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## 5331 Fernbank Road and 1039 Terry Fox Drive

### Transportation Impact Assessment

Engineering excellence. Planning precision. Inspired landscapes.

**Proposed Subdivision  
5331 Fernbank Road & 1039 Terry Fox Drive  
Transportation Impact Assessment**

Prepared By:

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

October 2018

Novatech File: 117198  
Ref: R-2018-028

October 10<sup>th</sup>, 2018

City of Ottawa  
Planning and Growth Management Department  
110 Laurier Ave. W., 4<sup>th</sup> Floor,  
Ottawa, Ontario K1P 1J1

**Attention: Ms. Rosanna Baggs**  
**Project Manager, Infrastructure Approvals**

Dear Ms. Baggs:

**Reference: 5331 Fernbank Road & 1039 Terry Fox Drive**  
**Transportation Impact Assessment**  
**Novatech File No. 117198**

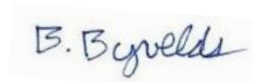
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We are pleased to submit the following Transportation Impact Assessment (TIA) in support of a Draft Plan of Subdivision application for 5331 Fernbank Road & 1039 Terry Fox Drive. The structure and format of this report is in accordance with the City of Ottawa Transportation Impact Assessment Guidelines (June 2017).

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

Yours truly,

**NOVATECH**



Brad Byvelds, P. Eng.  
Project Coordinator | Transportation/Traffic



## **TIA Plan Reports**

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

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

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

### **CERTIFICATION**

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

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Dated at Ottawa this 10th day of October, 201 8.  
(City)

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Professional Title: P. Eng. - Project Coordinator



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

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## EXECUTIVE SUMMARY

Novatech has been retained by Claridge Homes to prepare a Transportation Impact Assessment (TIA) in support of a Draft Plan of Subdivision application to allow for the development of the lands known as 5331 Fernbank Road and 1039 Terry Fox Drive in South Kanata, Ottawa. The Plan of Subdivision applies to only a portion of the larger property (Van Gaal Lands); specifically, the area south of the Monahan Drain, and north of Cope Drive. The subject lands are currently vacant, and are surrounded by the following:

- The Monahan Drain and future business park space to the north;
- Townhouse dwellings to the east;
- Cope Drive and future commercial development to the south; and
- Terry Fox Drive and vacant land to the west.

An amendment to the Zoning By-law was approved by the City in July 2017 (City File No.: D02-02-15-0066) to permit residential uses on this portion of the subject property. The proposed development conforms to the current zoning.

The proposed development will include 55 single detached dwelling units and approximately 129 townhouse units, along with a 0.96-hectare neighbourhood park in the northeast corner of the subject site. Collectively, the development consists of approximately 184 residential units.

Two accesses to the subject site will be provided and are described as follows:

- right-in/right-out (RIRO) access along Terry Fox Drive at Street 4, approximately 240m north of Cope Drive; and
- full movement access along Cope Drive at Street 1, approximately 140m east of Terry Fox Drive and 80m west of Northgraves Crescent.

The proposed development will be constructed in one phase, with an estimated completion date of 2022.

The subject application satisfies the trip generation, location and safety triggers for completing a TIA. Based on the TIA Screening Form, the proposed development satisfies all three triggers for completing a TIA.

This report will review the design elements along the Terry Fox Drive and Cope Drive boundary streets. The proposed study area for this report includes all accesses to the proposed development and the intersection of Terry Fox Drive and Cope Drive. The selected time periods for the analysis are the weekday AM and PM peak hours, which represent the 'worst case' combination of site-generated traffic and adjacent street traffic.

Analysis will be completed for the 2022 build-out year and the 2027 horizon year. For the purposes of the 2027 horizon year, two analysis scenarios will be reviewed. The 2027 analysis will review the impacts of the proposed development exclusively, as well as if the future commercial development to the south proceeds within the horizon. Traffic signalization warrants will be reviewed for both scenarios to determine if/when traffic signals are warranted.

The general conclusions and recommendations of this TIA can be summarized as follows:

- All roadways within the proposed subdivision will be classified as local roadways, and will have an 18 metre right-of-way. Sidewalks will be provided on the west side of Street 1 and the north side of Street 4 within the subdivision.
- The vehicular and pedestrian traffic at the Street 1/Street 4 intersection are not anticipated to meet the OTM criteria for a PXO. However, as the sidewalk along Street 1 will terminate at Street 4 across from the neighbourhood park, this location meets the pedestrian desire line criteria and a PXO is recommended. Based on the anticipated vehicular volumes along Street 4 and Table 7 (Pedestrian Crossover Selection Matrix) in OTM Book 15, a PXO D is recommended at this location.
- Terry Fox Drive currently meets the target TkLOS and Auto LOS, however it does not meet the target PLOS and BLOS. Opportunities to improve the PLOS and BLOS along Terry Fox Drive should be explored by the City through the future widening of Terry Fox Drive, as identified in the City's 2013 TMP network concept.
- Cope Drive currently meets the target PLOS, TkLOS and Auto LOS, however it does not meet the target BLOS. As on-street parking is currently permitted along Cope Drive, the implementation of a bike lane adjacent to the curbside parking lane will result in a BLOS D, which does not meet the target. A curbside parking restriction in conjunction with bike lanes would result in a BLOS C, achieving the target. Alternative to bike lanes, consideration could also be given to reducing the posted speed to 40km/hr, resulting in a BLOS B for the existing mixed traffic lanes.
- The recommended cycling improvements to Cope Drive are to address the existing conditions and are not attributable to the site. As the site provides cycling connectivity to the existing facilities along Cope Drive, the implementation of any cycling facilities along Cope Drive should be a City lead initiative.
- Based on the projected northbound right turning volumes along Terry Fox Drive at Street 4, a right turn lane is not recommended. A pork chop island will be provided to restrict the Terry Fox Drive/Street 4 intersection to right-in right-out operation.
- A 15m eastbound left turn lane is warranted at the Cope Drive/Street 1 intersection. Based on the projected westbound right turning volumes along Cope Drive at Street 1, a right turn lane is not recommended. If the commercial development at 5331 Fernbank Road is constructed, a westbound left turn lane is also anticipated to be warranted at the access.
- The proposed accesses are anticipated to operate with a LOS D or better during the weekday AM and PM peak hours under all scenarios. Based on the Ontario Traffic Manual (OTM) criteria, traffic signals along Cope Drive at Street 1 are anticipated to be 9% met by the 2027 horizon year. If the commercial development at 5331 Fernbank Road (south of Cope Drive) is constructed prior to the 2027 horizon year traffic signalization warrants are anticipated to be 35% met at this intersection. Based on the foregoing, side street stop control is recommended at the proposed accesses along Cope Drive and Terry Fox Drive.
- To encourage travel by sustainable modes, a multi-modal travel option information package will be provided to new residents of the subdivision. The site conforms to the City's TDM initiatives by providing easy access to area pedestrian, cycling and transit facilities.

- Based on the transit utilization data received from OC Transpo, the existing bus stops/routes in the vicinity of the subject site have capacity to accommodate the transit trips generated by proposed development. It is our understanding that there are no major transit service changes anticipated in the direct vicinity of the subject site.
- The Terry Fox Drive/Cope Drive intersection currently does not meet the target PLOS, BLOS or Auto LOS for the General Urban Area. A reduction in the crossing distance on all legs of the intersection would have the greatest improvement on the PETSI score and the Pedestrian Delay. Due to the high operational speed along Terry Fox Drive, a BLOS B is unachievable on the north and south approaches. If either bike lanes or a reduction in the operational speed are implemented along Cope Drive, the BLOS on the east and west approaches will be improved to a D. If two stage left-turn bike boxes are provided in conjunction with a reduction in the operational speed on the east and west approaches, a BLOS A can be achieved.
- The eastbound left turn movement at the Terry Fox Drive/Cope Drive intersection is currently operating with an Auto LOS F during the weekday PM peak hour. Consideration should be given by the City to providing a westbound right turn lane to improve intersection operations by permitting westbound right turning vehicles to bypass a through westbound through vehicle. The implementation of a westbound right turn lane is anticipated to improve intersection operations to a LOS B during the PM peak hour. However, the implementation of a westbound right turn lane is anticipated to increase the pedestrian crossing distance, subsequently decreasing the PLOS on the east leg.
- With the addition of traffic generated by the site, the eastbound left turn movement at the Terry Fox Drive/Cope Drive intersection will continue to operate with a LOS F during the PM peak hour. The implementation of a westbound right turn lane is anticipated to improve operating conditions to a LOS D. As the subject site is not anticipated to add traffic to the eastbound left or westbound right turn movements at this intersection, it is recommended the City monitor operating conditions at this intersection and construct any required road modifications as funding becomes available.
- With the addition of traffic generated by the future commercial development south of Cope Drive, the eastbound and southbound left turn movements at the Terry Fox Drive/Cope Drive intersection are anticipated to operate with a LOS F. With addition of traffic generated by the commercial development, consideration should be given to dual southbound left turn lanes. A further review of mitigation measures associated with the commercial development is considered outside the scope of this report.

## 1.0 INTRODUCTION

Novatech has been retained by Claridge Homes to prepare a Transportation Impact Assessment (TIA) in support of a Draft Plan of Subdivision application to allow for the development of the lands known as 5331 Fernbank Road and 1039 Terry Fox Drive in South Kanata, Ottawa. The Plan of Subdivision applies to only a portion of the larger property (Van Gaal Lands); specifically, the area south of the Monahan Drain, and north of Cope Drive. The subject lands are currently vacant, and are surrounded by the following:

- The Monahan Drain and future business park space to the north;
- Townhouse dwellings to the east;
- Cope Drive and future commercial development to the south; and
- Terry Fox Drive and vacant land to the west.

A view of the subject lands is provided in **Figure 1**.

**Figure 1: View of the Subject Lands**



## 2.0 PROPOSED DEVELOPMENT

An amendment to the Zoning By-law was approved by the City in July 2017 (City File No.: D02-02-15-0066) to permit residential uses on this portion of the subject property. The proposed development conforms to the current zoning.

The proposed development will include 55 single detached dwelling units and approximately 129 townhouse units, along with a 0.96-hectare neighbourhood park in the northeast corner of the subject site. Collectively, the development consists of approximately 184 residential units.

Two accesses to the subject site will be provided and are described as follows:

- right-in/right-out (RIRO) access along Terry Fox Drive at Street 4, approximately 240m north of Cope Drive; and
- full movement access along Cope Drive at Street 1, approximately 140m east of Terry Fox Drive and 80m west of Northgraves Crescent.

The proposed development will be constructed in one phase, with an estimated completion date of 2022. A concept plan is provided in **Figure 2**.

## 3.0 SCREENING AND SCOPING

### 3.1 Screening Form

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

The subject application satisfies the trip generation, location and safety triggers for completing a TIA. Based on the TIA Screening Form, the proposed development satisfies all three triggers for completing a TIA.

### 3.2 Existing Conditions

#### 3.2.1 Roadways

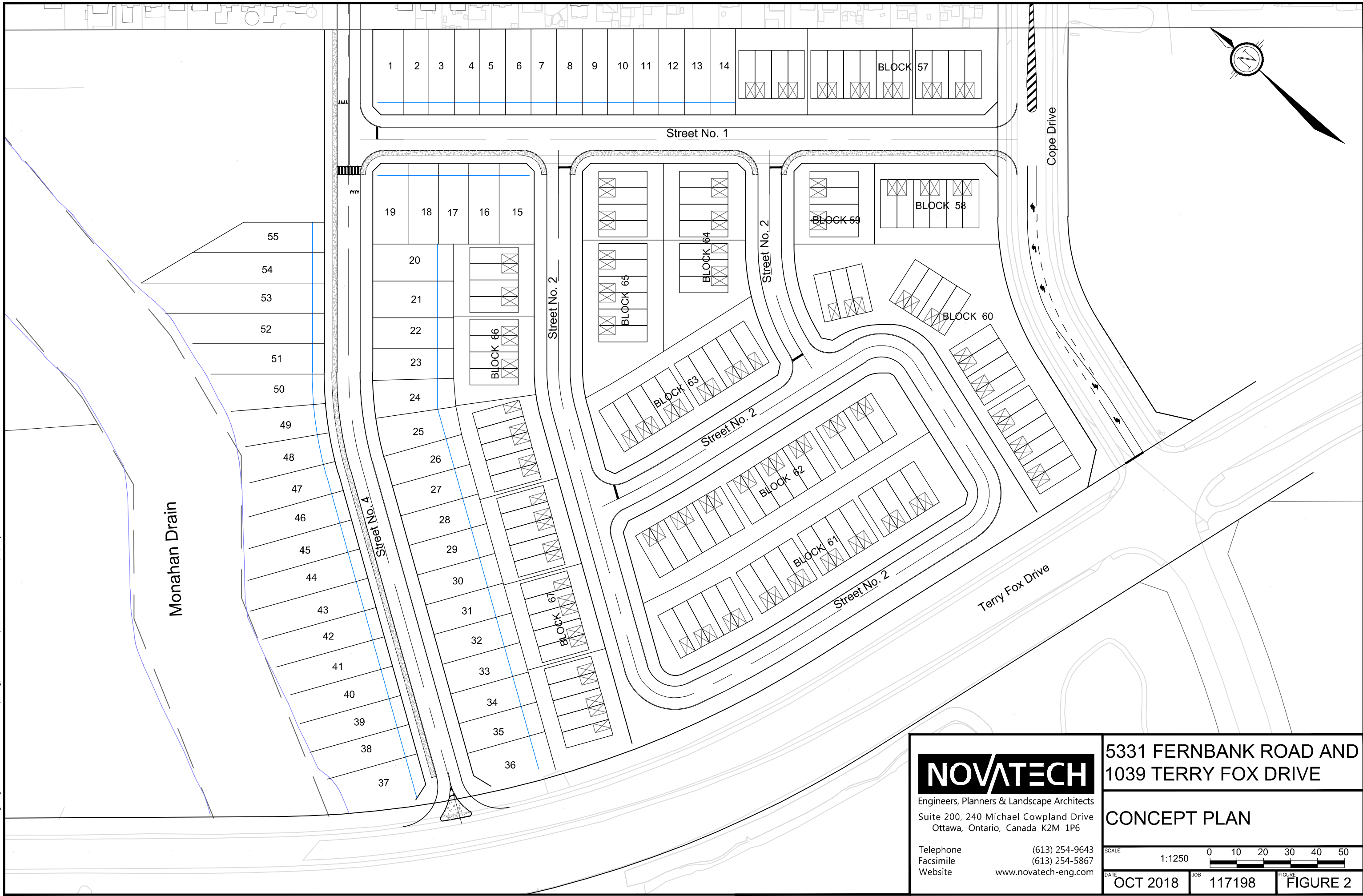
All roadways within the study area fall under the jurisdiction of the City of Ottawa.

Terry Fox Drive is an arterial roadway that generally runs on a north-south alignment within the study area. Near the subject lands, Terry Fox Drive has a two-lane undivided rural cross section. Terry Fox Drive is designated as a rural truck route with a posted speed limit of 80 km/hr within the study area. The City of Ottawa *Official Plan* (OP) identifies a 44.5 metre right-of-way (ROW) to be protected along Terry Fox Drive and the Old Rail Line.

Cope Drive is a collector roadway that generally runs on an east-west alignment between Terry Fox Drive and Eagleson Road. Cope Drive has a two-lane undivided urban cross section with a posted speed limit of 50km/hr along its entire length. The City of Ottawa OP identifies a 24 metre ROW to be protected along the entire length of Cope Drive.



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Northgraves Crescent is a local roadway, looping north of Cope Drive. The western Northgraves Crescent connection to Cope Drive is located approximately 80m east of the proposed Street 1. Northgraves Crescent has two-lane undivided urban cross section and a regulatory speed limit of 50km/hr.

Templeford Avenue is a collector roadway that generally runs on a north-south alignment between Cope Drive and Fernbank Road. Templeford Avenue has a two-lane undivided urban cross section and a regulatory speed limit of 50km/hr.

### 3.2.2 Intersections

A review of the existing lane configurations and traffic control at the study area intersections is provided below.

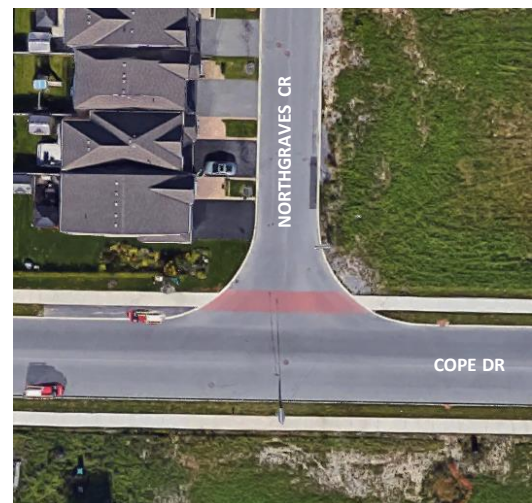
#### Terry Fox Drive/Cope Drive

- Signalized intersection
- Northbound: one left turn lane and one shared through/right turn lane
- Southbound: one left turn lane, one through turn lane and one right turn lane
- Eastbound/Westbound: one left turn lane and one shared through/right turn lane
- Standard crosswalks are provided on all four legs
- Pocket Bike lane is provided on the southbound approach



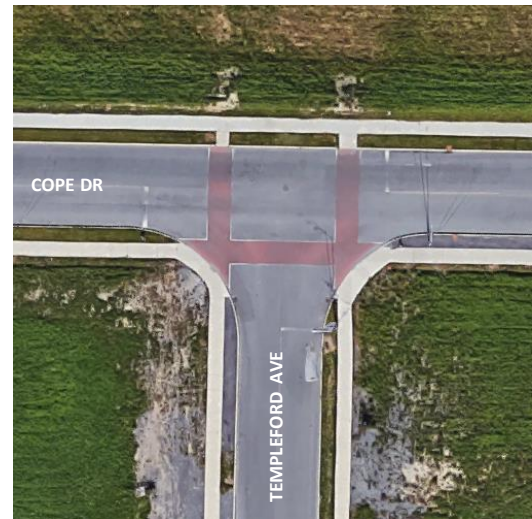
#### Cope Drive/Northgraves Crescent

- Unsignalized intersection
- Stop control on Northgraves Crescent
- One approach lane on all legs
- Crosswalk on north leg is textured with unit pavers



#### Cope Drive/Templeford Avenue

- Unsignalized intersection
- All-way stop control
- One approach lane on all legs
- Crosswalk on all legs are textured with unit pavers



### 3.2.3 Driveways

In accordance with the City's 2017 TIA guidelines, a review of adjacent driveways along the boundary roads are provided as follows:

#### **Terry Fox Drive, East Side:**

- No other driveways

#### **Cope Drive, North Side:**

- No other driveways
- Northgrave Crescent, approximately 80m north of proposed Street 1.

#### **Terry Fox Drive, West Side:**

- No other driveways

#### **Cope Drive, South Side:**

- Anticipated future driveway to commercial development

### 3.2.4 Pedestrian and Bicycle Facilities

Terry Fox Drive is identified as a spine cycling route, and Cope Drive east of Terry Fox Drive is identified as a local cycling route in the City's Ultimate Cycling Network. Existing pedestrian and bicycle facilities within the study area are described as follows:

- Paved shoulders are provided on Terry Fox Drive
- Sidewalks are provided on both sides of Cope Drive and Templeford Avenue
- Mixed traffic lanes are provided along Cope Drive and Templeford Avenue

### 3.2.5 Transit

OC Transpo bus stop #1919 and #6933 are located in the southeast and southwest corners of the Cope Drive/Templeford Road intersection. OC Transpo bus stop #4031 is located in the northwest corner of the Cope Drive/Northgraves Crescent intersection. These bus stops are within a walking distance of 400m, or a five-minute walk, of the subject site. The location of the bus stops is shown in **Figure 3**.



**Figure 3: OC Transpo Bus Stop Locations**



The aforementioned bus stops serve OC Transpo Route 161, Route 164, Route 168 and Route 252. Descriptions of the foregoing transit routes are provided in the following table. Route maps are included in **Appendix B**.

**Table 1: OC Transpo Route Information**

Route	Description	Schedule		
		Days	Service	Headways
161	Travels between Terry Fox Transit Station and Brildewood	Weekdays	All Day	Morning/Evening: 30 min Mid-Day/Night: 60 min
164	Travels between Terry Fox Transit Station and Hope Side Road	Weekdays	Peak Periods	Morning/Evening: 30 min
168	Travels between Terry Fox Transit Station and Cope Drive	7 Days/ Week	All Day	All Day: 30 min
252	Travels between Mackenzie King Transit Station and Cope Drive	Weekdays	Peak Periods	Morning/Evening: 15-20 min

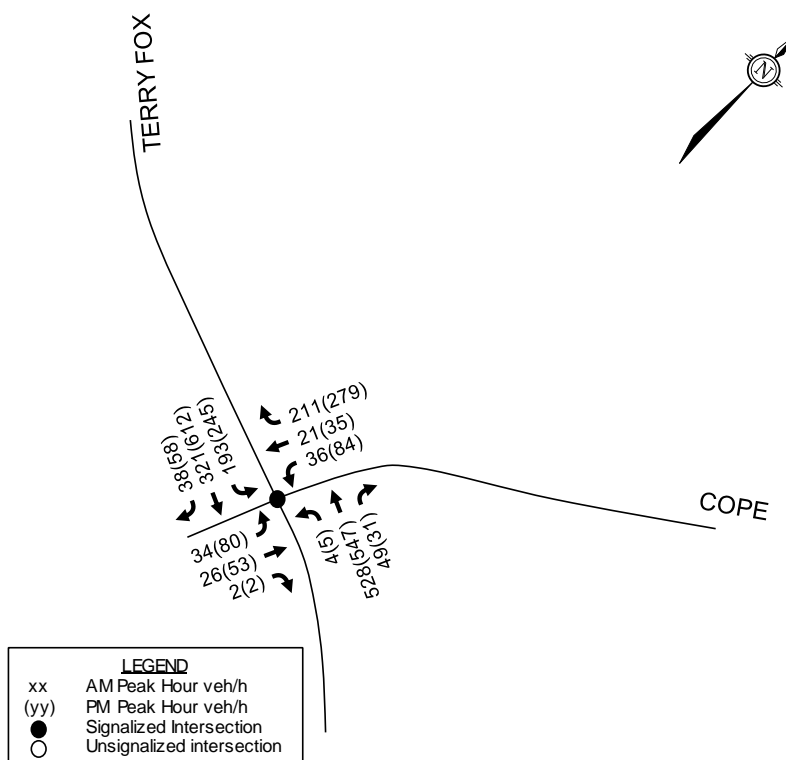
### 3.2.6 Existing Area Traffic Management Measures

There are currently no area traffic management measures in place along any of the study area roadways.

### 3.2.7 Existing Traffic Volumes

A traffic count was completed by the City of Ottawa at the Terry Fox Drive/Cope Drive intersection on January 25<sup>th</sup>, 2018. The existing traffic volumes at this intersection during the weekday AM and PM peak hours are shown in **Figure 4**. Peak hour summary sheets of the aforementioned traffic count are included in **Appendix C**.

**Figure 4: Existing Traffic Volumes**



### 3.2.8 Collision Records

Historical collision data from the last five years was obtained from the City's Public Works and Service Department for the Terry Fox Drive/Cope Drive intersection. Copies of the collision summary reports are included in **Appendix D**.

A total of 16 collisions occurred at the Terry Fox Drive/Cope Drive intersection over the last five years. Eight of the collisions were rear-end impacts, three were turning movement impacts, three were angle impacts and two were single vehicle impacts. Half of the collisions occurred under wet, icy or snowy surface conditions, suggesting environmental factors played a role in the collision history at this intersection. Personal injuries were incurred during three of the collisions. None of the

collisions involved pedestrians and cyclists. Of the eight rear-end impacts, four occurred on the north approach, three occurred on the south approach and one occurred on the west approach.

### **3.3 Planned Conditions**

The City of Ottawa's 2013 Transportation Master Plan (TMP) identifies a widening from two to four lanes along Eagleson Road between Cadence Gate and Hope Side Road. This widening will provide capacity for additional travel demands from new development areas and provide continuity from the four-lane Eagleson Road to the north. The widening of Eagleson Road is identified as a Phase 2 project with implementation between 2020 and 2025.

The City of Ottawa's 2013 TMP also identifies a widening from two to four lanes along Hope Side Road between Eagleson Road and Richmond Road. This widening will provide capacity and network continuity for growth areas in Kanata. The widening of Hope Side Road is identified as a Phase 3 project in the affordable plan with implementation between 2026 and 2031. It is noteworthy that a roundabout is anticipated to be constructed at the Eagleson Road/Hope Side Road intersection as part of the Hope Side Road widening project.

City staff advised that the Cope Drive/Templeford Road intersection has been approved to be converted into a mini roundabout.

A Site Plan Control application was submitted to the City of Ottawa in June 2018, in support of a six storey 143-unit apartment building at 800 Eagleson Road. No TIA has been submitted as part of this application.

A Transportation Impact Study was prepared in support of a Zoning By-law Amendment and Site Plan Control application in July 2015 for a proposed residential development at 80, 110, 140, 151 and 180 Cope Drive. The proposed residential development consists of 260 residential units.

A TIA was prepared in support of a Site Plan Control application in April 2018 for a proposed commercial development at 10 Cope Drive. The proposed commercial development consists of a 3,620m<sup>2</sup> grocery store and 1,982m<sup>2</sup> of commercial.

The lands immediately south of the proposed development (5331 Fernbank Road) are anticipated to be developed as commercial. It is our understanding that these lands will contain a food store of approximately 35,000 square feet of gross floor area (GFA) and approximately 60,000 square feet GFA of retail. This development is anticipated to have right-in right-out access along Terry Fox Drive and Fernbank Road, and all movement access along Cope Drive opposite the proposed Street 1.

### **3.4 Study Area and Time Periods**

This report will review the design elements along the Terry Fox Drive and Cope Drive boundary streets. The proposed study area for this report includes all accesses to the proposed development and the intersection of Terry Fox Drive and Cope Drive. The selected time periods for the analysis are the weekday AM and PM peak hours, which represent the 'worst case' combination of site-generated traffic and adjacent street traffic.

Analysis will be completed for the 2022 build-out year and the 2027 horizon year. For the purposes of the 2027 horizon year, two analysis scenarios will be reviewed. The 2027 analysis will review the impacts of the proposed development exclusively, as well as if the future commercial development

to the south proceeds within the horizon. Traffic signalization warrants will be reviewed for both scenarios to determine if/when traffic signals are warranted.

### 3.5 Exemptions Review

This module reviews possible exemptions from the final TIA, as outlined in the TIA Guidelines. The applicable exemptions for the subject lands are shown in **Table 2**.

**Table 2: TIA Exemptions**

Module	Element	Exemption Criteria	Exemption Applies
<b>Design Review Component</b>			
<b>4.1</b> Development Design	4.1.2 Circulation and Access	• Only required for site plans	Yes
	4.1.3 New Street Networks	• Only required for plans of subdivision	No
<b>4.2</b> Parking	4.2.1 Parking Supply	• Only required for site plans	Yes
	4.2.2 Spillover Parking	• Only required for site plans where parking supply is 15% below unconstrained demand	Yes
<b>Network Impact Component</b>			
<b>4.5</b> Transportation Demand Management	<i>All elements</i>	• Not required for non-residential site plans expected to have fewer than 60 employees and/or students on location at any given time	No
<b>4.6</b> Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	• Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Yes
<b>4.8</b> Network Concept	<i>All elements</i>	• Only required when proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by the established zoning	Yes

The traffic count at the Terry Fox Drive/Cope Drive intersection suggests a two-way total of approximately 536 and 727 vehicles use Cope Drive during the weekday AM and PM peak hours respectively. The peak directional traffic volumes along Cope Drive is approximately 268 vehicles (eastbound) during the AM peak hour and 398 vehicles (westbound) during the PM peak hour. The lane capacity along Cope Drive is estimated at 600 vehicles per hour per lane (vphpl) based on the City's Trans Long Range Transportation Model. Based on the foregoing, the peak directional traffic along Cope Drive is operating with a volume to capacity ratio of 0.45 and 0.66 during the weekday AM and PM peak hours respectively.

The majority of traffic generated by the subject site are anticipated to arrive from/depart to the Terry Fox Drive/Cope Drive intersection. The total traffic along Cope Drive is not anticipated to increase above the peak directional capacity threshold of 600 vphpl. As such, the Neighbourhood Traffic Management module is proposed to be exempt from the required analysis in the TIA.

