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Heritage Hills Retail Plaza 471 Terry Fox Drive, Ottawa Transportation Impact Assessment

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**Heritage Hills Retail Plaza
471 Terry Fox Drive
Transportation Impact Assessment**

Prepared By:

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Suite 200, 240 Michael Cowpland Drive
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Dated: January 2019
Revised: May 2019

Novatech File: 118133
Ref: R-2018-119

May 22, 2019

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

Attention: Ms. Rosanna Baggs
Project Manager, Infrastructure Approvals

Dear Ms. Baggs:

Reference: 471 Terry Fox Drive
Transportation Impact Assessment
Novatech File No. 118133

We are pleased to submit the following revised Transportation Impact Assessment (TIA) in support of Zoning and Site Plan Control Applications for 471 Terry Fox Drive, for your review and signoff. The structure and format of this report is in accordance with the City of Ottawa Transportation Impact Assessment Guidelines (June 2017).

The original TIA in support of this development was submitted to the City of Ottawa in January 2019. This revised TIA has been prepared to reflect updates in the site plan and address City comments.

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

Yours truly,

NOVATECH



Joshua Audia, B.Sc.
E.I.T. | 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 licensed¹ or registered² professional in good standing, whose field of expertise [check ☒ appropriate field(s)] is either transportation engineering ☒ or transportation planning ☐.

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

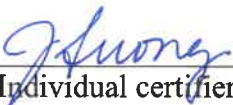
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Dated at Ottawa this 22 day of May, 2019.
(City)

Name: Jennifer Luong, P.Eng.
(Please Print)

Professional Title: Senior Project Manager, Transportation/Traffic


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

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	I
1.0 INTRODUCTION.....	1
2.0 PROPOSED DEVELOPMENT	1
3.0 SCREENING.....	2
3.1 SCREENING FORM	2
4.0 SCOPING.....	4
4.1 EXISTING CONDITIONS	4
4.1.1 Roadways.....	4
4.1.2 Intersections	5
4.1.3 Driveways.....	6
4.1.4 Pedestrian and Cycling Facilities	6
4.1.5 Area Traffic Management	6
4.1.6 Transit	6
4.1.7 Existing Traffic Volumes	8
4.1.8 Collision Records.....	9
4.2 PLANNED CONDITIONS	10
4.3 STUDY AREA AND TIME PERIODS	11
4.4 EXEMPTIONS REVIEW.....	11
5.0 FORECASTING	13
5.1 DEVELOPMENT-GENERATED TRAVEL DEMAND.....	13
5.1.1 Trip Generation.....	13
5.1.2 Trip Distribution.....	15
5.1.3 Trip Assignment.....	15
5.2 BACKGROUND TRAFFIC	16
5.2.1 General Background Growth Rate	16
5.2.2 Other Area Developments	17
6.0 ANALYSIS	23
6.1 DEVELOPMENT DESIGN	23
6.1.1 Design for Sustainable Modes	23
6.1.2 Circulation and Access	23
6.2 PARKING	25
6.3 BOUNDARY STREETS	26
6.3.1 Pedestrian Level of Service (PLOS).....	26
6.3.2 Bicycle Level of Service (BLOS)	26
6.3.3 Transit Level of Service (TLOS).....	27
6.3.4 Truck Level of Service (TkLOS)	27
6.3.5 Vehicular Level of Service (Auto LOS).....	28
6.3.6 Segment MMLOS Summary	28
6.4 ACCESS DESIGN	30
6.5 TRANSIT	32
6.6 INTERSECTION DESIGN.....	32
6.6.1 Intersection MMLOS Analysis	32
6.6.2 Intersection Operations with Identified Modifications.....	34
6.6.3 2019 Background Traffic – Intersection Operations	37
6.6.4 2024 Background Traffic – Intersection Operations	37

6.6.5	2019 Total Traffic – Intersection Operations	38
6.6.6	2024 Total Traffic – Intersection Operations	38
7.0	CONCLUSIONS AND RECOMMENDATIONS	39

