – West side
4	Individual house	Varley Drive – West side
5	Individual house	Varley Drive – West side
6	Individual house	Varley Drive – West side
7	Individual house	Varley Drive – West side
8	Individual house	Varley Drive – West side
9	Individual house	Varley Drive – West side

7	ahle	2 _	Fristing	Driveways
	abie	<u> </u>	LAISUNG	Direways

#### Figure 5 – Access locations



#### 3.4 Transit

There is one bus route (#265) on Varley Drive. That route only travels northbound, and the closest stop is located 60 meters south of Weeping Willow Lane. On Beaverbrook Road, there is only one route (#168) that travels east-west.

There are also 4 more bus routes on Teron Road (#63, #64, #110 and #166). The nearest bus stop on Teron Road is 350 meters south of the project. Bus route #63 is a rapid bus service operating 7 days/week in all time periods. It connects Kanata to Gatineau City Center. Bus route #64 is a local bus service that transits between OC Transpo - Innovation Park & Ride and Tunney's Pasture. Route #110 is a local bus service that transits between OC Transpo - Innovation Park & Ride and Fallowfield Station and the main roads that this route uses are Teron Road, Eagleson Road, Stonehaven Drive and Fallowfield Road. Bus route #166 is a local bus service that travels north-south.

The location of the bus stops in the study area are shown in yellow in Figure 6. The bus schedules are provided in Appendix C.



Figure 6 – Transit facilities and bus stops

#### 3.5 Peak Hour Travel Demand

Traffic counts were completed by GHD on June 15<sup>th</sup> 2021 at Weeping Willow Lane/Varley Drive and Beaverbrook Road/ Varley Drive. To take into account the impacts of the pandemic on the traffic volumes, calibration was completed using a count provided by the City for Teron Road & Beaverbrook Road intersection. The traffic volumes used in the TIA are shown in Figure 7. The traffic counts are presented in Appendix D.



Figure 7 – Vehicular volumes at the intersections

#### 3.6 Collision Analysis

The collision data was taken from the City of Ottawa open data website and is provided in Appendix E. The data covers a period of 5 years from 2015 until 2019. In total, 14 collisions occurred within the study area.

#### WEEPING WILLOW LANE

There were no collisions listed on Weeping Willow Lane.

#### VARLEY DRIVE

Two collisions were listed on Varley Drive between Beaverbrook Road and Milne Crescent. Both were injury collisions and both involved only one vehicle travelling southbound. One collision was in early December and the other late January. The weather was clear at the time of the collisions.

#### BEAVERBROOK ROAD

A single collision was listed between Teron Road and Leacock Drive with a vehicle going westbound turning left and another one going eastbound. The collision was property damage only and happened during daylight with clear conditions.

#### **TERON ROAD & BEAVERBROOK ROAD**

There were 8 collisions at this intersection from 2015 to 2019 with the following impact types: 5 SMV, 2 angle and 1 turning movement. Two collisions happened with bicycles and three involved pedestrians. 75% of the collisions occurred during daylight with clear conditions and there were two collisions during rainy or snowy conditions. Five collisions caused non-fatal injuries. Out of the 5 collisions involving active transportation, four of them have "failed to yield right-of-way" as the driver 1 action and the other one is an "improper turn".

#### VARLEY DRIVE & BEAVERBROOK ROAD

One collision occurred in 2019 where a vehicle failed to yield at the stop sign during rainy conditions, which resulted in an angle collision with non-fatal injury. The collision involved a vehicle travelling eastbound and another travelling southbound.

#### **BEAVERBROOK ROAD & LEACOCK DRIVE**

One collision happened in 2019 during snowy conditions where two vehicles travelling northbound collided (rear-end collision) resulting in personal damages only.

### 4. Planned Conditions

#### 4.1 Changes to the Area Transportation Network

According to the Ottawa Transportation Master Plan Affordable Network, a BRT is planned along March Road to connect with Highway 417 with a station at the intersection of Teron Road. That station will be approximately 400 meters from the proposed development.

Many cycling links are planned in the area according to the Ottawa Cycling Plan. A spine route is to be added along March Road with local routes on Teron Road, Beaverbrook Road and Varley Drive.

A sidewalk is planned on Varley Drive, on the west side of the road, from Beaverbrook Road to the existing sidewalk at Milne Crescent.

#### 4.2 Other Study Area Developments

The planned developments in the vicinity of the proposed development are as shown in Figure 8 and described in Table 3. However, given the locations and the sizes of these projects, they are unlikely to have a significant impact on the studied intersections.



Figure 8 – Other Study Area Developments

Source: Ottawa Development Applications Search

Table 3 – Other Study Area Developments

Location	Details
329 March Road	Three unit, single-storey commercial building of 380 m <sup>2</sup>
1131 Teron Road	3-storey apartment building
1151 Teron Road	9-storey apartment building
100 Steacie	Two 4-storey apartment buildings
231-251 Penfield Drive	8 townhouses

## 5. Study Area

The proposed development is located at the corner of Varley Drive and Weeping Willow Lane.

There is only one arterial intersection (March Road / Teron Road) that is within 1 km from the proposed development, as measured along roadways. However, few vehicles are expected to travel through that intersection since it is expected that most of the trips generated will be heading south towards Highway 417. Therefore, this intersection was not included in the study analyses.

The intersections that will be directly impacted by the development are identified in the table below. The primary access to the apartment building will be Weeping Willow Lane, which means most vehicles exiting and entering the building will travel through the intersection of Varley Drive / Weeping Willow Lane.

Intersection	Description
Varley Drive / Weeping Willow Lane	Adjacent to development
Varley Drive / Beaverbrook Road	Within 400m of the development access
Teron Road / Beaverbrook Road	Within 1 000m of the development access

## 6. Time Periods

The proposed development is a Medium-Rise residential building therefore the AM and PM peak hours will be examined since these times represent the peak travel time scenario.

## 7. Horizon Years

The planned year of development build-out is 2024 with full occupancy that same year. Therefore, the build-out plus five years horizon is 2029. The analysis will be completed for 2021 (existing), 2024 and 2029.

## 8. Exemptions Review

Based on the development proposed and following the Transportation Impact Assessment Guidelines (2017), this TIA is exempted from:

- Module 4.1.3: This development is not a subdivision
- Module 4.2.2: The parking supply meets the demand
- Module 4.6: The additional 36 vehicles generated in AM peak hour or 37 vehicles in the PM peak hour will not change the existing classification of the road
- Module 4.8: The development generates fewer than 200 person-trips in the peak hour

## 9. Development-generated Traffic

#### 9.1 Trip Generation

#### 9.1.1 Trip Generation Rates

The projected site trips were estimated based on TRANS Trip Generation Manual October 2020. The person-trip rates for a multi-unit mid-rise or high-rise dwelling unit (Land Use Code 221 and 222) is 0.80 for AM peak period and 0.90 for PM peak period. Thus, for the project, the total person-trips generated is 114 during AM peak period and 128 during PM peak period. No reduction was applied to the rates provided in TRANS Trip Generation Manual October 2020.

#### 9.1.2 Mode Shares

The recommended mode shares by TRANS district for high-rise multi family dwelling are summarized in Table 5.

Travel Mode	Mode Share	Mode Share
	AM	PM
Auto-Driver	43 %	55 %
Auto Passenger	26 %	19 %
Transit	28 %	21 %
Cycling	0 %	0 %
Walking	4 %	5 %

Table 5 – Residential Mode Share for High-Rise Housing in the Kanata / Stittsville District

Using the mode share, the number of generated trips per mode were calculated. The peak period to peak hour adjustment provided in the TRANS Trip Generation Manual October 2020 was used to calculate the number of trips that the proposed development will generate, per mode, per period. The recommended vehicle directional split for multi-unit high-rise is 31% inbound during AM Peak and 58% inbound during PM Peak. Table 6 summarizes trip generation by mode.

Table 6	6 – Tri	p Gene	eration	by	Mode
---------	---------	--------	---------	----	------

Period	Travel Mode	Mode share	Trips Peak Period	Peak period to peak hour factor	Trips Peak Hour	In	Out
	Auto Driver	43 %	49	0.48	24	7	17
АМ	Auto Passenger	26 %	30	0.48	14	4	10
	Transit	28 %	32	0.55	18	6	12
	Active	4 %	5	0.58	3	1	2
	Total		116		59	18	41

Period	Travel Mode	Mode share	Trips Peak Period	Peak period to peak hour factor	Trips Peak Hour	In	Out
	Auto Driver	55 %	70	0.44	31	18	13
РМ	Auto Passenger	19 %	24	0.44	11	6	5
	Transit	21 %	27	0.47	13	8	5
	Active	5 %	6	0.50	3	2	1
	Total		127		58	34	24

The proposed development will generate 24 vehicle trips in the AM peak hour and 31 vehicle trips in the PM peak hour since we assume that the "auto passenger" mode are passengers to the "auto driver" mode.

#### 9.2 Trip distribution

The trip distribution was completed using the existing travel patterns in the study area. Hence, the trip distribution is as follow for vehicles exiting the development in the AM peak hour. We assume the same proportions in the opposite direction for the PM peak hour.

- To the north using Varley Drive: 25%
- To the west using Varley Drive and Beaverbrook Road: 11%
- To the east using Varley Drive and Beaverbrook Road: 64%

#### 9.3 Trip assignment

Using the distribution above and the existing turning movement splits, the trips generated were assigned to the road network. Figure 9 shows the new trips assigned on the road network.



## 10. Background Network Traffic

#### **10.1** Changes to the Background Transportation Network

The transportation network plans were discussed in the Scoping Report. No changes are planned on the road network.

#### 10.2 General Background Growth Rates

The background growth rates were calculated using data from the TRANS Regional Model. GHD was provided snapshots for horizons 2011 and 2031. From the volumes estimated for both horizons, the growth was calculated on each road within the study area on a yearly basis. These annual growth rates were then used to expand the traffic counts, from the year they were completed to the forecasted horizons of 2024 and 2029. The annual growth rates are the following:

- 0.8% on Beaverbrook Road
- 0.4% on Teron Road
- 0.7% on Varley Drive

#### 10.3 Other Area Development

The volumes generated by the 1131-1151 Teron Road development were included in the background volumes (Figure 11 of the Parsons TIA Strategy Report). There other developments planned in the area, as listed in section 4.2, are unlikely to have a significant impact on the studied intersections given their sizes.

Figure 10 and Figure 11 show the projected background volumes without the development for 2024 and 2029.





## 11. Demand Rationalization

The trip generation is consistent with the procedure set by the City of Ottawa and since the traffic generated by the project is low, no adjustments are required.

Figure 12 and Figure 13 show the projected volumes with the development project for 2024 and 2029.







## 12. Development Design

Module 4.1.3 is exempt because this development is not a subdivision. The remainder of Module 4.1 is not required for a zoning application. These modules will be completed at the site plan application stage.

## 13. Parking

Module 4.2.2 is exempt because the parking supply meets the demand. The remainder of Module 4.2 is not required for a zoning application. These modules will be completed at the site plan application stage.

#### 14. Boundary Streets

Module 4.3 is not required for a zoning application. This module will be completed at the site plan application stage.

#### 15. Access Intersections

Module 4.4 is not required for a zoning application. This module will be completed at the site plan application stage.

### 16. Transportation Demand Management

#### 16.1 Context for TDM

The mode share used within the TIA represent the travel trends for this area of the City with auto and transit being the most important modes. Parking is planned in the development for the residents.

The development is not located within a Design Priority Area or a Transit-oriented Development zone. Homestead Land Holdings will be the property owner and property manager of the apartment building.

The total number of bedrooms will be reviewed once the zoning amendment is approved and confirmed during site plan. A total of 142 units are projected and there are no age restrictions.

#### 16.1.1 Need and Opportunity

The auto and transit modes will be the main modes of travel for the development but given the size of the project, the volumes generated are low. To encourage active travel, there are 103 parking spaces planned for bicycles, which is more than the number required by the zoning (71).

#### 16.1.2 TDM Program

The TDM Measures Checklist was completed and can be found in Appendix F. The key TDM measure for this development is to unbundle parking cost from monthly rent. Other measures to be put in place are:

- Display local area maps at entrances showing local walking and cycling routes.

- Display transit schedules and route maps in the lobby area

### 17. Neighbourhood Traffic Management

This section is intentionally left blank as this module is exempt from the present study.

#### 18. Transit

The expected transit volumes from the development are low with 18 new trips during AM peak hour and 13 new trips during PM peak hour.

According to the Transportation Master Plan Affordable Network, a BRT with at-grade crossings is planned on March Road, between Highway 417 and Soland Road. A station is planned at the intersection of Teron Road, a 600 meters walking distance from the development.

Thus, given that the site is well served by public transportation and that new transit infrastructure will be put in place to improve transit in the area, the addition of less than 20 new trips in the transit system at peak hours should not be an issue.

#### 19. Review of Network Concept

This section is intentionally left blank as this module is exempt from the present study.

#### 20. Intersection Design

#### 20.1 Existing Intersection Operations

The only signalized intersection in the study area is Teron Road / Beaverbrook Road. During both the AM and PM peak periods, the intersection operates on a free mode with a pedestrian recall on the through phases. The maximum cycle length is 95 seconds during AM peak and 107 seconds during PM peak.

The level of service (LOS) is based on the volume to capacity ratio (v/c) according to the guidelines from the City's Multimodal level of Service (MMLOS) Guide, as shown in Table 7. The results of the operational analysis at each intersection during AM and PM peak hours are shown in Table 8. The detailed performance results are provided in Appendix G.

Level of Service	Volume to Capacity Ratio
A	0 to 0.60
В	0.61 to 0.70
С	0.71 to 0.80
D	0.81 to 0.90

Table 7 – Level of	Service
--------------------	---------

Level of Service	Volume to Capacity Ratio					
E	0.91 to 1.00					
F	>1.00					

Intersection	Movement		۹M	РМ		
Intersection	wovement	V/C	LOS	V/C	LOS	
	WBL/R	0.07	А	0.04	А	
Varley Drive & Weeping Willow Lane	NBT/R	0.00	А	0.00	А	
(unsignalized)	SBL/T	0.00	А	0.00	А	
	Overall	0.02	Α	0.01	Α	
	EBL/T/R	0.40	А	0.35	А	
	WBL/T/R	0.37	А	0.50	А	
Beaverbrook Road & Varley Drive (unsignalized)	NBL/T/R	0.09	А	0.11	А	
(unorginalizod)	SBL/T/R	0.15	А	0.17	А	
	Overall	0.33	В	0.38	В	
	EBL	0.29	А	0.23	А	
	EBT/R	0.6	А	0.70	В	
	WBL	0.07	А	0.09	А	
	WBT/R	0.15	А	0.06	А	
Teron Road & Beaverbrook Road (signalized)	NBL	0.37	А	0.58	А	
(orginalizod)	NBT/R	0.51	А	0.17	А	
	SBL	0.02	А	0.04	А	
	SBT/R	0.28	А	0.81	D	
	Overall	0.47	Α	0.68	В	

Table 8 – Existing	intersection	operations
--------------------	--------------	------------

Note: saturation	flow rate of	f 1900	vob/b/lana	and DHE	
Note. Saturation	now rate o	1 1000	ven/n/lane		JI 0.90

During the AM peak hour, all the intersections show good overall performance with LOS 'A' to LOS 'B'. The movement showing the highest v/c is the southbound through and right-turn movements during the PM peak hour with a v/c of 0.81 and a LOS 'D'. The minimum desirable LOS target is 'D' for a general urban area according to the MMLOS Guide of the City of Ottawa.

#### 20.2 Network Intersection MMLOS

Table 9 summarizes the MMLOS analysis for the network intersections. The MMLOS detailed worksheet is presented in Appendix H. The target is based on the general urban area criteria in the MMLOS Guide of the City of Ottawa.

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
Varley Drive & Weeping Willow Lane	А	С	В	D	N/A	D	N/A	N/A	А	D
		<ul> <li>Image: A start of the start of</li></ul>	~		– (Unsignalized intersection)		-		~	

Table 9 – Network Intersection MMLOS Analysis

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
	A	С	В	D	N/A	D	N/A	N/A	A	D
Beaverbrook Road & Varley Drive		✓	~		– (Unsignalized intersection)		-		~	
Teron Road &	С	С	В	D	D	D	N/A	N/A	С	D
Beaverbrook Road		✓	۰	/	٦	1		-	٦	/

The targets are met for all criteria and at each intersection.

#### 20.3 Future Intersection Operations - 2024

The results of the operational analysis at each intersection during AM and PM peak hours are shown in Table 10. The detailed results are provided in Appendix I.

Intersection Mov	Movement	AM		PM	
	wovement	V/C	LOS	V/C	LOS
Varley Drive & Weeping Willow Lane (unsignalized)	WBL/R	0.09	А	0.05	А
	NBT/R	0.00	А	0.00	А
	SBL/T	0.00	А	0.01	А
	Overall	0.03	Α	0.01	Α
Beaverbrook Road & Varley Drive (unsignalized)	EBL/T/R	0.37	А	0.32	А
	WBL/T/R	0.35	А	0.47	А
	NBL/T/R	0.08	А	0.10	А
	SBL/T/R	0.15	А	0.17	А
	Overall	0.31	Α	0.35	Α
Teron Road & Beaverbrook Road (signalized)	EBL	0.26	А	0.22	А
	EBT/R	0.56	А	0.68	В
	WBL	0.06	А	0.08	А
	WBT/R	0.13	А	0.05	А
	NBL	0.35	А	0.54	А
	NBT/R	0.48	А	0.16	А
	SBL	0.02	А	0.04	А
	SBT/R	0.28	А	0.79	С
	Overall	0.44	Α	0.66	В

Table 10 – 2024 Intersection Operations with development

Note: saturation flow rate of 1800 veh/h/lane and PHF of 1.00

The intersection operations for 2024 are within the range of LOS 'A' and LOS 'C'. Thus, traffic will operate adequately even with the impacts of the development. Traffic operation results for the background and total traffic is similar due to the low number of development generated trips.