## 4.0 FORECASTING

### 4.1 Development-Generated Traffic

#### 4.1.1 Trip Generation

A Community Transportation Study (CTS) was prepared by Novatech in support of a Zoning By-law Amendment application for the entire Van Gaal Lands in August 2015. A subsequent addendum was prepared in June 2016 to review the impacts of the residential component (i.e. the subject lands). The Zoning By-law Amendment application was approved by City council on July 12, 2017. The aforementioned approved traffic studies used the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9<sup>th</sup> Edition to calculate residential trips.

In September 2017 ITE published the 10<sup>th</sup> Edition of the Trip Generation Manual. Previous editions of the ITE Trip Generation Manual contained separate land use codes for rental and ownership residential uses. The 10<sup>th</sup> edition reviewed previous data and found no clear difference between the rental and ownership sites within the ITE database. As such they combined the rental and ownership data, and separated the multifamily housing into three land use codes (low-rise, mid-rise, and high-rise). Land Use 220 – Multifamily Housing (Low-Rise) in the 10<sup>th</sup> edition of the Trip Generation Manual contains data from apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have one or two levels (floors).

To maintain consistency with previous reports for the subject lands, trips generated by the proposed development have been calculated using ITE trip generation rates. The ITE trip generation has been updated to reflect the 10<sup>th</sup> Edition rates as they are a more accurate representation of the proposed development.

**Table 3: ITE Trip Generation**

Land Use	ITE Code	Units	AM Peak			PM Peak		
			IN	OUT	TOT	IN	OUT	TOT
Single-Family Detached Housing	210	55	11	33	44	36	21	57
Multifamily Housing (Low-Rise)	220	129	14	47	61	47	27	74
Total			25	80	105	83	48	131

The original CTS/addendum prepared in support of the Zoning By-law Amendment application for the subject lands converted ITE trips to person trips using a person trip factor of 1.42. The City of Ottawa implemented new TIA guidelines in 2017, which include an approved person trip adjustment factor of 1.28. The approved person trip adjustment factor of 1.28 has been applied to the ITE trips, and is summarized in the following table.

**Table 4: Person Trip Generation**

Land Use	Units	AM Peak			PM Peak		
		IN	OUT	TOT	IN	OUT	TOT
Single Detached Dwelling Units	55	16	40	56	51	22	73
Residential Townhouse/ Condominium	129	20	58	78	67	28	95
Total		36	98	134	118	50	168



The modal share values applied to the trips generated by the proposed development have been developed based on the modal shares identified in the City's 2011 TRANS O-D Survey Report for the Kanata/Stittsville Area and are consistent with the modal shares identified in the approved Van Gaal Lands CTS/addendum. The trip generation by modal share is summarized in the following table.

**Table 5: Person Trips by Modal Share**

Travel Mode	Modal Share	AM Peak			PM Peak		
		IN	OUT	TOT	IN	OUT	TOT
Total Person Trips		36	98	134	118	50	168
Auto Driver	55%	20	54	74	65	27	92
Auto Passenger	15%	5	15	20	18	7	25
Transit	20%	7	20	27	24	10	34
Non-Auto	10%	4	9	13	11	5	17

Based on the foregoing, the proposed subdivision is anticipated to generate a total of 74 vehicle trips during the weekday AM peak hour and 92 vehicle trips during the weekday PM peak hour.

#### 4.1.2 Trip Distribution

The projected distribution of trips generated by the proposed development is consistent with the Van Gaal Lands CTS dated August 2015 and addendum dated June 2016. The projected distribution is summarized as follows:

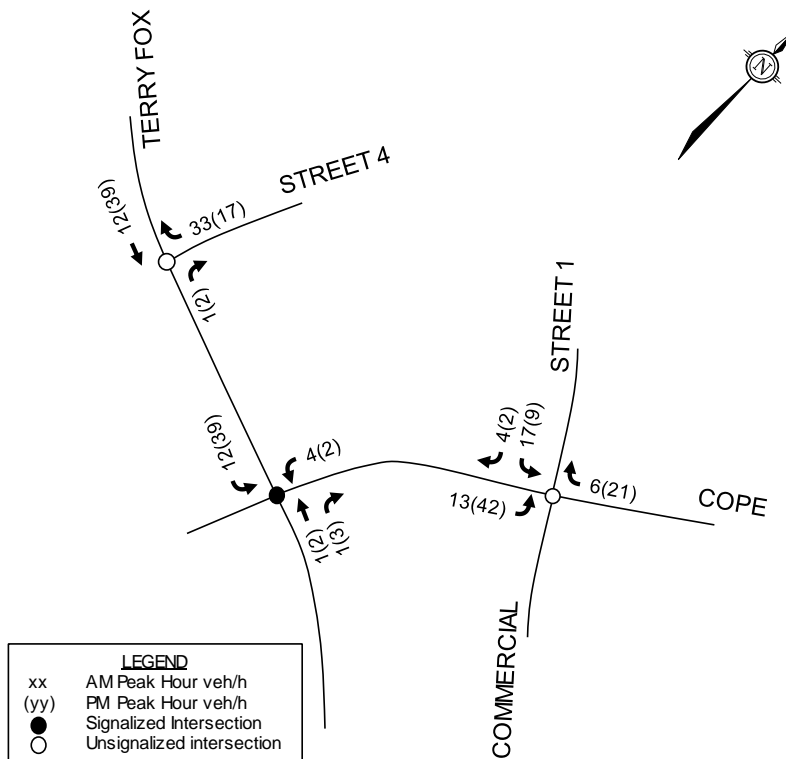
- 60% to/from the north via Terry Fox Drive
- 15% to/from the north via Eagleson Road
- 10% to/from the east via Stonehaven Drive and Cadence Gate
- 10% to/from the south via Eagleson Road and Terry Fox Drive
- 5% to/from the west via Fernbank Road

All trips generated by the proposed development are anticipated to arrive/depart using the Cope Drive access, excluding the following:

- All trips departing to the north via Terry Fox Drive
- 40% of the trips arriving from the south via Terry Fox Drive and west via Fernbank Road

Site generated traffic volumes are shown in **Figure 5**.

**Figure 5: Site Generated Traffic**



## 4.2 Background Traffic

### 4.2.1 General Background Growth Rate

The addendum to the Van Gaal Lands CTS applied a 2% background growth rate to the traffic volumes along Terry Fox Drive and Cope Drive. In the interest of maintaining consistency with the addendum, a 2% per annum growth rate has been carried forward for this analysis.

### 4.2.2 Other Area Development Traffic

As identified above, Site Plan Control applications have been filed for the following lands in the vicinity of the subject site:

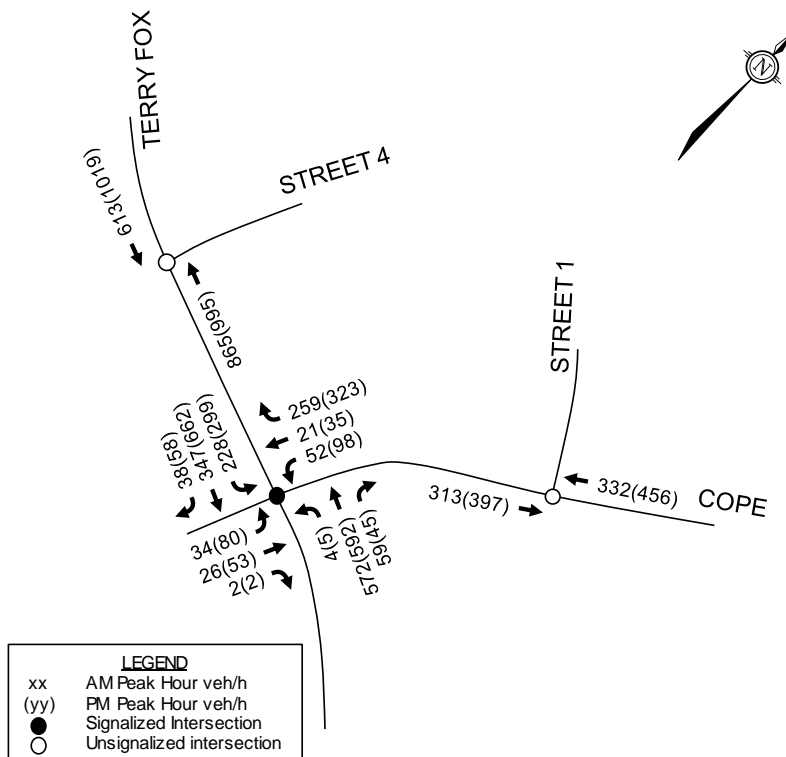
- 800 Eagleson Road and 5264 Fernbank Road
- 80, 110, 140, 151 and 180 Cope Drive
- 10 Cope Drive

The 2022 background traffic projections include traffic generated by the developments along Cope Drive. As a TIA was not submitted in support of the 800 Eagleson Road site, and the site is located in the southwest corner of the Eagleson Road/Fernbank Road intersection where minimal traffic is anticipated to travel through the study area, this development has not been accounted for in the background traffic projections. Relevant excerpts from other area developments are included in **Appendix E**.

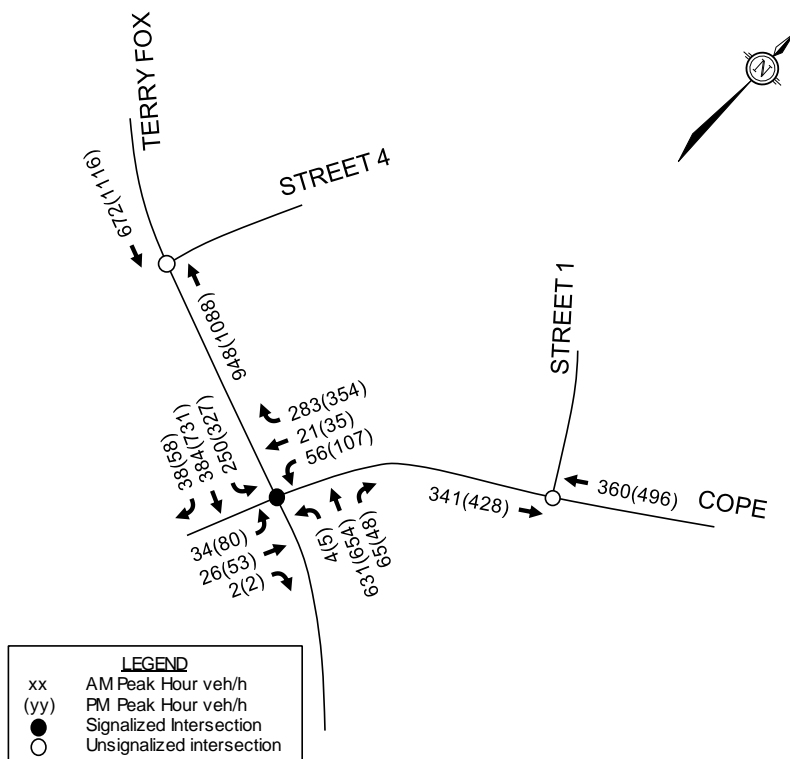
The 2027 background traffic projections consider two scenarios. The first scenario includes traffic generated by the developments along Cope Drive, consistent with the 2022 background traffic conditions. The second scenario assumes the commercial development at 5331 Fernbank Road (south of Cope Drive) is also developed by the 2027 horizon year. Traffic generated by the commercial site is based on ITE trip generation rates, and has been added to the background traffic projections. Trip generation and distribution for the commercial development at 5331 Fernbank Road site (south of Cope Drive) is summarized in **Appendix E**.

Background traffic within the study area for the 2022 build-out year is shown in **Figure 6**. Background traffic within the study area for the 2027 horizon year under the two scenarios described above are shown in **Figures 7** and 8. Total traffic volumes for the 2022 build-out year and 2027 horizon year (both scenarios) are shown in **Figure 9, 10** and **11**.

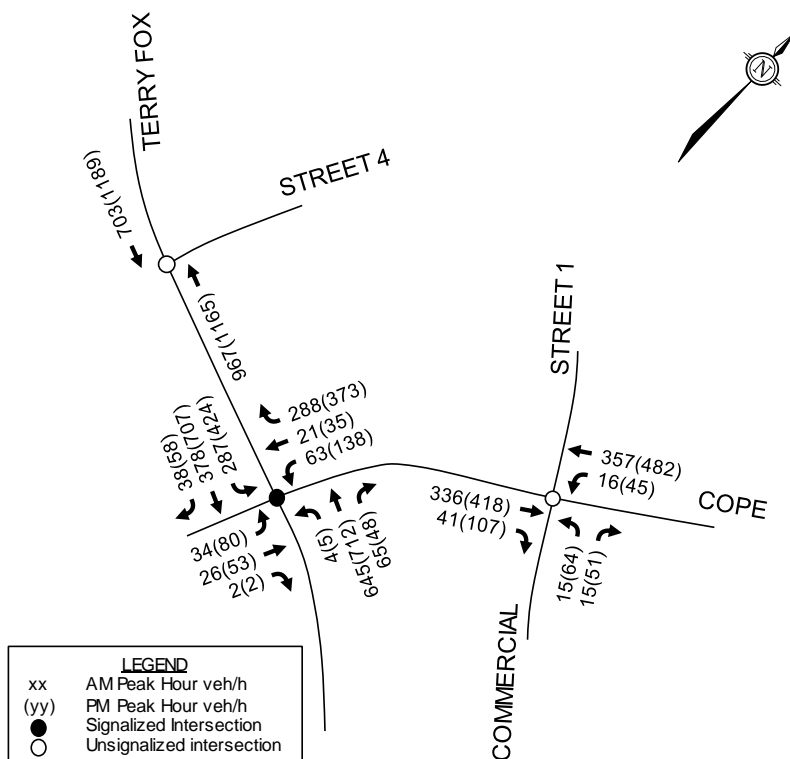
**Figure 6: 2022 Background Traffic**



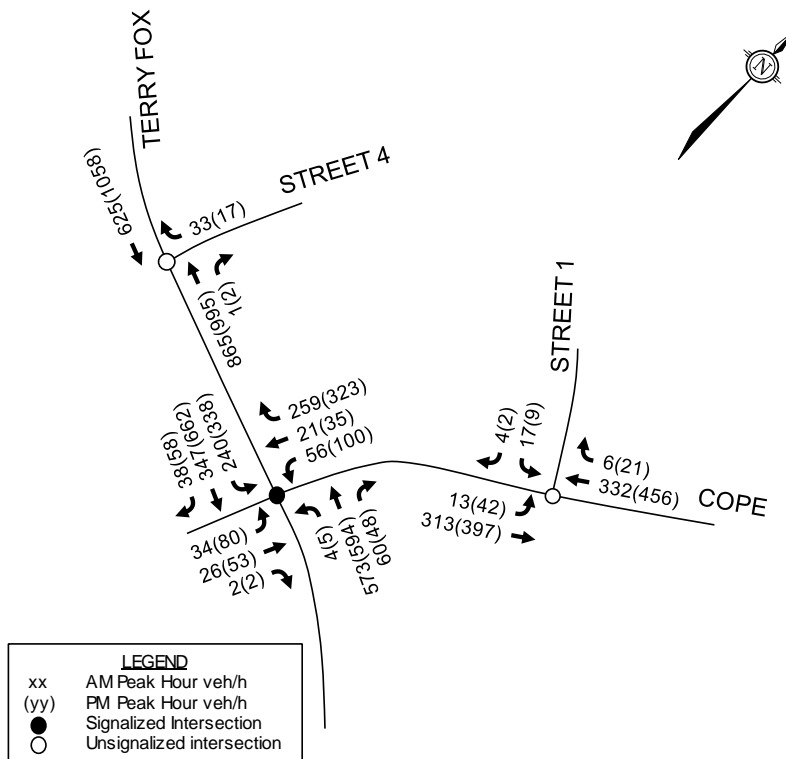
**Figure 7: 2027 Background Traffic – Scenario One**



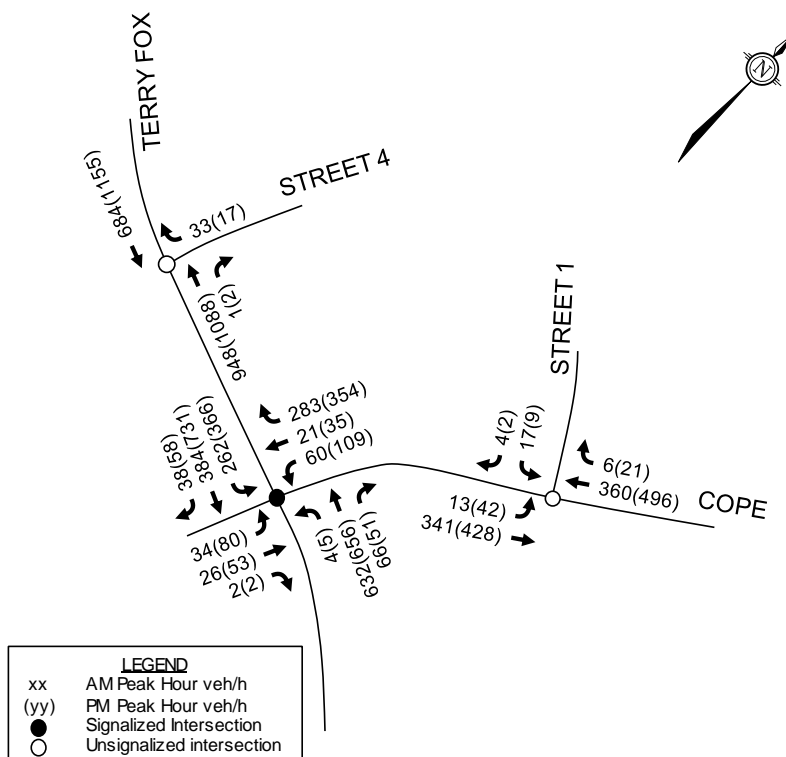
**Figure 8: 2027 Background Traffic – Scenario Two**



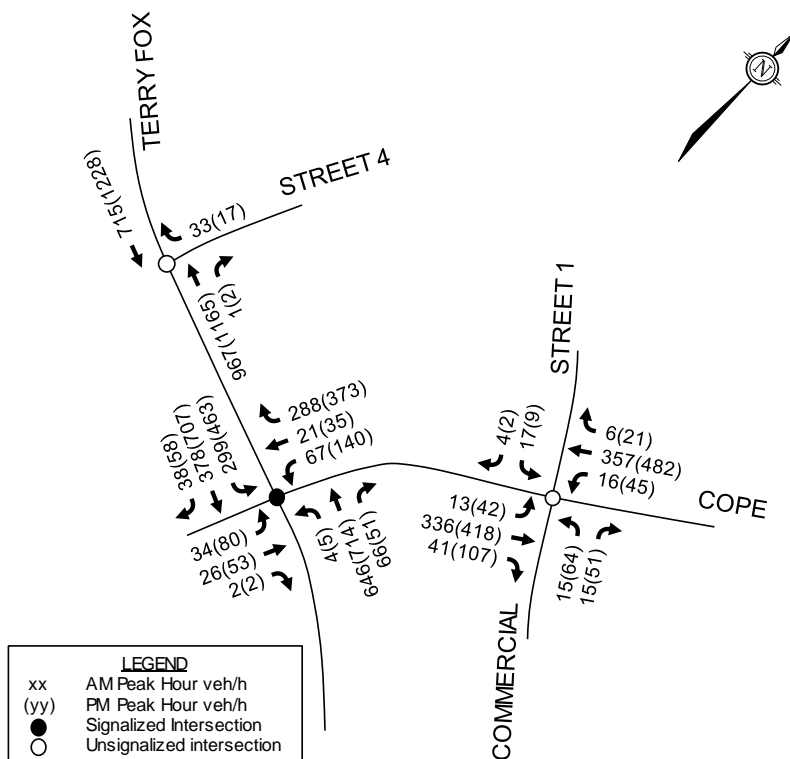
**Figure 9: 2022 Total Traffic**



**Figure 10: 2027 Total Traffic – Scenario One**



**Figure 11: 2027 Total Traffic – Scenario Two**



## 5.0 ANALYSIS

### 5.1 Development Design

All roadways within the proposed subdivision will be classified as local roadways, and will have an 18 metre right-of-way. Sidewalks will be provided on the west side of Street 1 and the north side of Street 4 within the subdivision. These sidewalks will provide pedestrian connectivity between the proposed subdivision and the existing facilities along Terry Fox Drive and Cope Drive.

Ontario Traffic Manual (OTM) Book 5 identifies the following criteria for consideration of all-way stop control along minor roadways:

- the total vehicle volumes on all intersection approaches exceeds 350 for the highest hour recorded; and
- the vehicular volume split does not exceed 75/25 for three-way control or 65/35 for four-way control

The vehicular volumes at all intersections within the development are not anticipated to meet the OTM criteria for all-way stop control. As such, side street stop control is recommended at all intersections within the proposed subdivision.

As stop control is proposed along Street 1 at Street 4, the north-south pedestrian crossing is uncontrolled and a pedestrian crossover (PXO) has been considered. OTM Book 15 identifies the following criteria for consideration of a PXO:

- If the total eight-hour pedestrian volume crossing the main road is greater than 100 and the total eight-hour vehicular volume is greater than 750; or
- If the crossing location provides system connectivity or is on a desired pedestrian line.

The vehicular and pedestrian traffic at this location are not anticipated to meet the OTM criteria for a PXO. However, as the sidewalk along Street 1 will terminate at Street 4 across from the neighbourhood park, this location meets the pedestrian desire line criteria and a PXO is recommended. Based on the anticipated vehicular volumes along Street 4 and Table 7 (Pedestrian Crossover Selection Matrix) in OTM Book 15, a PXO D is recommended at this location.

OC Transpo bus stop #1919 and #6933 are located in the southeast and southwest corners of the Cope Drive/Templeford Road intersection. OC Transpo bus stop #4031 is located in the northwest corner of the Cope Drive/Northgraves Crescent intersection. These bus stops are within a walking distance of 400m, or a five-minute walk, of the subject site. These bus stops serve OC Transpo Route 161, Route 164, Route 168 and Route 252.

## 5.2 Parking

As identified in Section 3.4, this module is exempt.

## 5.3 Boundary Streets

This section provides a review of the boundary streets using complete streets principles. The Multi-Modal Level of Service (MMLOS) guidelines produced by IBI Group in 2015 were used to evaluate the LOS of the boundary roadways for each mode of Transportation. Schedule B of the City of Ottawa's OP indicates Cope Drive is in the Enterprise Area, while Terry Fox Drive borders the Enterprise Area and the General Urban Area. For the purposes of this analysis, the MMLOS targets for Terry Fox Drive are based on the targets for the General Urban Area. Photos of the boundary streets (provided by Google Streetview) are provided below.

**Figure 12: Terry Fox Drive**



**Figure 13: Cope Drive**

The following table summarizes the findings of the MMLOS segment analysis. Detailed segment MMLOS calculations are included in **Appendix F**.

**Table 6: Segment MMLOS Summary**

Segment	PLOS	BLOS	TLOS	TkLOS	Auto LOS
Terry Fox Drive	F	E	D	C	B
<b>Target</b>	<b>C</b>	<b>C</b>	-	<b>D</b>	<b>D</b>
Cope Drive	A	F	D	B	A
<b>Target</b>	<b>C</b>	<b>B</b>	-	<b>E</b>	<b>D</b>

#### Terry Fox Drive

Terry Fox Drive currently meets the target TkLOS and Auto LOS, however it does not meet the target PLOS and BLOS. Terry Fox Drive currently has a two-lane undivided rural cross-section adjacent to the subject site. The City of Ottawa's 2013 TMP does not identify any roadway projects along this stretch of Terry Fox Drive in its affordable plan, however it does identify a widening from two to four lanes between Winchester Drive and Eagleson Road in its network concept. Opportunities to improve the PLOS and BLOS should be explored by the City through the future widening of Terry Fox Drive, as identified in the City's 2013 TMP network concept.

#### Cope Drive

Cope Drive currently meets the target PLOS, TkLOS and Auto LOS, however it does not meet the target BLOS. The Desirable Cycling Facility Pre-selection Nomograph provided in Ontario Traffic Manual Book 18 suggests bike lanes for a roadway with an operational speed of 60km/hr and an average daily traffic volume of 4,000. As on-street parking is currently permitted along Cope Drive, the implementation of a bike lane adjacent to the curbside parking lane will result in a BLOS D, which does not meet the target. A curbside parking restriction in conjunction with bike lanes would result in a BLOS C, achieving the target. Alternative to bike lanes, consideration could also be given to reducing the posted speed to 40km/hr, resulting in a BLOS B for the existing mixed traffic lanes.



The recommended cycling improvements to Cope Drive are to address the existing conditions and are not attributable to the site. As the site provides cycling connectivity to the existing facilities along Cope Drive, the implementation of any cycling facilities along Cope Drive should be a City lead initiative.

#### 5.4 Access Intersections Design

The proposed development will be served by an all movement access along Cope Drive (Street 1) and a right-in right-out access along Terry Fox Drive (Street 4). Street 4 will also connect the proposed subdivision to Northgraves Crescent.

The proposed Street 4 right-in right-out access along Terry Fox Drive will be located approximately 240m north of Cope Drive. Based on the projected northbound right turning volumes along Terry Fox Drive at Street 4, a right turn lane is not recommended. A pork chop island will be provided to restrict the Terry Fox Drive/Street 4 intersection to right-in right-out operation. A functional design of the pork chop island at this intersection is shown in **Figure 14**.

The proposed Street 1 all movement access along Cope Drive will be located approximately 140m east of Terry Fox Drive and 80m west of Northgraves Crescent. Ministry of Transportation of Ontario (MTO) left turn lane warrants were reviewed to determine if an eastbound left turn lane is required along Cope Drive at Street 1. Based on the MTO left turn lane graphs, a 15m eastbound left turn lane is warranted at the Cope Drive/Street 1 intersection. Based on the projected westbound right turning volumes along Cope Drive at Street 1, a right turn lane is not recommended. If the commercial development at 5331 Fernbank Road is constructed, a westbound left turn lane is anticipated to be warranted at the access. A copy of the MTO left turn lane graphs is included in **Appendix G**. Cope Drive has a paved width of 11 metres, which is sufficient to accommodate the aforementioned left turn lanes. A functional design of the eastbound left turn lane along Cope Drive at Street 1 is provided in **Appendix H**.

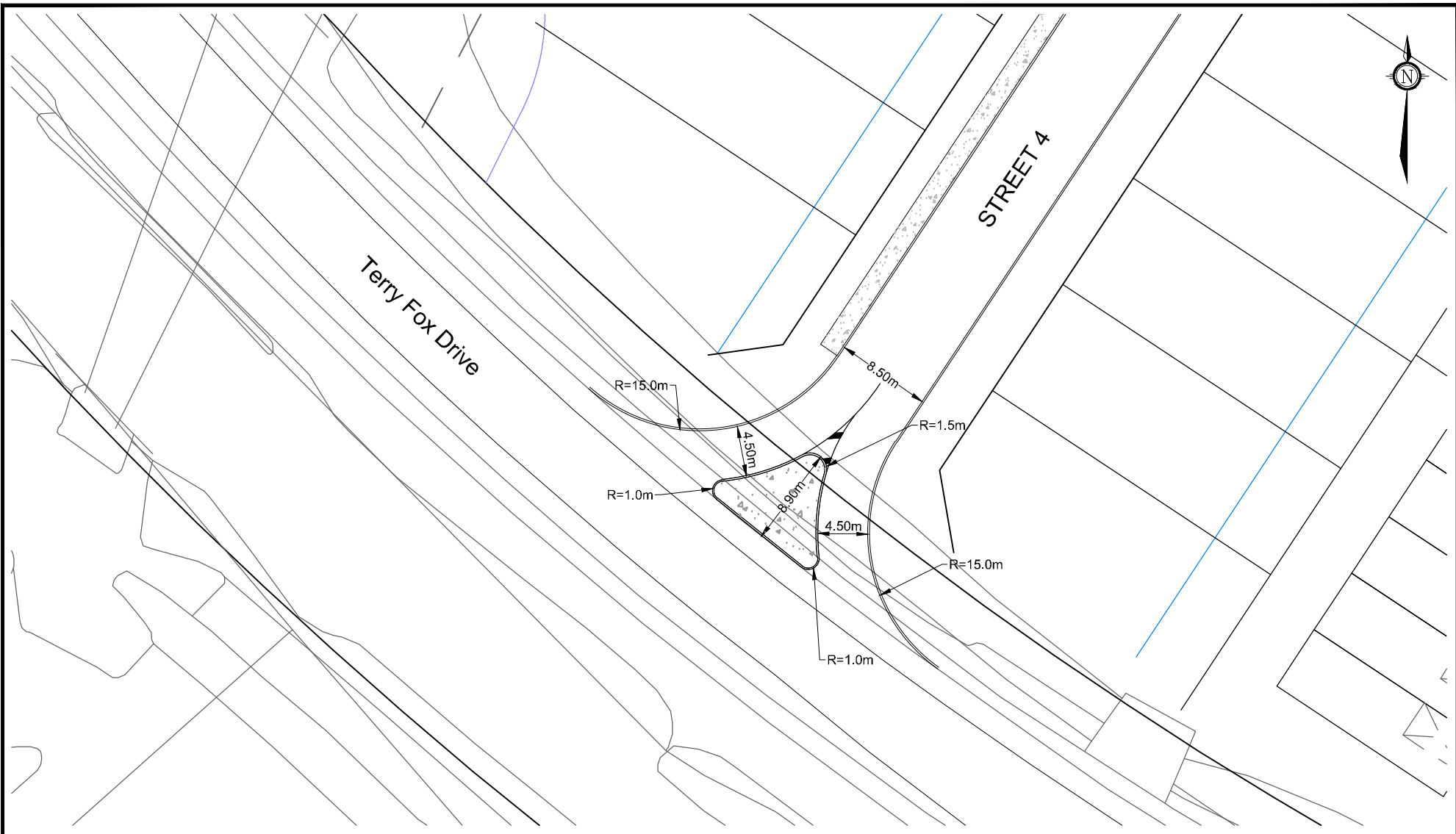
A roadway modification approval (RMA) package for the proposed eastbound left turn lane along Cope Drive at Street 1 will be submitted to the City under a separate letter.