Figures

Figure 1:	View of the Subject Site	2
Figure 2:	Site Plan Context	3
Figure 3:	OC Transpo Bus Stop Locations	7
Figure 4:	Existing Network Traffic Volumes	9
Figure 5:	Site-Generated Traffic	17
Figure 6:	Other Area Developments - 2019 Traffic	20
Figure 7:	Other Area Developments - 2024 Traffic	20
Figure 8:	2019 Background Traffic	21
Figure 9:	2024 Background Traffic	21
Figure 10:	2019 Total Traffic	22
Figure 11:	2024 Total Traffic	22
Figure 12:	Turning Movements	24

Tables

Table 1:	Reported Collisions	9
Table 2:	TIA Exemptions	12
Table 3:	Person Trip Generation	13
Table 4:	Person Trips by Modal Share	14
Table 5:	Internally Captured Trips	14
Table 6:	Primary and Pass-by Trips	15
Table 7:	Saturday Trip Generation - Other Area Developments	18
Table 8:	Saturday Trips by Modal Share - Other Area Developments	19
Table 9:	Vehicle Trips Generated by Other Area Developments	19
Table 10:	Parking Requirements Per Zoning By-Law	25
Table 11:	PLOS Segment Analysis	26
Table 12:	BLOS Segment Analysis	27
Table 13:	TLOS Segment Analysis	27
Table 14:	TkLOS Segment Analysis	28
Table 15:	Auto LOS Segment Analysis	28
Table 16:	Segment MMLOS Summary	29
Table 17:	Intersection MMLOS Summary	33
Table 18:	Terry Fox Drive/Kanata Avenue – Bicycle Crossing	35
Table 19:	Kanata Avenue/Huntsville Drive – Bicycle Crossing	35
Table 20:	Kanata Avenue/Huntsville Drive – Removal of WBR Lane	36
Table 21:	Kanata Avenue/Huntsville Drive – Increased SB Green Time	36
Table 22:	Kanata Avenue/Huntsville Drive – All Identified Modifications	36
Table 23:	2019 Background – Intersection Operations	37
Table 24:	2024 Background – Intersection Operations	37
Table 25:	2019 Total – Intersection Operations	38
Table 26:	2024 Total – Intersection Operations	39

Appendices

- Appendix A: Conceptual Site Plan
- Appendix B: TIA Screening Form
- Appendix C: OC Transpo Route Maps
- Appendix D: Traffic Count Data
- Appendix E: Collision Records
- Appendix F: Internal Capture Summary Sheets
- Appendix G: Other Area Developments
- Appendix H: Transportation Demand Management Checklist
- Appendix I: Intersection MMLOS Analysis
- Appendix J: Signal Timing Plans
- Appendix K: Synchro Analysis
- Appendix L: Road Modification Functional Design

EXECUTIVE SUMMARY

This Transportation Impact Assessment (TIA) has been prepared in support of Zoning and Site Plan Control Applications for the property located at 471 Terry Fox Drive. The subject site is currently undeveloped.

The site is part of the Broughton Subdivision, and was considered as commercial development with retail and gas station uses in the original 2004 TIS (revised in 2007 and 2008) and 2010 Addendum (D07-16-04-0020). Addendums 2, 3, and 4 were prepared in 2011, 2015, and 2016 to address development of the Phase 3B lands at the corner of Kanata Avenue and the former Richardson Side Road (revised SP D07-12-15-0150).

The subject site is designated as 'General Urban Area' on Schedule B of the City of Ottawa's Official Plan. The implemented zoning for the property is 'Local Commercial Zone' (LC), and there are no Secondary Plans or Community Design Plans applicable to the site. A minor rezoning application is required to permit the location of building setbacks closer to Terry Fox Drive and Tillsonburg Street.

The proposed development will feature a retail building with a total of 22,437 ft² of leasable space and 23,000 ft² of floor space, and a 3,315 ft² gas station with car wash. A total of 112 parking spaces will be provided, with 96 parking spaces serving the retail building and 16 parking spaces serving the gas station.

The proposed accesses to the site include a full-movement access on Tillsonburg Street, a right-in/right-out (RIRO) access on Kanata Avenue and a RIRO access on Terry Fox Drive. The full-movement access on Tillsonburg Street will serve the retail building, the RIRO access on Kanata Avenue will serve the gas station, and the RIRO access on Terry Fox Drive will serve both uses.

The study area for this report includes Terry Fox Drive, Kanata Avenue, Tillsonburg Street, and Huntsville Drive. The study area includes the signalized intersections at Terry Fox Drive/Kanata Avenue and Kanata Avenue/Huntsville Drive, as well as the unsignalized intersection at Terry Fox Drive/Tillsonburg Street.