#### 20.4 Future Intersection Operations- 2029

The results of the operational analysis at each intersection during AM and PM peak hours are shown in Table 11. The detailed results are provided in Appendix J.

Intersection M	Movement	AM		РМ	
		V/C	LOS	V/C	LOS
Varley Drive & Weeping Willow Lane (unsignalized)	WBL/R	0.09	A	0.05	А
	NBT/R	0.00	А	0.00	А
	SBL/T	0.00	А	0.01	А
	Overall	0.03	Α	0.01	Α
Beaverbrook Road & Varley Drive (unsignalized)	EBL/T/R	0.39	A	0.34	А
	WBL/T/R	0.37	А	0.50	А
	NBL/T/R	0.09	А	0.10	А
	SBL/T/R	0.16	A	0.18	А
	Overall	0.32	Α	0.37	Α
Teron Road & Beaverbrook Road (signalized)	EBL	0.27	А	0.22	А
	EBT/R	0.59	А	0.69	В
	WBL	0.07	A	0.08	А
	WBT/R	0.14	A	0.05	А
	NBL	0.36	A	0.57	А
	NBT/R	0.48	A	0.17	А
	SBL	0.02	А	0.04	А
	SBT/R	0.28	A	0.80	С
	Overall	0.45	Α	0.67	В

able 11 – 2029 Intersection	Operations with development
-----------------------------	-----------------------------

Note: saturation flow rate of 1800 veh/h/lane and PHF of 1.00

The intersection operations for 2029 are similar to the 2024 conditions. Thus, traffic will operate adequately even with the impacts of the development. Traffic operation results for the background and total traffic is similar due to the low number of development generated trips.

## 21. Summary of Improvements Indicated and Modification Options

The following summarizes the analysis and the results presented in this TIA report:

#### Proposed site and screening

- Located in the south-east corner of Varley Drive / Weeping Willow Lane intersection
- Residential development with 142 residential units, 142 underground parking spaces and 57 at-grade vehicular parking spaces and 103 bicycle parking spaces
- Construction is planned to start in 2022 and to be completed by the end of 2024 with occupancy starting in 2023
- A pedestrian connection is planned to the sidewalk on Varley Drive and a sidewalk is planned along Weeping Willow Lane, from Varley Drive to the development's entrance
- Site is served by transit and is 600 meters from the Kanata North Transitway BRT station at Teron Road

#### Forecasting

- Development will generate 116 and 127 new person trips respectively for the AM and PM peak hours with 24 new vehicle trips during AM peak hour and 31 during PM peak hour
- New vehicle trips will mostly be heading southbound to Teron Road
- Yearly background growth rates were calculated on each road in the study area using TRANS model outputs. Annual growth rates are below 1% for all collector roads

#### Strategy

- Managers of the development will unbundle parking costs from monthly rent
- Bicycle parking spaces are planned for the site and will be easily accessible
- The development generates less than 20 transit trips at peak hour which should not cause issues with the existing transit system
- The operations of the intersections within the study area remain similar between the existing and projected conditions (2025 and 2030). No mitigation is required.

All of Which is Respectfully Submitted,

GHD

Vanessa Skelton, P.Eng.

# Appendices

## Appendix A Screening Form

## Appendix B Architectural drawings

## Appendix C Bus schedules

## Appendix D Traffic Counts
# Appendix E Collision Data

# Appendix F TDM Measures Checklist

# Appendix G Existing Intersection Operations

# Appendix H MMLOS Analysis

## **Appendix I** 2024 Intersection Operations with Development

# **Appendix J** 2029 Intersection Operations with Development

# Appendix K Comments and Responses



ghd.com



# Appendices

# Appendix A Screening Form



### **TIA Plan Reports**

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

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

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

### CERTIFICATION



I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;



I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;



I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and



I am either a licensed<sup>1</sup> or registered<sup>2</sup> professional in good standing, whose field of expertise

is either transportation engineering

or transportation planning.

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

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



Ust-

Signature of individual certifier that s/he meets the above criteria

Office Contact Information (Please Print)			
Address: 179 Colonnade Road South Suite 400			
City / Postal Code: K2E 7J4			
Telephone / Extension: +1 613 288-1727			
E-Mail Address: Vanessa.Skelton@ghd.com			

### Stamp





### **City of Ottawa 2017 TIA Guidelines Screening Form**

### **1.** Description of Proposed Development

Municipal Address	
Description of Location	
Land Use Classification	
Development Size (units)	
Development Size (m <sup>2</sup> )	
Number of Accesses and Locations	
Phase of Development	
Buildout Year	

### 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, <u>the Trip Generation</u> <u>Trigger is satisfied.</u>



### **3. Location Triggers**

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

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

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

# 4. Safety TriggersYesNoAre posted speed limits on a boundary street are 80 km/hr or greater?Image: Constraint of the street of t

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

5. Summary		
	Yes	No
Does the development satisfy the Trip Generation Trigger?		
Does the development satisfy the Location Trigger?		
Does the development satisfy the Safety Trigger?		

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

# Appendix B Architectural drawings



Þ



rla/architecture





























rla/architecture





Þ

₼





₽





Þ

Ψ

PERSPECTIVES

SHEET #

12

4



Ф

PLOT DATE: Monday, October 03, 2022



PERSPECTIVES

SHEET #

13

PLOT DATE: Monday, October 03, 2022

Þ





₼

Þ

Ψ

SHEET #

14



Ъ

₽



Þ





₽

# Appendix C Bus schedules

### Schedules & Maps

The next service change is on Saturday, September 04.

Schedule times are based on typical driving conditions and may vary. Please arrive at your stop a few minutes early to allow for any fluctuations in schedule.

Wed, Jul 21

### 63 Briarbrook via Innovation

During morning and afternoon peak periods on weekdays, eastbound trips stop at Lincoln Fields, Dominion and Westboro Stations for drop-off only. No boarding. [L] Continues to Innovation

SACRE COEUR / LAURIER	PROMENADE / TERRASSES DE LA CHAUDIÈRE	TUNNEY'S PASTURE B	BAYSHORE 1A	INNOVATION A	MAXWELL BRIDGE / WINDANCE	INNOVATION B
		05:24	05:37	05:55		
		05:40	05:53	06:11		
		05:54	06:07	06:26		
		06:08	06:21	06:40		
		06:22	06:35	06:55		
		06:28	06:41			
		06:35	06:48	07:10		
		06:43	06:56			
		06:49	07:02	07:25		
		06:58	07:11			
		07:04	07:17	07:40		
		07:14	07:27			
		07:19	07:32	07:55		
		07:34	07:47	08:11		
		07:52	08:05	08:31		
		08:22	08:35	09:02		
		08:53	09:06	09:32		
		09:27	09:40	10:02		
		09:59	10:12	10:32		
		10:29	10:42	11:02		
		10:59	11:12	11:32		
		11:29	11:42	12:02		
		12:00[L]	12:13[L]	12:32	12:38	12:49
		12:30[L]	12:43[L]	13:02	13:08	13:19
		13:00[L]	13:13[L]	13:32	13:38	13:49
		13:30[L]	13:43[L]	14:03	14:09	14:19
		14:00[L]	14:13[L]	14:33	14:39	14:49
		14:30[L]	14:43[L]	15:03	15:09	15:19
		15:00[L]	15:13[L]	15:33	15:39	15:49
14:59[L]	15:07[L]	15:18[L]	15:31[L]	15:51	15:57	16:07
#### Schedules & Maps | OC Transpo

SACRE COEUR / LAURIER	PROMENADE / TERRASSES DE LA CHAUDIÈRE	TUNNEY'S PASTURE B	BAYSHORE 1A	INNOVATION A	MAXWELL BRIDGE / WINDANCE	INNOVATION B
		15:35[L]	15:49[L]	16:10	16:15	16:27
15:27[L]	15:36[L]	15:48[L]	16:02[L]	16:23	16:28	16:40
		16:05[L]	16:19[L]	16:41	16:48	16:59
15:56[L]	16:05[L]	16:18[L]	16:32[L]	16:53	16:59	17:11
		16:33[L]	16:47[L]	17:09	17:16	17:27
16:25[L]	16:34[L]	16:48[L]	17:02[L]	17:24	17:31	17:42
		17:05[L]	17:19[L]	17:41	17:48	17:58
16:55[L]	17:04[L]	17:18[L]	17:32[L]	17:54	18:01	18:11
17:12[L]	17:21[L]	17:32[L]	17:46[L]	18:09	18:15	18:25
		17:48[L]	18:02[L]	18:20	18:27	18:37
17:45[L]	17:52[L]	18:03[L]	18:17[L]	18:35	18:42	18:52
		18:20[L]	18:35[L]	18:53	18:58	19:08
18:18[L]	18:25[L]	18:35[L]	18:50[L]	19:08	19:13	19:23
		19:07[L]	19:20[L]	19:39	19:44	19:54
		19:37[L]	19:50[L]	20:09	20:14	20:24
		20:07[L]	20:20[L]	20:39	20:44	20:54
		20:37[L]	20:50[L]	21:09	21:14	21:24
		21:07[L]	21:20[L]	21:39	21:44	21:54
		21:37[L]	21:50[L]	22:09	22:14	22:24
		22:07[L]	22:20[L]	22:39	22:44	22:54
		22:37[L]	22:50[L]	23:09	23:14	23:24
		23:18[L]	23:31[L]	23:50	23:55	00:05

The next service change is on Saturday, September 04.

Schedule times are based on typical driving conditions and may vary. Please arrive at your stop a few minutes early to allow for any fluctuations in schedule.

Wed, Jul 21

63 Tunney's Pasture via Briarbrook & Gatineau

During morning and afternoon peak periods on weekdays, eastbound trips stop at Lincoln Fields, Dominion and Westboro Stations for drop-off only. No boarding. [V] to Sacré-Coeur

[x] via Legget / Solandt, to Sacré-Coeur

INNOVATION A	MAXWELL BRIDGE / WINDANCE	INNOVATION B	TERON 2A	TUNNEY'S PASTURE E	PIMISI A	PROMENADE / TERRASSES DE LA CHAUDIÈRE	SACRE COEUR / LAURIER
05:12[V]	05:17[V]	05:26[V]	05:34[V]	05:55[V]	06:01[V]	06:07	06:15
05:38[V]	05:43[V]	05:52[V]	06:00[V]	06:21[V]	06:27[V]	06:33	06:41
05:57[V]	06:02[V]	06:11[V]	06:19	06:40			
06:13[V]	06:18[V]	06:27[V]	06:37[V]	06:59[V]	07:05[V]	07:11	07:19
06:28[V]	06:33[V]	06:42[V]	06:53	07:17			
06:42[V]	06:47[V]	06:57[V]	07:08[V]	07:35[V]	07:44[V]	07:51	07:59
06:57[V]	07:02[V]	07:12[V]	07:23[V]	07:50[V]	08:00[V]	08:06	08:19
07:12[V]	07:17[V]	07:27[V]	07:39	08:06			
07:27[V]	07:32[V]	07:42[V]	07:54[V]	08:21[V]	08:30[V]	08:37	08:50
07:42[V]	07:47[V]	07:57[V]	08:09	08:35			
07:57[V]	08:02[V]	08:12[V]	08:24	08:50			
08:13[V]	08:18[V]	08:27[V]	08:40[V]	09:05[V]	09:11[V]	09:18	09:27
08:33[V]	08:38[V]	08:47[V]	09:01	09:26			
09:04[V]	09:09[V]	09:18[V]	09:29	09:51			
09:34[V]	09:39[V]	09:48[V]	09:59	10:21			
10:04[V]	10:09[V]	10:18[V]	10:29	10:51			
10:34[V]	10:39[V]	10:48[V]	10:58	11:19			
11:04[V]	11:09[V]	11:18[V]	11:28	11:51			
11:34[V]	11:39[V]	11:48[V]	11:58	12:21			
12:04[V]	12:09[V]	12:18[V]	12:28	12:50			
		12:51[V]	13:01	13:23			
		13:21[V]	13:31	13:53			
		13:51[V]	14:01	14:23			
		14:21[V]	14:34	14:59			
		14:51[V]	15:05	15:29			
		15:21[x]	15:36[V]	16:00			
		15:51[x]	16:07[V]	16:31			
		16:09[x]	16:26[V]	16:50			

#### Schedules & Maps | OC Transpo

INNOVATION A	MAXWELL BRIDGE / WINDANCE	INNOVATION B	TERON 2A	TUNNEY'S PASTURE E	PIMISI A	PROMENADE / TERRASSES DE LA CHAUDIÈRE	SACRE COEUR / LAURIER
		16:29[x]	16:48[V]	17:12			
		16:42[x]	17:01[V]	17:25			
		17:01[x]	17:21[V]	17:45			
		17:13[x]	17:30[V]	17:54			
		17:29[x]	17:45[V]	18:09			
		17:44[x]	18:00[V]	18:24			
		18:00[x]	18:16[V]	18:40			
		18:13[x]	18:29[V]	18:53			
		18:27[x]	18:42[V]	19:06			
		18:43[x]	18:58[V]	19:22			
		18:54[x]	19:09[V]	19:33			
		19:10[x]	19:23[V]	19:46			
		19:25[x]	19:38[V]	20:01			
		19:56[x]	20:09[V]	20:30			
		20:26[x]	20:39[V]	20:59			
		20:56[x]	21:09[V]	21:29			
		21:26[x]	21:38[V]	21:58			
		21:56[x]	22:08[V]	22:28			
		22:26[x]	22:38[V]	22:58			
		22:56[x]	23:08[V]	23:28			
		23:26[x]	23:38[V]	23:58			
		00:07[x]	00:19[V]	00:38			

The next service change is on Saturday, September 04.

Schedule times are based on typical driving conditions and may vary. Please arrive at your stop a few minutes early to allow for any fluctuations in schedule.

Wed, Jul 21

### 64 Morgan's Grant via Innovation

During morning and afternoon peak periods on weekdays, eastbound trips stop at Lincoln Fields, Dominion and Westboro Stations for drop-off only. No boarding. [S] Ends at Innovation

[V] Via March

TUNNEY'S PASTURE B	LINCOLN FIELDS	BAYSHORE 1A	TERON 1A	LEGGET / SOLANDT	INNOVATION A	OLD SECOND LINE / BRADY	INNOVATION B
05:46[S]	05:53[S]	05:59[S]	06:06[S]	06:10[S]	06:19[S]		
05:59[S]	06:06[S]	06:12[S]	06:19[S]	06:23[S]	06:32[S]		
06:14[S]	06:21[S]	06:27[S]	06:34[S]	06:38[S]	06:47[S]		
06:27[S]	06:34[S]	06:40[S]	06:47[S]	06:53[S]	07:02[S]		
06:42[S]	06:49[S]	06:55[S]	07:02[S]	07:08[S]	07:17[S]		
06:57[S]	07:04[S]	07:10[S]	07:17[S]	07:23[S]	07:32[S]		
07:12[S]	07:19[S]	07:25[S]	07:32[S]	07:38[S]	07:47[S]		
07:26[S]	07:33[S]	07:39[S]	07:46[S]	07:52[S]	08:02[S]		
07:44[S]	07:51[S]	07:57[S]	08:05[S]	08:12[S]	08:22[S]		
08:07[S]	08:14[S]	08:20[S]	08:28[S]	08:37[S]	08:47[S]		
08:43[S]	08:50[S]	08:56[S]	09:04[S]	09:11[S]	09:20[S]		
09:16[S]	09:23[S]	09:29[S]	09:37[S]	09:41[S]	09:50[S]		
09:47[S]	09:54[S]	10:00[S]	10:07[S]	10:11[S]	10:20[S]		
10:17[S]	10:24[S]	10:30[S]	10:37[S]	10:41[S]	10:50[S]		
10:47[S]	10:54[S]	11:00[S]	11:07[S]	11:11[S]	11:20[S]		
11:17[S]	11:24[S]	11:30[S]	11:37[S]	11:41[S]	11:50[S]		
11:46[S]	11:53[S]	11:59[S]	12:06[S]	12:10[S]	12:19[S]		
12:15	12:22	12:28	12:35	12:39	12:48	12:52	13:01
12:45	12:52	12:58	13:05	13:09	13:18	13:22	13:31
13:15	13:22	13:28	13:35	13:40	13:49	13:53	14:02
13:45	13:52	13:59	14:06	14:11	14:19	14:23	14:32
14:15	14:22	14:29	14:36	14:41	14:49	14:53	15:02
14:45	14:52	14:59	15:06	15:11	15:19	15:23	15:32
15:15[V]	15:23[V]	15:29[V]	15:38[V]		15:48	15:53	16:02
15:30[V]	15:38[V]	15:44[V]	15:53[V]		16:03	16:08	16:17
15:45[V]	15:53[V]	15:59[V]	16:08[V]		16:18	16:23	16:32
16:00[V]	16:08[V]	16:14[V]	16:23[V]		16:34	16:39	16:48
16:15[V]	16:23[V]	16:29[V]	16:38[V]		16:49	16:54	17:03
16:30[V]	16:38[V]	16:44[V]	16:53[V]		17:05	17:10	17:19

#### Schedules & Maps | OC Transpo

TUNNEY'S PASTURE B	LINCOLN FIELDS 1A	BAYSHORE 1A	TERON 1A	LEGGET / SOLANDT	INNOVATION A	OLD SECOND LINE / BRADY	INNOVATION B
16:45[V]	16:53[V]	16:59[V]	17:08[V]		17:20	17:25	17:34
17:00[V]	17:08[V]	17:14[V]	17:23[V]		17:35	17:40	17:49
17:15[V]	17:23[V]	17:29[V]	17:38[V]		17:50	17:56	18:05
17:30[V]	17:38[V]	17:44[V]	17:53[V]		18:02	18:06	18:15
17:43[V]	17:51[V]	17:57[V]	18:06[V]		18:15	18:19	18:28
17:58[V]	18:06[V]	18:12[V]	18:21[V]		18:30	18:34	18:43
18:29[V]	18:37[V]	18:43[V]	18:52[V]		19:01	19:05	19:14
18:52	18:59	19:06	19:13	19:17	19:25	19:29	19:38
19:22	19:29	19:35	19:42	19:46	19:54	19:58	20:07
19:52	19:59	20:05	20:12	20:16	20:24	20:28	20:37
20:22	20:29	20:35	20:42	20:46	20:54	20:58	21:07
20:52	20:59	21:05	21:12	21:16	21:24	21:28	21:37
21:22	21:29	21:35	21:42	21:46	21:54	21:58	22:07
21:52	21:59	22:05	22:12	22:16	22:24	22:28	22:37
22:22	22:29	22:35	22:42	22:46	22:54	22:58	23:07

The next service change is on Saturday, September 04.