A review of the intersection operations at the proposed accesses was conducted for the 2022 and 2027 total traffic conditions. The following table provides a summary of the access intersection operations, assuming side street stop control. Detailed summary sheets are provided in **Appendix I**.

**Table 7: Access Intersection Operations**

Intersection	AM Peak			PM Peak		
	Delay	LOS	Mvmt	Delay	LOS	Mvmt
<b>2022 Total</b>						
Terry Fox Drive Access	16 sec	C	WB	19 sec	C	WB
Cope Drive Access	13 sec	B	SB	17 sec	C	SB
<b>2027 Total – Scenario One</b>						
Terry Fox Drive Access	18 sec	C	WB	22 sec	C	WB
Cope Drive Access	14 sec	B	SB	19 sec	C	SB
<b>2027 Total – Scenario Two</b>						
Terry Fox Drive Access	19 sec	C	WB	26 sec	D	WB
Cope Drive/Commercial Access	16 sec	C	SB	33 sec	D	NB

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5331 FERNBANK ROAD  
1039 TERRY FOX DRIVE

FUNCTIONAL DESIGN  
TERRY FOX AT STREET 4

SCALE 1 : 500 0 5m 10m 20m

DATE OCT 2018 JOB 117198 FIGURE 14

The proposed accesses are anticipated to operate with a LOS D or better during the weekday AM and PM peak hours under all scenarios. A review of traffic signalization warrant criteria identified in Ontario Traffic Manual (OTM) Book 12 was conducted. Based on the OTM criteria, traffic signals along Cope Drive at Street 1 are anticipated to be 9% met by the 2027 horizon year. If the commercial development at 5331 Fernbank Road (south of Cope Drive) is constructed prior to the 2027 horizon year traffic signalization warrants are anticipated to be 35% met at this intersection. Copies of the OTM traffic signalization warrants are included in **Appendix G**.

Based on the foregoing, side street stop control is recommended at the proposed accesses along Cope Drive and Terry Fox Drive.

## 5.5 Transportation Demand Management

A review of the Transportation Demand Management (TDM) Measures checklist was conducted and can be found in **Appendix J**. To encourage travel by sustainable modes, a multi-modal travel option information package will be provided to new residents of the subdivision.

In addition to the above, the site conforms to the City's TDM initiatives by providing easy access to area pedestrian, cycling and transit facilities.

## 5.6 Neighbourhood Traffic Management

As identified in Section 3.4, this module is exempt.

## 5.7 Transit

Recent boarding/alighting information and bus occupancy information from the winter 2018 service period for OC Transpo bus stops #4031, #1919 and #6933 were received from OC Transpo. OC Transpo has also advised that the routes at these bus stops operate with 40-foot buses during the weekday AM and PM peak periods. Information received from OC Transpo is included in **Appendix B**. The following table summarizes the transit information received from OC Transpo.

**Table 8: Existing OC Transpo Utilization**

OC Transpo Stop	OC Transpo Route	AM Period			PM Period		
		Total Boarding	Total Alighting	Average Load	Total Boarding	Total Alighting	Average Load
#4031	252	-	-	-	0	3	2
	161	-	-	-	0	0	10
#1919	161	1	0	6	0	1	2
	164	5	0	4	-	-	-
#6933	252	6	0	3	-	-	-
	164	-	-	-	0	3	3
	168	0	0	0	1	0	1

Based on the trip generation presented in Section 4.1, the proposed development is anticipated to generate 27 transit trips (7 alighting, 20 boarding) during the weekday AM peak hour and 34 transit trips (24 alighting, 10 boarding) during the weekday PM peak hour. Based on the transit utilization data received from OC Transpo, the existing bus stops/routes in the vicinity of the subject site have capacity to accommodate the transit trips generated by proposed development. It is our

understanding that there are no major transit service changes anticipated in the direct vicinity of the subject site.

## 5.8 Review of Network Concept

As identified in Section 3.4, this module is exempt.

## 5.9 Intersection Design

### 5.9.1 Existing Intersection MMLOS Analysis

This section provides a review of the signalized study area intersections using complete streets principles. The MMLOS guidelines produced by IBI Group in October 2015 were used to evaluate the LOS of all study area intersections for each mode of transportation. Schedule B of the City of Ottawa's OP indicates the Terry Fox Drive/Cope Drive intersection borders the Enterprise Area and the General Urban Area. For the purposes of this analysis the targets for this intersection are based on the General Urban Area. An aerial photo of this intersection is provided in Section 3.2.2.

The following table summarizes the findings of the MMLOS intersection analysis. Detailed intersection MMLOS calculations are included in **Appendix K**.

**Table 9: Intersection MMLOS Summary**

Segment	PLOS	BLOS	TLOS	TkLOS	Auto LOS
Terry Fox Drive/ Cope Drive	F	F	D	C	F
<b>Target</b>	<b>C</b>	<b>B</b>	<b>-</b>	<b>D</b>	<b>D</b>

The Terry Fox Drive/Cope Drive intersection currently does not meet the target PLOS, BLOS or Auto LOS for the General Urban Area.

Based on the Pedestrian Exposure to Traffic (PETS) score, the Terry Fox Drive/Cope Drive intersection is operating with a PLOS F. Based on the Pedestrian Delay Evaluation Table, this intersection is operating with a PLOS D. A reduction in the crossing distance on all legs of the intersection would have the greatest improvement on the PETS score and the Pedestrian Delay.

This intersection is currently operating with a BLOS F. Due to the high operational speed along Terry Fox Drive, a BLOS B is unachievable on the north and south approaches. As identified in Section 5.3, consideration should be given to either providing bike lanes along Cope Drive or reducing the operating speed. If either bike lanes or a reduction in the operational speed are implemented, the BLOS on the east and west approaches will be improved to a D. If two stage left-turn bike boxes are provided in conjunction with a reduction in the operational speed on the east and west approaches, a BLOS A can be achieved.

The eastbound left turn movement at this intersection is currently operating with an Auto LOS F during the weekday PM peak hour. Based on the existing traffic count, approximately 280 vehicles perform the westbound right turn movement and 35 vehicles perform the westbound through movement during the PM peak hour at this intersection. As this is a shared through/right turn lane,

westbound right turning vehicles are occasionally blocked and queue behind a westbound through travelling vehicle. As the eastbound left turn movement is currently a permitted phase, the number of westbound right turning vehicles proceeding during the green phase impact the operations of the eastbound left turn movement. A site visit was conducted during the PM peak hour on September 20<sup>th</sup>, 2018 to confirm the results of the Synchro analysis. During the site visit, eastbound left turning vehicles generally cleared each cycle. However during critical periods, when westbound right turning vehicles queued behind a through travelling vehicle, only one to three eastbound left turning vehicle cleared. During these critical periods, the last eastbound left turning vehicle proceeded illegally through the all-red phase.

Based on the foregoing, consideration should be given by the City to providing a westbound right turn lane to improve intersection operations by permitting westbound right turning vehicles to bypass a westbound through vehicle. The implementation of a westbound right turn lane is anticipated to improve intersection operations to a LOS B during the PM peak hour. However, the implementation of a westbound right turn lane is anticipated to increase the pedestrian crossing distance, subsequently decreasing the PLOS on the east leg.

### 5.9.2 2022 Background Intersection Operations

Intersection capacity analysis has been completed for the 2022 background traffic conditions. The intersection parameters used in the analysis are consistent with the TIA guidelines (saturation flow rate: 1800 vphpl, PHF: 1.0).

The results of the intersection capacity analysis are summarized in the following table. Detailed summary sheets are provided in **Appendix I**.

**Table 10: 2022 Background Intersection Operations**

Intersection	AM Peak			PM Peak		
	V/C Ratio	LOS	Mvmt	V/C Ratio	LOS	Mvmt
Terry Fox Drive/ Cope Drive	0.63	B	WBT/R	1.13	F	EBL

Consistent with the existing conditions, the eastbound left turn movement at the Terry Fox Drive/Cope Drive intersection is anticipated to operate with a LOS F during the PM peak hour. The implementation of a westbound right turn lane is anticipated to improve intersection operations to a LOS B during the PM peak hour.

### 5.9.3 2027 Background Intersection Operations

Intersection capacity analysis has been completed for the 2027 background traffic conditions for both scenarios described above. The intersection parameters used in the analysis are consistent with the TIA guidelines (saturation flow rate: 1800 vphpl, PHF: 1.0).

#### 5.9.3.1 Scenario One

The results of the intersection capacity analysis for scenario one, where the commercial development at 5331 Fernbank Road (south of Cope Drive) is not constructed, are summarized in the following table. Detailed summary sheets are included in **Appendix I**.

**Table 11: 2027 Background Intersection Operations – Scenario One**

Intersection	AM Peak			PM Peak		
	V/C Ratio	LOS	Mvmt	V/C Ratio	LOS	Mvmt
Terry Fox Drive/ Cope Drive	0.69	B	WBT/R	1.11	F	EBL
				0.92	E	SBL

Consistent with the 2022 background traffic condition, the eastbound left turn movement at the Terry Fox Drive/Cope Drive intersection is anticipated to operate with a LOS F during the PM peak hour. The southbound left turn movement is also anticipated to operate with a LOS E during the PM peak hour. The implementation of a westbound right turn lane is anticipated to improve intersection operations to a LOS D during the PM peak hour.

### 5.9.3.2 Scenario Two

The results of the intersection capacity analysis for scenario two, where the commercial development at 5331 Fernbank Road (south of Cope Drive) is constructed, are summarized in the following table. Detailed summary sheets are included in **Appendix I**.

**Table 12: 2027 Background Intersection Operations – Scenario Two**

Intersection	AM Peak			PM Peak		
	V/C Ratio	LOS	Mvmt	V/C Ratio	LOS	Mvmt
Terry Fox Drive/ Cope Drive	0.71	C	WBT/R	1.47	F	SBL
				1.13	F	EBL

With the addition of the commercial traffic the southbound and eastbound left turn movements are anticipated to operate with a LOS F during the PM peak hour. The implementation of a westbound right turn lane and an increased cycle length (120 seconds) is anticipated to improve intersection operations to a LOS E during the PM peak hour. The additional traffic generated by the commercial development is anticipated to increase the southbound left turn traffic to approximately 425 vehicles during the PM peak hour, which warrants consideration of dual left turn lanes. A further review of mitigation measures associated with the commercial development is considered outside the scope of this report.

### 5.9.4 2022 Total Intersection Operations

Intersection capacity analysis has been completed for the 2022 total traffic conditions. The intersection parameters used in the analysis are consistent with the TIA guidelines (saturation flow rate: 1800 vphpl, PHF: 1.0).

The results of the intersection capacity analysis are summarized in the following table. Detailed reports are included in **Appendix I**.

**Table 13: 2022 Total Intersection Operations**

Intersection	AM Peak			PM Peak		
	V/C Ratio	LOS	Mvmt	V/C Ratio	LOS	Mvmt
Terry Fox Drive/ Cope Drive	0.63	B	WBT/R	1.13	F	EBL

Consistent with the 2022 background traffic conditions, the eastbound left turn movement at the Terry Fox Drive/Cope Drive intersection is anticipated to operate with a LOS F during the PM peak hour. The implementation of a westbound right turn lane is anticipated to improve intersection operations to a LOS C during the PM peak hour. As the subject site is not anticipated to add traffic to the eastbound left or westbound right turn movements at this intersection, it is recommended the City monitor operating conditions and construct any required road modifications as funding becomes available.

### 5.9.5 2027 Total Intersection Operations

Intersection capacity analysis has been completed for the 2027 total traffic conditions. The intersection parameters used in the analysis are consistent with the TIA guidelines (saturation flow rate: 1800 vphpl, PHF: 1.0).

#### 5.9.5.1 Scenario One

The results of the intersection capacity analysis for scenario one, where the commercial development at 5331 Fernbank Road (south of Cope Drive) is not constructed, are summarized in the following table. Detailed reports are included in **Appendix I**.

**Table 14: 2027 Total Intersection Operations – Scenario One**

Intersection	AM Peak			PM Peak		
	V/C Ratio	LOS	Mvmt	V/C Ratio	LOS	Mvmt
Terry Fox Drive/ Cope Drive	0.69	B	WBT/R	1.11	F	EBL
				1.04	F	SBL

The eastbound and southbound left turn movements are anticipated to operate with a LOS F during the PM peak hour. Consistent with the 2027 background traffic conditions (scenario one), the implementation of a westbound right turn lane is anticipated to improve operating conditions to a LOS D. It is recommended the City monitor operating conditions at this intersection and construct any required road modifications as funding becomes available.

#### 5.9.5.2 Scenario Two

The results of the intersection capacity analysis for scenario two, where the commercial development at 5331 Fernbank Road (south of Cope Drive) is constructed, are summarized in the following table. Detailed reports are included in **Appendix I**.



**Table 15: 2027 Total Intersection Operations – Scenario One**

Intersection	AM Peak			PM Peak		
	V/C Ratio	LOS	Mvmt	V/C Ratio	LOS	Mvmt
Terry Fox Drive/ Cope Drive	0.73	C	SBL	1.63	F	SBL
				1.13	F	EBL

Consistent with the 2027 background traffic analysis (scenario two), the southbound and eastbound left turn movements are anticipated to operate with a LOS F during the PM peak hour. The implementation of a westbound right turn lane and an increased cycle length (120 seconds) is anticipated to improve intersection operations to a LOS E during the PM peak hour. With addition of traffic generated by the commercial development, consideration should be given to dual southbound left turn lanes. A further review of mitigation measures associated with the commercial development is considered outside the scope of this report.

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

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

- All roadways within the proposed subdivision will be classified as local roadways, and will have an 18 metre right-of-way. Sidewalks will be provided on the west side of Street 1 and the north side of Street 4 within the subdivision.
- The vehicular and pedestrian traffic at the Street 1/Street 4 intersection are not anticipated to meet the OTM criteria for a PXO. However, as the sidewalk along Street 1 will terminate at Street 4 across from the neighbourhood park, this location meets the pedestrian desire line criteria and a PXO is recommended. Based on the anticipated vehicular volumes along Street 4 and Table 7 (Pedestrian Crossover Selection Matrix) in OTM Book 15, a PXO D is recommended at this location.
- Terry Fox Drive currently meets the target TkLOS and Auto LOS, however it does not meet the target PLOS and BLOS. Opportunities to improve the PLOS and BLOS along Terry Fox Drive should be explored by the City through the future widening of Terry Fox Drive, as identified in the City's 2013 TMP network concept.
- Cope Drive currently meets the target PLOS, TkLOS and Auto LOS, however it does not meet the target BLOS. As on-street parking is currently permitted along Cope Drive, the implementation of a bike lane adjacent to the curbside parking lane will result in a BLOS D, which does not meet the target. A curbside parking restriction in conjunction with bike lanes would result in a BLOS C, achieving the target. Alternative to bike lanes, consideration could also be given to reducing the posted speed to 40km/hr, resulting in a BLOS B for the existing mixed traffic lanes.
- The recommended cycling improvements to Cope Drive are to address the existing conditions and are not attributable to the site. As the site provides cycling connectivity to the existing facilities along Cope Drive, the implementation of any cycling facilities along Cope Drive should be a City lead initiative.



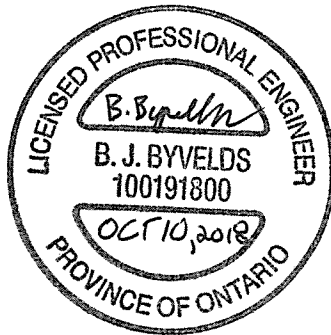
- Based on the projected northbound right turning volumes along Terry Fox Drive at Street 4, a right turn lane is not recommended. A pork chop island will be provided to restrict the Terry Fox Drive/Street 4 intersection to right-in right-out operation.
- A 15m eastbound left turn lane is warranted at the Cope Drive/Street 1 intersection. Based on the projected westbound right turning volumes along Cope Drive at Street 1, a right turn lane is not recommended. If the commercial development at 5331 Fernbank Road is constructed, a westbound left turn lane is also anticipated to be warranted at the access.
- The proposed accesses are anticipated to operate with a LOS D or better during the weekday AM and PM peak hours under all scenarios. Based on the Ontario Traffic Manual (OTM) criteria, traffic signals along Cope Drive at Street 1 are anticipated to be 9% met by the 2027 horizon year. If the commercial development at 5331 Fernbank Road (south of Cope Drive) is constructed prior to the 2027 horizon year traffic signalization warrants are anticipated to be 35% met at this intersection. Based on the foregoing, side street stop control is recommended at the proposed accesses along Cope Drive and Terry Fox Drive.
- To encourage travel by sustainable modes, a multi-modal travel option information package will be provided to new residents of the subdivision. The site conforms to the City's TDM initiatives by providing easy access to area pedestrian, cycling and transit facilities.
- Based on the transit utilization data received from OC Transpo, the existing bus stops/routes in the vicinity of the subject site have capacity to accommodate the transit trips generated by proposed development. It is our understanding that there are no major transit service changes anticipated in the direct vicinity of the subject site.
- The Terry Fox Drive/Cope Drive intersection currently does not meet the target PLOS, BLOS or Auto LOS for the General Urban Area. A reduction in the crossing distance on all legs of the intersection would have the greatest improvement on the PETSI score and the Pedestrian Delay. Due to the high operational speed along Terry Fox Drive, a BLOS B is unachievable on the north and south approaches. If either bike lanes or a reduction in the operational speed are implemented along Cope Drive, the BLOS on the east and west approaches will be improved to a D. If two stage left-turn bike boxes are provided in conjunction with a reduction in the operational speed on the east and west approaches, a BLOS A can be achieved.
- The eastbound left turn movement at the Terry Fox Drive/Cope Drive intersection is currently operating with an Auto LOS F during the weekday PM peak hour. Consideration should be given by the City to providing a westbound right turn lane to improve intersection operations by permitting westbound right turning vehicles to bypass a through westbound through vehicle. The implementation of a westbound right turn lane is anticipated to improve intersection operations to a LOS B during the PM peak hour. However, the implementation of a westbound right turn lane is anticipated to increase the pedestrian crossing distance, subsequently decreasing the PLOS on the east leg.
- With the addition of traffic generated by the site, the eastbound left turn movement at the Terry Fox Drive/Cope Drive intersection will continue to operate with a LOS F during the PM peak hour. The implementation of a westbound right turn lane is anticipated to improve operating conditions to a LOS D. As the subject site is not anticipated to add traffic to the eastbound left or westbound right turn movements at this intersection, it is recommended the

City monitor operating conditions at this intersection and construct any required road modifications as funding becomes available.

- With the addition of traffic generated by the future commercial development south of Cope Drive, the eastbound and southbound left turn movements at the Terry Fox Drive/Cope Drive intersection are anticipated to operate with a LOS F. With addition of traffic generated by the commercial development, consideration should be given to dual southbound left turn lanes. A further review of mitigation measures associated with the commercial development is considered outside the scope of this report.

**NOVATECH**

Prepared by:



Brad Byvelds, P. Eng.  
Project Coordinator | Transportation/Traffic

## **APPENDIX A**

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TIA Screening Form

## City of Ottawa 2017 TIA Guidelines Screening Form

### 1. Description of Proposed Development

Municipal Address	<b>5331 Fernbank Road and 1039 Terry Fox Drive</b>
Description of Location	<b>The 8.15-hectare property is located at the northeast corner of Terry Fox Drive &amp; Cope Drive</b>
Land Use Classification	<b>Residential</b>
Development Size (units)	<b>55 Single Detached and 129 Townhouse units</b>
Development Size (m <sup>2</sup> )	<b>-</b>
Number of Accesses and Locations	<b>One proposed access at Terry Fox Drive and one proposed access at Cope Drive</b>
Phase of Development	<b>1</b>
Buildout Year	<b>2022</b>

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

### 2. Trip Generation Trigger

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

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

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

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

### 3. Location Triggers

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

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

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

### 4. Safety Triggers

	Yes	No
Are posted speed limits on a boundary street are 80 km/hr or greater?	✓	
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		✓
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	✓	
Is the proposed driveway within auxiliary lanes of an intersection?		✓
Does the proposed driveway make use of an existing median break that serves an existing site?		✓
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		✓
Does the development include a drive-thru facility?		✓

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

**5. Summary**

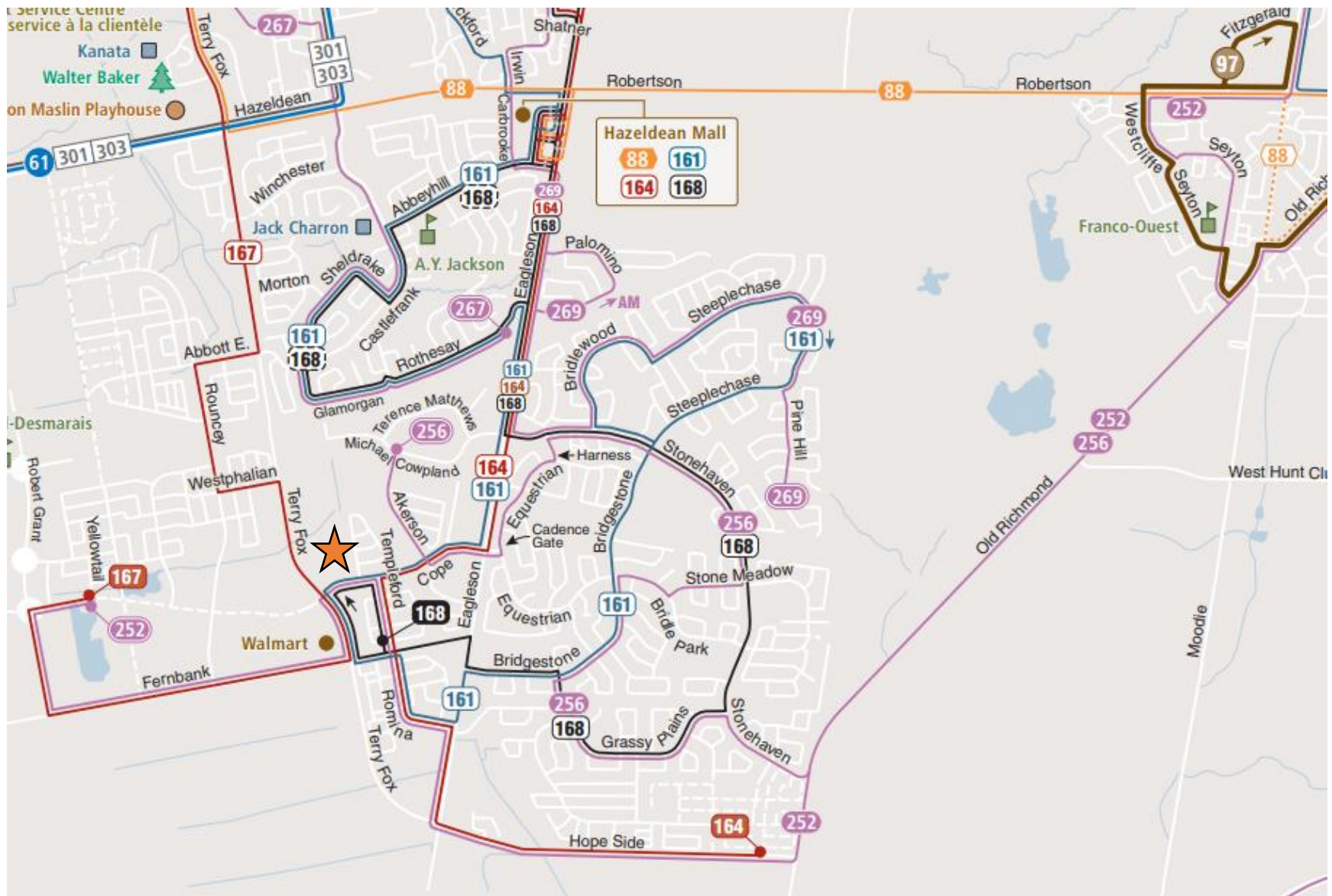
	Yes	No
Does the development satisfy the Trip Generation Trigger?	✓	
Does the development satisfy the Location Trigger?	✓	
Does the development satisfy the Safety Trigger?	✓	

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

## **APPENDIX B**

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### OC Transpo System Information



SUBJECT LANDS



# 161

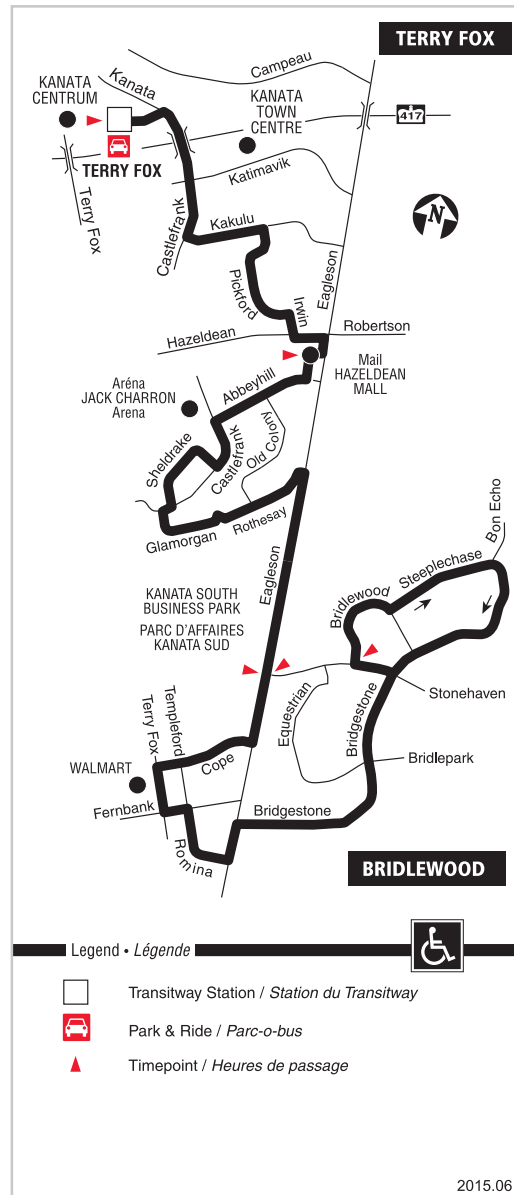
## TERRY FOX BRIDLEWOOD

**Monday to Friday / Lundi au vendredi**

All day service. No weekend service

Service toute la journée.