The selected time periods for the analysis are the weekday AM and PM peak hours and the Saturday peak hour, as they represent the 'worst case' combination of site generated traffic and adjacent street traffic. The proposed development is expected to be completed in one phase, with full occupancy by the year 2019. Therefore, the analysis considers the buildout year 2019 and the horizon year 2024.

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

Forecasting

- The proposed development is projected to generate approximately 132 person trips during the AM peak hour, 260 person trips during the PM peak hour, and 267 person trips during the Saturday peak hour.
- The proposed development is projected to generate 103 vehicle trips during the AM peak hour, 197 vehicle trips during the PM peak hour, and 206 vehicle trips during the Saturday peak hour.

Development Design and Parking

- Pedestrian facilities will be provided between the building entrances and the parking areas. Additionally, pedestrian facilities will connect the retail buildings to the existing sidewalks along Terry Fox Drive and Tillsonburg Street. Sidewalks will be depressed and continuous across the accesses, in accordance with City standards. A barrier-free pedestrian pathway is proposed on-site between the retail building and gas station, to provide pedestrian connectivity throughout the site.
- All building entrances are within 400m walking distances of stops for both OC Transpo routes 165 and 264.
- Retail garbage collection will take place approximately 80m south of the full-movement access on Tillsonburg Street. Gas station garbage collection will take place south of the proposed car wash, approximately 15m north of the RIRO access on Kanata Avenue.
- Loading and delivery spaces for the retail uses are provided adjacent to the east and west of the full-movement access on Tillsonburg Street.
- The accesses to the gas station are sufficient to accommodate a fuel tanker, the largest vehicle to enter and exit the site. Some mountable curb is required for the tanker to negotiate turning into/out of the accesses.
- The fire route for the proposed development accesses the site from the full-movement access on Tillsonburg Street and the RIRO access on Terry Fox Drive.
- Approximately 112 vehicle parking spaces and 16 bicycle parking spaces are proposed for the development, meeting the minimum requirements of the ZBL. Four of the 96 retail parking spaces and one of the 16 gas station parking spaces are accessible spaces, meeting the minimum requirements of the City's *Accessibility Design Standards*.
- A total of ten bicycle parking spaces will be provided for the retail building, and a total of six bicycle parking spaces will be provided for the gas station and convenience store, thereby meeting the requirements of the ZBL.
- The proposed car wash provides queueing space for ten vehicles before/in the car wash bay, and one vehicle after the bay, thereby meeting the minimum requirements of the ZBL.
- Two retail loading spaces are proposed, thereby meeting the minimum requirements of the ZBL.

Boundary Streets

- The results of the segment MMLOS analysis can be summarized as follows:
 - Kanata Avenue meets the target pedestrian level of service (PLOS), while Terry Fox Drive and Tillsonburg Street do not;
 - No boundary streets meet the target bicycle level of service (BLOS);
 - No boundary streets have targets for transit level of service (TLOS), however Terry Fox Drive and Kanata Avenue both currently meet the target for Transit Priority Corridors with Isolated Measures;
 - Terry Fox Drive meets the target truck level of service (TkLOS);

- All boundary streets meet the vehicular level of service (Auto LOS).
- The east side of Terry Fox Drive does not achieve the target PLOS C. The target PLOS can only be achieved by reducing the operating speed significantly (i.e. reducing the posted speed limit from 70 km/h to 50 km/h). Therefore, no recommendations have been made in improving the PLOS on Terry Fox Drive.
- The north side of Tillsonburg Street has no pedestrian facilities. Current City standards suggest that if required, sidewalks can be provided on one side of local roadways. Any potential pedestrian traffic generated by the proposed development are anticipated to use the sidewalk on the south side of Tillsonburg Street, which meets the target PLOS C. Therefore, no recommendations have been made in improving the PLOS on Tillsonburg Street.
- Terry Fox Drive does not achieve the target BLOS E, despite the existing bike lanes. The target BLOS can only be achieved by reducing the operating speed to 60 km/h or implementing a physically separated bikeway (such as a multi-use pathway). Site observations indicate that the majority of cyclists likely use the east sidewalk on Terry Fox Drive rather than the bike lanes, as an existing multi-use pathway ties into this sidewalk north of Richardson Side Road. Consideration could be given to extending the multi-use pathway on the east side of Terry Fox Drive. This is identified for the City's consideration as funding becomes available.
- Tillsonburg Street does not achieve the target BLOS D. If classified as a residential street with an operating speed of 50 km/h, Tillsonburg Street achieves a BLOS B. Book 18 of the *Ontario Traffic Manual* indicates that shared use lanes are acceptable for Tillsonburg Street, given the operating speed and traffic volumes. Therefore, no recommendations have been made in improving the BLOS on Tillsonburg Street.
- Kanata Avenue does not achieve the target BLOS B. The target BLOS can only be achieved through either a reduction in the operating speed to 50 km/h and a raised median, or implementation of a physically separated bikeway. A nearby alternate local route is Richardson Side Road east of Terry Fox Drive, which is closed to vehicular traffic. Therefore, no recommendations have been made in improving the BLOS on Kanata Avenue.