Schedule times are based on typical driving conditions and may vary. Please arrive at your stop a few minutes early to allow for any fluctuations in schedule.

Wed, Jul 21

## 64 Tunney's Pasture via Morgan's Grant

During morning and afternoon peak periods on weekdays, eastbound trips stop at Lincoln Fields, Dominion and Westboro Stations for drop-off only. No boarding. [V] Via Legget

INNOVATION A	OLD SECOND LINE / BRADY	INNOVATION B	LEGGET / SOLANDT	EAGLESON 2A	BAYSHORE 2A	LINCOLN FIELDS 2A	TUNNEY'S PASTURE C
05:32	05:35	05:43		05:55	06:01	06:09	06:14
05:57	06:00	06:08		06:20	06:26	06:34	06:39
06:07	06:10	06:18		06:30	06:36	06:44	06:49
06:21	06:24	06:33		06:44	06:51	07:00	07:05
06:34	06:38	06:48		07:00	07:08	07:18	07:25
06:49	06:53	07:03		07:15	07:23	07:34	07:41
07:04	07:08	07:18		07:30	07:38	07:49	07:56
07:19	07:23	07:33		07:45	07:53	08:04	08:11
07:34	07:38	07:48		08:00	08:08	08:19	08:26
07:49	07:53	08:03		08:15	08:21	08:31	08:38
08:04	08:08	08:18		08:30	08:36	08:45	08:52
08:24	08:28	08:38		08:50	08:56	09:05	09:12
08:49	08:53	09:03		09:15	09:21	09:28	09:35
09:22	09:25	09:33		09:45	09:51	09:58	10:05
09:52	09:55	10:03		10:15	10:21	10:28	10:35
10:22	10:25	10:33		10:45	10:51	10:58	11:05
10:52	10:55	11:03		11:15	11:21	11:28	11:34
11:22	11:25	11:33		11:45	11:51	11:59	12:05
11:52	11:55	12:03		12:15	12:21	12:29	12:35
12:21	12:25	12:33		12:45	12:52	12:59	13:05
		13:03		13:15	13:22	13:29	13:35
		13:33		13:44	13:51	13:58	14:04
		14:04		14:15	14:22	14:30	14:37
		14:34		14:46	14:53	15:01	15:08
		15:04		15:19	15:26	15:34	15:41
		15:34[V]	15:39[V]	15:50	15:58	16:06	16:13
		16:04[V]	16:09[V]	16:21	16:28	16:36	16:43
		16:19[V]	16:24[V]	16:36	16:43	16:51	16:58
		16:34[V]	16:39[V]	16:51	16:58	17:06	17:13
		16:50[V]	16:55[V]	17:10	17:17	17:25	17:32
		17:05[V]	17:10[V]	17:24	17:31	17:39	17:46

Schedules & Maps | OC Transpo

INNOVATION A	OLD SECOND LINE / BRADY	INNOVATION B	LEGGET / SOLANDT	EAGLESON 2A	BAYSHORE 2A	LINCOLN FIELDS 2A	TUNNEY'S PASTURE C
		17:21[V]	17:26[V]	17:39	17:46	17:54	18:01
		17:36[V]	17:41[V]	17:53	18:00	18:08	18:15
		17:51[V]	17:55[V]	18:06	18:13	18:21	18:28
		18:07[V]	18:12[V]	18:22	18:29	18:37	18:44
		18:17[V]	18:21[V]	18:31	18:37	18:45	18:52
		18:30[V]	18:34[V]	18:44	18:50	18:58	19:05
		18:45[V]	18:49[V]	18:59	19:05	19:13	19:20
		19:16[V]	19:20[V]	19:30	19:37	19:45	19:52
		19:40		19:51	19:58	20:06	20:12
		20:09		20:20	20:27	20:33	20:39
		20:39		20:50	20:57	21:03	21:09
		21:09		21:21	21:27	21:33	21:39
		21:39		21:51	21:57	22:03	22:09
		22:09		22:21	22:27	22:33	22:39
		22:39		22:51	22:57	23:03	23:09
		23:09		23:21	23:27	23:33	23:39

The next service change is on Sunday, September 04.

Schedule times are based on typical driving conditions and may vary. Please arrive at your stop a few minutes early to allow for any fluctuations in schedule.

Tue, Oct 25

INNOVATION A	LEGGET / SOLANDT	EAGLESON 3A	HAZELDEAN MALL / WEST STOP	STONEHAVEN / GRASSY PLAINS	STONEHAVEN / SUMMITVIEW	SYSTEMHOUSE / TRINITY CROSSING	AGRI-FOOD CANADA	FALLOWFIELD 2A
03:54	03:59	04:10	04:14	04:26	04:27	04:40		04:49
04:28	04:33	04:44	04:48	05:00	05:01	05:14		05:23
05:28	05:33	05:44	05:48	06:00	06:01	06:14		06:23
06:03	06:08	06:19	06:23	06:35	06:36	06:49		06:58
06:25	06:30	06:43	06:47	06:59	07:00	07:15		07:24
07:06	07:11	07:24	07:28	07:40	07:41	07:56		08:05
07:40	07:45	07:58	08:02	08:14	08:15	08:30		08:39
08:05	08:10	08:23	08:27	08:39	08:40	08:55		09:04
08:30	08:35	08:48	08:52	09:04	09:05	09:20		09:29
09:00	09:05	09:17	09:21	09:33	09:34	09:48		09:57
09:30	09:35	09:47	09:51	10:03	10:04	10:18		10:27
10:00	10:05	10:17	10:21	10:33	10:34	10:48		10:57
10:30	10:35	10:47	10:51	11:03	11:04	11:18		11:27
11:00	11:05	11:17	11:21	11:33	11:34	11:48		11:57
11:30	11:35	11:47	11:51	12:03	12:04	12:18		12:27
12:00	12:05	12:17	12:21	12:33	12:34	12:48		12:57
12:30	12:35	12:47	12:51	13:03	13:04	13:18		13:27
13:00	13:05	13:17	13:21	13:33	13:34	13:48		13:57
13:30	13:35	13:47	13:51	14:03	14:04	14:18		14:27
14:00	14:05	14:17	14:21	14:33	14:34	14:48		14:57
14:30	14:35	14:48	14:52	15:04	15:05	15:20		15:29
14:56	15:01	15:14	15:18	15:30	15:31	15:46		15:55
			15:46	15:58	15:59			
							16:11	16:17
15:26	15:31	15:44	15:48	16:00	16:01	16:16		16:25
16:00	16:05	16:18	16:22	16:34	16:35	16:50		16:59
16:30	16:35	16:48	16:52	17:04	17:05	17:20		17:29
17:00	17:05	17:18	17:22	17:34	17:35	17:50		17:59
17:30	17:35	17:48	17:52	18:04	18:05	18:20		18:29
18:02	18:07	18:20	18:24	18:36	18:37	18:52		19:01
18:37	18:42	18:54	18:58	19:10	19:11	19:25		19:34
19:12	19:17	19:29	19:33	19:45	19:46	20:00		20:09
19:39	19:44	19:56	20:00	20:12	20:13	20:27		20:36

# 110 Fallowfield

INNOVATION A	LEGGET / SOLANDT	EAGLESON 3A	HAZELDEAN MALL / WEST STOP	STONEHAVEN / GRASSY PLAINS	STONEHAVEN / SUMMITVIEW	SYSTEMHOUSE / TRINITY CROSSING	AGRI-FOOD CANADA	FALLOWFIELD 2A
20:05	20:10	20:22	20:26	20:38	20:39	20:53		21:02

The next service change is on Sunday, September 04.

Schedule times are based on typical driving conditions and may vary. Please arrive at your stop a few minutes early to allow for any fluctuations in schedule.

Tue, Oct 25

# 110 Innovation & CFIA ~ ACIA

[V] Agri-Food Canada

FALLOWFIELD 1A	CITIGATE / CROSSKEYS	SYSTEMHOUSE / PATHWAY	STONEHAVEN / GRASSY PLAINS	HAZELDEAN MALL / EAST STOP	EAGLESON 4A	LEGGET / SOLANDT	INNOVATION B	AGRI-FOOD CANADA
04:31	04:36	04:37	04:51	05:03	05:07	05:17	05:22	
05:06	05:11	05:12	05:26	05:38	05:42	05:52	05:57	
06:09	06:14	06:15	06:29	06:41	06:45	06:55	07:00	
06:35	06:43	06:44	07:00	07:12	07:16	07:29	07:34	
07:00	07:08	07:09	07:25	07:37	07:41	07:54	07:59	
07:25	07:33	07:34	07:50	08:02	08:06	08:19	08:24	
07:35[V]								07:40
07:55	08:03	08:04	08:20	08:32	08:36	08:49	08:54	
08:25	08:33	08:34	08:50	09:02	09:06	09:19	09:24	
08:55	09:03	09:04	09:20	09:32	09:36	09:49	09:54	
09:29	09:36	09:37	09:52	10:04	10:08	10:19	10:24	
09:59	10:06	10:07	10:22	10:34	10:38	10:49	10:54	
10:29	10:36	10:37	10:52	11:04	11:08	11:19	11:24	
10:59	11:06	11:07	11:22	11:34	11:38	11:49	11:54	
11:29	11:36	11:37	11:52	12:04	12:08	12:19	12:24	
11:59	12:06	12:07	12:22	12:34	12:38	12:49	12:54	
12:29	12:36	12:37	12:52	13:04	13:08	13:19	13:24	
12:59	13:06	13:07	13:22	13:34	13:38	13:49	13:54	
13:29	13:36	13:37	13:52	14:04	14:08	14:19	14:24	
13:55	14:02	14:03	14:18	14:30	14:34	14:45	14:50	
14:25	14:32	14:33	14:48	15:00	15:04	15:15	15:20	
14:55	15:03	15:04	15:20	15:32	15:36	15:49	15:54	
15:25	15:33	15:34	15:50	16:02	16:06	16:19	16:24	
15:55	16:03	16:04	16:20	16:32	16:36	16:49	16:54	
16:25	16:33	16:34	16:50	17:02	17:06	17:19	17:24	
16:57	17:05	17:06	17:22	17:34	17:38	17:51	17:56	
17:32	17:40	17:41	17:57	18:09	18:13	18:26	18:31	
18:07	18:15	18:16	18:32	18:44	18:48	19:01	19:06	
18:38	18:44	18:45	19:00	19:12	19:16	19:28	19:33	
19:04	19:10	19:11	19:26	19:38	19:42	19:54	19:59	
19:35	19:41	19:42	19:57	20:09	20:13	20:25	20:30	

FALLOWFIELD 1A	CITIGATE / CROSSKEYS	SYSTEMHOUSE / PATHWAY	STONEHAVEN / GRASSY PLAINS	HAZELDEAN MALL / EAST STOP	EAGLESON 4A	LEGGET / SOLANDT	INNOVATION B	AGRI-FOOD CANADA
19:55	20:01	20:02	20:17	20:29	20:33	20:45	20:50	
20:29	20:35	20:36	20:51	21:03	21:07	21:19	21:24	

The next service change is on Saturday, September 04.

Schedule times are based on typical driving conditions and may vary. Please arrive at your stop a few minutes early to allow for any fluctuations in schedule.

Wed, Jul 21

### 166 Innovation

EAGLESON 4A	TERON 1A	HERZBERG / MARCH	INNOVATION B
07:35	07:37	07:41	07:54

The next service change is on Saturday, September 04.

Schedule times are based on typical driving conditions and may vary. Please arrive at your stop a few minutes early to allow for any fluctuations in schedule.

Wed, Jul 21

## 166 Eagleson

INNOVATION A	HERZBERG / MARCH	TERON 2A	EAGLESON 3A
17:04	17:17	17:21	17:24

The next service change is on Saturday, September 04.

Schedule times are based on typical driving conditions and may vary. Please arrive at your stop a few minutes early to allow for any fluctuations in schedule.

Wed, Jul 21

TERRY FOX 4A	GOULBOURN FORCED / BADGELEY	BEAVERBROOK / LEACOCK	EAGLESON 3A	HAZELDEAN MALL / WEST STOP	GRASSY PLAINS/STONEHAVEN	FERNBANK / TERRY FOX
05:32	05:39	05:44	05:47	05:50	05:57	06:04
06:12	06:19	06:24	06:28	06:31	06:38	06:46
06:42	06:49	06:54	06:58	07:01	07:08	07:16
07:12	07:20	07:26	07:30	07:34	07:42	07:50
07:40	07:48	07:54	07:58	08:02	08:10	08:18
08:12	08:20	08:26	08:31	08:35	08:44	08:52
08:43	08:51	08:57	09:02	09:06	09:15	09:23
09:12	09:20	09:26	09:31	09:35	09:44	09:52
09:44	09:52	09:57	10:01	10:05	10:13	10:21
10:14	10:22	10:27	10:31	10:35	10:43	10:51
10:44	10:52	10:57	11:01	11:05	11:13	11:21
11:15	11:23	11:28	11:32	11:36	11:44	11:52
11:44	11:52	11:57	12:01	12:05	12:13	12:21
12:14	12:22	12:27	12:31	12:35	12:43	12:51
12:44	12:52	12:57	13:01	13:05	13:13	13:21
13:14	13:22	13:27	13:31	13:35	13:44	13:52
13:44	13:52	13:57	14:01	14:05	14:14	14:22
14:14	14:22	14:27	14:31	14:35	14:44	14:52
14:39	14:47	14:53	14:58	15:02	15:11	15:20
15:10	15:18	15:24	15:29	15:33	15:42	15:51
15:40	15:48	15:54	15:59	16:03	16:12	16:21
16:08	16:16	16:22	16:27	16:31	16:40	16:49
16:40	16:48	16:54	16:59	17:03	17:12	17:21
17:10	17:19	17:24	17:29	17:33	17:41	17:51
17:40	17:49	17:54	17:59	18:03	18:11	18:21
18:10	18:19	18:24	18:29	18:33	18:41	18:51
18:40	18:48	18:53	18:57	19:01	19:09	19:17
19:10	19:18	19:23	19:27	19:31	19:39	19:47
19:40	19:48	19:53	19:57	20:01	20:09	20:17
20:10	20:17	20:22	20:26	20:29	20:37	20:45
20:40	20:47	20:52	20:56	20:59	21:07	21:15
21:10	21:17	21:22	21:26	21:29	21:37	21:45
21:40	21:47	21:52	21:56	21:59	22:07	22:15
22:10	22:17	22:22	22:26	22:29	22:37	22:45
22:40	22:47	22:52	22:56	22:59	23:07	23:15
23:10	23:16	23:21	23:25	23:28	23:35	23:43

### 168 Bridlewood

https://www.octranspo.com/en/plan-your-trip/schedules-maps/?sched-lang=en&date=20210721&rte=168

Schedules & Maps | OC Transpo

TERRY FOX 4A	GOULBOURN FORCED / BADGELEY	BEAVERBROOK / LEACOCK	EAGLESON 3A	HAZELDEAN MALL / WEST STOP	GRASSY PLAINS/STONEHAVEN	FERNBANK / TERRY FOX
23:40	23:46	23:51	23:55	23:58	00:05	00:13

The next service change is on Saturday, September 04.

Schedule times are based on typical driving conditions and may vary. Please arrive at your stop a few minutes early to allow for any fluctuations in schedule.