Aucun service les fins de semaine



Information / Renseignement.....**613-741-4390**

Customer Relations  
Service à la clientèle .....**613-842-3600**

Lost and Found / Objets perdus .....**613-563-4011**

Schedule / Horaire.....**613-560-1000**

Text / Texto .....**560560**

*plus your four digit bus stop number / plus votre numéro d'arrêt à quatre chiffres*

**Effective / En vigueur June 29 juin 2015**

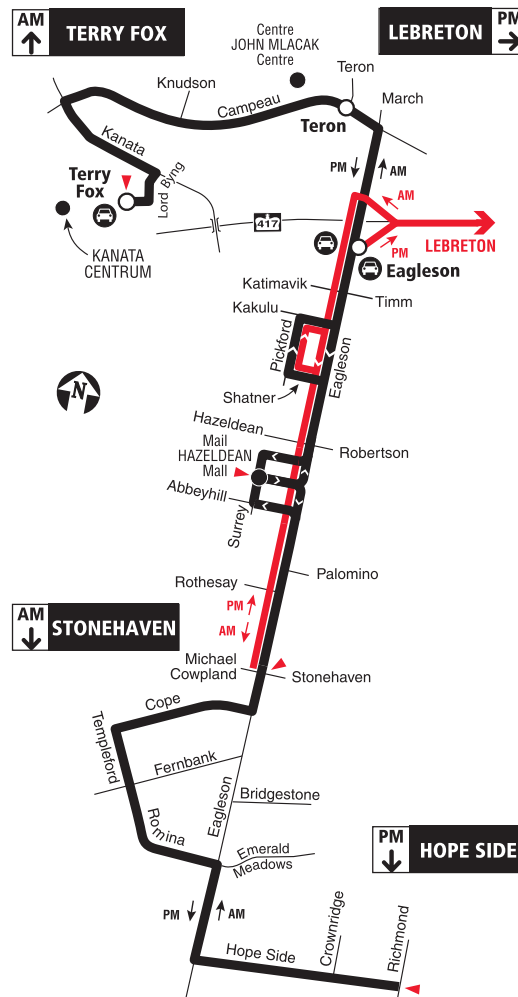
# 164

## TERRY FOX HOPE SIDE

### Local

**Monday to Friday/ Lundi au vendredi**

Peak periods only  
Périodes de pointe seulement



2017.12



**Schedule / Horaire.....613-560-1000**

**Text / Texto .....560560**

plus your four digit bus stop number / plus votre numéro d'arrêt à quatre chiffres

Customer Relations

Service à la clientèle ..... 613-842-3600

Lost and Found / Objets perdus..... 613-563-4011

Security / Sécurité ..... 613-741-2478

**Effective December 24, 2017**

**En vigueur 24 décembre 2017**



INFO 613-741-4390  
octranspo.com

# 168

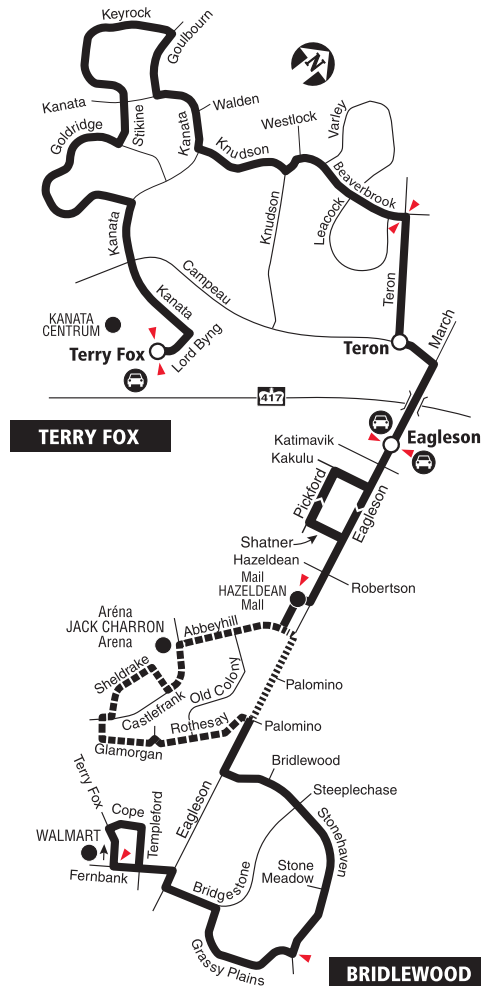
## TERRY FOX BRIDLEWOOD

*Local*

**7 days a week / 7 jours par semaine**

All day service

Service toute la journée



- Transitway Station / Station du Transitway
- Saturday and Sunday only / Samedi et dimanche seulement
- ||||||| No weekend service / Aucun service la fin de semaine
- 🚌 Park & Ride / Parc-o-bus
- ▲ Timepoint / Heures de passage

2017.12



**Schedule / Horaire.....613-560-1000**

**Text / Texto .....560560**

*plus your four digit bus stop number / plus votre numéro d'arrêt à quatre chiffres*

Customer Relations

Service à la clientèle ..... **613-842-3600**

Lost and Found / Objets perdus..... **613-563-4011**

Security / Sécurité ..... **613-741-2478**

**Effective December 24, 2017**

**En vigueur 24 décembre 2017**



**INFO 613-741-4390**  
**octranspo.com**



# 252

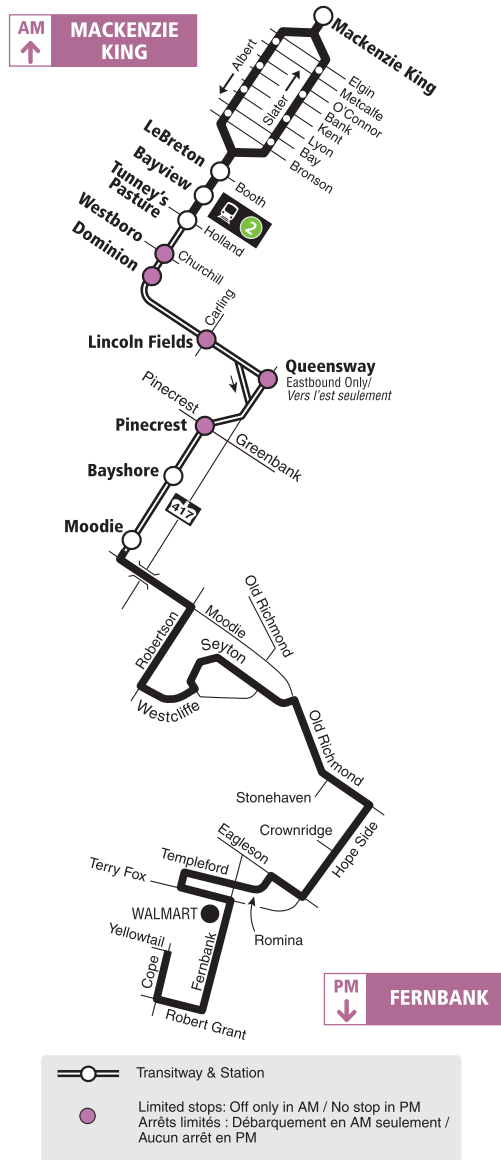
## MACKENZIE KING FERNBANK

### Connexion

**Monday to Friday / Lundi au vendredi**

Peak periods only

Périodes de pointe seulement



2017.12



**Schedule / Horaire.....613-560-1000**

**Text / Texto .....560560**

plus your four digit bus stop number / plus votre numéro d'arrêt à quatre chiffres

Customer Relations

Service à la clientèle ..... **613-842-3600**

Lost and Found / Objets perdus..... **613-563-4011**

Security / Sécurité ..... **613-741-2478**

**Effective December 24, 2017**

**En vigueur 24 décembre 2017**



**INFO 613-741-4390**  
[octranspo.com](http://octranspo.com)

## Brad Byvelds

**From:** Stefanoff, Genya <genya.stefanoff@ottawa.ca>  
**Sent:** Wednesday, August 29, 2018 1:05 PM  
**To:** Brad Byvelds  
**Subject:** RE: Request for OC Transpo Boarding/Alighting Data - Cope Drive

Hi Brad,

Good timing – I just received the ridership data from my colleague. The tables below show the ridership at the three stops requested, for both the AM and PM peak periods (6am-9am and 3pm-6pm, respectively). The data is from the Winter 2018 service period.

### AM PEAK PERIOD

Stop	Route	Total Weekday Boardings	Total Weekday Alightings	Average of Load at Departure
COPE / TEMPLEFORD	161	1	0	6
	164	5	0	4
TEMPLEFORD / COPE	168	0	0	0
	252	6	0	3

### PM PEAK PERIOD

Stop	Route	Total Weekday Boardings	Total Weekday Alightings	Average of Load at Departure
COPE / NORTHGRAVES	161	0	0	10
	252	0	3	2
COPE / TEMPLEFORD	161	0	1	2
TEMPLEFORD / COPE	164	0	3	3
	168	1	0	1

In terms of bus type operating on these routes, they are all planned to operate with 40-foot buses during the AM and PM peak periods.

If you have any questions or require additional information, please don't hesitate to contact me.

Best regards,  
Genya

**Genya Stefanoff, MCIP, RPP**  
**Senior Transit Planner, Service Strategy**

City of Ottawa | OC Transpo | Transportation Services Department  
1500 St. Laurent Blvd., Ottawa, ON K1G 0Z8

tel: 613-580-2424 ext. 52294  
[genya.stefanoff@ottawa.ca](mailto:genya.stefanoff@ottawa.ca)



---

**From:** Brad Byvelds <B.Byvelds@novatech-eng.com>  
**Sent:** Wednesday, August 29, 2018 10:42 AM  
**To:** Stefanoff, Genya <genya.stefanoff@ottawa.ca>  
**Subject:** RE: Request for OC Transpo Boarding/Alighting Data

Hello Genya,

I am just following up on the below request. When might we receive this data?

Thanks,

**Brad Byvelds**, P.Eng., Project Coordinator | Transportation/Traffic

**NOVATECH** Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 286 | Fax: 613.254.5867

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**From:** Stefanoff, Genya <[genya.stefanoff@ottawa.ca](mailto:genya.stefanoff@ottawa.ca)>  
**Sent:** Thursday, August 02, 2018 3:06 PM  
**To:** Brad Byvelds <[B.Byvelds@novatech-eng.com](mailto:B.Byvelds@novatech-eng.com)>  
**Subject:** RE: Request for OC Transpo Boarding/Alighting Data

Hi Brad,

Yes, I can certainly provide the requested data to you. It may take a few weeks as my colleagues who gather this information are away on vacation.

Thanks,  
Genya

**Genya Stefanoff, MCIP, RPP**  
**Senior Transit Planner, Service Strategy**

City of Ottawa | OC Transpo | Transportation Services Department  
1500 St. Laurent Blvd., Ottawa, ON K1G 0Z8

tel: 613-580-2424 ext. 52294

[genya.stefanoff@ottawa.ca](mailto:genya.stefanoff@ottawa.ca)



---

**From:** Brad Byvelds <[B.Byvelds@novatech-eng.com](mailto:B.Byvelds@novatech-eng.com)>  
**Sent:** Thursday, August 02, 2018 2:40 PM  
**To:** Stefanoff, Genya <[genya.stefanoff@ottawa.ca](mailto:genya.stefanoff@ottawa.ca)>  
**Subject:** Request for OC Transpo Boarding/Alighting Data

Hello Genya,

I would like to request the transit boarding and alighting data for the following OC Transpo stops:

- #4031 – Cope Drive west of Northgraves Crescent
- #1919 – Cope Drive east of Templeford Avenue

- #6933 – Templeford Avenue south of Cope Drive

Thanks,

**Brad Byvelds**, P.Eng., Project Coordinator | Transportation/Traffic

**NOVATECH** Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 286 | Fax: 613.254.5867

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,



## Brad Byvelds

---

**From:** Korol-Paradis, Andre <andre.korol-paradis@ottawa.ca>  
**Sent:** Monday, September 17, 2018 11:07 AM  
**To:** Brad Byvelds; Stefanoff, Genya; Rathwell, Graham  
**Cc:** Greg Winters; Marc St.Pierre; Ellen Potts  
**Subject:** RE: 5331 Fernbank Road and 1039 Terry Fox Drive - Future Transit Servicing

God morning Brad,

Review of internal strategy analysis documents do not indicate any major service changes in the direct vicinity of the proposed development. Future consideration has been given to the transit service as it applies to Kizell lands west of Terry Fox Drive. As stated previously, this would not change the service offer of this development. Bear in mind that OC Transpo will continue to provide service on Cope Drive and Terry Fox Drive. Modifications to the bus stop infrastructure in proximity to the project will be, if needed, provided during the CUP review stage.

Please do not hesitate to contact me for additional questions. Have a nice day.

### André Korol-Paradis

Transit Planner, Network Service Design  
Service Planning Branch  
Transportation Services Department  
OC Transpo | City of Ottawa  
Tel: (613) 580-2424 ext. 52465



---

**From:** Brad Byvelds <B.Byvelds@novatech-eng.com>  
**Sent:** Wednesday, September 12, 2018 11:39 AM  
**To:** Stefanoff, Genya <genya.stefanoff@ottawa.ca>; Korol-Paradis, Andre <andre.korol-paradis@ottawa.ca>; Rathwell, Graham <graham.rathwell@ottawa.ca>  
**Cc:** Greg Winters <G.Winters@novatech-eng.com>; Marc St.Pierre <m.stpierre@novatech-eng.com>; Ellen Potts <e.potts@novatech-eng.com>  
**Subject:** RE: 5331 Fernbank Road and 1039 Terry Fox Drive - Future Transit Servicing

Hello André and Graham,

I am just following up on the below email. Can you please advise any future OC Transpo plans in the vicinity of Terry Fox/Cope.

Thanks,

**Brad Byvelds**, P.Eng., Project Coordinator | Transportation/Traffic

**NOVATECH** Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 286 | Fax: 613.254.5867

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---

**From:** Stefanoff, Genya <[genya.stefanoff@ottawa.ca](mailto:genya.stefanoff@ottawa.ca)>

**Sent:** Tuesday, September 04, 2018 10:10 AM

**To:** Brad Byvelds <[B.Byvelds@novatech-eng.com](mailto:B.Byvelds@novatech-eng.com)>; Korol-Paradis, Andre <[andre.korol-paradis@ottawa.ca](mailto:andre.korol-paradis@ottawa.ca)>; Rathwell, Graham <[graham.rathwell@ottawa.ca](mailto:graham.rathwell@ottawa.ca)>

**Cc:** Greg Winters <[G.Winters@novatech-eng.com](mailto:G.Winters@novatech-eng.com)>; Marc St.Pierre <[m.stpierre@novatech-eng.com](mailto:m.stpierre@novatech-eng.com)>; Ellen Potts <[e.potts@novatech-eng.com](mailto:e.potts@novatech-eng.com)>

**Subject:** RE: 5331 Fernbank Road and 1039 Terry Fox Drive - Future Transit Servicing

Hi Brad,

I am including my colleagues André Korol-Paradis and Graham Rathwell from OC's Network Service Design group who may have provided the pre-consultation transit comments as they both work on development applications in Kanata/Stittsville.

André and Graham, can you please follow up with Brad regarding our service plan for the Cope/Terry Fox area.

Thanks,  
Genya

**Genya Stefanoff, MCIP, RPP**  
**Senior Transit Planner, Service Strategy**

City of Ottawa | OC Transpo | Transportation Services Department  
1500 St. Laurent Blvd., Ottawa, ON K1G 0Z8

tel: 613-580-2424 ext. 52294

[genya.stefanoff@ottawa.ca](mailto:genya.stefanoff@ottawa.ca)



---

**From:** Brad Byvelds <[B.Byvelds@novatech-eng.com](mailto:B.Byvelds@novatech-eng.com)>

**Sent:** Tuesday, September 04, 2018 9:35 AM

**To:** Stefanoff, Genya <[genya.stefanoff@ottawa.ca](mailto:genya.stefanoff@ottawa.ca)>

**Cc:** Greg Winters <[G.Winters@novatech-eng.com](mailto:G.Winters@novatech-eng.com)>; Marc St.Pierre <[m.stpierre@novatech-eng.com](mailto:m.stpierre@novatech-eng.com)>; Ellen Potts <[e.potts@novatech-eng.com](mailto:e.potts@novatech-eng.com)>

**Subject:** 5331 Fernbank Road and 1039 Terry Fox Drive - Future Transit Servicing

Hello Genya,

I am working on a TIA for the a residential subdivision located at 5331 Fernbank Road and 1039 Terry Fox Drive (northeast corner of Terry Fox/Cope intersection), as shown in the attached. The subdivision will contain a total of 184 residential units. The pre-consultation comments received from the City suggest we follow up with OC Transpo about their future plans for the development (i.e. bus stops along Cope Drive). Can you please advise any future OC Transpo plans for this area?

I'm not sure if you are the appropriate contact for this, but if not can you please pass this along to the appropriate person.

Thanks,  
**Brad Byvelds**, P.Eng., Project Coordinator | Transportation/Traffic

**NOVATECH** Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 286 | Fax: 613.254.5867

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## **APPENDIX C**

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### Traffic Count Data

## Turning Movement Count - Peak Hour Diagram

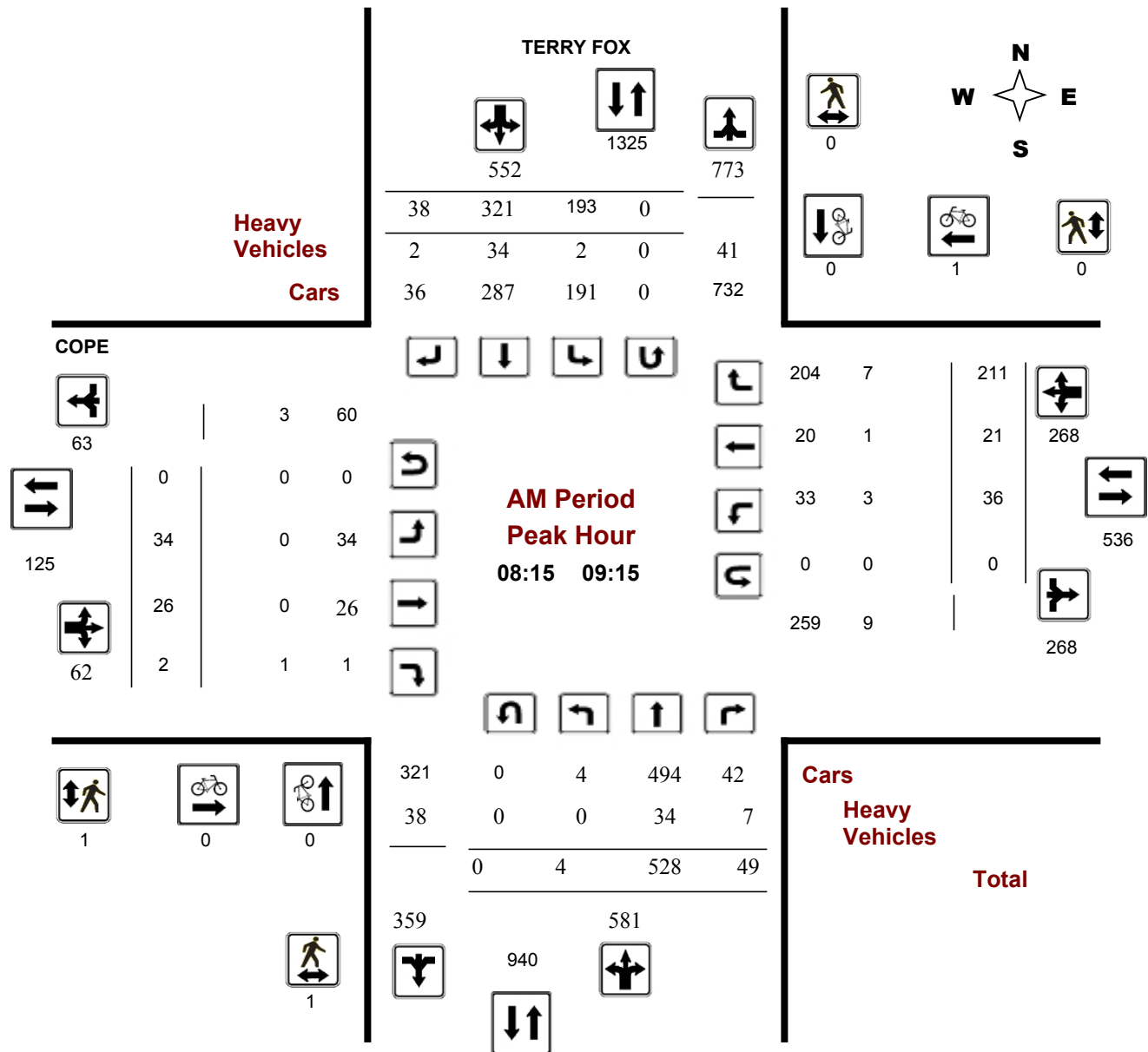
### COPE @ TERRY FOX

**Survey Date:** Thursday, January 25, 2018

**Start Time:** 07:00

**WO No:** 37446

**Device:** Miovision



**Comments**

## Turning Movement Count - Peak Hour Diagram

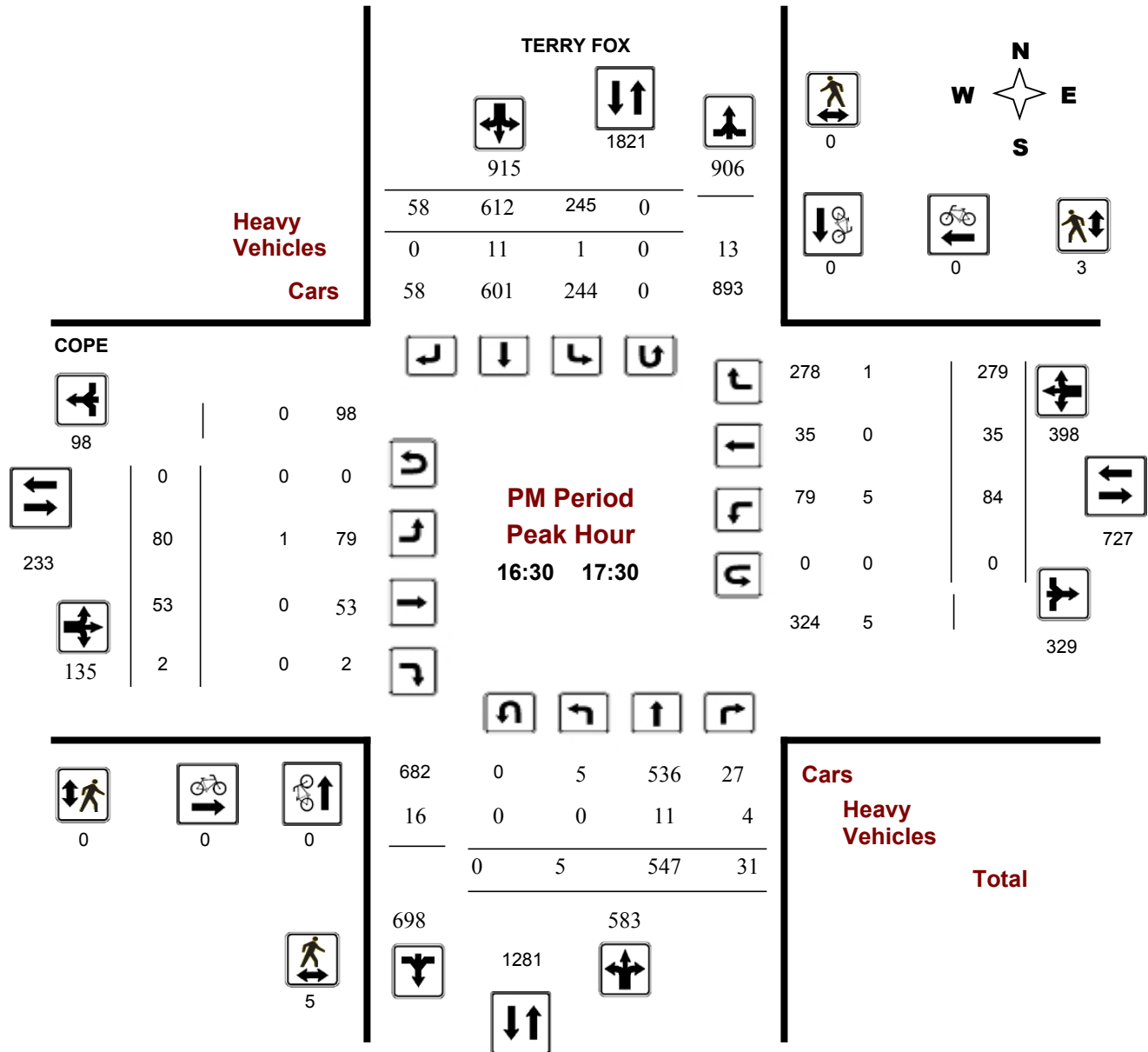
### COPE @ TERRY FOX

**Survey Date:** Thursday, January 25, 2018

**Start Time:** 07:00

**WO No:** 37446

**Device:** Miovision



## **APPENDIX D**

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### Collision Records





# City Operations - Transportation Services

## Collision Details Report - Public Version

**From:** January 1, 2012 **To:** December 31, 2016

**Location:** COPE @ TERRY FOX

**Traffic Control:** Traffic signal

**Total Collisions:** 16

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Jun-12, Thu,18:12	Rain	Rear end	Non-fatal injury	Wet	North	Going ahead	Pick-up truck	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Dec-01, Mon,16:58	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Dec-27, Sat,17:10	Rain	SMV other	P.D. only	Wet	West	Turning left	Automobile, station wagon	Ran off road	
2014-Nov-19, Wed,19:33	Clear	Angle	P.D. only	Wet	West	Turning right	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Pick-up truck	Other motor vehicle	
2015-Feb-26, Thu,11:48	Clear	Turning movement	P.D. only	Wet	North	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	

2015-Sep-09, Wed,07:25	Clear	Turning movement	P.D. only	Dry	South	Turning left	Pick-up truck	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2016-Jan-22, Fri,19:12	Clear	Angle	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle
2016-Feb-22, Mon,16:09	Clear	Turning movement	P.D. only	Dry	North	Turning left	Pick-up truck	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Apr-06, Wed,17:52	Snow	Rear end	P.D. only	Loose snow	North	Slowing or stopping	Pick-up truck	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2016-May-01, Sun,15:35	Clear	Rear end	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2016-May-03, Tue,19:43	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2016-Oct-04, Tue,03:47	Clear	SMV other	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Curb
2016-Oct-17, Mon,08:04	Clear	Angle	Non-fatal injury	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle

2016-Oct-18, Tue,19:06	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North	Stopped	Municipal transit bus	Other motor vehicle
2016-Nov-12, Sat,15:27	Clear	Rear end	Non-fatal injury	Dry	South	Turning left	Pick-up truck	Other motor vehicle
					South	Turning left	Automobile, station wagon	Other motor vehicle
2016-Dec-09, Fri,17:51	Snow	Rear end	P.D. only	Ice	South	Going ahead	Pick-up truck	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle

## **APPENDIX E**

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Other Area Development Traffic