Access Design

- Section 25 (a) of the *Private Approach By-Law* identifies a maximum requirement for the number of approaches based on the amount of frontage, and Section 25 (b) identifies that each roadway shall be evaluated separately. For 46m to 150m of frontage (Tillsonburg Street and Kanata Avenue), up to two two-way approaches are permitted. For every additional 90m in excess of 150m (Terry Fox Drive), another two-way approach is permitted. This requirement is met by the proposed accesses.
- Section 25 (c) of the *Private Approach By-Law* identifies a maximum width requirement of 9m for two-way private approaches, and Section 107 (1)(a) of the *Zoning By-Law* identifies a minimum width requirement of 6.7m for two-way private approaches to a parking lot. These requirements are met by the proposed accesses.

- Section 25 (l) of the *Private Approach By-Law* identifies minimum separation distances of 30m between a two-way approach and the nearest intersecting street line, and between a two-way approach and any other private approach. These requirements are met by the proposed accesses.
- If all parking spaces are considered rather than dividing the retail and gas station parking, the minimum separation distance requirement increases to 45m between a two-way approach and the nearest intersecting street line. In this case, the Tillsonburg Street access would not meet the requirement and a waiver would be required. However, this access is located as far from Terry Fox Drive as possible, and the retail and gas station uses are anticipated to function somewhat independently. In addition, the long throat length will help to mitigate any concerns with regards to queueing back to Terry Fox Drive.
- Figure 8.8.2 of the *Geometric Design Guide* identifies minimum corner clearance distances of 70m on arterial roadways, 25m on collector roadways divided with a raised median, and 15m on local roadways. These requirements are met by the proposed accesses.
- Section 25 (o) of the *Private Approach By-Law* identifies a minimum distance requirement of 3m between a private approach and the nearest property line. The spacing between the Tillsonburg Street access and the property line is approximately 4.2m and the spacing between the Kanata Avenue access and the property line is approximately 15.5m, thereby meeting this requirement.
- Section 2.5.3 of the *Geometric Design Guide* identifies minimum stopping sight distance (SSD) requirements based on the roadway grade and design speed. Adjusting the design speed for traffic turning onto Tillsonburg Street from Terry Fox Drive to reflect a lower operating speed, all accesses meet the minimum SSD requirements.
- The Terry Fox Drive access is critical to the proposed development. Connectivity between the retail and gas station areas is important due to the turning restrictions at the accesses, and each land use depends on the other use's access for at least one movement. Additionally, providing an access on Terry Fox Drive allows fuel trucks to enter the site without navigating the entire retail parking lot first.
- A right turn taper is included for the Terry Fox Drive access, to accommodate vehicles entering the site.
- Table 8.9.3 of the *Geometric Design Guide* identifies a minimum clear throat length requirement of 8m for collector roadways and 15m for arterial roadways, for shopping centres less than 25,000 m². No clear throat length requirement is explicitly stated for gas stations. The access on Kanata Avenue achieves a clear throat length of 15m, thereby meeting the requirements. Measured from the end of the curb radius, the access on Terry Fox Drive achieves a clear throat length of approximately 10m, in addition to the required right turn taper. Additionally, there is a significant amount of open paved area on-site, which is anticipated to contain any inbound queueing.