Wed, Jul 21

FERNBANK / TERRY	GRASSY PLAINS /	HAZELDEAN MALL /	EAGLESON 4A	BEAVERBROOK /	TERRY FOX 3B
FUX	MEADOWBREEZE	EAST STOP	05.12		05-24
04:55	05:00	05:07	05:12	05:16	05:31
05:25	05:30	05:37	05:42	05:46	06:01
05:55	06:00	06:07	06:12	06:16	06:31
06:30	06:35	06:43	06:48	06:52	07:09
07:00	07:05	07:13	07:20	07:23	07:41
07:29	07:34	07:42	07:49	07:53	08:11
08:00	08:05	08:13	08:19	08:23	08:41
08:30	08:35	08:43	08:49	08:53	09:11
09:00	09:05	09:13	09:19	09:23	09:41
09:30	09:35	09:43	09:49	09:53	10:11
10:00	10:05	10:13	10:19	10:23	10:41
10:30	10:35	10:43	10:49	10:53	11:11
11:00	11:05	11:13	11:19	11:23	11:41
11:30	11:35	11:43	11:49	11:53	12:11
12:00	12:05	12:12	12:18	12:22	12:40
12:30	12:35	12:42	12:48	12:52	13:10
13:00	13:05	13:12	13:18	13:22	13:40
13:30	13:35	13:42	13:48	13:52	14:10
14:00	14:05	14:12	14:18	14:22	14:40
14:30	14:35	14:43	14:48	14:53	15:10
15:00	15:05	15:13	15:18	15:23	15:40
15:30	15:35	15:44	15:49	15:53	16:11
15:58	16:03	16:12	16:18	16:23	16:42
16:32	16:37	16:45	16:50	16:55	17:13
17:01	17:06	17:14	17:19	17:24	17:42
17:30	17:35	17:43	17:48	17:53	18:11
18:00	18:05	18:12	18:17	18:21	18:38
18:30	18:35	18:42	18:47	18:51	19:08
19:00	19:05	19:12	19:17	19:21	19:38
19:25	19:30	19:37	19:42	19:46	20:03
19:55	20:00	20:07	20:12	20:16	20:33
20:25	20:30	20:36	20:41	20:45	21:01
20:55	21:00	21:06	21:11	21:15	21:31
21:25	21:30	21:36	21:41	21:45	22:01
21:55	22:00	22:06	22:11	22:15	22:31
22:25	22:30	22:36	22:40	22:44	23:00

### 168 Terry Fox

#### Schedules & Maps | OC Transpo

FERNBANK / TERRY FOX	GRASSY PLAINS / MEADOWBREEZE	HAZELDEAN MALL / EAST STOP	EAGLESON 4A	BEAVERBROOK / LEACOCK	TERRY FOX 3B
22:55	23:00	23:06	23:10	23:14	23:30
23:25	23:30	23:36	23:40	23:44	00:00

# Appendix D Traffic Counts









		Eas	stbou	und			Wes	stbo	und			Nor	thbo	und			Sou	thbo	und		
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	2	1	0	3	1	3	0	0	4	1	1	0	0	2	0	0	0	0	0	9
0800-0900	0	4	0	0	4	1	5	2	0	8	0	0	0	0	0	1	0	0	0	1	13
1600-1700	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
1700-1800	0	3	0	0	3	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	6
Totals	0	10	1	0	11	2	11	2	0	15	1	2	0	0	3	1	0	0	0	1	30

#### Comments:

Traffic count conducted during SARS-CoV-2 (Covid-19) pandemic. All schools closed to in-class learning; however, all businesses open as well as all restaurant patios. OCTranspo and ParaTranspo buses comprise 66.67 % of the heavy vehicle traffic. The majority of the heavy truck traffic was comprised of garbage trucks. Some drivers on Beaverbrook Road and the majority of the cyclists ignore the stop control.







		Beav	erbroo	ok Rd.			Beave	erbroo	k Rd.			Lea	acock	Dr.			Va	arley D	)r.		
		Ea	istbou	nd			We	stbou	nd			No	rthbou	und			Soi	uthbou	Ind		
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	2	0	0	2	0	5	0	0	5	2	1	0	0	3	0	0	0	0	0	10
0800-0900	0	2	2	0	4	0	0	2	0	2	0	2	0	0	2	1	0	0	0	1	9
1600-1700	0	7	7	0	14	1	4	4	0	9	6	2	0	0	8	0	7	0	0	7	38
1700-1800	0	6	13	0	19	2	7	4	0	13	11	5	2	0	18	4	6	0	0	10	60
Totals	0	17	22	0	39	3	16	10	0	29	19	10	2	0	31	5	13	0	0	18	117

#### Comments:

Traffic count conducted during SARS-CoV-2 (Covid-19) pandemic. All schools closed to in-class learning; however, all businesses open as well as all restaurant patios. OCTranspo and ParaTranspo buses comprise 66.67 % of the heavy vehicle traffic. The majority of the heavy truck traffic was comprised of garbage trucks. Some drivers on Beaverbrook Road and the majority of the cyclists ignore the stop control.





#### Beaverbrook Road & Leacock Drive/Varley Drive Kanata, ON Tuesday, June 15, 2021 **Pedestrian** 0700-0900 & 1600-1800 Crossings Varley Dr. 4 Hour Survey City of Ottawa Ward ► 4 20 Beaverbrook Rd Beaverbrook Rd Grand Total 28 24 **Pedestrian Crossings** Note 赲 The values in the summary table below and the flow diagram represent the number of pedestrian crossings 11 NOT the number of individual pedestrians crossing. For example, some pedestrians will cross one approach, then another to reach their destination. Accordingly, one pedestrian crossing two approaches ñ will be recorded as two crossings. Leacock Dr.

Time Deried	West Side Crossing	East Side Crossing	Street	South Side Crossing	North Side Crossing	Street	Grand
Time Period	Beaverbrook Rd.	Beaverbrook Rd.	Total	Leacock Dr.	Varley Dr.	Total	Total
0700-0800	7	4	11	6	2	8	19
0800-0900	8	5	13	1	4	5	18
1600-1700	6	8	14	1	6	7	21
1700-1800	7	7	14	3	8	11	25
Totals	28	24	52	11	20	31	83

#### Comments:

Traffic count conducted during SARS-CoV-2 (Covid-19) pandemic. All schools closed to in-class learning; however, all businesses open as well as all restaurant patios. OCTranspo and ParaTranspo buses comprise 66.67 % of the heavy vehicle traffic. The majority of the heavy truck traffic was comprised of garbage trucks. Some drivers on Beaverbrook Road and the majority of the cyclists ignore the stop control.



### **Turning Movement Count**

Summary Report

Including AM and PM Peak Hours



Kanata, ON

**All Vehicles Except Bicycles** 

### Beaverbrook Road & Leacock Drive/Varley Drive

Survey Da Weather AM Weather PM	nte: M: M:	Tueso Overc Partly	day, J ast +1 Cloud	lune  6º C ly +23	15, 20 <sup>3º</sup> C	21 <b>S</b> u	irvey	Dura	tion:	4	Hrs.	Start Surv Surv	t Time ey Ho eyor(	e: ours: s):		0700 0700- T. Ca	-0900 <u>rmod</u>	& 160 y	<b>AAD</b> 00-18	<b>T Fa</b> 00	ctor:		0.9
	Be	eave	rbro	ok F	Rd.	Be	eave	rbro	ok F	Rd.			Lea	cocl	k Dr			Vai	rley	Dr.			
		Ea	stbou	nd			Westbound						Nor	thbo	und			Sou	ithbo	und			
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
0700-0800	2	62	6	0	70	10	36	5	0	51	121	8	1	11	0	20	15	1	4	0	20	40	161
0800-0900	4	83	5	0	92	8	51	20	0	79	171	5	2	12	0	19	22	2	4	0	28	47	218
1600-1700	5	91	18	0	114	13	102	30	0	145	259	13	1	16	0	30	21	4	8	0	33	63	322
1700-1800	10	72	11	0	93	17	110	29	0	156	249	11	4	9	0	24	21	2	9	0	32	56	305
Totals	21	308	40	0	369	48	299	84	0	431	800	37	8	48	0	93	79	9	25	0	113	206	1006

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

# Expansion factors are applied exclusively to standard <u>weekday</u> 8-hour turning movement counts conducted during the hours of 0700h - 1000h, 1130h - 1330h and 1500h - 1800h

	E	quivale	nt 12-ł	nour ve	hicle vo	olumes	. These	volum	nes are	calcula	ted by n	nultiply	ing the	8-houi	r totals	by the	8 🗭 12	expans	sion fac	ctor of 1	.39		
Equ. 12 Hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		Avera	ge dai	ly 12-ho	our veh	icle vo	lumes.	These	volum	es are c	alculate	d by m	ultiplyin	ng the o	equival	ent 12-	hour to	otals by	the AA	DT fact	or of: (	).9	
AADT 12-hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	24-H	lour AA	DT. Th	ese vo	lumes a	are calo	culated	by mu	ltiplyin	g the av	verage d	aily 12-	hour ve	ehicle v	volume	s by th	e 12 单	24 expa	ansion	factor of	of 1.31		
AADT 24 Hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

#### AADT and expansion factors provided by the City of Ottawa

AM Peak Ho	ur Fac	ctor <	•	0.9	92									Hig	hest	Hourl	y Vehi	cle Vo	lume	Betw	veen O	700h &	0900h
AM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total S	tr. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
0800-0900	4	83	5	0	92	8	51	20	0	79	171	5	2	12	0	19	22	2	4	0	28	47	218
											_												
PM Peak Ho	ur Fac	ctor 🗖		0.9	90									Higl	hest	Hourl	y Vehi	icle Vo	olume	Betw	een 1	600h &	1800h
PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total S	tr. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1630-1730	10	83	17	0	110	12	102	36	0	150	260	14	3	12	0	29	30	5	11	0	46	75	335

#### Comments:

Traffic count conducted during SARS-CoV-2 (Covid-19) pandemic. All schools closed to in-class learning; however, all businesses open as well as all restaurant patios. OCTranspo and ParaTranspo buses comprise 66.67 % of the heavy vehicle traffic. The majority of the heavy truck traffic was comprised of garbage trucks. Some drivers on Beaverbrook Road and the majority of the cyclists ignore the stop control.

#### Notes:

1. Includes all vehicle types except bicycles, electric bicycles, and electric scooters.

2. When expansion and AADT factors are applied, the results will differ slightly due to rounding.



Prepared by: thetrafficspecialist@gmail.com

Flow Diagrams: AM PM Peak













			N/A			W	eeping	Willo	w Ln.	(S)		Va	arley [	Dr.			V	arley [	)r.		
		Ea	stbou	nd			We	estbou	ind			No	<u>rthboı</u>	und			So	uthboı	und		
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800						0		0	0	0		2	0	0	2	0	0		0	0	2
0800-0900						0		0	0	0		5	0	0	5	0	1		0	1	6
1600-1700						6		0	0	6		5	0	0	5	0	3		0	3	14
1700-1800						7		0	0	7		6	0	0	6	0	3		0	3	16
Totals						13		0	0	13		18	0	0	18	0	7		0	7	38







#### Comments:

Traffic count conducted during SARS-CoV-2 (Covid-19) pandemic. All schools closed to in-class learning; however, all businesses open as well as all restaurant patios. OCTranspo and ParaTranspo buses comprise 28.57% of the heavy vehicle traffic. The majority of the heavy vehicle traffic was comprised of garbage trucks.



### **Turning Movement Count**

Summary Report

Including AM and PM Peak Hours



Kanata, ON

**All Vehicles Except Bicycles** 

### Varley Drive & Weeping Willow Lane (South)

Survey Da Weather AM Weather PM	nte: M: M:	Tues Overc Partly	day, J ast +1 Cloud	June 16º C Jy +23	15, 20 <sup>3º</sup> C	21 <b>S</b> u	irvey	Dura	tion:	4	Hrs.	Start Surv Surv	t Time ey Ho eyor(	e: ours: s):		0700 0700- T. Ca	0900 rmod	& 160 y	<b>AAD</b> 00-18	<b>T Fa</b> 00	ctor:		0.9
			N/A			Wee	eping	Willo	ow Lr	n. (S)			Vai	rley	Dr.			Vai	rley	Dr.			
		Ea	stbou	ınd			We	stbou	und				Nor	thbo	und			Sou	Ithbo	und			
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
0700-0800	0	0	0	0	0	7	0	5	0	12	12	0	7	0	0	7	1	7	0	0	8	15	27
0800-0900	0	0	0	0	0	11	0	2	0	13	13	0	18	5	0	23	2	11	0	0	13	36	49
1600-1700	0	0	0	0	0	9	0	6	0	15	15	0	15	12	0	27	5	21	0	0	26	53	68
1700-1800	0	0	0	0	0	7	0	4	0	11	11	0	22	14	0	36	4	18	0	0	22	58	69
Totals	0	0	0	0	0	34	0	17	0	51	51	0	62	31	0	93	12	57	0	0	69	162	213

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

# Expansion factors are applied exclusively to standard <u>weekday</u> 8-hour turning movement counts conducted during the hours of 0700h - 1000h, 1130h - 1330h and 1500h - 1800h

	E	quivale	nt 12-ł	nour ve	hicle vo	olumes	. These	volum	ies are	calcula	ted by n	nultiply	ing the	8-houi	r totals	by the	8 🏓 12	expans	ion fac	tor of 1	.39		
Equ. 12 Hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Average daily 12-hour vehicle volumes. These volumes are calculated by multiplying the equivalent 12-hour totals by the AADT factor of: 0.9																						
AADT 12-hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	24-H	lour AA	DT. Th	ese vo	lumes a	are calo	culated	by mu	ltiplyin	g the av	erage d	aily 12-	hour ve	ehicle v	volumes	s by th	e 12 Þ	24 expa	ansion	factor o	of 1.31		
AADT 24 Hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

#### AADT and expansion factors provided by the City of Ottawa

AM Peak Ho	our Fac	tor <		0.0	69						ſ			Hig	hest	Hourly	/ Vehi	cle Vo	lume	Betw	veen O	700h &	0900h
AM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
0730-0830	0	0	0	0	0	12	0	5	0	17	17	0	17	4	0	21	1	11	0	0	12	33	50

PM Peak He	our Fac	tor ٵ	>	0.9	95									Hig	hest	Hourly	y Vehi	cle Vo	lume	Betw	/een 1	600h &	1800h
PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1630-1730	0	0	0	0	0	9	0	2	0	11	11	0	20	16	0	36	5	28	0	0	33	69	80

#### Comments:

Traffic count conducted during SARS-CoV-2 (Covid-19) pandemic. All schools closed to in-class learning; however, all businesses open as well as all restaurant patios. OCTranspo and ParaTranspo buses comprise 28.57% of the heavy vehicle traffic. The majority of the heavy vehicle traffic was comprised of garbage trucks.

#### Notes:

1. Includes all vehicle types except bicycles, electric bicycles, and electric scooters.

2. When expansion and AADT factors are applied, the results will differ slightly due to rounding.





5479343 - MAR 10 2020 - 8HRS - LORETTA





5479343 - MAR 10 2020 - 8HRS - LORETTA



Survey D	ate: 7	Fuesda	y, Ma	rch 10,	2020							wo	No:			39	593		
Start Tir	me: (	07:00										Dev	ice:			Miov	ision/		
				F	ull s	Stud	y Sı	umma	ary (8	B HR	Sta	nda	rd)						
Survey D	ate:	Tuesda	ay, Ma	arch 10	, 2020	D		٦	Fotal C	)bserv	ved U-	Turns	•				AAD	Facto	or
							Ν	lorthbou	nd: 0		Sout	nbound	0				1.00		
								Eastbour	nd: 0		Wes	tbound:	0						
	No	orthbou	nd		So	uthbou	Ind			E	astbou	und		W	/estboi	und			
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	71	148	7	226	8	75	36	119	345	113	4	152	269	21	9	28	58	327	672
08:00 09:00	197	320	9	526	16	144	39	199	725	142	11	189	342	23	13	30	66	408	1133
09:00 10:00	98	168	7	273	10	84	41	135	408	79	4	167	250	12	4	25	41	291	699
11:30 12:30	85	99	18	202	24	185	49	258	460	56	2	103	161	18	6	18	42	203	663
12:30 13:30	90	122	18	230	11	129	56	196	426	50	3	99	152	15	0	9	24	176	602
15:00 16:00	164	147	22	333	24	177	83	284	617	66	8	147	221	22	9	20	51	272	889
16:00 17:00	205	121	26	352	22	333	133	488	840	75	5	186	266	18	6	14	38	304	1144
17:00 18:00	191	131	30	352	22	360	127	509	861	72	12	133	217	19	7	8	34	251	1112
Sub Total	1101	1256	137	2494	137	1487	564	2188	4682	653	49	1176	1878	148	54	152	354	2232	6914
U Turns	0			0	0			0	0	0			0	0			0	0	0
Total	1101	1256	137	2494	137	1487	564	2188	4682	653	49	1176	1878	148	54	152	354	2232	6914
<b>EQ 12Hr</b> Note: These	1530 values a	1746 are calcu	190 lated by	<b>3466</b> y multiply	190 ying the	2067 totals b	784 y the ap	<b>3041</b> ppropriate	6507 e expans	908 sion fact	68 or.	1635	2611	206 <b>1.39</b>	75	211	492	3103	9610
AVG 12Hr	1530	1746	190	3466	190	2067	784	3041	6507	908	68	1635	2611	206	75	211	492	3103	9610
Note: These	volumes	s are calo	culated	by multi	plying th	ne Equiv	alent 1	2 hr. tota	ls by the	AADT f	actor.			1.00					
AVG 24Hr	2004	2287	249	4540	249	2708	1027	3984	8524	1189	89	2142	3420	270	98	276	644	4064	12588
Note: These	volumes	s are calo	culated	by multij	plying th	ne Avera	age Dai	ly 12 hr. †	totals by	12 to 24	4 expan	sion fac	tor.	1.31					