Figure 6: 'New' Site-Generated Traffic

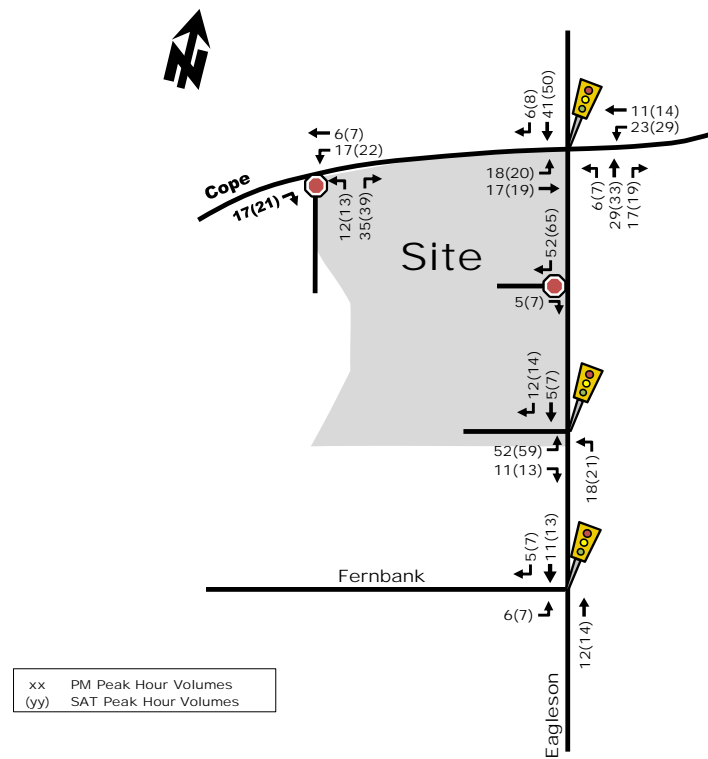
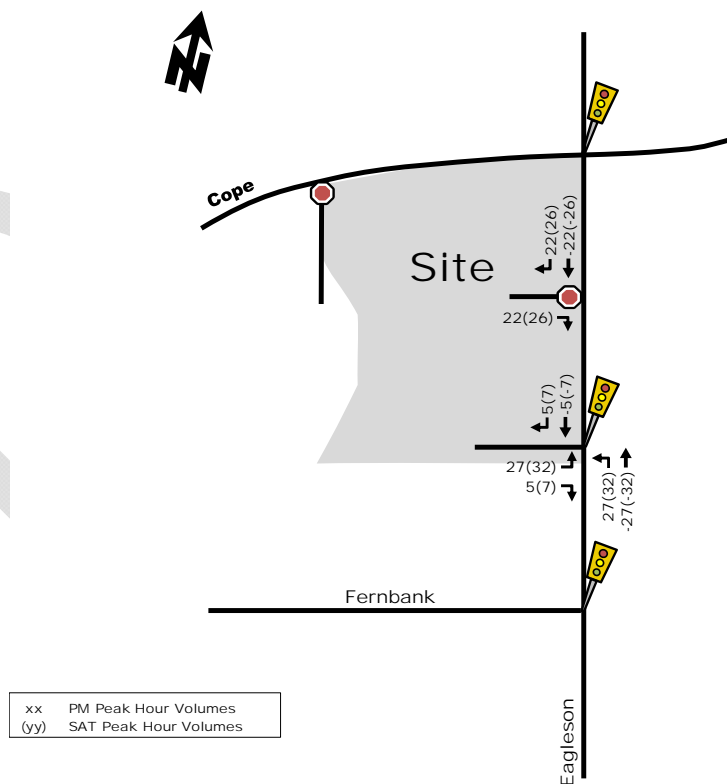
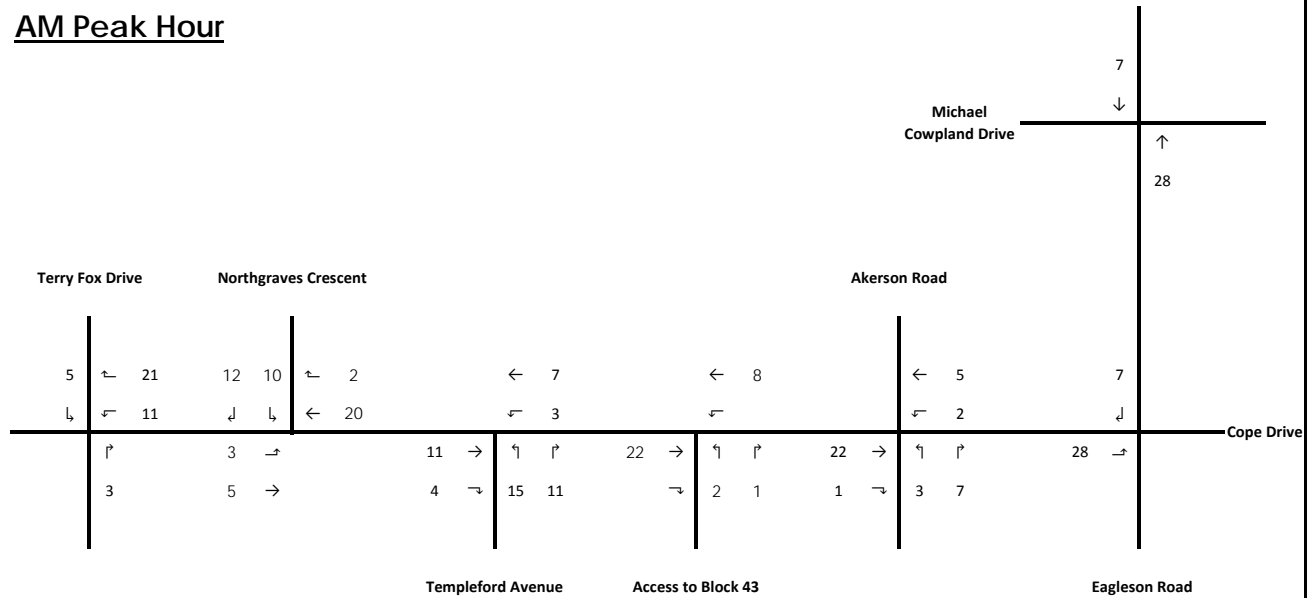


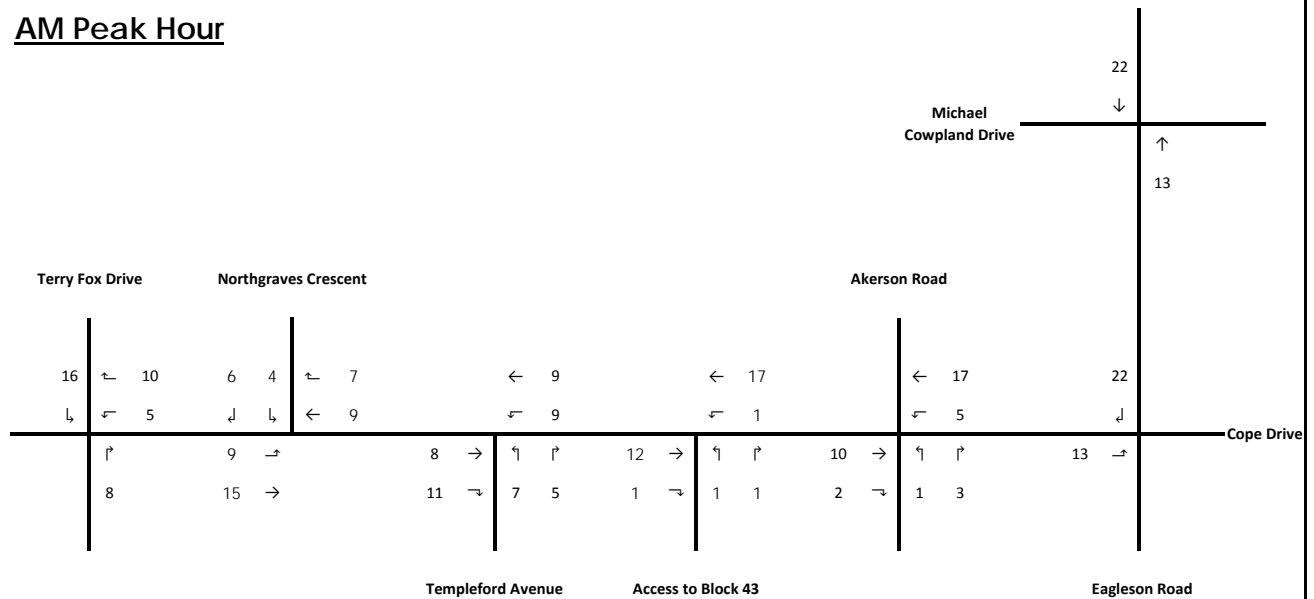
Figure 7: 'Pass-by' Site-Generated Traffic



## AM Peak Hour



## AM Peak Hour



Stantec Consulting Ltd.  
1331 Clyde Avenue, Suite 400  
Ottawa, ON, Canada K2C 3G4  
Tel: (613) 722-4420  
www.stantec.com



Thomas Cavanagh Construction Ltd.  
Cope Drive Lands TIS  
Figure 8  
Total Development Site Trips

Trips generated by the future commercial development at 5331 Fernbank Road (south of Cope Drive) are based on rates identified in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9<sup>th</sup> Edition, and are summarized in the following table.

**Table 1: ITE Trip Generation**

Land Use	ITE Code	GFA (ft <sup>2</sup> )	AM Peak			PM Peak		
			IN	OUT	TOT	IN	OUT	TOT
Supermarket	850	35,000	74	45	119	169	163	332
Specialty Retail	826	60,000	26	16	42	72	91	163
Total			100	61	161	241	254	495

The ITE trips have been converted to person trips using an ITE trip to person trip factor of 1.42, consistent with the Van Gaal Lands CTS. The person trip generation is summarized in the following table.

**Table 2: Person Trip Generation**

Land Use	GFA (ft <sup>2</sup> )	AM Peak			PM Peak		
		IN	OUT	TOT	IN	OUT	TOT
Supermarket	35,000	105	64	169	240	231	471
Specialty Retail	60,000	37	23	60	102	129	231
Total		142	87	229	342	360	702

The modal share values applied to the trips generated by the proposed development are based on all trips within the Kanata/Stittsville district, as identified in the 2011 TRANS O-D Survey Report.

**Table 3: Person Trips by Modal Share**

Travel Mode	Modal Share	AM Peak			PM Peak		
		IN	OUT	TOT	IN	OUT	TOT
Total Person Trips		142	87	229	342	360	702
Auto Driver	55%	78	48	126	188	198	386
Auto Passenger	20%	29	17	46	68	72	140
Transit	5%	14	9	23	34	36	70
Non-Auto	20%	21	13	34	52	54	106

The commercial development is anticipated to generate two types of peak hour trips: primary trips and pass-by trips. Primary trips are made for the specific purpose of visiting the site and pass-by trips are made as intermediate stops on the way to another destination. Peak hour pass-by trips are estimated based on a pass-by rate of 35%. The ITE Trip Generation Handbook, 9<sup>th</sup> Edition identifies this as an average rate for the Shopping Centre and Supermarket land uses. The primary and pass-by trip generation is presented in the following table.

**Table 4: Primary and Pass-by Trip Generation**

Trip Type	AM Peak			PM Peak		
	IN	OUT	TOT	IN	OUT	TOT
Total Vehicle Trips	78	48	126	188	198	386
Pass-by	23	23	46	68	68	136
Primary	55	25	80	120	130	250



The distribution of trips generated by the future commercial development at 5331 Fernbank Road (South of Cope Drive) is consistent with the Van Gaal Lands Community Transportation Study.

## **APPENDIX F**

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### Segment MMLOS Analysis

**Pedestrian Level of Service (PLOS)**

Sidewalk Width	Boulevard Width	Avg. Daily Curb Lane Traffic Volume	Presence of On-Street Parking	Operating Speed <sup>1</sup>	Segment PLOS
<b>Terry Fox Drive</b>					
2.0m <sup>2</sup>	None	>3,000 vpd	No	90 km/hr	F
<b>Cope Drive</b>					
2.0m	>2.0m	<3,000 vpd	N/A	60 km/hr	A

1. Operating speed based on 10km/hr above posted speed limit
2. Paved Shoulder
3. Adjusted downward for rural conditions

**Bicycle Level of Service (BLOS)**

Road Class	Bike Route	Type of Bikeway	Travel Lanes <sup>1</sup>	Centerline Markings	Operating Speed <sup>2</sup>	Segment BLOS
<b>Terry Fox Drive</b>						
Arterial	Spine	Bike Lane/ Paved Shoulder	1	N/A	90 km/hr	E
<b>Cope Drive</b>						
Collector	Local	Mixed Traffic	1	No	60 km/hr	F

1. Travel lanes in each direction
2. Operating speed based on 10km/hr above posted speed limit

**Transit Level of Service (TLOS)**

Facility Type	Level/Exposure to Congestion Delay, Friction and Incidents			Segment TLOS
	Congestion	Friction	Incident Potential	
Terry Fox Drive				
Mixed Traffic	Yes	Low	Medium	D
Cope Drive				
Mixed Traffic	Yes	Low	Medium	D

**Truck Level of Service (TkLOS)**

Curb Lane Width	Number of Travel Lanes (Per Direction)	Segment TkLOS
<b>Terry Fox Drive</b>		
≤3.5m	1	C
<b>Cope Drive</b>		
>3.7m	1	B

**Auto LOS**

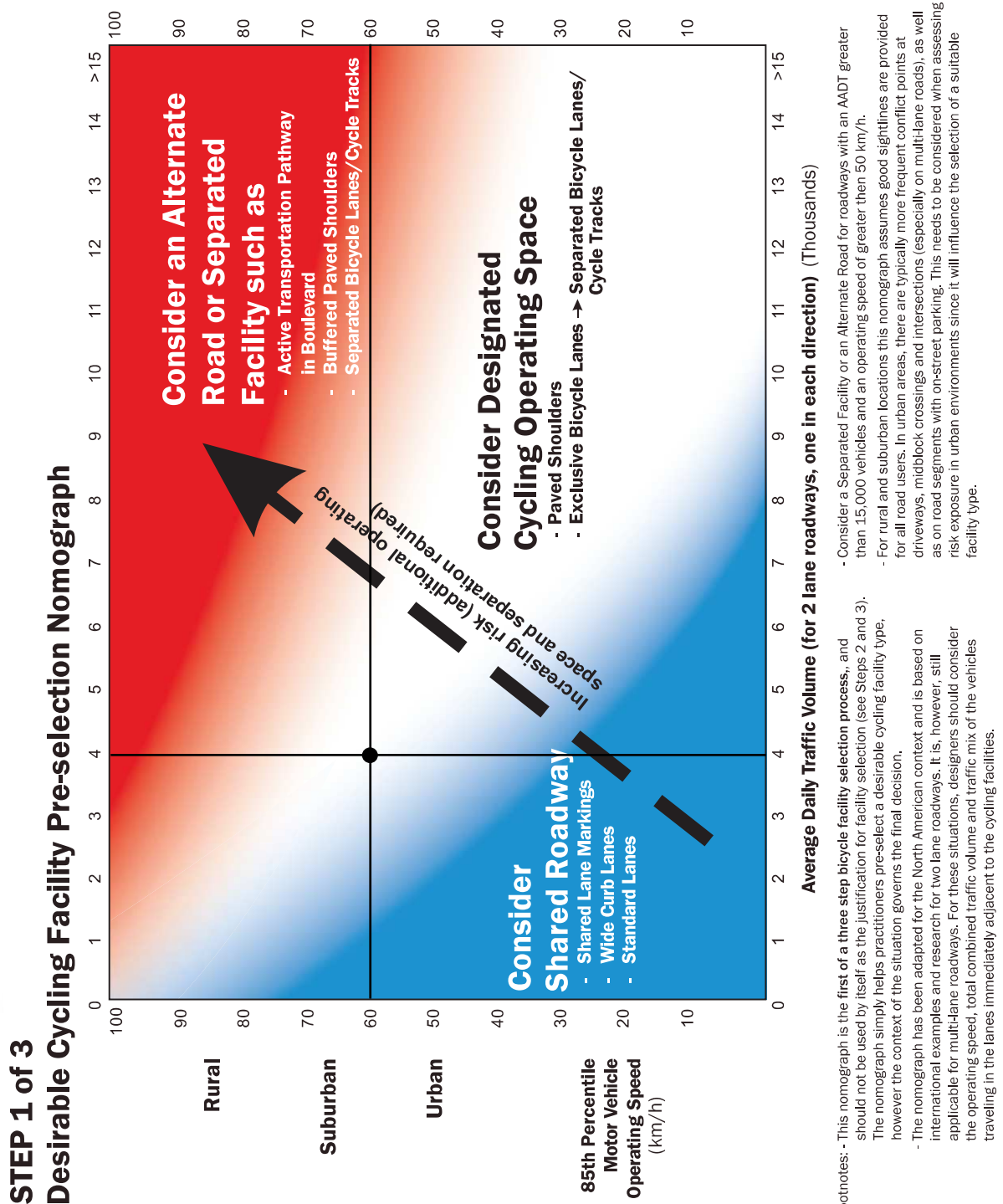
Direction	Directional Capacity <sup>1</sup>	Traffic Volumes		V/C Ratio and LOS				Auto LOS
		AM Peak	PM Peak	AM Peak		PM Peak		
				v/c	LOS	v/c	LOS	
Terry Fox Drive								
NB	1200vph	734	663	0.61	B	0.55	A	B
SB	1200vph	426	746	0.36	S	0.62	B	
Cope Drive								
EB	600vph	182	291	0.30	A	0.48	A	A
WB	600vph	203	300	0.34	A	0.50	A	

1. Typical lane capacity based on the City's guidelines for the TRANS long-range transportation model

## Segment MMLOS Summary

	Segment	Terry Fox Drive	Cope Drive
Pedestrian	Sidewalk Width	2.0m	2.0m
	Boulevard Width	None	> 2.0m
	Average Daily Curb Lane Traffic Volume	>3000 vpd	< 3000vpd
	On-Street Parking	No	N/A
	Operating Speed	90 km/h	60 km/hr
	Level of Service	F	A
	Target	C	C
Cyclist	Road Classification	Arterial	Collector
	Bike Route Classification	Spine	Local
	Type of Bikeway	Paved Shoulder	Mixed Traffic
	Travel Lanes (Each Direction)	1	1
	Centerline Markings	N/A	No
	Operating Speed	90 km/h	60 km/hr
	Level of Service	E	F
	Target	C	B
Transit	Facility Type	Mixed Traffic	Mixed Traffic
	Congestion	Yes	Yes
	Friction	Low	Low
	Incident Potential	Medium	Medium
	Level of Service	D	D
	Target	-	-
Truck	Lane Width	≤3.5m	> 3.7m
	Travel Lanes (per direction)	1	1
	Level of Service	C	B
	Target	D	E
Auto	Volume	746 vph	300 vph
	Capacity	1200 vph	600 vph
	Volume to Capacity Ratio	0.62	0.50
	Level of Service	B	A
	Target	D	D

Figure 3.3 – Desirable Bicycle Facility Pre-Selection Nomograph



Source: MMM, 2013

## **APPENDIX G**

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MTO Left Turn Land Graphs and  
OTM Traffic Signalization Warrants



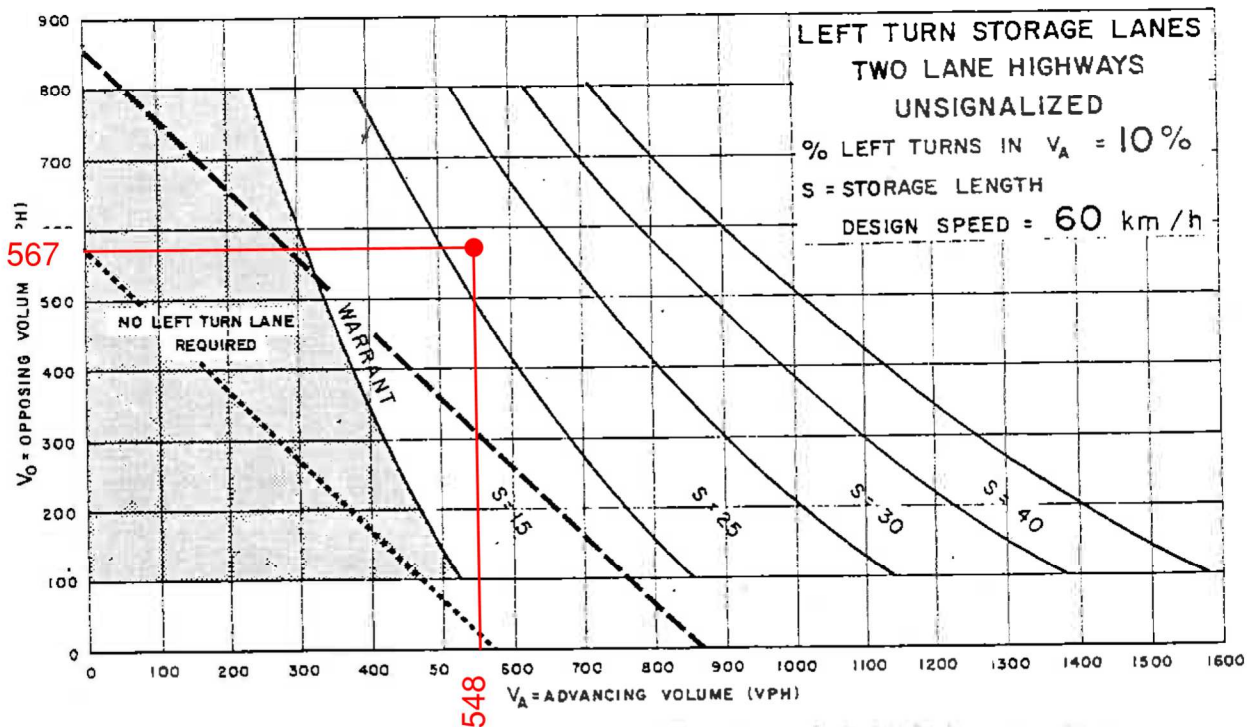
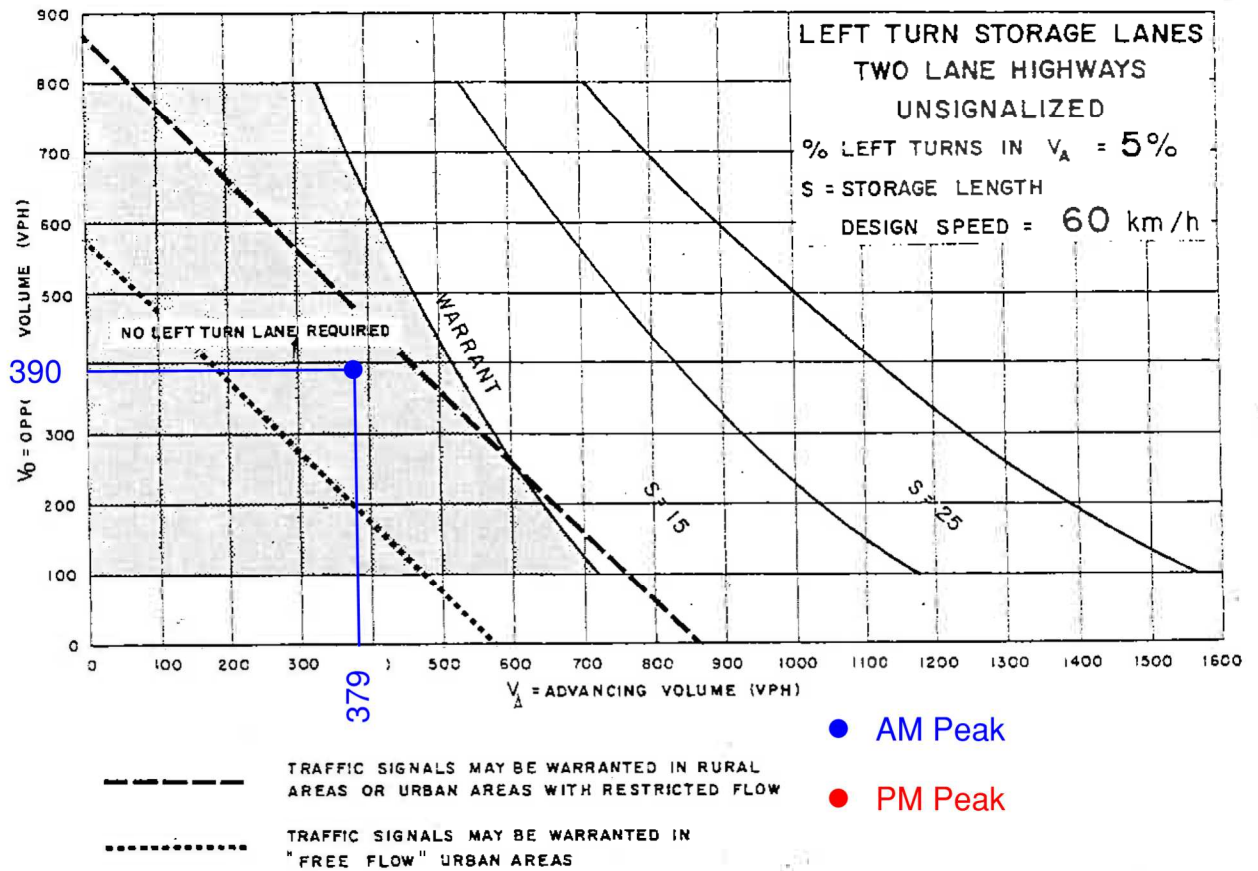


Figure EA-6

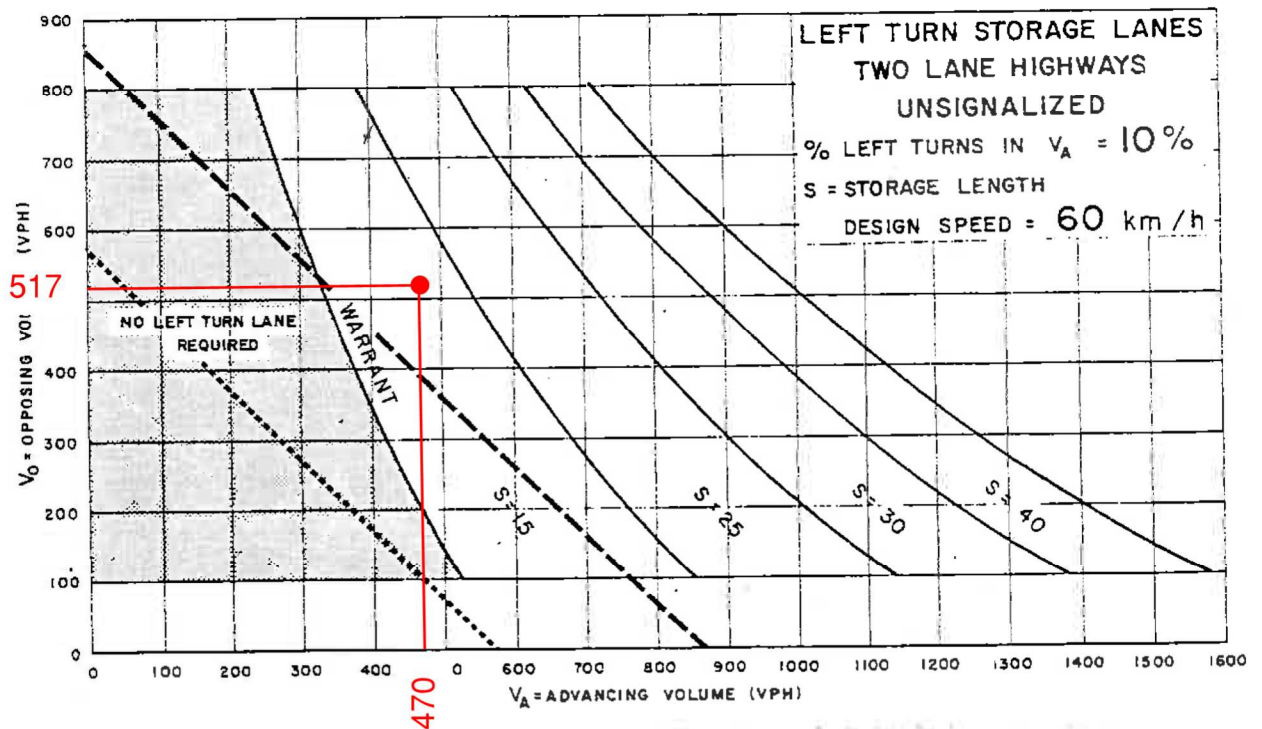
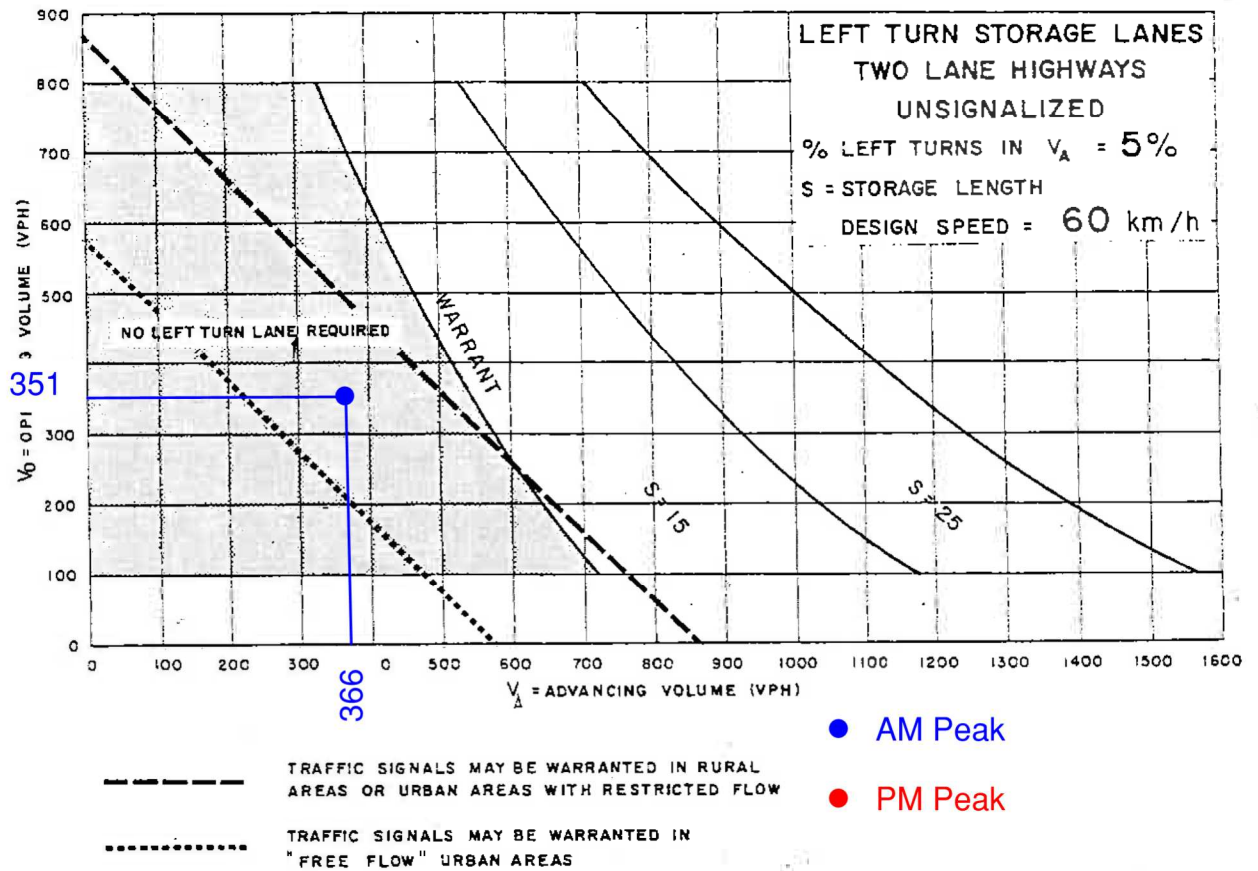


Figure EA-6

**TRAFFIC SIGNAL JUSTIFICATION  
USING PROJECTED VOLUMES**

LOCATION: COPE DR at STREET 1

YEAR: 2027

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT		COMPLIANCE		
		FREE FLOW	RESTRICTED FLOW	SECTIONAL		ENTIRE % <sup>(2)</sup>
		OPERATING SPEED ≥ 70KM/H	OPERATING SPEED < 70 KM/H	NUMERICAL	PERCENT	
<b>1. MINIMUM VEHICULAR WARRANT</b>	A. Vehicle volume, all approaches (average hour)	480 600 (2 or more lane approach)	<u>720</u> 900 (2 or more lane approach)	<u>435</u>	<u>60%</u>	<u>3%</u>
	B. Vehicle volume along minor street (average hour)	120 180 (tee intersection)	<u>170</u> <u>255</u> (tee intersection)	<u>8</u>	<u>3%</u>	
<b>2. DELAY TO CROSS TRAFFIC</b>	A. Vehicle volume along major street (average hour)	480 600 (2 or more lane approach)	<u>720</u> 900 (2 or more lane approach)	<u>420</u>	<u>58%</u>	<u>9%</u>
	B <sup>(1)</sup> . Combined vehicle and pedestrian volume <u>crossing</u> the major street (average hour)	50	<u>75</u>	<u>7</u>	<u>9%</u>	

**NOTES**

- 1) For definition of crossing volume refer to the Ontario Traffic Manual Book 12, Section 4.5 (Nov. 2007).
- 2) The lowest sectional percentage governs the entire Justification.
- 3) Average hourly volumes estimated from peak hour volumes,  $AHV = PM / 2$  or  $AHV = (AM + PM) / 4$ .