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



Survey Dat	: <b>e:</b> Τι	lesda	ay, Ma	rch 10	), 202	0							WO	No:			3	9593	
Start Time	: 07	7:00											Devi	ice:			Mio	ovision	
						F		tud	. 16	: Мі	nute	Inc	rom	onte	2				
								nuu	y i		Tute		I CIII	enta	2				
	NL	orthhou	und		5	uthhau	nd			-	aathauw	. d		10/2	o th our	ad			
	INC	orindol	una	N	50	uindou	na	s	STR	E	astbour	10	F	vve	estbour	מו	w	STR	Grand
Time Period	LT	ST	RT	тот	LT	ST	RT	тот	тот	LT	ST	RT	тот	LT	ST	RT	тот	тот	Total
07:00 07:15	14	30	1	45	0	19	4	23	68	14	1	39	54	3	0	6	9	63	131
07:15 07:30	26	28	3	57	1	18	5	24	81	27	2	40	69	4	2	8	14	83	164
07:30 07:45	16	34	0	50	2	15	10	27	77	25	1	30	56	8	3	5	16	72	149
07:45 08:00	15	56	3	74	5	23	17	45	119	47	0	43	90	6	4	9	19	109	228
08:00 08:15	28	57	3	88	8	28	12	48	136	42	4	42	88	4	1	3	8	96	232
08:15 08:30	42	80	1	123	4	47	9	60	183	26	4	50	80	4	3	9	16	96	279
08:30 08:45	69	101	2	172	2	37	7	46	218	33	2	56	91	11	2	7	20	111	329
08:45 09:00	58	82	3	143	2	32	11	45	188	41	1	41	83	4	7	11	22	105	293
09:00 09:15	30	66	2	98	2	20	9	31	129	32	2	66	100	3	4	9	16	116	245
09:15 09:30	25	51	1	77	3	24	8	35	112	20	0	40	60	4	0	3	7	67	179
09:30 09:45	22	21	1	44	2	19	11	32	76	15	0	32	47	1	0	4	5	52	128
09:45 10:00	21	30	3	54	3	21	13	37	91	12	2	29	43	4	0	9	13	56	147
11:30 11:45	21	28	3	52	2	47	8	57	109	21	1	25	47	7	1	5	13	60	169
11:45 12:00	30	29	2	61	13	48	13	74	135	12	1	36	49	2	3	7	12	61	196
12:00 12:15	20	19	6	45	7	45	13	65	110	13	0	19	32	7	1	3	11	43	153
12:15 12:30	14	23	7	44	2	45	15	62	106	10	0	23	33	2	1	3	6	39	145
12:30 12:45	15	31	6	52	3	38	17	58	110	14	0	27	41	6	0	2	8	49	159
12:45 13:00	24	35	3	62	3	32	13	48	110	16	1	18	35	3	0	2	5	40	150
13:00 13:15	30	33	6	69	3	28	14	45	114	9	0	30	39	2	0	1	3	42	156
13:15 13:30	21	23	3	47	2	31	12	45	92	11	2	24	37	4	0	4	8	45	137
15:00 15:15	47	45	7	99	7	37	19	63	162	13	2	37	52	5	1	11	17	69	231
15:15 15:30	36	37	3	76	7	35	14	56	132	16	2	21	39	3	5	5	13	52	184
15:30 15:45	42	34	3	79	5	42	23	70	149	14	1	49	64	7	2	2	11	75	224
15:45 16:00	39	31	9	79	5	63	27	95	174	23	3	40	66	7	1	2	10	76	250
16:00 16:15	44	37	6	87	6	71	35	112	199	20	2	48	70	7	1	5	13	83	282
16:15 16:30	55	30	9	94	5	79	33	117	211	20	1	39	60	5	3	3	11	71	282
16:30 16:45	52	27	5	84	7	89	27	123	207	17	2	54	73	2	1	3	6	79	286
16:45 17:00	54	27	6	87	4	94	38	136	223	18	0	45	63	4	1	3	8	71	294
17:00 17:15	58	31	9	98	4	97	31	132	230	21	2	49	72	5	3	2	10	82	312
17:15 17:30	53	43	7	103	7	99	34	140	243	21	6	25	52	5	1	1	7	59	302
17:30 17:45	37	34	6	77	8	101	41	150	227	14	3	31	48	5	1	2	8	56	283
17:45 18:00	43	23	8	74	3	63	21	87	161	16	1	28	45	4	2	3	9	54	215
Total:	1101	1256	137	2494	137	1487	564	2188	4682	653	49	1176	1878	148	54	152	354	4682	6,914

Note: U-Turns are included in Totals.



Survey Date: Tuesday, March 10, 2020

WO No:

39593

Start Time: 07:00

Device:

Miovision

### Full Study Cyclist Volume

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



Survey Date: Tuesday, March 10, 2020	WO No:	39593
Start Time: 07:00	Device:	Miovision

#### Full Study Pedestrian Volume

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	3	3	3	1	4	7
07:30 07:45	0	4	4	1	0	1	5
07:45 08:00	0	2	2	2	1	3	5
08:00 08:15	0	4	4	3	3	6	10
08:15 08:30	0	0	0	5	6	11	11
08:30 08:45	0	2	2	0	6	6	8
08:45 09:00	0	3	3	2	0	2	5
09:00 09:15	0	1	1	3	1	4	5
09:15 09:30	0	2	2	1	1	2	4
09:30 09:45	0	2	2	4	1	5	7
09:45 10:00	0	2	2	2	0	2	4
11:30 11:45	0	0	0	0	4	4	4
11:45 12:00	0	0	0	1	2	3	3
12:00 12:15	0	0	0	2	2	4	4
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	1	1	2	0	2	3
12:45 13:00	0	1	1	2	0	2	3
13:00 13:15	0	0	0	1	0	1	1
13:15 13:30	0	1	1	0	0	0	1
15:00 15:15	0	3	3	5	5	10	13
15:15 15:30	0	6	6	6	4	10	16
15:30 15:45	0	1	1	0	7	7	8
15:45 16:00	0	8	8	5	1	6	14
16:00 16:15	0	2	2	2	2	4	6
16:15 16:30	0	3	3	3	0	3	6
16:30 16:45	0	2	2	1	0	1	3
16:45 17:00	0	0	0	1	0	1	1
17:00 17:15	0	3	3	3	1	4	7
17:15 17:30	0	4	4	1	0	1	5
17:30 17:45	0	0	0	1	0	1	1
17:45 18:00	0	1	1	0	0	0	1
Total	0	61	61	62	48	110	171

5479343 - MAR 10 2020 - 8HRS - LORETTA



Survey Dat	te: T	uesda	ay, Ma	rch 10	), 202	20							wo	No:			3	9593	
Start Time	<b>):</b> 0 <sup>.</sup>	7:00											Dev	ice:			Mie	ovisior	ı
						F		tud		aw	Voł	nicle							
						•		nuu	yiic	avy,	V CI	nore	3						
	N	orthbo	und		Sc	outhbou	und			F	astboui	nd		W	estbour	nd			
Time a Dania d		от	от. ПТ	Ν		от	 т	S	STR		от		Е		от.		w	STR	Grand
Time Period	LT	51	RI	тот		51	RI	тот	тот		51	RI	тот		51	RI	тот	тот	Total
07:00 07:15	0	6	0	6	0	2	0	2	8	0	0	0	0	0	0	0	0	0	8
07:15 07:30	1	5	0	6	0	1	0	1	7	0	1	1	2	0	0	0	0	2	9
07:30 07:45	0	3	0	3	0	3	2	5	8	0	0	0	0	0	0	1	1	1	9
07:45 08:00	1	5	0	6	0	2	4	6	12	1	0	2	3	0	1	0	1	4	16
08:00 08:15	1	3	1	5	1	4	0	5	10	1	0	2	3	0	0	0	0	3	13
08:15 08:30	2	0	0	2	1	4	0	5	7	0	0	9	9	0	2	0	2	11	18
08:30 08:45	2	5	0	7	0	5	1	6	13	1	0	4	5	0	1	2	3	8	21
08:45 09:00	3	4	0	7	1	3	0	4	11	2	0	1	3	0	2	0	2	5	16
09:00 09:15	0	2	0	2	0	0	1	1	3	0	0	5	5	0	0	0	0	5	8
09:15 09:30	1	1	0	2	0	3	1	4	6	0	0	2	2	0	0	0	0	2	8
09:30 09:45	2	1	0	3	0	0	1	1	4	2	0	2	4	0	0	1	1	5	9
09:45 10:00	1	4	1	6	0	4	0	4	10	0	1	0	1	0	0	1	1	2	12
11:30 11:45	0	1	0	1	0	2	0	2	3	0	0	1	1	0	0	0	0	1	4
11:45 12:00	0	1	0	1	0	1	0	1	2	0	0	0	0	0	1	0	1	1	3
12:00 12:15	0	2	0	2	0	2	0	2	4	0	0	1	1	0	0	1	1	2	6
12:15 12:30	1	1	0	2	0	1	0	1	3	0	0	1	1	0	0	0	0	1	4
12:30 12:45	1	1	0	2	0	1	0	1	3	1	0	0	1	1	0	0	1	2	5
12:45 13:00	3	2	0	5	0	1	1	2	7	1	0	1	2	0	0	0	0	2	9
13:00 13:15	0	2	0	2	0	2	1	3	5	1	0	0	1	0	0	0	0	1	6
13:15 13:30	3	1	0	4	0	2	2	4	8	1	0	0	1	0	0	0	0	1	9
15:00 15:15	1	3	0	4	1	3	0	4	8	0	0	2	2	0	0	3	3	5	13
15:15 15:30	5	4	0	9	0	2	0	2	11	0	0	1	1	0	0	0	0	1	12
15:30 15:45	0	2	0	2	0	1	0	1	3	1	0	1	2	0	0	0	0	2	5
15:45 16:00	4	2	0	6	0	2	2	4	10	3	2	2	7	0	0	0	0	7	17
16:00 16:15	1	3	0	4	0	0	0	0	4	0	0	4	4	0	0	0	0	4	8
16:15 16:30	1	3	0	4	1	7	0	8	12	2	0	2	4	0	1	0	1	5	17
16:30 16:45	1	1	0	2	0	3	0	3	5	0	0	1	1	0	0	0	0	1	6
16:45 17:00	1	2	0	3	0	3	0	3	6	0	0	0	0	0	0	0	0	0	6
17:00 17:15	1	4	0	5	0	5	0	5	10	0	0	2	2	0	0	0	0	2	12
17:15 17:30	1	3	0	4	0	3	0	3	7	0	0	0	0	0	1	0	1	1	8
17:30 17:45	0	1	0	1	0	1	0	1	2	0	0	1	1	0	0	0	0	1	3

17:45 18:00

Total: None



Survey Date:	Tuesday, March 10, 2020	WO No:	39593
Start Time:	07:00	Device:	Miovision

### Full Study 15 Minute U-Turn Total

Time	Period	Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
To	otal	0	0	0	0	0
# Appendix E Collision Data



## Transportation Services - Traffic Services Collision Details Report - Public Version

From: January 1, 2015 To: December 31, 2019

Location: BEAVE	RBROOK RD	@ LEACOCK DR	E								
Traffic Control: Sto	p sign						Total Collisions:	: 1			
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuve	r Vehicle type	First Event	No. Ped		
2015-Feb-04, Wed,17:30	Snow	Rear end	P.D. only	Loose snow	North	Slowing or stopping	g Automobile, station wagon	Other motor vehicle	0		
					North	Stopped	Automobile, station wagon	Other motor vehicle			
Location: BEAVE	RBROOK RD	@ LEACOCK DR	W/VARLEY DR E								
Traffic Control: Sto	p sign						Total Collisions:	: 1			
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuve	r Vehicle type	First Event	No. Ped		
2019-Apr-26, Fri,08:25	Rain	Angle	Non-fatal injury	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	0		
					South	Going ahead	Automobile, station wagon	Other motor vehicle			
Location: BEAVE	RBROOK RD	btwn LEACOCK D	R & TERON RD								
Traffic Control: No	control						Total Collisions:	: 1			
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuve	r Vehicle type	First Event	No. Ped		
2018-Apr-18, Wed,09:15	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0		
					East	Going ahead	Automobile, station wagon	Other motor vehicle			
Location: TERON	I RD @ BEAV	ERBROOK RD/PE	NFIELD DR N								
Traffic Control: Tra	ffic signal				Total Collisions: 8						
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuve	r Vehicle type	First Event	No. Ped		
2015-Sep-02, Wed,16:36	Clear	Angle	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0		
					West	Turning left	Passenger van	Other motor vehicle			
2015-Sep-22, Tue,17:31	Clear	Turning movement	Non-fatal injury	Dry	North	Turning left	Bicycle	Other motor vehicle	0		
					South	Going ahead	Pick-up truck	Cyclist			
2015-Oct-29, Thu,12:42	Clear	SMV other	Non-fatal injury	Dry	East	Turning left	Pick-up truck	Pedestrian	1		
2016-Nov-04, Fri,12:04	Clear	SMV other	P.D. only	Dry	North	Turning left	Automobile, station wagon	Ran off road	0		
2017-Mar-28, Tue,08:36	Rain	SMV other	Non-fatal injury	Wet	East	Turning left	Automobile, station wagon	Pedestrian	1		



## Transportation Services - Traffic Services Collision Details Report - Public Version

From: January 1, 2015 To: December 31, 2019

Location: TERON	NRD @ BEAV	ERBROOK RD/PI	ENFIELD DR N						
Traffic Control: Tra	ffic signal						Total Collisions:	8	
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuve	er Vehicle type	First Event	No. Ped
2018-Jun-28, Thu,19:57	Clear	Angle	Non-fatal injury	Dry	East	Turning left	Bicycle	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Cyclist	
2018-Dec-10, Mon,10:40	Clear	SMV other	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Skidding/sliding	0
2018-Dec-11, Tue, 18:21	Snow	SMV other	Non-fatal injury	Wet	East	Turning left	Automobile, station wagon	Pedestrian	1
Location: VARLE	Y DR @ VAR	LEY LANE N							
Traffic Control: No	control						Total Collisions:	: 1	
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuve	er Vehicle type	First Event	No. Ped
2018-Nov-03, Sat,16:30	Clear	SMV other	P.D. only	Dry	West	Turning right	Automobile, station wagon	Ran off road	0
Location: VARLE	Y DR btwn BE	AVERBROOK RE	0 & MILNE CRES						
Traffic Control: No	control						Total Collisions:	2	
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuve	er Vehicle type	First Event	No. Ped
2015-Dec-03, Thu,09:23	Clear	SMV other	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Ran off road	0
2017-Jan-31, Tue,20:50	Clear	SMV unattended vehicle	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Unattended vehicle	0

## Appendix F TDM Measures Checklist

## **TDM Measures Checklist:**

Residential Developments (multi-family, condominium or subdivision)

#### Legend

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

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

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

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

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

TDN	l measures: Residential developments	Check if proposed & add descriptions
6.	TDM MARKETING & COMMUNICATIONS	5
6.1	Multimodal travel information	
BASIC ★ 6.1.1	Provide a multimodal travel option information package to new residents	
6.2	Personalized trip planning	
BETTER ★ 6.2.1	Offer personalized trip planning to new residents	

## Appendix G Existing Intersection Operations

#### Intersection

3.1					
WBL	WBR	NBT	NBR	SBL	SBT
Y		et –			÷
44	15	67	15	3	41
44	15	67	15	3	41
0	0	0	0	0	0
Stop	Stop	Free	Free	Free	Free
-	None	-	None	-	None
0	-	-	-	-	-
e, # 0	-	0	-	-	0
0	-	0	-	-	0
90	90	90	90	90	90
0	0	17	0	0	0
49	17	74	17	3	46
	3.1 WBL 44 44 0 Stop - 0 , # 0 0 90 0 49	3.1 ₩BL WBR 44 15 44 15 44 15 0 0 Stop Stop Stop Stop 0 - 0 - ,# 0 - 90 90 0 0 49 17	3.1     WBL   WBR   NBT     WBL   UBR   NBT     44   15   67     44   15   67     44   15   67     44   15   67     0   0   0     Stop   Stop   Free     None   -     0   -   -     #   0   -   0     90   90   90   90     90   90   90   90     0   0   17   74	3.1     WBL   WBR   NBT   NBR     Y   F   F     44   15   67   15     44   15   67   15     44   15   67   15     0   0   0   0     Stop   Stop   Free   Free     0   -   -   -     0   -   0   -     0   -   0   -     90   90   90   90   90     90   0   17   0     49   17   74   17	3.1     WBL   WBR   NBT   NBR   SBL     Y   >   >   SBL     44   15   67   15   3     44   15   67   15   3     44   15   67   15   3     0   0   0   0   0     Stop   Free   Free   Free     None   -   None   -     0   -   0   -   -     0   -   0   -   -     0   -   0   -   -     0   -   0   -   -     90   90   90   90   90   90     0   0   17   0   0     49   17   74   17   3

Major/Minor	Minor1	Μ	ajor1	Ν	lajor2		
Conflicting Flow All	135	83	0	0	91	0	
Stage 1	83	-	-	-	-	-	
Stage 2	52	-	-	-	-	-	
Critical Hdwy	6.4	6.2	-	-	4.1	-	
Critical Hdwy Stg 1	5.4	-	-	-	-	-	
Critical Hdwy Stg 2	5.4	-	-	-	-	-	
Follow-up Hdwy	3.5	3.3	-	-	2.2	-	
Pot Cap-1 Maneuver	863	982	-	-	1517	-	
Stage 1	945	-	-	-	-	-	
Stage 2	976	-	-	-	-	-	
Platoon blocked, %			-	-		-	
Mov Cap-1 Maneuver	r 861	982	-	-	1517	-	
Mov Cap-2 Maneuver	r 861	-	-	-	-	-	
Stage 1	945	-	-	-	-	-	
Stage 2	974	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.5
HCM LOS	А		

Minor Lane/Major Mvmt	NBT	NBRW	BLn1	SBL	SBT
Capacity (veh/h)	-	-	889	1517	-
HCM Lane V/C Ratio	-	- (	0.074	0.002	-
HCM Control Delay (s)	-	-	9.4	7.4	0
HCM Lane LOS	-	-	Α	А	А
HCM 95th %tile Q(veh)	-	-	0.2	0	-