## TRAFFIC SIGNAL JUSTIFICATION USING PROJECTED VOLUMES

LOCATION: COPE DR at STREET 1 / COMMERCIAL

YEAR: 2027

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT		COMPLIANCE		
		FREE FLOW	RESTRICTED FLOW	SECTIONAL		ENTIRE % <sup>(2)</sup>
		OPERATING SPEED ≥ 70KM/H	OPERATING SPEED < 70 KM/H	NUMERICAL	PERCENT	
1. MINIMUM VEHICULAR WARRANT	A. Vehicle volume, all approaches (average hour)	480 600 (2 or more lane approach)	<u>720</u> 900 (2 or more lane approach)	515	72%	26%
	B. Vehicle volume along minor street (average hour)	120 180 (tee intersection)	<u>170</u> 255 (tee intersection)	44	26%	
2. DELAY TO CROSS TRAFFIC	A. Vehicle volume along major street (average hour)	480 600 (2 or more lane approach)	<u>720</u> 900 (2 or more lane approach)	427	59%	35%
	B <sup>(1)</sup> . Combined vehicle and pedestrian volume <u>crossing</u> the major street (average hour)	50	<u>75</u>	26	35%	

### NOTES

- 1) For definition of crossing volume refer to the Ontario Traffic Manual Book 12, Section 4.5 (Nov. 2007).
- 2) The lowest sectional percentage governs the entire Justification.
- 3) Average hourly volumes estimated from peak hour volumes,  $AHV = PM / 2$  or  $AHV = (AM + PM) / 4$ .

## **APPENDIX H**

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### Functional Design





## **APPENDIX I**

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






















### Synchro Analysis Reports



1: Terry Fox Drive & Cope Drive  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive













Existing Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	26	2	36	21	211	4	528	49	193	321	38
Future Volume (vph)	34	26	2	36	21	211	4	528	49	193	321	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	0.98		1.00					0.98
Frt		0.990			0.863			0.987				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1743	0	1601	1493	0	1729	1684	0	1712	1640	1473
Flt Permitted	0.306			0.737			0.547			0.369		
Satd. Flow (perm)	557	1743	0	1240	1493	0	994	1684	0	665	1640	1441
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			234			8				42
Link Speed (k/h)		80			50			80				80
Link Distance (m)		159.6			156.9			382.3				318.7
Travel Time (s)		7.2			11.3			17.2				14.3
Confl. Peds. (#/hr)			1	1			1					1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	50%	8%	5%	3%	0%	6%	14%	1%	11%	5%
Adj. Flow (vph)	38	29	2	40	23	234	4	587	54	214	357	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	31	0	40	257	0	4	641	0	214	357	42
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2		28.4	28.4		28.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0		57.0	57.0		57.0	57.0	57.0
Total Split (%)	36.7%	36.7%		36.7%	36.7%		63.3%	63.3%		63.3%	63.3%	63.3%
Maximum Green (s)	26.8	26.8		26.8	26.8		50.6	50.6		50.6	50.6	50.6
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6



1: Terry Fox Drive & Cope Drive  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive  
Existing Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.9	2.9		2.9	2.9		1.8	1.8		1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.4	6.4		6.4	6.4	6.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	2
Act Effct Green (s)	13.4	13.4		13.4	13.4		64.0	64.0		64.0	64.0	64.0
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.71	0.71		0.71	0.71	0.71
v/c Ratio	0.46	0.12		0.22	0.61		0.01	0.53		0.45	0.31	0.04
Control Delay	50.9	29.8		34.0	12.4		6.2	9.4		11.2	6.8	2.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	50.9	29.8		34.0	12.4		6.2	9.4		11.2	6.8	2.4
LOS	D	C		C	B		A	A		B	A	A
Approach Delay		41.4			15.3			9.4			8.0	
Approach LOS		D			B			A			A	
Queue Length 50th (m)	6.4	4.6		6.5	3.7		0.2	35.8		11.1	16.0	0.0
Queue Length 95th (m)	13.5	10.0		12.6	20.5		1.6	107.2		44.8	49.4	4.0
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0			35.0			15.0		130.0
Base Capacity (vph)	165	520		369	608		706	1200		473	1166	1036
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.23	0.06		0.11	0.42		0.01	0.53		0.45	0.31	0.04

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 55 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 11.3

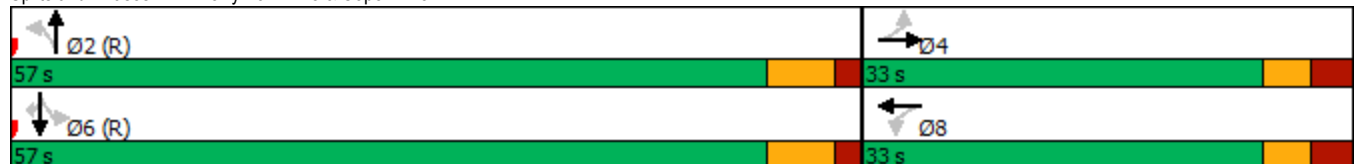
Intersection LOS: B

Intersection Capacity Utilization 88.0%

ICU Level of Service E

Analysis Period (min) 15

























Splits and Phases: 1: Terry Fox Drive & Cope Drive



1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive













Existing Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	53	2	84	35	279	5	547	31	245	612	58
Future Volume (vph)	80	53	2	84	35	279	5	547	31	245	612	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.99				1.00				
Frt		0.995			0.867			0.992				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1712	1809	0	1631	1578	0	1729	1758	0	1729	1784	1547
Flt Permitted	0.200			0.717			0.406			0.227		
Satd. Flow (perm)	360	1809	0	1220	1578	0	739	1758	0	413	1784	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			300			4				64
Link Speed (k/h)		50			50			80				80
Link Distance (m)		159.6			156.9			382.3				318.7
Travel Time (s)		11.5			11.3			17.2				14.3
Confl. Peds. (#/hr)			5	5					3	3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	0%	0%	6%	0%	0%	0%	2%	13%	0%	2%	0%
Adj. Flow (vph)	89	59	2	93	39	310	6	608	34	272	680	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	61	0	93	349	0	6	642	0	272	680	64
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2		28.4	28.4		11.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0		55.0	55.0		12.0	67.0	67.0
Total Split (%)	33.0%	33.0%		33.0%	33.0%		55.0%	55.0%		12.0%	67.0%	67.0%
Maximum Green (s)	26.8	26.8		26.8	26.8		48.6	48.6		5.6	60.6	60.6
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	2.9	2.9		2.9	2.9		1.8	1.8		1.8	1.8	1.8

1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

Existing Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjst (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.4	6.4		6.4	6.4	6.4
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	2
Act Effct Green (s)	20.0	20.0		20.0	20.0		51.7	51.7		67.4	67.4	67.4
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.52	0.52		0.67	0.67	0.67
v/c Ratio	1.24	0.17		0.38	0.63		0.02	0.71		0.68	0.57	0.06
Control Delay	220.3	30.3		37.1	11.6		13.6	24.6		20.6	12.2	2.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	220.3	30.3		37.1	11.6		13.6	24.6		20.6	12.2	2.3
LOS	F	C		D	B		B	C		C	B	A
Approach Delay		143.0			16.9			24.5			13.9	
Approach LOS		F			B			C			B	
Queue Length 50th (m)	~20.6	9.4		15.5	7.8		0.6	96.3		19.0	64.7	0.0
Queue Length 95th (m)	#47.0	18.6		27.9	31.3		2.7	141.0		#51.6	112.7	4.8
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0			35.0			15.0		130.0
Base Capacity (vph)	96	486		326	642		382	910		400	1202	1063
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.93	0.13		0.29	0.54		0.02	0.71		0.68	0.57	0.06

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 69 (69%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.24

Intersection Signal Delay: 26.1

Intersection LOS: C

Intersection Capacity Utilization 96.2%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.























Splits and Phases: 1: Terry Fox Drive & Cope Drive



1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive


Existing Traffic (WBR)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	53	2	84	35	279	5	547	31	245	612	58
Future Volume (vph)	80	53	2	84	35	279	5	547	31	245	612	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		75.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.99				1.00				
Frt		0.995				0.850		0.992				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1712	1809	0	1631	1820	1547	1729	1758	0	1729	1784	1547
Flt Permitted	0.732			0.717			0.406			0.248		
Satd. Flow (perm)	1319	1809	0	1220	1820	1547	739	1758	0	451	1784	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				300		4				64
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		159.6			156.9			382.3			318.7	
Travel Time (s)		11.5			11.3			17.2			14.3	
Confl. Peds. (#/hr)			5	5					3	3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	0%	0%	6%	0%	0%	0%	2%	13%	0%	2%	0%
Adj. Flow (vph)	89	59	2	93	39	310	6	608	34	272	680	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	61	0	93	39	310	6	642	0	272	680	64
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	2	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2	32.2	28.4	28.4		11.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0	33.0	55.0	55.0		12.0	67.0	67.0
Total Split (%)	33.0%	33.0%		33.0%	33.0%	33.0%	55.0%	55.0%		12.0%	67.0%	67.0%
Maximum Green (s)	26.8	26.8		26.8	26.8	26.8	48.6	48.6		5.6	60.6	60.6
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	2.9	2.9		2.9	2.9	2.9	1.8	1.8		1.8	1.8	1.8

1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

Existing Traffic (WBR)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2	6.2	6.4	6.4		6.4	6.4	6.4
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	C-Max	C-Max		None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0	19.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2	2	2	2		2	2	2
Act Effct Green (s)	15.1	15.1		15.1	15.1	15.1	54.6	54.6		72.3	72.3	72.3
Actuated g/C Ratio	0.15	0.15		0.15	0.15	0.15	0.55	0.55		0.72	0.72	0.72
v/c Ratio	0.45	0.22		0.51	0.14	0.64	0.01	0.67		0.58	0.53	0.06
Control Delay	43.9	35.5		46.8	35.0	10.9	12.8	21.6		13.2	9.2	1.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	43.9	35.5		46.8	35.0	10.9	12.8	21.6		13.2	9.2	1.9
LOS	D	D		D	C	B	B	C		B	A	A
Approach Delay		40.5			20.6			21.5			9.8	
Approach LOS		D			C			C			A	
Queue Length 50th (m)	16.4	10.5		17.2	6.8	1.7	0.5	82.8		13.3	45.4	0.0
Queue Length 95th (m)	26.9	18.8		28.2	13.8	22.0	2.7	141.0		#42.7	110.1	4.7
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0		75.0	35.0			15.0		130.0
Base Capacity (vph)	353	486		326	487	634	403	962		469	1289	1135
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.25	0.13		0.29	0.08	0.49	0.01	0.67		0.58	0.53	0.06

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 69 (69%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 17.3

Intersection LOS: B

Intersection Capacity Utilization 75.5%

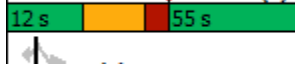
ICU Level of Service D

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.






















Splits and Phases: 1: Terry Fox Drive & Cope Drive

			
12 s	55 s	33 s	
			
67 s		33 s	

1: Terry Fox Drive & Cope Drive  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive













2022 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	26	2	52	21	259	4	572	59	228	347	38
Future Volume (vph)	34	26	2	52	21	259	4	572	59	228	347	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	0.98		1.00					0.98
Frt		0.989			0.861			0.986				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1735	0	1601	1489	0	1729	1681	0	1712	1640	1473
Flt Permitted	0.299			0.739			0.553			0.375		
Satd. Flow (perm)	544	1735	0	1243	1489	0	1005	1681	0	676	1640	1441
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			259			9				39
Link Speed (k/h)		50			50			80				80
Link Distance (m)		159.6			156.9			382.3				318.7
Travel Time (s)		11.5			11.3			17.2				14.3
Confl. Peds. (#/hr)			1	1			1					1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	50%	8%	5%	3%	0%	6%	14%	1%	11%	5%
Adj. Flow (vph)	34	26	2	52	21	259	4	572	59	228	347	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	28	0	52	280	0	4	631	0	228	347	38
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2		28.4	28.4		28.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0		57.0	57.0		57.0	57.0	57.0
Total Split (%)	36.7%	36.7%		36.7%	36.7%		63.3%	63.3%		63.3%	63.3%	63.3%
Maximum Green (s)	26.8	26.8		26.8	26.8		50.6	50.6		50.6	50.6	50.6
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6

1: Terry Fox Drive & Cope Drive  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2022 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.9	2.9		2.9	2.9		1.8	1.8		1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.4	6.4		6.4	6.4	6.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	2
Act Effct Green (s)	13.4	13.4		13.4	13.4		64.0	64.0		64.0	64.0	64.0
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.71	0.71		0.71	0.71	0.71
v/c Ratio	0.42	0.11		0.28	0.63		0.01	0.53		0.47	0.30	0.04
Control Delay	48.4	29.4		35.7	12.3		6.2	9.2		11.7	6.7	2.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	48.4	29.4		35.7	12.3		6.2	9.2		11.7	6.7	2.4
LOS	D	C		D	B		A	A		B	A	A
Approach Delay		39.8			15.9			9.2			8.3	
Approach LOS		D			B			A			A	
Queue Length 50th (m)	5.7	4.1		8.5	3.3		0.2	34.7		12.1	15.4	0.0
Queue Length 95th (m)	12.5	9.3		15.4	20.8		1.6	104.6		49.1	47.8	3.8
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0			35.0			15.0		130.0
Base Capacity (vph)	161	518		370	625		714	1198		480	1166	1035
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.21	0.05		0.14	0.45		0.01	0.53		0.47	0.30	0.04

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 55 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 11.4

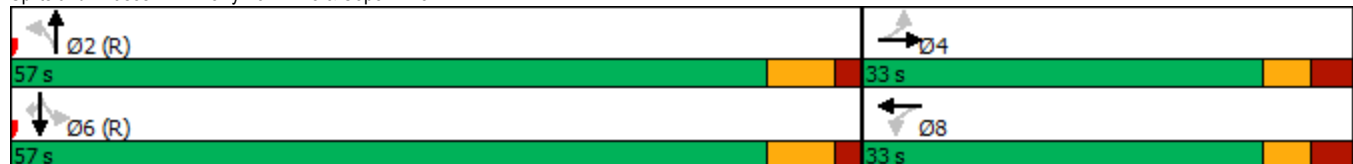
Intersection LOS: B

Intersection Capacity Utilization 94.5%

ICU Level of Service F

Analysis Period (min) 15






















Splits and Phases: 1: Terry Fox Drive & Cope Drive



1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2022 Background Traffic













												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	53	2	98	35	323	5	592	45	299	662	58
Future Volume (vph)	80	53	2	98	35	323	5	592	45	299	662	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.99				1.00				
Frt		0.995			0.865			0.989				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1712	1809	0	1631	1574	0	1729	1748	0	1729	1784	1547
Flt Permitted	0.207			0.721			0.413			0.221		
Satd. Flow (perm)	373	1809	0	1227	1574	0	752	1748	0	402	1784	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			309			5				58
Link Speed (k/h)		50			50			80				80
Link Distance (m)		159.6			156.9			382.3				318.7
Travel Time (s)		11.5			11.3			17.2				14.3
Confl. Peds. (#/hr)			5	5					3	3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	0%	0%	6%	0%	0%	0%	2%	13%	0%	2%	0%
Adj. Flow (vph)	80	53	2	98	35	323	5	592	45	299	662	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	55	0	98	358	0	5	637	0	299	662	58
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2		28.4	28.4		11.4	28.3	28.3
Total Split (s)	33.0	33.0		33.0	33.0		55.0	55.0		12.0	67.0	67.0
Total Split (%)	33.0%	33.0%		33.0%	33.0%		55.0%	55.0%		12.0%	67.0%	67.0%
Maximum Green (s)	26.8	26.8		26.8	26.8		48.6	48.6		5.6	60.7	60.7
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	2.9	2.9		2.9	2.9		1.8	1.8		1.8	1.7	1.7



1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2022 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjst (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.4	6.4		6.4	6.3	6.3
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	2
Act Effct Green (s)	19.3	19.3		19.3	19.3		50.4	50.4		68.1	68.2	68.2
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.50	0.50		0.68	0.68	0.68
v/c Ratio	1.13	0.16		0.41	0.65		0.01	0.72		0.71	0.54	0.05
Control Delay	180.9	30.6		38.7	12.0		13.6	25.6		22.0	11.5	2.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	180.9	30.6		38.7	12.0		13.6	25.6		22.0	11.5	2.3
LOS	F	C		D	B		B	C		C	B	A
Approach Delay		119.7			17.7			25.5			14.0	
Approach LOS		F			B			C			B	
Queue Length 50th (m)	~17.3	8.5		16.6	7.9		0.5	95.3		20.4	58.9	0.0
Queue Length 95th (m)	#41.0	17.1		29.2	31.9		2.4	139.7		#64.4	107.8	4.6
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0			35.0			15.0		130.0
Base Capacity (vph)	99	486		328	648		378	883		423	1215	1072
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.81	0.11		0.30	0.55		0.01	0.72		0.71	0.54	0.05

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 69 (69%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.13

Intersection Signal Delay: 24.4

Intersection LOS: C

Intersection Capacity Utilization 105.6%

ICU Level of Service G

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
























Queue shown is maximum after two cycles.

Splits and Phases: 1: Terry Fox Drive & Cope Drive















1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive  
2022 Background Traffic (WBR)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	53	2	98	35	323	5	592	45	299	662	58
Future Volume (vph)	80	53	2	98	35	323	5	592	45	299	662	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		75.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.99				1.00				
Frt		0.995				0.850		0.989				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1712	1809	0	1631	1820	1547	1729	1748	0	1729	1784	1547
Flt Permitted	0.734			0.721			0.413			0.234		
Satd. Flow (perm)	1323	1809	0	1227	1820	1547	752	1748	0	426	1784	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				309		5				58
Link Speed (k/h)		50			50			80				80
Link Distance (m)		159.6			156.9			382.3				318.7
Travel Time (s)		11.5			11.3			17.2				14.3
Confl. Peds. (#/hr)			5	5					3	3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	0%	0%	6%	0%	0%	0%	2%	13%	0%	2%	0%
Adj. Flow (vph)	80	53	2	98	35	323	5	592	45	299	662	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	55	0	98	35	323	5	637	0	299	662	58
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	2	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2	32.2	28.4	28.4		11.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0	33.0	55.0	55.0		12.0	67.0	67.0
Total Split (%)	33.0%	33.0%		33.0%	33.0%	33.0%	55.0%	55.0%		12.0%	67.0%	67.0%
Maximum Green (s)	26.8	26.8		26.8	26.8	26.8	48.6	48.6		5.6	60.6	60.6
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	2.9	2.9		2.9	2.9	2.9	1.8	1.8		1.8	1.8	1.8

1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive  
2022 Background Traffic (WBR)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2	6.2	6.4	6.4		6.4	6.4	6.4
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	C-Max	C-Max		None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0	19.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2	2	2	2		2	2	2
Act Effct Green (s)	15.4	15.4		15.4	15.4	15.4	52.2	52.2		72.0	72.0	72.0
Actuated g/C Ratio	0.15	0.15		0.15	0.15	0.15	0.52	0.52		0.72	0.72	0.72
v/c Ratio	0.40	0.20		0.52	0.13	0.65	0.01	0.70		0.62	0.52	0.05
Control Delay	41.9	34.9		47.3	34.4	11.3	13.2	23.6		15.3	9.1	2.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	41.9	34.9		47.3	34.4	11.3	13.2	23.6		15.3	9.1	2.0
LOS	D	C		D	C	B	B	C		B	A	A
Approach Delay		39.0			20.8			23.6			10.5	
Approach LOS		D			C			C			B	
Queue Length 50th (m)	14.5	9.3		18.2	6.1	2.4	0.5	86.7		15.3	44.2	0.0
Queue Length 95th (m)	24.5	17.3		29.5	12.6	23.0	2.4	139.7		#57.1	105.5	4.4
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0		75.0	35.0			15.0		130.0
Base Capacity (vph)	354	486		328	487	640	392	914		482	1285	1130
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.23	0.11		0.30	0.07	0.50	0.01	0.70		0.62	0.52	0.05

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 69 (69%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 18.0

Intersection LOS: B

Intersection Capacity Utilization 82.0%

ICU Level of Service E

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.






















Splits and Phases: 1: Terry Fox Drive & Cope Drive

			
Ø1	Ø2 (R)		Ø4
12 s	55 s		33 s
			
Ø6 (R)			Ø8
67 s			33 s

1: Terry Fox Drive & Cope Drive  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive













2027 Background Traffic - Scenario 1

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	26	2	56	21	283	4	631	65	250	384	38
Future Volume (vph)	34	26	2	56	21	283	4	631	65	250	384	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	0.98		1.00					0.98
Frt		0.989			0.860			0.986				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1735	0	1601	1488	0	1729	1681	0	1712	1640	1473
Flt Permitted	0.288			0.739			0.528			0.335		
Satd. Flow (perm)	524	1735	0	1243	1488	0	960	1681	0	604	1640	1441
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			253			9				39
Link Speed (k/h)		50			50			80				80
Link Distance (m)		159.6			156.9			382.3				318.7
Travel Time (s)		11.5			11.3			17.2				14.3
Confl. Peds. (#/hr)			1	1			1					1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	50%	8%	5%	3%	0%	6%	14%	1%	11%	5%
Adj. Flow (vph)	34	26	2	56	21	283	4	631	65	250	384	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	28	0	56	304	0	4	696	0	250	384	38
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2		28.4	28.4		28.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0		57.0	57.0		57.0	57.0	57.0
Total Split (%)	36.7%	36.7%		36.7%	36.7%		63.3%	63.3%		63.3%	63.3%	63.3%
Maximum Green (s)	26.8	26.8		26.8	26.8		50.6	50.6		50.6	50.6	50.6
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6

1: Terry Fox Drive & Cope Drive  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2027 Background Traffic - Scenario 1

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.9	2.9		2.9	2.9		1.8	1.8		1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.4	6.4		6.4	6.4	6.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	2
Act Effct Green (s)	13.9	13.9		13.9	13.9		63.5	63.5		63.5	63.5	63.5
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.71	0.71		0.71	0.71	0.71
v/c Ratio	0.42	0.10		0.29	0.69		0.01	0.59		0.59	0.33	0.04
Control Delay	48.0	28.7		35.4	15.6		6.2	10.6		16.5	7.2	2.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	48.0	28.7		35.4	15.6		6.2	10.6		16.5	7.2	2.5
LOS	D	C		D	B		A	B		B	A	A
Approach Delay		39.3			18.7			10.5			10.4	
Approach LOS		D			B			B			B	
Queue Length 50th (m)	5.7	4.1		9.2	8.3		0.2	40.9		15.0	17.6	0.0
Queue Length 95th (m)	12.6	9.3		16.4	27.4		1.6	123.6		#72.9	53.8	3.8
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0			35.0			15.0		130.0
Base Capacity (vph)	156	518		370	620		677	1189		426	1158	1028
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.22	0.05		0.15	0.49		0.01	0.59		0.59	0.33	0.04

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 55 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 13.1

Intersection LOS: B

Intersection Capacity Utilization 99.5%

ICU Level of Service F

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.






















Splits and Phases: 1: Terry Fox Drive & Cope Drive



1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive













2027 Background Traffic - Scenario 1

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	53	2	107	35	354	5	654	48	327	731	58
Future Volume (vph)	80	53	2	107	35	354	5	654	48	327	731	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.99				1.00				
Frt		0.995			0.863			0.990				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1712	1809	0	1631	1571	0	1729	1750	0	1729	1784	1547
Flt Permitted	0.190			0.721			0.388			0.160		
Satd. Flow (perm)	342	1809	0	1227	1571	0	706	1750	0	291	1784	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			278			5				58
Link Speed (k/h)		50			50			80				80
Link Distance (m)		159.6			156.9			382.3				318.7
Travel Time (s)		11.5			11.3			17.2				14.3
Confl. Peds. (#/hr)			5	5					3	3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	0%	0%	6%	0%	0%	0%	2%	13%	0%	2%	0%
Adj. Flow (vph)	80	53	2	107	35	354	5	654	48	327	731	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	55	0	107	389	0	5	702	0	327	731	58
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2		28.4	28.4		11.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0		55.0	55.0		12.0	67.0	67.0
Total Split (%)	33.0%	33.0%		33.0%	33.0%		55.0%	55.0%		12.0%	67.0%	67.0%
Maximum Green (s)	26.8	26.8		26.8	26.8		48.6	48.6		5.6	60.6	60.6
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	2.9	2.9		2.9	2.9		1.8	1.8		1.8	1.8	1.8

1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2027 Background Traffic - Scenario 1

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjst (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.4	6.4		6.4	6.4	6.4
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	2
Act Effct Green (s)	21.1	21.1		21.1	21.1		48.6	48.6		66.3	66.3	66.3
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.49	0.49		0.66	0.66	0.66
v/c Ratio	1.11	0.14		0.41	0.71		0.01	0.82		0.92	0.62	0.06
Control Delay	178.1	29.1		37.1	17.4		13.6	31.8		51.6	13.9	2.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	178.1	29.1		37.1	17.4		13.6	31.8		51.6	13.9	2.4
LOS	F	C		D	B		B	C		D	B	A
Approach Delay		117.4			21.7			31.6			24.4	
Approach LOS		F			C			C			C	
Queue Length 50th (m)	15.4	8.1		17.3	17.7		0.5	111.4		~30.8	80.2	0.0
Queue Length 95th (m)	#42.7	17.1		31.5	47.6		2.4	#170.6		#91.7	127.5	4.6
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0			35.0			15.0		130.0
Base Capacity (vph)	91	486		328	624		343	853		354	1182	1044
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.88	0.11		0.33	0.62		0.01	0.82		0.92	0.62	0.06

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 69 (69%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 31.0

Intersection LOS: C

Intersection Capacity Utilization 112.9%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.
