#### Intersection Intersection Delay, s/veh 10.3 Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			\$			\$			\$	
Traffic Vol, veh/h	12	251	15	25	162	64	15	6	36	67	6	12
Future Vol, veh/h	12	251	15	25	162	64	15	6	36	67	6	12
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
Heavy Vehicles, %	0	5	0	13	10	10	0	0	0	5	0	0
Mvmt Flow	13	279	17	28	180	71	17	7	40	74	7	13
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	10.7			10.6			8.7			9.5		
HCM LOS	В			В			А			А		

Lane	NBLn1	EBLn1	WBLn1	SBLn1	
Vol Left, %	26%	4%	10%	79%	
Vol Thru, %	11%	90%	65%	7%	
Vol Right, %	63%	5%	25%	14%	
Sign Control	Stop	Stop	Stop	Stop	
Traffic Vol by Lane	57	278	251	85	
LT Vol	15	12	25	67	
Through Vol	6	251	162	6	
RT Vol	36	15	64	12	
Lane Flow Rate	63	309	279	94	
Geometry Grp	1	1	1	1	
Degree of Util (X)	0.089	0.396	0.368	0.144	
Departure Headway (Hd)	5.069	4.619	4.756	5.493	
Convergence, Y/N	Yes	Yes	Yes	Yes	
Сар	699	775	753	647	
Service Time	3.154	2.672	2.811	3.573	
HCM Lane V/C Ratio	0.09	0.399	0.371	0.145	
HCM Control Delay	8.7	10.7	10.6	9.5	
HCM Lane LOS	А	В	В	А	
HCM 95th-tile Q	0.3	1.9	1.7	0.5	

### Queues 3: Teron Road & Beaverbrook Road

	≯	-	1	-	1	1	1	Ŧ	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Group Flow (vph)	147	247	24	58	221	375	11	191	
v/c Ratio	0.33	0.38	0.06	0.10	0.49	0.52	0.03	0.28	
Control Delay	14.5	4.4	11.7	6.6	14.8	13.7	8.6	9.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	14.5	4.4	11.7	6.6	14.8	13.7	8.6	9.3	
Queue Length 50th (m)	9.0	0.6	1.3	1.0	13.8	23.6	0.6	9.1	
Queue Length 95th (m)	23.2	13.2	5.7	7.3	29.2	42.7	2.7	19.6	
Internal Link Dist (m)		196.7		99.1		157.1		329.4	
Turn Bay Length (m)	40.0		15.0		30.0		40.0		
Base Capacity (vph)	631	824	543	769	1102	1742	821	1609	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.23	0.30	0.04	0.08	0.20	0.22	0.01	0.12	
Intersection Summary									

## HCM 6th Signalized Intersection Summary 3: Teron Road & Beaverbrook Road

10-24-2022	1	0	-24	4-	-2	0	22	
------------	---	---	-----	----	----	---	----	--

	٭	-	$\mathbf{\hat{z}}$	4	+	*	1	Ť	۲	1	ŧ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	f,		5	f,		ሻ	f,		ሻ	ĥ	
Traffic Volume (veh/h)	132	9	213	22	16	36	199	329	8	10	136	36
Future Volume (veh/h)	132	9	213	22	16	36	199	329	8	10	136	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1800	1674	1800	1660	1716	1744	1758	1800	1702	1674	1716
Adj Flow Rate, veh/h	147	10	237	24	18	40	221	366	9	11	151	40
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
Percent Heavy Veh, %	2	0	9	0	10	6	4	3	0	7	9	6
Cap, veh/h	516	17	395	342	123	273	600	723	18	452	540	143
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	1345	62	1473	1151	458	1018	1173	1708	42	968	1275	338
Grp Volume(v), veh/h	147	0	247	24	0	58	221	0	375	11	0	191
Grp Sat Flow(s),veh/h/ln	1345	0	1535	1151	0	1476	1173	0	1750	968	0	1613
Q Serve(g s), s	3.5	0.0	5.2	0.7	0.0	1.1	5.6	0.0	5.8	0.3	0.0	2.9
Cycle Q Clear(g c), s	4.6	0.0	5.2	5.9	0.0	1.1	8.5	0.0	5.8	6.1	0.0	2.9
Prop In Lane	1.00		0.96	1.00		0.69	1.00		0.02	1.00		0.21
Lane Grp Cap(c), veh/h	516	0	412	342	0	396	600	0	741	452	0	683
V/C Ratio(X)	0.29	0.00	0.60	0.07	0.00	0.15	0.37	0.00	0.51	0.02	0.00	0.28
Avail Cap(c_a), veh/h	1028	0	996	780	0	958	2008	0	2841	1613	0	2618
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.0	0.0	11.8	14.3	0.0	10.3	9.8	0.0	7.8	10.1	0.0	7.0
Incr Delay (d2), s/veh	0.3	0.0	1.5	0.1	0.0	0.2	0.4	0.0	0.6	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/In	1.0	0.0	1.8	0.2	0.0	0.4	0.9	0.0	1.1	0.0	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.4	0.0	13.3	14.4	0.0	10.5	10.2	0.0	8.4	10.1	0.0	7.2
LnGrp LOS	В	А	В	В	А	В	В	А	А	В	А	Α
Approach Vol, veh/h		394			82			596			202	
Approach Delay, s/veh		13.0			11.6			9.1			7.4	
Approach LOS		В			В			А			А	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		21.2		15.7		21.2		15.7				
Change Period (Y+Rc), s		5.6		* 5.8		5.6		* 5.8				
Max Green Setting (Gmax), s		60.0		* 24		60.0		* 24				
Max Q Clear Time (g_c+I1), s		10.5		7.2		8.1		7.9				
Green Ext Time (p_c), s		5.2		2.7		1.8		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			10.2									
HCM 6th LOS			В									

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

#### Intersection

2						
WBL	WBR	NBT	NBR	SBL	SBT	
Y		et 👘			र्भ	
24	4	63	51	11	73	
24	4	63	51	11	73	
0	0	0	0	0	0	
Stop	Stop	Free	Free	Free	Free	
-	None	-	Free	-	Free	
0	-	-	-	-	-	
,# 0	-	0	-	-	0	
0	-	0	-	-	0	
90	90	90	90	90	90	
0	0	0	0	0	0	
27	4	70	57	12	81	
	2 WBL 24 24 0 Stop - 0 ,# 0 0 90 0 27	2 WBL WBR 24 4 24 4 24 4 0 0 Stop Stop Stop Stop 1 None 0 - 90 - 90 - 90 90 0 0 27 4	2 WBL WBR NBT ↑ 1 24 4 63 24 4 63 24 4 63 0 0 0 Stop Stop Free None - None - 0 - 1 0 0 - 0 - 0 - 0 - 0 0 0 0 0 0 0	2     WBR     NBT     NBR       ₩     ₩     NBT     NBR       1     1     1     1       24     4     63     51       24     4     63     51       24     4     63     51       24     4     63     51       0     0     0     0       Stop     Stop     Free     Free       None     -     Free     Free       0     -     0     -       ,#     0     -     0     -       90     90     90     90     90       90     0     0     0     0       27     4     70     57	2     NBR     NBR     SBL       WBL     WBR     NBT     NBR     SBL       Y     I     I     SBL       24     4     63     51     11       24     4     63     51     11       Q     0     0     0     0       Stop     Stop     Free     Free     Free       None     -     Free     -     -       0     -     0     -     -       0     -     0     -     -       0     -     0     -     -       0     -     0     -     -       0     -     0     -     -       90     90     90     90     90     90       0     0     0     0     0     0       0     0     0     0     0     0       10     0     0     0     0     0	2   WBL WBR NBT NBR SBL SBT   Y Image: Probability of the stress

Major/Minor	Minor1	Μ	lajor1	Ν	/lajor2		
Conflicting Flow All	175	70	0	-	70	0	
Stage 1	70	-	-	-	-	-	
Stage 2	105	-	-	-	-	-	
Critical Hdwy	6.4	6.2	-	-	4.1	-	
Critical Hdwy Stg 1	5.4	-	-	-	-	-	
Critical Hdwy Stg 2	5.4	-	-	-	-	-	
Follow-up Hdwy	3.5	3.3	-	-	2.2	-	
Pot Cap-1 Maneuver	819	998	-	0	1544	-	
Stage 1	958	-	-	0	-	-	
Stage 2	924	-	-	0	-	-	
Platoon blocked, %			-			-	
Mov Cap-1 Maneuver	r 812	998	-	-	1544	-	
Mov Cap-2 Maneuver	r 812	-	-	-	-	-	
Stage 1	958	-	-	-	-	-	
Stage 2	917	-	-	-	-	-	

Approach	WB	NB	SB	
HCM Control Delay, s	9.5	0	1	
HCM LOS	A			

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	834	1544	-
HCM Lane V/C Ratio	-	0.037	0.008	-
HCM Control Delay (s)	-	9.5	7.3	0
HCM Lane LOS	-	Α	А	А
HCM 95th %tile Q(veh)	-	0.1	0	-

## Intersection Delay, s/veh 11 Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			\$			4			\$	
Traffic Vol, veh/h	22	173	38	28	240	85	31	7	25	62	11	24
Future Vol, veh/h	22	173	38	28	240	85	31	7	25	62	11	24
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
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	24	192	42	31	267	94	34	8	28	69	12	27
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay 10.3				12.1			9.2			9.6		
HCM LOS	В			В			А			А		

Lane	NBLn1	EBLn1	WBLn1	SBLn1	
Vol Left, %	49%	9%	8%	64%	
Vol Thru, %	11%	74%	68%	11%	
Vol Right, %	40%	16%	24%	25%	
Sign Control	Stop	Stop	Stop	Stop	
Traffic Vol by Lane	63	233	353	97	
LT Vol	31	22	28	62	
Through Vol	7	173	240	11	
RT Vol	25	38	85	24	
Lane Flow Rate	70	259	392	108	
Geometry Grp	1	1	1	1	
Degree of Util (X)	0.107	0.341	0.496	0.166	
Departure Headway (Hd)	5.504	4.74	4.55	5.546	
Convergence, Y/N	Yes	Yes	Yes	Yes	
Сар	655	751	784	651	
Service Time	3.508	2.824	2.623	3.548	
HCM Lane V/C Ratio	0.107	0.345	0.5	0.166	
HCM Control Delay	9.2	10.3	12.1	9.6	
HCM Lane LOS	А	В	В	А	
HCM 95th-tile Q	0.4	1.5	2.8	0.6	

## Queues 3: Teron Road & Beaverbrook Road

	۶	-	•	-	1	1	1	Ŧ	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Group Flow (vph)	86	203	18	17	241	172	24	565	
v/c Ratio	0.29	0.42	0.08	0.05	0.55	0.16	0.05	0.85	
Control Delay	33.0	9.1	30.9	20.8	12.2	5.2	14.4	34.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	33.0	9.1	30.9	20.8	12.2	5.2	14.4	34.0	
Queue Length 50th (m)	11.5	1.4	2.3	0.9	14.0	8.5	2.4	78.1	
Queue Length 95th (m)	29.1	20.9	9.2	7.0	28.5	15.2	6.8	118.4	
Internal Link Dist (m)		196.7		99.1		157.1		329.4	
Turn Bay Length (m)	40.0		15.0		30.0		40.0		
Base Capacity (vph)	520	705	389	642	465	1383	679	986	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.17	0.29	0.05	0.03	0.52	0.12	0.04	0.57	
Intersection Summary									

## HCM 6th Signalized Intersection Summary 3: Teron Road & Beaverbrook Road

10-24-2022	1	0	-24	4-	-2	0	22	
------------	---	---	-----	----	----	---	----	--

	≯	→	$\mathbf{\hat{z}}$	4	+	*	1	1	۲	1	ŧ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	<u> </u>	4		ň	4		۳.	4		٦	4	
Traffic Volume (veh/h)	77	10	173	16	6	9	217	128	27	22	379	130
Future Volume (veh/h)	77	10	173	16	6	9	217	128	27	22	379	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1800	1772	1800	1800	1800	1772	1688	1800	1800	1744	1800
Adj Flow Rate, veh/h	86	11	192	18	7	10	241	142	30	24	421	144
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
Percent Heavy Veh, %	0	0	2	0	0	0	2	8	0	0	4	0
Cap, veh/h	373	16	275	196	127	181	414	845	178	634	521	178
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.11	0.63	0.63	0.42	0.42	0.42
Sat Flow, veh/h	1418	83	1455	1198	670	957	1688	1351	285	1232	1242	425
Grp Volume(v), veh/h	86	0	203	18	0	17	241	0	172	24	0	565
Grp Sat Flow(s),veh/h/ln	1418	0	1538	1198	0	1628	1688	0	1636	1232	0	1667
Q Serve(q s), s	3.3	0.0	7.6	0.9	0.0	0.5	4.4	0.0	2.7	0.7	0.0	18.3
Cycle Q Clear(q c), s	3.8	0.0	7.6	8.4	0.0	0.5	4.4	0.0	2.7	0.7	0.0	18.3
Prop In Lane	1.00		0.95	1.00		0.59	1.00		0.17	1.00		0.25
Lane Grp Cap(c), veh/h	373	0	291	196	0	308	414	0	1023	634	0	700
V/C Ratio(X)	0.23	0.00	0.70	0.09	0.00	0.06	0.58	0.00	0.17	0.04	0.00	0.81
Avail Cap(c a), veh/h	797	0	751	554	0	795	633	0	1747	1020	0	1221
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.0	0.0	23.3	27.2	0.0	20.4	11.4	0.0	4.8	10.5	0.0	15.6
Incr Delay (d2), s/veh	0.3	0.0	3.3	0.2	0.0	0.1	1.4	0.0	0.1	0.0	0.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	3.0	0.3	0.0	0.2	1.2	0.0	0.5	0.2	0.0	5.7
Unsig. Movement Delay, s/veh	1											
LnGrp Delay(d),s/veh	22.3	0.0	26.5	27.4	0.0	20.5	12.8	0.0	4.9	10.6	0.0	18.1
LnGrp LOS	С	А	С	С	А	С	В	А	А	В	А	В
Approach Vol. veh/h		289			35			413			589	
Approach Delay, s/veh		25.3			24.1			9.5			17.8	
Approach LOS		С			С			A			В	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		44.0		17.4	12.6	31.4		17.4				
Change Period (Y+Rc), s		5.6		* 5.8	5.6	5.6		* 5.8				
Max Green Setting (Gmax), s		65.6		* 30	15.0	45.0		* 30				
Max Q Clear Time (g_c+I1), s		4.7		9.6	6.4	20.3		10.4				
Green Ext Time (p_c), s		1.5		2.1	0.7	5.5		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			17.0									
HCM 6th LOS			В									

#### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# Appendix H MMLOS Analysis

	INTERSECTIONS			Varley Drive / Weeping Willow Lane							
			NORTHBOUND	WESTBOUND	SOUTHBOUND						
	Lanes		2	2	2						
z	Median		No median	No median	No median						
TRIA	Island Refuge		No	No	No						
EDES	Crosswalk Type		Standard transverse markings	Standard transverse markings	Standard transverse markings						
B	Lovel of convice		A (101)	A (104)	A (109)						
	Level of service		A								
	Type of Bikeway		Mixed Traffic	Mixed Traffic	Mixed Traffic						
	Turning Speed (25km/h to 80 km/h)		25	25	25						
	Right Turn Storage Length		0 to 25 m	0 to 25 m	0 to 25 m						
	Dual Right Turn ?		No	No	No						
ы	Shared Through-Right ?		No	No	No						
/CLI	Bike Box ?		No	No	Νο						
G	Number of Lanes Crossed for L	_eft Turns	1	1	1						
	Operating Speed on Approach		40-49 km/h	< 40 km/h	40-49 km/h						
	Dual Left Turn Lanes ?		No	No	No						
	Lovel of convice		A	А	В						
	Level of service			В							
то	Level of service	АМ	A	A	A						
AU	Level of service		A	A	A						

INTERSECTIONS			Beaverbrook Road / Varley Drive										
		NORTHBOUND	WESTBOUND	SOUTHBOUND	EASTBOUND								
Lanes		2	2	2	2								
Median		No median	No median	No median	No median								
Island Refuge		No	No	No	No								
Corner Radius (largest)		0	2	0	0								
Crosswalk Type		Standard transverse markings	Standard transverse markings	Standard transverse markings	Standard transverse markings								
Loval of sorvice		A (103)	A (103)	A (103)	A (101)								
Level of service			4	A									
Type of Bikeway		Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic								
Turning Speed (25km/h to 8	0 km/h)	25	25	25	25								
Right Turn Storage Length		0 to 25 m	0 to 25 m	0 to 25 m	0 to 25 m								
Dual Right Turn ?		No	No	No	No								
Shared Through-Right ?		No	No	No	No								
Bike Box ?		No	No	No	No								
Number of Lanes Crossed for	or Left Turns	1	1	1	1								
Operating Speed on Approa	ch	40-49 km/h	40-49 km/h	40-49 km/h	40-49 km/h								
Dual Left Turn Lanes ?		No	No	No	No								
Lovel of convice		В	В	В	В								
Level of service			E	3									
	AM	A	A	A	A								
	PM	A	A	A	A								

	INTERSECTIONS			Teron Road / Be	averbrook Road						
	INTERSECTIONS		NORTHBOUND	WESTBOUND	SOUTHBOUND	EASTBOUND					
	Lanes		3	3	3	3					
	Median		No median	No median	No median	No median					
	Island Refuge		No	No	No	No					
	Conflicting Left Turns		Permissive	Permissive	Permissive	Protected/permissive					
RIAN	Conflicting Right Turns		Permissive	Permissive	Permissive	Permissive					
ESTF	RTOR?		RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed					
PED	Ped Leading Interval ?		No	No	No	No					
	Corner Radius (largest)		0	1	0	0					
	Crosswalk Type		Standard transverse markings	Standard transverse markings	Standard transverse markings	Standard transverse markings					
	Lovel of convice		C (71)	C (71)	C (71)	C (68)					
	Level of service			c							
	Type of Bikeway		Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic					
	Turning Speed (25km/h to 80 k	(m/h)	25	25	25	25					
	Right Turn Storage Length		0 to 25 m								
	Dual Right Turn ?		No	No	No	No					
ST	Shared Through-Right ?		No	No	No	No					
/CLI	Bike Box ?		No	No	No	No					
ΰ	Number of Lanes Crossed for I	Left Turns	1	1	1	1					
	Operating Speed on Approach		50-59 km/h	40-49 km/h	50-59 km/h	40-49 km/h					
	Dual Left Turn Lanes ?		No	No	No	No					
	Level of service		В	В	В	В					
				E	1						
μ	Average Signal Delay		9,5	24,1	17,8	25,3					
ANSI			В	D	c	D					
Т	Level of service				)						
	Turning Radius (smallest)		10-15 m	10-15 m	10-15 m	15+ m					
ICK	Number of Receiving Lanes		1	1	1	1					
TRL			E	E	E	С					
				E							
ТО	Level of service	AM	A	A	A	A					
AU		PM	A	A	D	В					

## **Appendix I** 2024 Intersection Operations with Development

#### Intersection

Int Delay, s/veh

Int Delay, s/veh	3.5								
Movement	WBL	WBR	NBT	NBR	SBL	SBT			
Lane Configurations	Y		el 👘			र्च			
Traffic Vol, veh/h	58	19	69	21	4	42			
Future Vol, veh/h	58	19	69	21	4	42			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Stop	Stop	Free	Free	Free	Free			
RT Channelized	-	None	-	None	-	None			
Storage Length	0	-	-	-	-	-			
Veh in Median Storage,	# 0	-	0	-	-	0			
Grade, %	0	-	0	-	-	0			
Peak Hour Factor	100	100	100	100	100	100			
Heavy Vehicles, %	0	0	17	0	0	0			
Mvmt Flow	58	19	69	21	4	42			

Major/Minor	Minor1	Μ	ajor1	Ν	/lajor2		
Conflicting Flow All	130	80	0	0	90	0	
Stage 1	80	-	-	-	-	-	
Stage 2	50	-	-	-	-	-	
Critical Hdwy	6.4	6.2	-	-	4.1	-	
Critical Hdwy Stg 1	5.4	-	-	-	-	-	
Critical Hdwy Stg 2	5.4	-	-	-	-	-	
Follow-up Hdwy	3.5	3.3	-	-	2.2	-	
Pot Cap-1 Maneuver	869	986	-	-	1518	-	
Stage 1	948	-	-	-	-	-	
Stage 2	978	-	-	-	-	-	
Platoon blocked, %			-	-		-	
Mov Cap-1 Maneuve	r 866	986	-	-	1518	-	
Mov Cap-2 Maneuve	r 866	-	-	-	-	-	
Stage 1	948	-	-	-	-	-	
Stage 2	975	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.6
HCM LOS	А		

Minor Lane/Major Mvmt	NBT	NBRW	BLn1	SBL	SBT	
Capacity (veh/h)	-	-	893	1518	-	
HCM Lane V/C Ratio	-	- (	0.086	0.003	-	
HCM Control Delay (s)	-	-	9.4	7.4	0	
HCM Lane LOS	-	-	А	А	А	
HCM 95th %tile Q(veh)	-	-	0.3	0	-	

## Intersection Delay, s/veh 10 Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			÷			\$			\$	
Traffic Vol, veh/h	13	259	15	26	168	71	15	6	37	80	6	14
Future Vol, veh/h	13	259	15	26	168	71	15	6	37	80	6	14
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	5	0	13	10	10	0	0	0	5	0	0
Mvmt Flow	13	259	15	26	168	71	15	6	37	80	6	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	10.3			10.3			8.5			9.4		
HCM LOS	В			В			А			А		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	26%	5%	10%	80%
Vol Thru, %	10%	90%	63%	6%
Vol Right, %	64%	5%	27%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	58	287	265	100
LT Vol	15	13	26	80
Through Vol	6	259	168	6
RT Vol	37	15	71	14
Lane Flow Rate	58	287	265	100
Geometry Grp	1	1	1	1
Degree of Util (X)	0.08	0.367	0.347	0.15
Departure Headway (Hd)	4.988	4.599	4.718	5.404
Convergence, Y/N	Yes	Yes	Yes	Yes
Сар	712	778	758	659
Service Time	3.066	2.648	2.77	3.476
HCM Lane V/C Ratio	0.081	0.369	0.35	0.152
HCM Control Delay	8.5	10.3	10.3	9.4
HCM Lane LOS	А	В	В	А
HCM 95th-tile Q	0.3	1.7	1.6	0.5

### Queues 3: Teron Road & Beaverbrook Road

	≯	-	1	-	1	1	1	Ļ
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	140	236	22	53	209	344	10	182
v/c Ratio	0.31	0.36	0.06	0.10	0.46	0.48	0.03	0.27
Control Delay	13.8	4.2	11.1	6.3	14.4	13.2	8.7	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.8	4.2	11.1	6.3	14.4	13.2	8.7	9.1
Queue Length 50th (m)	8.5	0.5	1.2	0.9	12.8	21.2	0.5	8.4
Queue Length 95th (m)	20.9	12.2	5.1	6.6	27.6	39.0	2.6	18.8
Internal Link Dist (m)		196.7		99.1		157.1		329.4
Turn Bay Length (m)	40.0		15.0		30.0		40.0	
Base Capacity (vph)	639	824	552	772	1113	1744	880	1607
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.29	0.04	0.07	0.19	0.20	0.01	0.11
Intersection Summary								

## HCM 6th Signalized Intersection Summary 3: Teron Road & Beaverbrook Road

10-24-2022
------------

	≯	-	$\mathbf{r}$	4	-	*	1	1	1	1	Ŧ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	ţ,		۲.	4Î		ሻ	4Î		۲	f,	
Traffic Volume (veh/h)	140	9	227	22	16	37	209	336	8	10	142	40
Future Volume (veh/h)	140	9	227	22	16	37	209	336	8	10	142	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1800	1674	1800	1660	1716	1744	1758	1800	1702	1674	1716
Adj Flow Rate, veh/h	140	9	227	22	16	37	209	336	8	10	142	40
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	9	0	10	6	4	3	0	7	9	6
Cap, veh/h	537	16	407	369	123	284	591	694	17	460	510	144
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	1351	59	1476	1162	445	1029	1183	1710	41	996	1256	354
Grp Volume(v), veh/h	140	0	236	22	0	53	209	0	344	10	0	182
Grp Sat Flow(s),veh/h/ln	1351	0	1534	1162	0	1474	1183	0	1751	996	0	1610
Q Serve(g s), s	3.1	0.0	4.7	0.6	0.0	1.0	5.2	0.0	5.2	0.3	0.0	2.7
Cycle Q Clear(g c), s	4.1	0.0	4.7	5.3	0.0	1.0	7.9	0.0	5.2	5.5	0.0	2.7
Prop In Lane	1.00		0.96	1.00		0.70	1.00		0.02	1.00		0.22
Lane Grp Cap(c), veh/h	537	0	423	369	0	407	591	0	710	460	0	653
V/C Ratio(X)	0.26	0.00	0.56	0.06	0.00	0.13	0.35	0.00	0.48	0.02	0.00	0.28
Avail Cap(c a), veh/h	1070	0	1028	827	0	988	2092	0	2932	1724	0	2696
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.3	0.0	11.1	13.4	0.0	9.7	9.8	0.0	7.9	9.9	0.0	7.1
Incr Delay (d2), s/veh	0.3	0.0	1.2	0.1	0.0	0.2	0.4	0.0	0.6	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	1.6	0.2	0.0	0.3	0.8	0.0	1.0	0.0	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.5	0.0	12.3	13.4	0.0	9.9	10.2	0.0	8.4	9.9	0.0	7.4
LnGrp LOS	В	А	В	В	А	А	В	А	А	А	А	А
Approach Vol, veh/h		376			75			553			192	
Approach Delay, s/veh		12.0			10.9			9.1			7.5	
Approach LOS		В			В			А			А	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		20.1		15.7		20.1		15.7				
Change Period (Y+Rc), s		5.6		* 5.8		5.6		* 5.8				
Max Green Setting (Gmax), s		60.0		* 24		60.0		* 24				
Max Q Clear Time (g_c+I1), s		9.9		6.7		7.5		7.3				
Green Ext Time (p_c), s		4.7		2.6		1.7		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			9.9									
HCM 6th LOS			Α									

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

#### Intersection

2.6						
WBL	WBR	NBT	NBR	SBL	SBT	
Y		et			ŧ	
36	6	65	67	14	75	
36	6	65	67	14	75	
0	0	0	0	0	0	
Stop	Stop	Free	Free	Free	Free	
-	None	-	Free	-	Free	
0	-	-	-	-	-	
,# 0	-	0	-	-	0	
0	-	0	-	-	0	
100	100	100	100	100	100	
0	0	0	0	0	0	
36	6	65	67	14	75	
	2.6 WBL 36 36 0 Stop - 0 ,# 0 0 100 0 36	2.6 ₩BL WBR 36 6 36 6 0 0 Stop Stop - None 0 - ,# 0 - 100 100 0 0 36 6	2.6 WBL WBR NBT → → 36 6 65 36 6 65 36 7 6 50 0 0 50 7 7 50 7	2.6       WBL     WBR     NBT     NBR       Y     I     I       36     6     65     67       36     6     65     67       36     6     65     67       36     6     65     67       36     6     55     67       0     0     0     0       Stop     Stop     Free     Free       0     -     -     -       0     -     0     -       0     -     0     -       0     -     0     -       100     100     100     100       36     6     65     67	2.6     WBL   WBR   NBT   NBR   SBL     Y   I   I     36   6   65   67   14     36   6   65   67   14     36   6   65   67   14     36   0   0   0   0     Stop   Stop   Free   Free   Free     None   -   Free   -     0   -   0   -   -     0   -   0   -   -     0   -   0   -   -     0   -   0   -   -     0   -   0   -   -     0   -   0   -   -     100   100   100   100   100     0   0   0   0   0   0     36   6   65   67   14	2.6     WBL   WBR   NBT   NBR   SBL   SBT     M   6   65   67   14   75     36   6   65   67   14   75     36   6   65   67   14   75     0   0   0   0   0   0     Stop   Free   Free   Free   Free     None   -   Free   Free   Free     0   -   0   -   Free     0   -   0   -   -     #0   -   0   -   0     0   -   0   -   0     100   100   100   100   100     100   0   0   0   0     36   6   65   67   14   75

Major/Minor	Minor1	N	1ajor1	Ν	/lajor2		
Conflicting Flow All	168	65	0	-	65	0	
Stage 1	65	-	-	-	-	-	
Stage 2	103	-	-	-	-	-	
Critical Hdwy	6.4	6.2	-	-	4.1	-	
Critical Hdwy Stg 1	5.4	-	-	-	-	-	
Critical Hdwy Stg 2	5.4	-	-	-	-	-	
Follow-up Hdwy	3.5	3.3	-	-	2.2	-	
Pot Cap-1 Maneuver	827	1005	-	0	1550	-	
Stage 1	963	-	-	0	-	-	
Stage 2	926	-	-	0	-	-	
Platoon blocked, %			-			-	
Mov Cap-1 Maneuver	r 820	1005	-	-	1550	-	
Mov Cap-2 Maneuver	r 820	-	-	-	-	-	
Stage 1	963	-	-	-	-	-	
Stage 2	918	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	1.2
HCM LOS	А		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	842	1550	-
HCM Lane V/C Ratio	-	0.05	0.009	-
HCM Control Delay (s)	-	9.5	7.3	0
HCM Lane LOS	-	Α	А	А
HCM 95th %tile Q(veh)	-	0.2	0	-

#### Intersection Intersection Delay, s/veh Intersection LOS 10.6

В

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			\$			4	
Traffic Vol, veh/h	26	179	39	29	248	99	32	7	26	72	11	28
Future Vol, veh/h	26	179	39	29	248	99	32	7	26	72	11	28
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	26	179	39	29	248	99	32	7	26	72	11	28
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	10			11.6			9			9.5		
HCM LOS	А			В			А			А		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	49%	11%	8%	65%
Vol Thru, %	11%	73%	66%	10%
Vol Right, %	40%	16%	26%	25%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	65	244	376	111
LT Vol	32	26	29	72
Through Vol	7	179	248	11
RT Vol	26	39	99	28
Lane Flow Rate	65	244	376	111
Geometry Grp	1	1	1	1
Degree of Util (X)	0.096	0.319	0.471	0.165
Departure Headway (Hd)	5.321	4.711	4.505	5.359
Convergence, Y/N	Yes	Yes	Yes	Yes
Сар	666	756	793	663
Service Time	3.419	2.778	2.564	3.45
HCM Lane V/C Ratio	0.098	0.323	0.474	0.167
HCM Control Delay	9	10	11.6	9.5
HCM Lane LOS	А	А	В	А
HCM 95th-tile Q	0.3	1.4	2.5	0.6

### Queues 3: Teron Road & Beaverbrook Road

	≯	-	•	-	1	1	1	Ļ
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	82	195	16	15	232	166	22	526
v/c Ratio	0.27	0.40	0.07	0.04	0.52	0.16	0.05	0.83
Control Delay	30.7	8.6	28.9	20.1	10.5	5.4	15.0	32.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.7	8.6	28.9	20.1	10.5	5.4	15.0	32.9
Queue Length 50th (m)	10.3	1.2	1.9	0.7	13.4	8.2	2.1	69.9
Queue Length 95th (m)	27.1	19.7	8.1	6.4	22.5	14.8	6.5	107.3
Internal Link Dist (m)		196.7		99.1		157.1		329.4
Turn Bay Length (m)	40.0		15.0		30.0		40.0	
Base Capacity (vph)	541	720	425	664	482	1432	708	1022
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.27	0.04	0.02	0.48	0.12	0.03	0.51
Intersection Summary								

## HCM 6th Signalized Intersection Summary 3: Teron Road & Beaverbrook Road

10-24-2022	1	0	-24	4-	-2	0	22	
------------	---	---	-----	----	----	---	----	--

	۶	-	$\mathbf{\hat{z}}$	4	+	×	1	1	1	1	ŧ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ľ	¢Î		ľ	el el		ľ	eî 🗧		ľ	el el	
Traffic Volume (veh/h)	82	10	185	16	6	9	232	139	27	22	388	138
Future Volume (veh/h)	82	10	185	16	6	9	232	139	27	22	388	138
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1800	1772	1800	1800	1800	1772	1688	1800	1800	1744	1800
Adj Flow Rate, veh/h	82	10	185	16	6	9	232	139	27	22	388	138
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	2	0	0	0	2	8	0	0	4	0
Cap, veh/h	380	15	273	208	121	182	430	844	164	623	493	175
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.12	0.61	0.61	0.40	0.40	0.40
Sat Flow, veh/h	1421	79	1459	1207	650	975	1688	1373	267	1239	1228	437
Grp Volume(v), veh/h	82	0	195	16	0	15	232	0	166	22	0	526
Grp Sat Flow(s),veh/h/ln	1421	0	1537	1207	0	1625	1688	0	1640	1239	0	1665
Q Serve(g_s), s	2.9	0.0	6.8	0.7	0.0	0.4	4.1	0.0	2.5	0.6	0.0	15.9
Cycle Q Clear(g_c), s	3.3	0.0	6.8	7.5	0.0	0.4	4.1	0.0	2.5	0.6	0.0	15.9
Prop In Lane	1.00		0.95	1.00		0.60	1.00		0.16	1.00		0.26
Lane Grp Cap(c), veh/h	380	0	287	208	0	304	430	0	1008	623	0	668
V/C Ratio(X)	0.22	0.00	0.68	0.08	0.00	0.05	0.54	0.00	0.16	0.04	0.00	0.79
Avail Cap(c_a), veh/h	858	0	804	614	0	849	676	0	1875	1097	0	1306
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.5	0.0	21.7	25.2	0.0	19.1	10.5	0.0	4.7	10.5	0.0	15.0
Incr Delay (d2), s/veh	0.3	0.0	3.0	0.2	0.0	0.1	1.1	0.0	0.1	0.0	0.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	2.7	0.2	0.0	0.2	1.0	0.0	0.5	0.1	0.0	4.8
Unsig. Movement Delay, s/veh	1											
LnGrp Delay(d),s/veh	20.8	0.0	24.8	25.4	0.0	19.2	11.6	0.0	4.8	10.5	0.0	17.3
LnGrp LOS	С	Α	С	С	Α	В	В	А	Α	В	Α	B
Approach Vol, veh/h		277			31			398			548	
Approach Delay, s/veh		23.6			22.4			8.8			17.0	
Approach LOS		С			С			А			В	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		40.9		16.5	12.2	28.6		16.5				
Change Period (Y+Rc), s		5.6		* 5.8	5.6	5.6		* 5.8				
Max Green Setting (Gmax), s		65.6		* 30	15.0	45.0		* 30				
Max Q Clear Time (g_c+I1), s		4.5		8.8	6.1	17.9		9.5				
Green Ext Time (p_c), s		1.5		2.0	0.7	5.2		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			16.0									
HCM 6th LOS			В									

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

## **Appendix J** 2029 Intersection Operations with Development

#### Intersection

Int Delay, s/veh	3.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		et –			÷
Traffic Vol, veh/h	59	20	71	22	4	44
Future Vol, veh/h	59	20	71	22	4	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage	,# 0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	17	0	0	0
Mvmt Flow	59	20	71	22	4	44