Splits and Phases: 1: Terry Fox Drive & Cope Drive



1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2027 Background Traffic - Scenario 1 (WBR)













												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	53	2	107	35	354	5	654	48	327	731	58
Future Volume (vph)	80	53	2	107	35	354	5	654	48	327	731	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		75.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.99				1.00				
Frt		0.995				0.850		0.990				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1712	1809	0	1631	1820	1547	1729	1750	0	1729	1784	1547
Flt Permitted	0.734			0.721			0.388			0.160		
Satd. Flow (perm)	1323	1809	0	1227	1820	1547	706	1750	0	291	1784	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				278		5				58
Link Speed (k/h)		50			50			80				80
Link Distance (m)		159.6			156.9			382.3				318.7
Travel Time (s)		11.5			11.3			17.2				14.3
Confl. Peds. (#/hr)			5	5					3	3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	0%	0%	6%	0%	0%	0%	2%	13%	0%	2%	0%
Adj. Flow (vph)	80	53	2	107	35	354	5	654	48	327	731	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	55	0	107	35	354	5	702	0	327	731	58
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	2	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2	32.2	28.4	28.4		11.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0	33.0	55.0	55.0		12.0	67.0	67.0
Total Split (%)	33.0%	33.0%		33.0%	33.0%	33.0%	55.0%	55.0%		12.0%	67.0%	67.0%
Maximum Green (s)	26.8	26.8		26.8	26.8	26.8	48.6	48.6		5.6	60.6	60.6
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	2.9	2.9		2.9	2.9	2.9	1.8	1.8		1.8	1.8	1.8



1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2027 Background Traffic - Scenario 1 (WBR)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2	6.2	6.4	6.4		6.4	6.4	6.4
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	C-Max	C-Max		None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0	19.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2	2	2	2		2	2	2
Act Effct Green (s)	16.0	16.0		16.0	16.0	16.0	48.6	48.6		71.4	71.4	71.4
Actuated g/C Ratio	0.16	0.16		0.16	0.16	0.16	0.49	0.49		0.71	0.71	0.71
v/c Ratio	0.38	0.19		0.55	0.12	0.74	0.01	0.82		0.74	0.57	0.05
Control Delay	40.7	34.2		47.7	33.8	18.8	13.6	31.8		25.4	10.4	2.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	40.7	34.2		47.7	33.8	18.8	13.6	31.8		25.4	10.4	2.0
LOS	D	C		D	C	B	B	C		C	B	A
Approach Delay		38.1			26.1			31.6			14.3	
Approach LOS		D			C			C			B	
Queue Length 50th (m)	14.2	9.1		19.6	6.0	13.4	0.5	111.4		23.5	56.3	0.0
Queue Length 95th (m)	24.5	17.3		31.9	12.6	38.5	2.4	#170.6		#87.3	124.5	4.4
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0		75.0	35.0			15.0		130.0
Base Capacity (vph)	354	486		328	487	618	343	853		443	1274	1121
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.23	0.11		0.33	0.07	0.57	0.01	0.82		0.74	0.57	0.05

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 69 (69%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 23.0

Intersection LOS: C

Intersection Capacity Utilization 87.3%

ICU Level of Service E

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

























Splits and Phases: 1: Terry Fox Drive & Cope Drive

			
Ø1	Ø2 (R)		Ø4
12 s	55 s		33 s
			
Ø6 (R)			Ø8
67 s			33 s

1: Terry Fox Drive & Cope Drive  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive













2027 Background Traffic - Scenario 2

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	26	2	63	21	288	4	645	65	287	378	38
Future Volume (vph)	34	26	2	63	21	288	4	645	65	287	378	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	0.98		1.00					0.98
Frt		0.989			0.860			0.986				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1735	0	1601	1488	0	1729	1681	0	1712	1640	1473
Flt Permitted	0.286			0.739			0.532			0.327		
Satd. Flow (perm)	521	1735	0	1243	1488	0	967	1681	0	589	1640	1441
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			245			9				39
Link Speed (k/h)		80			50			80				80
Link Distance (m)		159.6			156.9			382.3				318.7
Travel Time (s)		7.2			11.3			17.2				14.3
Confl. Peds. (#/hr)			1	1			1					1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	50%	8%	5%	3%	0%	6%	14%	1%	11%	5%
Adj. Flow (vph)	34	26	2	63	21	288	4	645	65	287	378	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	28	0	63	309	0	4	710	0	287	378	38
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2		28.4	28.4		28.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0		57.0	57.0		57.0	57.0	57.0
Total Split (%)	36.7%	36.7%		36.7%	36.7%		63.3%	63.3%		63.3%	63.3%	63.3%
Maximum Green (s)	26.8	26.8		26.8	26.8		50.6	50.6		50.6	50.6	50.6
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6

1: Terry Fox Drive & Cope Drive  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2027 Background Traffic - Scenario 2

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.9	2.9		2.9	2.9		1.8	1.8		1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.4	6.4		6.4	6.4	6.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	2
Act Effct Green (s)	14.0	14.0		14.0	14.0		63.4	63.4		63.4	63.4	63.4
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.70	0.70		0.70	0.70	0.70
v/c Ratio	0.42	0.10		0.33	0.71		0.01	0.60		0.69	0.33	0.04
Control Delay	47.8	28.5		36.1	17.3		6.5	10.9		21.9	7.2	2.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	47.8	28.5		36.1	17.3		6.5	10.9		21.9	7.2	2.5
LOS	D	C		D	B		A	B		C	A	A
Approach Delay		39.1			20.5			10.9			12.9	
Approach LOS		D			C			B			B	
Queue Length 50th (m)	5.7	4.1		10.4	10.5		0.2	42.5		19.7	17.2	0.0
Queue Length 95th (m)	12.6	9.3		17.9	30.2		1.6	128.0		#90.4	52.7	3.8
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0			35.0			15.0		130.0
Base Capacity (vph)	155	518		370	615		681	1186		415	1155	1026
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.22	0.05		0.17	0.50		0.01	0.60		0.69	0.33	0.04

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 55 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 14.5

Intersection LOS: B

Intersection Capacity Utilization 102.4%

ICU Level of Service G

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.






















Splits and Phases: 1: Terry Fox Drive & Cope Drive



1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

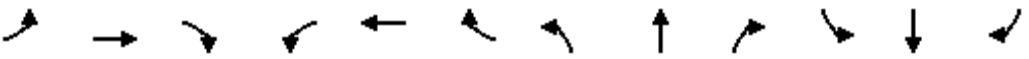
2027 Background Traffic - Scenario 2

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	53	2	138	35	373	5	712	48	424	707	58
Future Volume (vph)	80	53	2	138	35	373	5	712	48	424	707	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.99				1.00				
Frt		0.995			0.863			0.991				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1712	1809	0	1631	1571	0	1729	1753	0	1729	1784	1547
Flt Permitted	0.176			0.721			0.394			0.120		
Satd. Flow (perm)	317	1809	0	1227	1571	0	717	1753	0	218	1784	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			253			5				58
Link Speed (k/h)		50			50			80				80
Link Distance (m)		159.6			156.9			382.3				318.7
Travel Time (s)		11.5			11.3			17.2				14.3
Confl. Peds. (#/hr)			5	5					3	3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	0%	0%	6%	0%	0%	0%	2%	13%	0%	2%	0%
Adj. Flow (vph)	80	53	2	138	35	373	5	712	48	424	707	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	55	0	138	408	0	5	760	0	424	707	58
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2		28.4	28.4		11.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0		55.0	55.0		12.0	67.0	67.0
Total Split (%)	33.0%	33.0%		33.0%	33.0%		55.0%	55.0%		12.0%	67.0%	67.0%
Maximum Green (s)	26.8	26.8		26.8	26.8		48.6	48.6		5.6	60.6	60.6
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	2.9	2.9		2.9	2.9		1.8	1.8		1.8	1.8	1.8

1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2027 Background Traffic - Scenario 2

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjst (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.4	6.4		6.4	6.4	6.4
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	2
Act Effct Green (s)	22.7	22.7		22.7	22.7		48.6	48.6		64.7	64.7	64.7
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.49	0.49		0.65	0.65	0.65
v/c Ratio	1.13	0.13		0.50	0.74		0.01	0.89		1.47	0.61	0.06
Control Delay	182.5	28.3		38.8	21.2		13.6	37.8		252.6	14.3	2.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	182.5	28.3		38.8	21.2		13.6	37.8		252.6	14.3	2.4
LOS	F	C		D	C		B	D		F	B	A
Approach Delay		119.7			25.7			37.6			98.7	
Approach LOS		F			C			D			F	
Queue Length 50th (m)	15.2	7.7		22.1	25.4		0.5	127.6		~88.9	82.6	0.0
Queue Length 95th (m)	#44.0	17.1		39.9	58.9		2.4	#203.6		#151.6	120.3	4.6
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0			35.0			15.0		130.0
Base Capacity (vph)	84	486		328	606		348	854		288	1155	1022
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.95	0.11		0.42	0.67		0.01	0.89		1.47	0.61	0.06

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 69 (69%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.47

Intersection Signal Delay: 66.9

Intersection LOS: E

Intersection Capacity Utilization 123.0%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
























Queue shown is maximum after two cycles.

Splits and Phases: 1: Terry Fox Drive & Cope Drive















1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive  
2027 Background Traffic - Scenario 2 (WBR)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	53	2	138	35	373	5	712	48	424	707	58
Future Volume (vph)	80	53	2	138	35	373	5	712	48	424	707	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		75.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.99				1.00				
Frt		0.995				0.850		0.991				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1712	1809	0	1631	1820	1547	1729	1753	0	1729	1784	1547
Flt Permitted	0.734			0.721			0.396			0.072		
Satd. Flow (perm)	1323	1809	0	1225	1820	1547	721	1753	0	131	1784	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				373		4				58
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		159.6			156.9			382.3			318.7	
Travel Time (s)		11.5			11.3			17.2			14.3	
Confl. Peds. (#/hr)			5	5					3	3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	0%	0%	6%	0%	0%	0%	2%	13%	0%	2%	0%
Adj. Flow (vph)	80	53	2	138	35	373	5	712	48	424	707	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	55	0	138	35	373	5	760	0	424	707	58
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	2	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2	32.2	28.4	28.4		11.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0	33.0	60.0	60.0		27.0	87.0	87.0
Total Split (%)	27.5%	27.5%		27.5%	27.5%	27.5%	50.0%	50.0%		22.5%	72.5%	72.5%
Maximum Green (s)	26.8	26.8		26.8	26.8	26.8	53.6	53.6		20.6	80.6	80.6
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	2.9	2.9		2.9	2.9	2.9	1.8	1.8		1.8	1.8	1.8

1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive  
2027 Background Traffic - Scenario 2 (WBR)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2	6.2	6.4	6.4		6.4	6.4	6.4
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	C-Max	C-Max		None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0	19.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2	2	2	2		2	2	2
Act Effct Green (s)	19.3	19.3		19.3	19.3	19.3	53.6	53.6		88.1	88.1	88.1
Actuated g/C Ratio	0.16	0.16		0.16	0.16	0.16	0.45	0.45		0.73	0.73	0.73
v/c Ratio	0.38	0.19		0.70	0.12	0.66	0.02	0.97		0.90	0.54	0.05
Control Delay	48.1	41.7		65.4	41.0	10.3	18.8	58.2		57.7	9.9	1.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	48.1	41.7		65.4	41.0	10.3	18.8	58.2		57.7	9.9	1.7
LOS	D	D		E	D	B	B	E		E	A	A
Approach Delay		45.5			26.2			57.9			26.5	
Approach LOS		D			C			E			C	
Queue Length 50th (m)	17.0	11.1		31.0	7.1	0.0	0.7	170.1		80.3	64.9	0.0
Queue Length 95th (m)	30.0	21.4		49.4	15.2	25.2	3.0	#252.5		#165.2	115.2	4.1
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0		75.0	35.0			15.0		130.0
Base Capacity (vph)	295	404		273	406	635	322	785		470	1310	1151
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.27	0.14		0.51	0.09	0.59	0.02	0.97		0.90	0.54	0.05

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 36.5

Intersection LOS: D

Intersection Capacity Utilization 98.0%


ICU Level of Service F

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.






















Splits and Phases: 1: Terry Fox Drive & Cope Drive

											
Ø1			Ø2 (R)						Ø4		
27 s			60 s						33 s		
											
Ø6 (R)									Ø8		
87 s									33 s		

1: Terry Fox Drive & Cope Drive  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2022 Total Traffic













												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	26	2	56	21	259	4	573	60	240	347	38
Future Volume (vph)	34	26	2	56	21	259	4	573	60	240	347	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	0.98		1.00					0.98
Frt		0.989			0.861			0.986				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1735	0	1601	1489	0	1729	1681	0	1712	1640	1473
Flt Permitted	0.299			0.739			0.553			0.373		
Satd. Flow (perm)	544	1735	0	1243	1489	0	1005	1681	0	672	1640	1441
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			259			10				39
Link Speed (k/h)		50			50			80				80
Link Distance (m)		159.6			156.9			382.3				318.7
Travel Time (s)		11.5			11.3			17.2				14.3
Confl. Peds. (#/hr)			1	1			1					1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	50%	8%	5%	3%	0%	6%	14%	1%	11%	5%
Adj. Flow (vph)	34	26	2	56	21	259	4	573	60	240	347	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	28	0	56	280	0	4	633	0	240	347	38
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2		28.4	28.4		28.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0		57.0	57.0		57.0	57.0	57.0
Total Split (%)	36.7%	36.7%		36.7%	36.7%		63.3%	63.3%		63.3%	63.3%	63.3%
Maximum Green (s)	26.8	26.8		26.8	26.8		50.6	50.6		50.6	50.6	50.6
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6



1: Terry Fox Drive & Cope Drive  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2022 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.9	2.9		2.9	2.9		1.8	1.8		1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.4	6.4		6.4	6.4	6.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	2
Act Effct Green (s)	13.4	13.4		13.4	13.4		64.0	64.0		64.0	64.0	64.0
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.71	0.71		0.71	0.71	0.71
v/c Ratio	0.42	0.11		0.30	0.63		0.01	0.53		0.50	0.30	0.04
Control Delay	48.2	29.3		36.2	12.2		6.2	9.3		12.5	6.7	2.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	48.2	29.3		36.2	12.2		6.2	9.3		12.5	6.7	2.4
LOS	D	C		D	B		A	A		B	A	A
Approach Delay		39.7			16.2			9.3			8.7	
Approach LOS		D			B			A			A	
Queue Length 50th (m)	5.7	4.1		9.2	3.3		0.2	34.9		13.1	15.4	0.0
Queue Length 95th (m)	12.5	9.3		16.4	20.8		1.6	105.1		53.8	47.8	3.8
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0			35.0			15.0		130.0
Base Capacity (vph)	161	518		370	625		714	1197		477	1165	1035
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.21	0.05		0.15	0.45		0.01	0.53		0.50	0.30	0.04

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 55 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 11.6

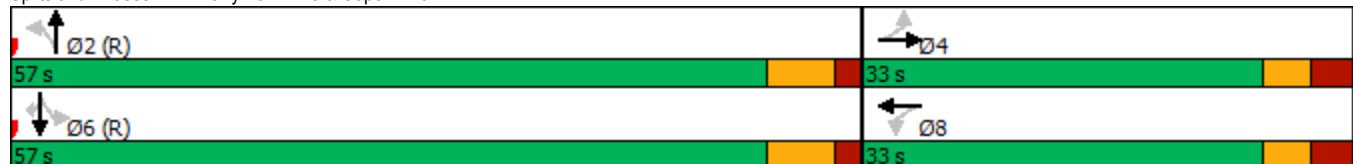
Intersection LOS: B

Intersection Capacity Utilization 95.4%

ICU Level of Service F










Analysis Period (min) 15

Splits and Phases: 1: Terry Fox Drive & Cope Drive



2: Terry Fox Drive & Street 4  
AM Peak

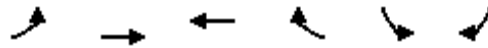
5331 Fernbank Road and 1039 Terry Fox Drive  
2022 Total Traffic

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	33	865	1	0	625
Future Volume (vph)	0	33	865	1	0	625
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected						
Satd. Flow (prot)	0	1543	1733	0	0	1701
Flt Permitted						
Satd. Flow (perm)	0	1543	1733	0	0	1701
Link Speed (k/h)	50		80			80
Link Distance (m)	70.9		318.7			174.7
Travel Time (s)	5.1		14.3			7.9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	5%	2%	2%	7%
Adj. Flow (vph)	0	33	865	1	0	625
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	33	866	0	0	625
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 58.1%	ICU Level of Service B					
Analysis Period (min) 15						

3: Cope Drive & Street 1  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2022 Total Traffic
























Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	13	313	332	6	17	4
Future Volume (vph)	13	313	332	6	17	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	75.0				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.998		0.974	
Flt Protected	0.950				0.961	
Satd. Flow (prot)	1695	1767	1747	0	1670	0
Flt Permitted	0.950				0.961	
Satd. Flow (perm)	1695	1767	1747	0	1670	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		156.9	145.6		71.2	
Travel Time (s)		11.3	10.5		5.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	3%	4%	2%	2%	2%
Adj. Flow (vph)	13	313	332	6	17	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	313	338	0	21	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 28.8%	ICU Level of Service A					
Analysis Period (min) 15						

1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive













2022 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	53	2	100	35	323	5	594	48	338	662	58
Future Volume (vph)	80	53	2	100	35	323	5	594	48	338	662	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.99				1.00				
Frt		0.995			0.865			0.989				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1712	1809	0	1631	1574	0	1729	1747	0	1729	1784	1547
Flt Permitted	0.207			0.721			0.413			0.203		
Satd. Flow (perm)	373	1809	0	1227	1574	0	752	1747	0	369	1784	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			308			6				58
Link Speed (k/h)		50			50			80				80
Link Distance (m)		159.6			156.9			382.3				318.7
Travel Time (s)		11.5			11.3			17.2				14.3
Confl. Peds. (#/hr)			5	5					3	3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	0%	0%	6%	0%	0%	0%	2%	13%	0%	2%	0%
Adj. Flow (vph)	80	53	2	100	35	323	5	594	48	338	662	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	55	0	100	358	0	5	642	0	338	662	58
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2		28.4	28.4		11.4	28.3	28.3
Total Split (s)	33.0	33.0		33.0	33.0		55.0	55.0		12.0	67.0	67.0
Total Split (%)	33.0%	33.0%		33.0%	33.0%		55.0%	55.0%		12.0%	67.0%	67.0%
Maximum Green (s)	26.8	26.8		26.8	26.8		48.6	48.6		5.6	60.7	60.7
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	2.9	2.9		2.9	2.9		1.8	1.8		1.8	1.7	1.7

1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2022 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjst (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.4	6.4		6.4	6.3	6.3
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	2
Act Effct Green (s)	19.3	19.3		19.3	19.3		48.6	48.6		68.1	68.2	68.2
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.49	0.49		0.68	0.68	0.68
v/c Ratio	1.13	0.16		0.42	0.65		0.01	0.75		0.79	0.54	0.05
Control Delay	180.9	30.6		38.9	12.1		13.6	27.6		29.1	11.5	2.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	180.9	30.6		38.9	12.1		13.6	27.6		29.1	11.5	2.3
LOS	F	C		D	B		B	C		C	B	A
Approach Delay		119.7			17.9			27.5			16.6	
Approach LOS		F			B			C			B	
Queue Length 50th (m)	~17.3	8.5		17.0	8.1		0.5	96.2		23.7	58.9	0.0
Queue Length 95th (m)	#41.0	17.1		29.8	32.1		2.4	141.3		#86.2	107.8	4.6
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0			35.0			15.0		130.0
Base Capacity (vph)	99	486		328	647		365	852		428	1215	1072
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.81	0.11		0.30	0.55		0.01	0.75		0.79	0.54	0.05

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 69 (69%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.13

Intersection Signal Delay: 26.0

Intersection LOS: C

Intersection Capacity Utilization 108.2%

ICU Level of Service G

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.










Splits and Phases: 1: Terry Fox Drive & Cope Drive



2: Terry Fox Drive & Street 4  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

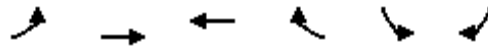
2022 Total Traffic






						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	17	995	2	0	1058
Future Volume (vph)	0	17	995	2	0	1058
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected						
Satd. Flow (prot)	0	1543	1784	0	0	1784
Flt Permitted						
Satd. Flow (perm)	0	1543	1784	0	0	1784
Link Speed (k/h)	50		80			80
Link Distance (m)	70.9		318.7			174.7
Travel Time (s)	5.1		14.3			7.9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	17	995	2	0	1058
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	17	997	0	0	1058
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 65.4%	ICU Level of Service C					
Analysis Period (min) 15						

3: Cope Drive & Street 1  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2022 Total Traffic


























Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations					 	
Traffic Volume (vph)	42	397	456	21	9	2
Future Volume (vph)	42	397	456	21	9	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	75.0				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.994		0.975	
Flt Protected	0.950				0.961	
Satd. Flow (prot)	1695	1784	1774	0	1672	0
Flt Permitted	0.950				0.961	
Satd. Flow (perm)	1695	1784	1774	0	1672	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		156.9	145.6		71.2	
Travel Time (s)		11.3	10.5		5.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	42	397	456	21	9	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	397	477	0	11	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	43.3%			ICU Level of Service A		
Analysis Period (min)	15					

1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2022 Total Traffic (WBR)













												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	53	2	100	35	323	5	594	48	338	662	58
Future Volume (vph)	80	53	2	100	35	323	5	594	48	338	662	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		75.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.99				1.00				
Frt		0.995				0.850		0.989				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1712	1809	0	1631	1820	1547	1729	1747	0	1729	1784	1547
Flt Permitted	0.734			0.721			0.413			0.205		
Satd. Flow (perm)	1323	1809	0	1227	1820	1547	752	1747	0	373	1784	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				308		6				58
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		159.6			156.9			382.3			318.7	
Travel Time (s)		11.5			11.3			17.2			14.3	
Confl. Peds. (#/hr)			5	5					3	3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	0%	0%	6%	0%	0%	0%	2%	13%	0%	2%	0%
Adj. Flow (vph)	80	53	2	100	35	323	5	594	48	338	662	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	55	0	100	35	323	5	642	0	338	662	58
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	2	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2	32.2	28.4	28.4		11.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0	33.0	55.0	55.0		12.0	67.0	67.0
Total Split (%)	33.0%	33.0%		33.0%	33.0%	33.0%	55.0%	55.0%		12.0%	67.0%	67.0%
Maximum Green (s)	26.8	26.8		26.8	26.8	26.8	48.6	48.6		5.6	60.6	60.6
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	2.9	2.9		2.9	2.9	2.9	1.8	1.8		1.8	1.8	1.8



1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2022 Total Traffic (WBR)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2	6.2	6.4	6.4		6.4	6.4	6.4
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	C-Max	C-Max		None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0	19.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2	2	2	2		2	2	2
Act Effct Green (s)	15.5	15.5		15.5	15.5	15.5	48.8	48.8		71.9	71.9	71.9
Actuated g/C Ratio	0.16	0.16		0.16	0.16	0.16	0.49	0.49		0.72	0.72	0.72
v/c Ratio	0.39	0.20		0.53	0.12	0.65	0.01	0.75		0.68	0.52	0.05
Control Delay	41.7	34.8		47.5	34.3	11.3	13.6	27.3		19.0	9.2	2.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	41.7	34.8		47.5	34.3	11.3	13.6	27.3		19.0	9.2	2.0
LOS	D	C		D	C	B	B	C		B	A	A
Approach Delay		38.9			21.0			27.2			11.9	
Approach LOS		D			C			C			B	
Queue Length 50th (m)	14.5	9.3		18.5	6.1	2.6	0.5	95.1		17.9	44.7	0.0
Queue Length 95th (m)	24.5	17.3		30.1	12.6	23.3	2.4	141.3		#81.1	105.5	4.4
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0		75.0	35.0			15.0		130.0
Base Capacity (vph)	354	486		328	487	640	367	855		495	1283	1129
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.23	0.11		0.30	0.07	0.50	0.01	0.75		0.68	0.52	0.05

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 69 (69%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 19.6

Intersection LOS: B

Intersection Capacity Utilization 84.6%

ICU Level of Service E

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.






















Splits and Phases: 1: Terry Fox Drive & Cope Drive

			
Ø1	Ø2 (R)		Ø4
12 s	55 s		33 s
			
Ø6 (R)			Ø8
67 s			33 s

1: Terry Fox Drive & Cope Drive  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive













2027 Total Traffic - Scenario 1

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	26	2	60	21	283	4	632	66	262	384	38
Future Volume (vph)	34	26	2	60	21	283	4	632	66	262	384	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	0.98		1.00					0.98
Frt		0.989			0.860			0.986				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1735	0	1601	1488	0	1729	1681	0	1712	1640	1473
Flt Permitted	0.288			0.739			0.528			0.334		
Satd. Flow (perm)	524	1735	0	1243	1488	0	960	1681	0	602	1640	1441
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			252			10				39
Link Speed (k/h)		50			50			80				80
Link Distance (m)		159.6			156.9			382.3				318.7
Travel Time (s)		11.5			11.3			17.2				14.3
Confl. Peds. (#/hr)			1	1			1					1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	50%	8%	5%	3%	0%	6%	14%	1%	11%	5%
Adj. Flow (vph)	34	26	2	60	21	283	4	632	66	262	384	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	28	0	60	304	0	4	698	0	262	384	38
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2		28.4	28.4		28.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0		57.0	57.0		57.0	57.0	57.0
Total Split (%)	36.7%	36.7%		36.7%	36.7%		63.3%	63.3%		63.3%	63.3%	63.3%
Maximum Green (s)	26.8	26.8		26.8	26.8		50.6	50.6		50.6	50.6	50.6
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6

1: Terry Fox Drive & Cope Drive  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2027 Total Traffic - Scenario 1

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.9	2.9		2.9	2.9		1.8	1.8		1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.4	6.4		6.4	6.4	6.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	2
Act Effct Green (s)	13.9	13.9		13.9	13.9		63.5	63.5		63.5	63.5	63.5
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.71	0.71		0.71	0.71	0.71
v/c Ratio	0.42	0.10		0.31	0.69		0.01	0.59		0.62	0.33	0.04
Control Delay	48.0	28.7		36.0	15.7		6.2	10.6		17.9	7.2	2.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	48.0	28.7		36.0	15.7		6.2	10.6		17.9	7.2	2.5
LOS	D	C		D	B		A	B		B	A	A
Approach Delay		39.3			19.1			10.5			11.0	
Approach LOS		D			B			B			B	
Queue Length 50th (m)	5.7	4.1		9.9	8.4		0.2	41.2		16.3	17.6	0.0
Queue Length 95th (m)	12.6	9.3		17.3	27.6		1.6	124.3		#78.2	53.8	3.8
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0			35.0			15.0		130.0
Base Capacity (vph)	156	518		370	620		677	1189		424	1158	1028
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.22	0.05		0.16	0.49		0.01	0.59		0.62	0.33	0.04

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 55 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 13.4

Intersection LOS: B

Intersection Capacity Utilization 100.3%

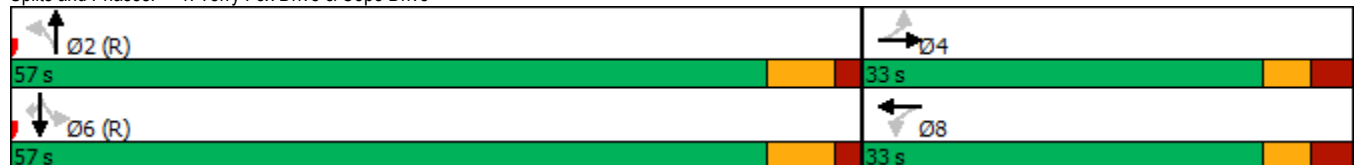
ICU Level of Service G

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.










Queue shown is maximum after two cycles.

Splits and Phases: 1: Terry Fox Drive & Cope Drive



2: Terry Fox Drive & Street 4  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive  
2027 Total Traffic - Scenario 1

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	33	948	1	0	684
Future Volume (vph)	0	33	948	1	0	684
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected						
Satd. Flow (prot)	0	1543	1733	0	0	1701
Flt Permitted						
Satd. Flow (perm)	0	1543	1733	0	0	1701
Link Speed (k/h)	50		80			80
Link Distance (m)	70.9		318.7			174.7
Travel Time (s)	5.1		14.3			7.9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	5%	2%	2%	7%
Adj. Flow (vph)	0	33	948	1	0	684
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	33	949	0	0	684
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 62.7%	ICU Level of Service B					
Analysis Period (min) 15						

3: Cope Drive & Street 1  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive  
2027 Total Traffic - Scenario 1
























Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	13	341	360	6	17	4
Future Volume (vph)	13	341	360	6	17	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	75.0				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.998		0.974	
Flt Protected	0.950				0.961	
Satd. Flow (prot)	1695	1767	1747	0	1670	0
Flt Permitted	0.950				0.961	
Satd. Flow (perm)	1695	1767	1747	0	1670	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		156.9	145.6		71.2	
Travel Time (s)		11.3	10.5		5.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	3%	4%	2%	2%	2%
Adj. Flow (vph)	13	341	360	6	17	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	341	366	0	21	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 30.4%	ICU Level of Service A					
Analysis Period (min) 15						

1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive













2027 Total Traffic - Scenario 1

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	53	2	109	35	354	5	656	51	366	731	58
Future Volume (vph)	80	53	2	109	35	354	5	656	51	366	731	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.99				1.00				
Frt		0.995			0.863			0.989				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1712	1809	0	1631	1571	0	1729	1748	0	1729	1784	1547
Flt Permitted	0.190			0.721			0.388			0.157		
Satd. Flow (perm)	342	1809	0	1227	1571	0	706	1748	0	286	1784	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			277			5				58
Link Speed (k/h)		50			50			80				80
Link Distance (m)		159.6			156.9			382.3				318.7
Travel Time (s)		11.5			11.3			17.2				14.3
Confl. Peds. (#/hr)			5	5					3	3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	0%	0%	6%	0%	0%	0%	2%	13%	0%	2%	0%
Adj. Flow (vph)	80	53	2	109	35	354	5	656	51	366	731	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	55	0	109	389	0	5	707	0	366	731	58
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2		28.4	28.4		11.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0		55.0	55.0		12.0	67.0	67.0
Total Split (%)	33.0%	33.0%		33.0%	33.0%		55.0%	55.0%		12.0%	67.0%	67.0%
Maximum Green (s)	26.8	26.8		26.8	26.8		48.6	48.6		5.6	60.6	60.6
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	2.9	2.9		2.9	2.9		1.8	1.8		1.8	1.8	1.8

1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2027 Total Traffic - Scenario 1

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjst (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.4	6.4		6.4	6.4	6.4
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	2
Act Effct Green (s)	21.1	21.1		21.1	21.1		48.6	48.6		66.3	66.3	66.3
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.49	0.49		0.66	0.66	0.66
v/c Ratio	1.11	0.14		0.42	0.71		0.01	0.83		1.04	0.62	0.06
Control Delay	178.1	29.1		37.4	17.5		13.6	32.3		80.8	13.9	2.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	178.1	29.1		37.4	17.5		13.6	32.3		80.8	13.9	2.4
LOS	F	C		D	B		B	C		F	B	A
Approach Delay		117.4			21.9			32.1			34.5	
Approach LOS		F			C			C			C	
Queue Length 50th (m)	15.4	8.1		17.7	17.8		0.5	113.0		~44.3	80.2	0.0
Queue Length 95th (m)	#42.7	17.1		32.1	47.9		2.4	#180.5		#111.7	127.5	4.6
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0			35.0			15.0		130.0
Base Capacity (vph)	91	486		328	623		343	852		352	1182	1044
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.88	0.11		0.33	0.62		0.01	0.83		1.04	0.62	0.06

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 69 (69%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 35.8

Intersection LOS: D

Intersection Capacity Utilization 115.5%

ICU Level of Service H

Analysis Period (min) 15

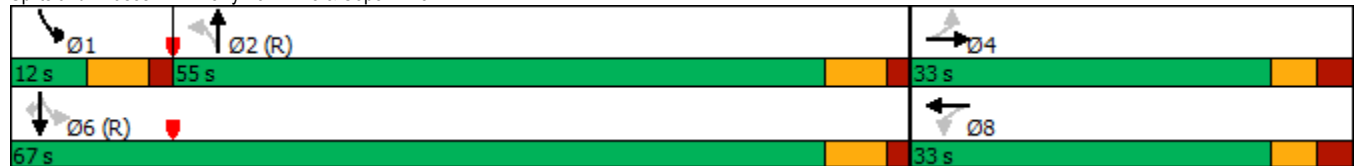
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.










Queue shown is maximum after two cycles.

Splits and Phases: 1: Terry Fox Drive & Cope Drive



2: Terry Fox Drive & Street 4  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive  
2027 Total Traffic - Scenario 1






						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	17	1088	2	0	1155
Future Volume (vph)	0	17	1088	2	0	1155
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected						
Satd. Flow (prot)	0	1543	1784	0	0	1784
Flt Permitted						
Satd. Flow (perm)	0	1543	1784	0	0	1784
Link Speed (k/h)	50		80			80
Link Distance (m)	70.9		318.7			174.7
Travel Time (s)	5.1		14.3			7.9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	17	1088	2	0	1155
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	17	1090	0	0	1155
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 70.6%	ICU Level of Service C					
Analysis Period (min) 15						



3: Cope Drive & Street 1  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive  
2027 Total Traffic - Scenario 1

























Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations					 	
Traffic Volume (vph)	42	428	496	21	9	2
Future Volume (vph)	42	428	496	21	9	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	75.0				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.995		0.975	
Flt Protected	0.950				0.961	
Satd. Flow (prot)	1695	1784	1775	0	1672	0
Flt Permitted	0.950				0.961	
Satd. Flow (perm)	1695	1784	1775	0	1672	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		156.9	145.6		71.2	
Travel Time (s)		11.3	10.5		5.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	42	428	496	21	9	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	428	517	0	11	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	45.6%			ICU Level of Service A		
Analysis Period (min)	15					

1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive













2027 Total Traffic - Scenario 1 (WBR)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	53	2	109	35	354	5	656	51	366	731	58
Future Volume (vph)	80	53	2	109	35	354	5	656	51	366	731	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		75.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.99				1.00				
Frt		0.995				0.850		0.989				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1712	1809	0	1631	1820	1547	1729	1748	0	1729	1784	1547
Flt Permitted	0.734			0.721			0.388			0.157		
Satd. Flow (perm)	1323	1809	0	1227	1820	1547	706	1748	0	286	1784	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				277		5				58
Link Speed (k/h)		50			50			80				80
Link Distance (m)		159.6			156.9			382.3				318.7
Travel Time (s)		11.5			11.3			17.2				14.3
Confl. Peds. (#/hr)			5	5					3	3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	0%	0%	6%	0%	0%	0%	2%	13%	0%	2%	0%
Adj. Flow (vph)	80	53	2	109	35	354	5	656	51	366	731	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	55	0	109	35	354	5	707	0	366	731	58
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	2	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2	32.2	28.4	28.4		11.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0	33.0	55.0	55.0		12.0	67.0	67.0
Total Split (%)	33.0%	33.0%		33.0%	33.0%	33.0%	55.0%	55.0%		12.0%	67.0%	67.0%
Maximum Green (s)	26.8	26.8		26.8	26.8	26.8	48.6	48.6		5.6	60.6	60.6
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	2.9	2.9		2.9	2.9	2.9	1.8	1.8		1.8	1.8	1.8

1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2027 Total Traffic - Scenario 1 (WBR)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjst (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2	6.2	6.4	6.4		6.4	6.4	6.4
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	C-Max	C-Max		None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0	19.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2	2	2	2		2	2	2
Act Effct Green (s)	16.1	16.1		16.1	16.1	16.1	48.6	48.6		71.3	71.3	71.3
Actuated g/C Ratio	0.16	0.16		0.16	0.16	0.16	0.49	0.49		0.71	0.71	0.71
v/c Ratio	0.38	0.19		0.55	0.12	0.74	0.01	0.83		0.83	0.57	0.05
Control Delay	40.6	34.1		47.9	33.7	18.8	13.6	32.3		34.5	10.4	2.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	40.6	34.1		47.9	33.7	18.8	13.6	32.3		34.5	10.4	2.1
LOS	D	C		D	C	B	B	C		C	B	A
Approach Delay		37.9			26.2			32.1			17.6	
Approach LOS		D			C			C			B	
Queue Length 50th (m)	14.2	9.1		19.9	5.9	13.5	0.5	113.0		33.1	56.9	0.0
Queue Length 95th (m)	24.5	17.3		32.5	12.6	38.7	2.4	#180.5		#106.7	124.5	4.4
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0		75.0	35.0			15.0		130.0
Base Capacity (vph)	354	486		328	487	617	343	852		439	1272	1120
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.23	0.11		0.33	0.07	0.57	0.01	0.83		0.83	0.57	0.05

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 69 (69%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 24.6

Intersection LOS: C

Intersection Capacity Utilization 90.0%

ICU Level of Service E

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.






















Splits and Phases: 1: Terry Fox Drive & Cope Drive

			
Ø1	Ø2 (R)		Ø4
12 s	55 s		33 s
			
Ø6 (R)			Ø8
67 s			33 s

1: Terry Fox Drive & Cope Drive  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive













2027 Total Traffic - Scenario 2

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	26	2	67	21	288	4	646	66	299	378	38
Future Volume (vph)	34	26	2	67	21	288	4	646	66	299	378	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	0.98		1.00					0.98
Frt		0.989			0.860			0.986				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1735	0	1601	1488	0	1729	1681	0	1712	1640	1473
Flt Permitted	0.284			0.739			0.531			0.325		
Satd. Flow (perm)	517	1735	0	1243	1488	0	965	1681	0	586	1640	1441
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			244			9				39
Link Speed (k/h)		80			50			80				80
Link Distance (m)		159.6			156.9			382.3				318.7
Travel Time (s)		7.2			11.3			17.2				14.3
Confl. Peds. (#/hr)			1	1			1					1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	50%	8%	5%	3%	0%	6%	14%	1%	11%	5%
Adj. Flow (vph)	34	26	2	67	21	288	4	646	66	299	378	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	28	0	67	309	0	4	712	0	299	378	38
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2		28.4	28.4		28.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0		57.0	57.0		57.0	57.0	57.0
Total Split (%)	36.7%	36.7%		36.7%	36.7%		63.3%	63.3%		63.3%	63.3%	63.3%
Maximum Green (s)	26.8	26.8		26.8	26.8		50.6	50.6		50.6	50.6	50.6
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6

1: Terry Fox Drive & Cope Drive  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2027 Total Traffic - Scenario 2

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.9	2.9		2.9	2.9		1.8	1.8		1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.4	6.4		6.4	6.4	6.4
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	2
Act Effct Green (s)	14.1	14.1		14.1	14.1		63.3	63.3		63.3	63.3	63.3
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.70	0.70		0.70	0.70	0.70
v/c Ratio	0.42	0.10		0.35	0.71		0.01	0.60		0.73	0.33	0.04
Control Delay	47.7	28.5		36.6	17.4		6.5	11.0		24.0	7.2	2.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	47.7	28.5		36.6	17.4		6.5	11.0		24.0	7.2	2.5
LOS	D	C		D	B		A	B		C	A	A
Approach Delay		39.0			20.8			11.0			14.0	
Approach LOS		D			C			B			B	
Queue Length 50th (m)	5.7	4.1		11.1	10.6		0.2	43.2		21.7	17.5	0.0
Queue Length 95th (m)	12.6	9.3		18.9	30.3		1.6	129.0		#95.8	52.7	3.8
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0			35.0			15.0		130.0
Base Capacity (vph)	153	518		370	614		678	1185		412	1153	1025
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.22	0.05		0.18	0.50		0.01	0.60		0.73	0.33	0.04

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 55 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 15.0

Intersection LOS: B

Intersection Capacity Utilization 103.3%

ICU Level of Service G

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.










Queue shown is maximum after two cycles.

Splits and Phases: 1: Terry Fox Drive & Cope Drive



2: Terry Fox Drive & Street 4  
AM Peak



















5331 Fernbank Road and 1039 Terry Fox Drive  
2027 Total Traffic - Scenario 2

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	33	967	1	0	715
Future Volume (vph)	0	33	967	1	0	715
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected						
Satd. Flow (prot)	0	1543	1733	0	0	1701
Flt Permitted						
Satd. Flow (perm)	0	1543	1733	0	0	1701
Link Speed (k/h)	50		80			80
Link Distance (m)	70.9		318.7			174.7
Travel Time (s)	5.1		14.3			7.9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	5%	2%	2%	7%
Adj. Flow (vph)	0	33	967	1	0	715
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	33	968	0	0	715
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 63.8%	ICU Level of Service B					
Analysis Period (min) 15						

3: Commercial/Street 1 & Cope Drive  
AM Peak

5331 Fernbank Road and 1039 Terry Fox Drive






















2027 Total Traffic - Scenario 2

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	336	41	16	357	6	15	0	15	17	0	4
Future Volume (vph)	13	336	41	16	357	6	15	0	15	17	0	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	30.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	75.0			75.0			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984			0.998			0.932			0.974	
Flt Protected	0.950			0.950				0.976			0.961	
Satd. Flow (prot)	1695	1741	0	1695	1747	0	0	1623	0	0	1670	0
Flt Permitted	0.950			0.950				0.976			0.961	
Satd. Flow (perm)	1695	1741	0	1695	1747	0	0	1623	0	0	1670	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		156.9			145.6			89.1			71.2	
Travel Time (s)		11.3			10.5			6.4			5.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	3%	2%	2%	4%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	13	336	41	16	357	6	15	0	15	17	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	377	0	16	363	0	0	30	0	0	21	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 31.3%	ICU Level of Service A											
Analysis Period (min) 15												

1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2027 Total Traffic - Scenario 2













												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	53	2	140	35	373	5	714	51	463	707	58
Future Volume (vph)	80	53	2	140	35	373	5	714	51	463	707	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.99				1.00				
Frt		0.995			0.863			0.990				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1712	1809	0	1631	1571	0	1729	1751	0	1729	1784	1547
Flt Permitted	0.176			0.721			0.394			0.116		
Satd. Flow (perm)	317	1809	0	1227	1571	0	717	1751	0	211	1784	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			252			5				58
Link Speed (k/h)		50			50			80				80
Link Distance (m)		159.6			156.9			382.3				318.7
Travel Time (s)		11.5			11.3			17.2				14.3
Confl. Peds. (#/hr)			5	5					3	3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	0%	0%	6%	0%	0%	0%	2%	13%	0%	2%	0%
Adj. Flow (vph)	80	53	2	140	35	373	5	714	51	463	707	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	55	0	140	408	0	5	765	0	463	707	58
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2		28.4	28.4		11.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0		55.0	55.0		12.0	67.0	67.0
Total Split (%)	33.0%	33.0%		33.0%	33.0%		55.0%	55.0%		12.0%	67.0%	67.0%
Maximum Green (s)	26.8	26.8		26.8	26.8		48.6	48.6		5.6	60.6	60.6
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	2.9	2.9		2.9	2.9		1.8	1.8		1.8	1.8	1.8



1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2027 Total Traffic - Scenario 2

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjst (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2		6.4	6.4		6.4	6.4	6.4
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	2
Act Effct Green (s)	22.7	22.7		22.7	22.7		48.6	48.6		64.7	64.7	64.7
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.49	0.49		0.65	0.65	0.65
v/c Ratio	1.13	0.13		0.51	0.74		0.01	0.90		1.63	0.61	0.06
Control Delay	182.5	28.3		39.1	21.4		13.6	38.6		320.8	14.3	2.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	182.5	28.3		39.1	21.4		13.6	38.6		320.8	14.3	2.4
LOS	F	C		D	C		B	D		F	B	A
Approach Delay		119.7			25.9			38.4			129.3	
Approach LOS		F			C			D			F	
Queue Length 50th (m)	15.2	7.7		22.4	25.6		0.5	129.4		~105.9	82.6	0.0
Queue Length 95th (m)	#44.0	17.1		40.4	59.1		2.4	#205.8		#175.3	120.3	4.6
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0			35.0			15.0		130.0
Base Capacity (vph)	84	486		328	605		348	853		284	1155	1022
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.95	0.11		0.43	0.67		0.01	0.90		1.63	0.61	0.06

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 69 (69%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.63

Intersection Signal Delay: 81.6

Intersection LOS: F

Intersection Capacity Utilization 125.6%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.










Queue shown is maximum after two cycles.

Splits and Phases: 1: Terry Fox Drive & Cope Drive



2: Terry Fox Drive & Street 4  
PM Peak



















5331 Fernbank Road and 1039 Terry Fox Drive  
2027 Total Traffic - Scenario 2

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	17	1165	2	0	1228
Future Volume (vph)	0	17	1165	2	0	1228
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				
Flt Protected						
Satd. Flow (prot)	0	1543	1784	0	0	1784
Flt Permitted						
Satd. Flow (perm)	0	1543	1784	0	0	1784
Link Speed (k/h)	50		80			80
Link Distance (m)	70.9		318.7			174.7
Travel Time (s)	5.1		14.3			7.9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	17	1165	2	0	1228
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	17	1167	0	0	1228
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 74.9%	ICU Level of Service D					
Analysis Period (min) 15						

3: Commercial/Street 1 & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive
























2027 Total Traffic - Scenario 2

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	418	107	45	482	21	64	0	51	9	0	2
Future Volume (vph)	42	418	107	45	482	21	64	0	51	9	0	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	30.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	75.0			75.0			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.969			0.994			0.940			0.975	
Flt Protected	0.950			0.950				0.973			0.961	
Satd. Flow (prot)	1695	1729	0	1695	1774	0	0	1632	0	0	1672	0
Flt Permitted	0.950			0.950				0.973			0.961	
Satd. Flow (perm)	1695	1729	0	1695	1774	0	0	1632	0	0	1672	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		156.9			145.6			89.1			71.2	
Travel Time (s)		11.3			10.5			6.4			5.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	42	418	107	45	482	21	64	0	51	9	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	525	0	45	503	0	0	115	0	0	11	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization 50.4%					ICU Level of Service A							
Analysis Period (min) 15												

1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2027 Total Traffic - Scenario 2 (WBR)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	53	2	140	35	373	5	714	51	463	707	58
Future Volume (vph)	80	53	2	140	35	373	5	714	51	463	707	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		75.0	35.0		0.0	15.0		130.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	55.0			55.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.99				1.00				
Frt		0.995				0.850		0.990				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1712	1809	0	1631	1820	1547	1729	1751	0	1729	1784	1547
Flt Permitted	0.734			0.721			0.396			0.068		
Satd. Flow (perm)	1323	1809	0	1225	1820	1547	721	1751	0	124	1784	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				373		4				58
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		159.6			156.9			382.3			318.7	
Travel Time (s)		11.5			11.3			17.2			14.3	
Confl. Peds. (#/hr)			5	5					3	3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	0%	0%	6%	0%	0%	0%	2%	13%	0%	2%	0%
Adj. Flow (vph)	80	53	2	140	35	373	5	714	51	463	707	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	55	0	140	35	373	5	765	0	463	707	58
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	2	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0
Minimum Split (s)	32.2	32.2		32.2	32.2	32.2	28.4	28.4		11.4	28.4	28.4
Total Split (s)	33.0	33.0		33.0	33.0	33.0	60.0	60.0		27.0	87.0	87.0
Total Split (%)	27.5%	27.5%		27.5%	27.5%	27.5%	50.0%	50.0%		22.5%	72.5%	72.5%
Maximum Green (s)	26.8	26.8		26.8	26.8	26.8	53.6	53.6		20.6	80.6	80.6
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	4.6	4.6		4.6	4.6	4.6
All-Red Time (s)	2.9	2.9		2.9	2.9	2.9	1.8	1.8		1.8	1.8	1.8

1: Terry Fox Drive & Cope Drive  
PM Peak

5331 Fernbank Road and 1039 Terry Fox Drive

2027 Total Traffic - Scenario 2 (WBR)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2		6.2	6.2	6.2	6.4	6.4		6.4	6.4	6.4
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	C-Max	C-Max		None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0	19.0	15.0	15.0		15.0	15.0	15.0
Pedestrian Calls (#/hr)	2	2		2	2	2	2	2		2	2	2
Act Effct Green (s)	19.4	19.4		19.4	19.4	19.4	53.6	53.6		88.0	88.0	88.0
Actuated g/C Ratio	0.16	0.16		0.16	0.16	0.16	0.45	0.45		0.73	0.73	0.73
v/c Ratio	0.37	0.19		0.71	0.12	0.66	0.02	0.98		1.00	0.54	0.05
Control Delay	47.9	41.5		65.7	40.9	10.3	18.8	59.9		77.9	9.9	1.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	47.9	41.5		65.7	40.9	10.3	18.8	59.9		77.9	9.9	1.7
LOS	D	D		E	D	B	B	E		E	A	A
Approach Delay		45.3			26.4			59.6			35.2	
Approach LOS		D			C			E			D	
Queue Length 50th (m)	16.9	11.1		31.4	7.1	0.0	0.7	172.3		~95.2	65.3	0.0
Queue Length 95th (m)	30.0	21.4		50.0	15.2	25.2	3.0	#255.7		#187.9	115.2	4.1
Internal Link Dist (m)		135.6			132.9			358.3			294.7	
Turn Bay Length (m)	30.0			30.0		75.0	35.0			15.0		130.0
Base Capacity (vph)	295	404		273	406	635	322	784		464	1308	1149
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.27	0.14		0.51	0.09	0.59	0.02	0.98		1.00	0.54	0.05

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 40.9

Intersection LOS: D

Intersection Capacity Utilization 100.7%

ICU Level of Service G

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Terry Fox Drive & Cope Drive



## **APPENDIX J**

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### **Transportation Demand Management (TDM) Measures Checklist**

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

<b>Legend</b>	
<b>BASIC</b>	The measure is generally feasible and effective, and in most cases would benefit the development and its users
<b>BETTER</b>	The measure could maximize support for users of sustainable modes, and optimize development performance
<b>★</b>	The measure is one of the most dependably effective tools to encourage the use of sustainable modes

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

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



TDM measures: <i>Residential developments</i>		Check if proposed & add descriptions
<b>6. TDM MARKETING &amp; COMMUNICATIONS</b>		
<b>6.1 Multimodal travel information</b>		
<b>BASIC</b> ★	6.1.1 Provide a multimodal travel option information package to new residents	<input checked="" type="checkbox"/>
<b>6.2 Personalized trip planning</b>		
<b>BETTER</b> ★	6.2.1 Offer personalized trip planning to new residents	<input checked="" type="checkbox"/>

## **APPENDIX K**

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### Intersection MMLOS Analysis

**Pedestrian Level of Service (PLOS)**

Criteria	North Approach		South Approach		East Approach		West Approach	
Terry Fox Drive/Cope Drive								
PETSİ SCORE								
CROSSİNG DISTANCE CONDITIONS								
Median > 2.4m in Width	No	55	No	72	No	72	No	72
Lanes Crossed (3.5m Lane Width)	6		5		5		5	
SİGNAL PHASİNG AND TİMİNG								
Left Turn Conflict	Permissive	-8	Permissive	-8	Perm + Prot	-8	Permissive	-8
Right Turn Conflict	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNİER RADIUS								
Parallel Radius	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8
Parallel Right Turn Channel	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSİNG TREATMENT								
Treatment	Standard	-7	Standard	-7	Standard	-7	Standard	-7
PETSİ SCORE		18		35		35		35
LOS		F		E		E		E
DELAY SCORE								
Cycle Length		95		95		95		95
Pedestrian Walk Time		14.8		14.8		31.7		53.7
DELAY SCORE		33.9		33.9		21.1		9
LOS		D		D		C		A
OVERALL		F		E		E		E

**Bicycle Level of Service (BLOS)**

Approach	Bikeway Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
<b>Terry Fox Drive/Cope Drive</b>				
North Approach	Pocket Bike Lane	Right Turn Lane Characteristics	Right turn lane >50m long	D
		Left Turn Accommodation	One lane crossed, 90 km/hr	E
South Approach	Bike Lane	Right Turn Lane Characteristics	No impact on LTS	A
		Left Turn Accommodation	One lane crossed, 90 km/hr	E
East Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact on LTS	A
		Left Turn Accommodation	One lane crossed, 60 km/hr	F
West Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact on LTS	A
		Left Turn Accommodation	One Lane Crossed, 60 km/hr	F

**Transit Level of Service (TLOS)**

Approach	Facility Type	Delay <sup>1</sup>	TLOS
<b>Terry Fox Drive/Cope Drive</b>			
North Approach	Mixed Traffic (No TSP)	7 seconds	B
South Approach	Mixed Traffic (No TSP)	18 seconds	C
East Approach	Mixed Traffic (No TSP)	23 seconds	D
West Approach	Mixed Traffic (No TSP)	N/A <sup>2</sup>	N/A

1. Mixed traffic delay based on the critical approach delay in Synchro analysis

2. No OC Transpo Service on Cedarview Road north of Fallowfield Road

**Truck Level of Service (TkLOS)**

Approach	Effective Corner Radius	Number of Receiving Lanes on Departure from Intersection	LOS
<b>Terry Fox Drive/Cope Drive</b>			
North Approach	> 15m	One	C
South Approach	> 15m	One	C
East Approach	> 15m	One	C
West Approach	> 15m	One	C

**Auto LOS**

Approach	AM Peak			PM Peak		
	V/C or Delay	LOS	Mvmt	V/C or Delay	LOS	Mvmt
<b>Terry Fox Drive/Cope Drive</b>						
North Approach	0.45	A	SBL	0.68	B	SBL
South Approach	0.53	A	NBT/R	0.71	C	NBT/R
East Approach	0.61	B	WBT/R	0.63	B	WBT/R
West Approach	0.46	A	EBL	1.24	F	EBL

MMLOS Summary Table

		Terry Fox Drive/Cope Drive			
Intersection		North Approach	South Approach	East Approach	West Approach
Pedestrian	Median > 2.4m in Width	No	No	No	No
	Lanes (3.5m Lane Width)	Six	Five	Five	Five
	Conflicting Left Turns	Permissive	Permissive	Perm + Prot	Permissive
	Conflicting Right Turns	Permissive	Permissive	Permissive	Permissive
	Right Turn on Red	Permitted	Permitted	Permitted	Permitted
	Pedestrian Leading Interval	No	No	No	No
	Parallel Radius	15m to 25m	15m to 25m	15m to 25m	15m to 25m
	Parallel Channel	No Channel	No Channel	No Channel	No Channel
	Perpendicular Radius	N/A	N/A	N/A	N/A
	Perpendicular Channel	N/A	N/A	N/A	N/A
	Crosswalk Type	Standard	Standard	Standard	Standard
	PETSI Score	20	37	37	37
	Delay Score	40	40	18.5	22
	Level of Service	F	E	E	E
	Target	C			
Cyclist	Type of Bikeway	Pocket Bike Land	Bike Lane	Mixed Traffic	Mixed Traffic
	Turning Speed	≤ 30km/hr	N/A	N/A	N/A
	Right Turn Storage	> 50m	N/A	N/A	N/A
	Dual Right Turn Lanes	No	No	No	No
	Shared Through-Right Lane	No	Yes	Yes	Yes
	Bike Box	No	No	No	No
	Lanes Crossed for Left Turns	One	One	One	One
	Dual Left Turn Lanes	No	No	No	No
	Approach Speed	90 km/hr	90 km/hr	60 km/hr	60 km/hr
	Level of Service	E	E	F	F
Transit	Facility Type	Mixed Traffic	Mixed Traffic	Mixed Traffic	N/A
	Average Signal Delay	7 seconds	18 seconds	23 seconds	N/A
	Level of Service	B	C	D	-
	Target	-			
Truck	Turning Radius	> 15m	> 15m	> 15m	> 15m
	Receiving Lanes	One	One	One	One
	Level of Service	C	C	C	C
	Target	D			
Auto	Volume to Capacity Ratio	0.68	0.71	0.63	1.24
	Level of Service	B	C	B	F
	Target	D			