Major/Minor	Minor1	M	ajor1	Ν	lajor2				
Conflicting Flow All	134	82	0	0	93	0			
Stage 1	82	-	-	-	-	-			
Stage 2	52	-	-	-	-	-			
Critical Hdwy	6.4	6.2	-	-	4.1	-			
Critical Hdwy Stg 1	5.4	-	-	-	-	-			
Critical Hdwy Stg 2	5.4	-	-	-	-	-			
Follow-up Hdwy	3.5	3.3	-	-	2.2	-			
Pot Cap-1 Maneuver	864	983	-	-	1514	-			
Stage 1	946	-	-	-	-	-			
Stage 2	976	-	-	-	-	-			
Platoon blocked, %			-	-		-			
Mov Cap-1 Maneuver	<sup>-</sup> 861	983	-	-	1514	-			
Mov Cap-2 Maneuver	<sup>.</sup> 861	-	-	-	-	-			
Stage 1	946	-	-	-	-	-			
Stage 2	973	-	-	-	-	-			

Approach	WB	NB	SB	
HCM Control Delay, s	9.4	0	0.6	
HCM LOS	А			

Minor Lane/Major Mvmt	NBT	NBRW	BLn1	SBL	SBT	
Capacity (veh/h)	-	-	889	1514	-	
HCM Lane V/C Ratio	-	- (	0.089	0.003	-	
HCM Control Delay (s)	-	-	9.4	7.4	0	
HCM Lane LOS	-	-	Α	А	А	
HCM 95th %tile Q(veh)	-	-	0.3	0	-	

## Intersection Delay, s/veh 10.3 Intersection LOS B

	501	EDT			MOT		NIDI	NDT	NDD		ODT	000
Movement	ERL	ERI	EBK	WBL	WBI	WBR	NBL	NRT	NBK	SBL	SBT	SBR
Lane Configurations		4			4			4			4	
Traffic Vol, veh/h	14	270	16	27	176	73	16	6	38	82	6	15
Future Vol, veh/h	14	270	16	27	176	73	16	6	38	82	6	15
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	5	0	13	10	10	0	0	0	5	0	0
Mvmt Flow	14	270	16	27	176	73	16	6	38	82	6	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	10.6			10.5			8.6			9.6		
HCM LOS	В			В			А			А		

Lane	NBLn1	EBLn1	WBLn1	SBLn1	
Vol Left, %	27%	5%	10%	80%	
Vol Thru, %	10%	90%	64%	6%	
Vol Right, %	63%	5%	26%	15%	
Sign Control	Stop	Stop	Stop	Stop	
Traffic Vol by Lane	60	300	276	103	
LT Vol	16	14	27	82	
Through Vol	6	270	176	6	
RT Vol	38	16	73	15	
Lane Flow Rate	60	300	276	103	
Geometry Grp	1	1	1	1	
Degree of Util (X)	0.084	0.386	0.364	0.156	
Departure Headway (Hd)	5.057	4.629	4.753	5.461	
Convergence, Y/N	Yes	Yes	Yes	Yes	
Сар	701	774	753	651	
Service Time	3.144	2.684	2.811	3.541	
HCM Lane V/C Ratio	0.086	0.388	0.367	0.158	
HCM Control Delay	8.6	10.6	10.5	9.6	
HCM Lane LOS	А	В	В	А	
HCM 95th-tile Q	0.3	1.8	1.7	0.6	

### Queues 3: Teron Road & Beaverbrook Road

	٦	-	1	-	1	1	1	Ŧ	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Group Flow (vph)	145	245	23	55	217	349	10	186	
v/c Ratio	0.32	0.38	0.06	0.10	0.48	0.49	0.03	0.28	
Control Delay	14.3	4.4	11.5	6.7	14.7	13.2	8.6	9.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	14.3	4.4	11.5	6.7	14.7	13.2	8.6	9.1	
Queue Length 50th (m)	8.9	0.6	1.3	1.0	13.5	21.6	0.5	8.7	
Queue Length 95th (m)	22.5	12.9	5.4	7.0	28.6	39.5	2.6	19.0	
Internal Link Dist (m)		196.7		99.1		157.1		329.4	
Turn Bay Length (m)	40.0		15.0		30.0		40.0		
Base Capacity (vph)	634	824	545	770	1108	1743	870	1607	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.23	0.30	0.04	0.07	0.20	0.20	0.01	0.12	
Intersection Summary									

## HCM 6th Signalized Intersection Summary 3: Teron Road & Beaverbrook Road

1	0	-24	4-	-2	0	22	
I	U	-2'	+	-2	υ	22	

	٭	-	$\mathbf{\hat{z}}$	4	+	*	1	1	1	1	ŧ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ľ	4Î		ň	f,		<u>۲</u>	4		۲	4	
Traffic Volume (veh/h)	145	10	235	23	18	37	217	341	8	10	145	41
Future Volume (veh/h)	145	10	235	23	18	37	217	341	8	10	145	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1800	1674	1800	1660	1716	1744	1758	1800	1702	1674	1716
Adj Flow Rate, veh/h	145	10	235	23	18	37	217	341	8	10	145	41
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	0	9	0	10	6	4	3	0	7	9	6
Cap, veh/h	528	17	402	353	132	272	595	707	17	463	519	147
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	1349	63	1472	1153	484	996	1179	1711	40	991	1255	355
Grp Volume(v), veh/h	145	0	245	23	0	55	217	0	349	10	0	186
Grp Sat Flow(s),veh/h/ln	1349	0	1535	1153	0	1480	1179	0	1751	991	0	1610
Q Serve(q s), s	3.3	0.0	5.0	0.6	0.0	1.0	5.4	0.0	5.3	0.3	0.0	2.8
Cycle Q Clear(q c), s	4.3	0.0	5.0	5.7	0.0	1.0	8.2	0.0	5.3	5.6	0.0	2.8
Prop In Lane	1.00		0.96	1.00		0.67	1.00		0.02	1.00		0.22
Lane Grp Cap(c), veh/h	528	0	419	353	0	404	595	0	724	463	0	666
V/C Ratio(X)	0.27	0.00	0.59	0.07	0.00	0.14	0.36	0.00	0.48	0.02	0.00	0.28
Avail Cap(c a), veh/h	1051	0	1014	800	0	978	2054	0	2890	1690	0	2658
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.6	0.0	11.4	13.9	0.0	10.0	9.8	0.0	7.8	9.8	0.0	7.1
Incr Delay (d2), s/veh	0.3	0.0	1.4	0.1	0.0	0.2	0.4	0.0	0.5	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	1.7	0.2	0.0	0.3	0.8	0.0	1.0	0.0	0.0	0.5
Unsig. Movement Delay, s/veh	1											
LnGrp Delay(d),s/veh	11.9	0.0	12.8	14.0	0.0	10.1	10.2	0.0	8.3	9.9	0.0	7.3
LnGrp LOS	В	А	В	В	А	В	В	А	А	А	А	А
Approach Vol. veh/h		390			78			566			196	
Approach Delay, s/veh		12.5			11.3			9.1			7.4	
Approach LOS		В			В			А			А	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		20.6		15.7		20.6		15.7				
Change Period (Y+Rc), s		5.6		* 5.8		5.6		* 5.8				
Max Green Setting (Gmax), s		60.0		* 24		60.0		* 24				
Max Q Clear Time (g_c+I1), s		10.2		7.0		7.6		7.7				
Green Ext Time (p_c), s		4.8		2.7		1.7		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			10.0									
HCM 6th LOS			В									

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

#### Intersection

Int Delay, s/veh	2.6						
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	Y		et			ŧ	
Traffic Vol, veh/h	37	6	68	69	15	78	
Future Vol, veh/h	37	6	68	69	15	78	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	Free	-	Free	
Storage Length	0	-	-	-	-	-	
Veh in Median Storage,	# 0	-	0	-	-	0	
Grade, %	0	-	0	-	-	0	
Peak Hour Factor	100	100	100	100	100	100	
Heavy Vehicles, %	0	0	0	0	0	0	
Mvmt Flow	37	6	68	69	15	78	

Major/Minor	Minor1	Ν	lajor1	Ν	/lajor2		
Conflicting Flow All	176	68	0	-	68	0	
Stage 1	68	-	-	-	-	-	
Stage 2	108	-	-	-	-	-	
Critical Hdwy	6.4	6.2	-	-	4.1	-	
Critical Hdwy Stg 1	5.4	-	-	-	-	-	
Critical Hdwy Stg 2	5.4	-	-	-	-	-	
Follow-up Hdwy	3.5	3.3	-	-	2.2	-	
Pot Cap-1 Maneuver	818	1001	-	0	1546	-	
Stage 1	960	-	-	0	-	-	
Stage 2	921	-	-	0	-	-	
Platoon blocked, %			-			-	
Mov Cap-1 Maneuver	r 810	1001	-	-	1546	-	
Mov Cap-2 Maneuver	r 810	-	-	-	-	-	
Stage 1	960	-	-	-	-	-	
Stage 2	912	-	-	-	-	-	

Approach	WB	NB	SB	
HCM Control Delay, s	9.6	0	1.2	
HCMLOS	А			

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	832	1546	-
HCM Lane V/C Ratio	-	0.052	0.01	-
HCM Control Delay (s)	-	9.6	7.4	0
HCM Lane LOS	-	Α	А	А
HCM 95th %tile Q(veh)	-	0.2	0	-

#### Intersection Intersection Delay, s/veh Intersection LOS 10.9 В

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			\$			\$			\$	
Traffic Vol, veh/h	27	186	41	30	258	103	33	7	27	74	12	29
Future Vol, veh/h	27	186	41	30	258	103	33	7	27	74	12	29
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	27	186	41	30	258	103	33	7	27	74	12	29
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	10.3			12			9.1			9.7		
HCM LOS	В			В			А			А		

lano	NRI n1	FRI n1	WRI n1	SRI n1
Vol Lett, %	49%	11%	8%	64%
Vol Thru, %	10%	73%	66%	10%
Vol Right, %	40%	16%	26%	25%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	67	254	391	115
LT Vol	33	27	30	74
Through Vol	7	186	258	12
RT Vol	27	41	103	29
Lane Flow Rate	67	254	391	115
Geometry Grp	1	1	1	1
Degree of Util (X)	0.102	0.335	0.493	0.176
Departure Headway (Hd)	5.497	4.751	4.54	5.524
Convergence, Y/N	Yes	Yes	Yes	Yes
Сар	655	749	786	653
Service Time	3.501	2.835	2.614	3.524
HCM Lane V/C Ratio	0.102	0.339	0.497	0.176
HCM Control Delay	9.1	10.3	12	9.7
HCM Lane LOS	А	В	В	А
HCM 95th-tile Q	0.3	1.5	2.8	0.6
### Queues 3: Teron Road & Beaverbrook Road

	٦	-	•	-	1	1	1	Ļ	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Group Flow (vph)	85	202	16	15	240	168	23	541	
v/c Ratio	0.28	0.41	0.07	0.04	0.54	0.16	0.05	0.84	
Control Delay	31.9	8.9	29.8	20.7	11.4	5.3	14.7	33.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	31.9	8.9	29.8	20.7	11.4	5.3	14.7	33.3	
Queue Length 50th (m)	10.9	1.3	2.0	0.7	14.0	8.3	2.3	72.9	
Queue Length 95th (m)	28.5	20.6	8.3	6.5	25.8	15.0	6.6	111.4	
Internal Link Dist (m)		196.7		99.1		157.1		329.4	
Turn Bay Length (m)	40.0		15.0		30.0		40.0		
Base Capacity (vph)	533	715	404	653	475	1409	696	1005	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.16	0.28	0.04	0.02	0.51	0.12	0.03	0.54	
Intersection Summary									

## HCM 6th Signalized Intersection Summary 3: Teron Road & Beaverbrook Road

1(	0-	24	1-	2(	0	22
----	----	----	----	----	---	----

	≯	→	$\mathbf{\hat{z}}$	4	+	*	1	1	۲	1	ŧ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	<u> </u>	4		ň	4		٦	4		٦	4	
Traffic Volume (veh/h)	85	11	191	16	6	9	240	140	28	23	396	145
Future Volume (veh/h)	85	11	191	16	6	9	240	140	28	23	396	145
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1800	1772	1800	1800	1800	1772	1688	1800	1800	1744	1800
Adj Flow Rate, veh/h	85	11	191	16	6	9	240	140	28	23	396	145
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	2	0	0	0	2	8	0	0	4	0
Cap, veh/h	380	16	276	202	124	185	424	845	169	625	497	182
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.12	0.62	0.62	0.41	0.41	0.41
Sat Flow, veh/h	1421	84	1454	1199	650	975	1688	1365	273	1237	1218	446
Grp Volume(v), veh/h	85	0	202	16	0	15	240	0	168	23	0	541
Grp Sat Flow(s),veh/h/ln	1421	0	1538	1199	0	1625	1688	0	1639	1237	0	1664
Q Serve(g s), s	3.1	0.0	7.3	0.8	0.0	0.4	4.4	0.0	2.6	0.7	0.0	17.0
Cycle Q Clear(g c), s	3.5	0.0	7.3	8.0	0.0	0.4	4.4	0.0	2.6	0.7	0.0	17.0
Prop In Lane	1.00		0.95	1.00		0.60	1.00		0.17	1.00		0.27
Lane Grp Cap(c), veh/h	380	0	292	202	0	309	424	0	1013	625	0	679
V/C Ratio(X)	0.22	0.00	0.69	0.08	0.00	0.05	0.57	0.00	0.17	0.04	0.00	0.80
Avail Cap(c_a), veh/h	826	0	775	578	0	818	652	0	1805	1055	0	1257
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.2	0.0	22.5	26.2	0.0	19.7	11.0	0.0	4.8	10.6	0.0	15.5
Incr Delay (d2), s/veh	0.3	0.0	3.2	0.2	0.0	0.1	1.3	0.0	0.1	0.0	0.0	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/In	1.1	0.0	2.9	0.2	0.0	0.2	1.1	0.0	0.5	0.1	0.0	5.3
Unsig. Movement Delay, s/veh	l .											
LnGrp Delay(d),s/veh	21.5	0.0	25.6	26.4	0.0	19.8	12.3	0.0	4.9	10.7	0.0	17.9
LnGrp LOS	С	А	С	С	А	В	В	А	А	В	А	В
Approach Vol, veh/h		287			31			408			564	
Approach Delay, s/veh		24.4			23.2			9.2			17.6	
Approach LOS		С			С			А			В	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		42.4		17.1	12.5	29.9		17.1				
Change Period (Y+Rc), s		5.6		* 5.8	5.6	5.6		* 5.8				
Max Green Setting (Gmax), s		65.6		* 30	15.0	45.0		* 30				
Max Q Clear Time (g_c+I1), s		4.6		9.3	6.4	19.0		10.0				
Green Ext Time (p_c), s		1.5		2.1	0.7	5.3		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			16.6									
HCM 6th LOS			В									

#### Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# Appendix K Comments and Responses



File Number D02-02-21-0121

January 6, 2022

Fotenn Planning Consultants 300-396 Cooper Street Ottawa, ON

Attention: Ghada Zaki Planner

Dear Ms. Zaki

#### Re: Zoning By-law Amendment 100 Weeping Willow Lane, 1<sup>st</sup> Submission Technical Comments

The following review comments are provided in response to the Zoning Bylaw Amendment submission:

### Transportation (Patrick.mcmahon@ottawa.ca):

Traffic Signal perations

For future submissions, please include queue lengths in synchro analysis.

#### Transit Services

- 1. Section 3.4 Existing Transit Route 110, which runs along Teron Road past the subject site, is missing. Please add a description of this route.
- 2. Bus Stop 5343 (Varley/Milne) update this bus stop to meet City of Ottawa standards.
- 3. TDM Checklist Section 3 Transit consider implementing some, or all, of the suggestions listed.

In the Summary of Improvements section, the forecasted numbers are incorrectly recorded.

#### For the next submission

- The next submission should address <u>all and each</u> of the comments or issues, to ensure the effectiveness and consistency of the next review.
- A cover letter must be included that states how each comment was addressed in the resubmission. Please co-ordinate the numbering of each resubmission comment, or issue, with the above noted comment number.
- All addenda or revisions to any studies or plans should be submitted as PDF documents.

The development review team will be happy to meet you to discuss comments and resolve issues. We highly recommend holding the comments review meeting within one week from the date of this letter. Please contact me at your earliest convenience to confirm the meeting date, time, format and location.

Should there be any other questions, please do not hesitate to contact me.

Yours Truly,

RA

Lisa Stern Planner Development Review West City of Ottawa Tel.: 613-580-2424, ext. 21108 Lisa.Stern@ottawa.ca

CC:

		HLH		
	Comment	Comment	Consultant	Response
	Traffic Signal Operations			
	For future submissions, please include			
27	queue lengths in synchro analysis.	JACK	GHD	Addressed
	Transit Services			
28	Section 3.4 - Existing Transit - Route 110, which runs along Teron Road past the subject site, is missing. Please add a description of this route	IACK	GHD	Addressed
20	Bus Stop 5343 (Varley/Milne) - undate	JACK		Addressed
	this hus stop to meet City of Ottawa			
29	standards.		RLA	
30	TDM Checklist - Section 3 - Transit - consider implementing some, or all, of the suggestions listed.	JACK	GHD	Addressed
31	In the Summary of Improvements section, the forecasted numbers are incorrectly recorded.	JACK	GHD	Please clarify, forecasted numbers seem to be correctly recorded
		1	1	1



ghd.com