Transit

- The transit trips generated by the proposed development are not anticipated to have a significant impact on the operations of OC Transpo routes 165 and 264. No mitigation measures have been recommended, as none are required.

Intersection Design

- Based on the results of the intersection MMLOS analysis:
 - Neither intersection meets the target pedestrian level of service (PLOS);
 - Neither intersection meets the target bicycle level of service (BLOS);
 - Neither intersection has a target transit level of service (TLOS), however all approaches achieve a TLOS E or better;
 - Terry Fox Drive/Kanata Avenue meets the target truck level of service (TkLOS);
 - All intersections meet the vehicular level of service (Auto LOS).
- Pedestrian Level of Service:
 - Both crosswalks of Terry Fox Drive/Kanata Avenue do not achieve the target PLOS C, due to crossing distances equivalent to at least eight lanes. There are limited opportunities in improving the PLOS without reducing the number of travel lanes on Terry Fox Drive and Kanata Avenue, and as such, no recommendations have been made in improving the PLOS at this intersection.
 - At Kanata Avenue/Huntsville Drive, the east crosswalk does not achieve the target PLOS C based on PETSI score, due to a crossing distance equivalent to five lanes. Additionally, the east and west crosswalks do not achieve the target PLOS C based on delay score. There are limited opportunities in improving the PLOS at the east approach without reducing the number of travel lanes on Kanata Avenue, with the only possible modification being the removal of the westbound right turn lane. To achieve the target PLOS C based on delay score, the effective walk time for pedestrians would require an increase of approximately three seconds.
- Bicycle Level of Service:
 - At Terry Fox Drive/Kanata Avenue, the south and east approaches do not achieve the target BLOS B based on right turn characteristics, and the north approach does not achieve the target BLOS B based on left turn characteristics. The east approach does not meet the target, as the pocket bike lane is adjacent to a right turn lane greater than 50m. Bike access to Terry Fox Drive is also provided at Richardson Side Road, where the east approach is closed to vehicular traffic.
 - For the south and east approaches, this would require removal of the existing channelized right turn lanes, which is not recommended based on the right turn volumes. Therefore, no recommendations have been made in improving the BLOS for the south and east approaches. A jug handle and crossride for cyclists coming from the north approach can feasibly be implemented along with the installation of a bicycle traffic signal.
 - At Kanata Avenue/Huntsville Drive, the east approach does not achieve the target BLOS B based on right turn characteristics, and the west approach does not achieve the target BLOS B based on left turn characteristics. Consideration could be given to shifting the location of the bike lane to the curb at the east approach or removing the

westbound right turn lane, which would improve the BLOS of the approach to a BLOS A. In addition, a crossride could be considered to improve cyclist visibility through the intersection. City staff have confirmed that the westbound right turn lane will not be removed.

- With respect to left turns, a jug handle and crossride for cyclists coming from the west approach can feasibly be implemented along with the installation of a bicycle traffic signal.
- The following modifications can be accommodated at the intersections of Terry Fox Drive/Kanata Avenue and Kanata Avenue/Huntsville Drive, and are identified for the City's consideration:
 - A jug handle and crossride for southbound cyclists at Terry Fox Drive/Kanata Avenue;
 - A jug handle and crossride for eastbound cyclists at Kanata Avenue/Huntsville Drive;
 - Removal of the westbound right turn lane at Kanata Avenue/Huntsville Drive;
 - A southbound green time increase of three seconds at Kanata Avenue/Huntsville Drive, such that the intersection achieves the target PLOS C.
- Compared to existing conditions, marginal increases in the v/c ratios and delays at the study area intersections are anticipated as a result of background growth and site-generated traffic.
- All study area intersections are projected to continue operating acceptably during the AM, PM, and Saturday peak hours (Auto LOS B or better). There are no queueing issues identified in Synchro for the 2024 total traffic conditions, which can be considered the 'worst case' scenario analyzed in this TIA.
- Based on the foregoing, the proposed development is recommended from a transportation perspective.

1.0 INTRODUCTION

This Transportation Impact Assessment has been prepared in support of Zoning and Site Plan Control Applications for the property located at 471 Terry Fox Drive. The subject site is currently undeveloped.

The site is part of the Broughton Subdivision, and was considered as commercial development with retail and gas station uses in the original 2004 TIS (revised in 2007 and 2008) and 2010 Addendum (D07-16-04-0020). Addendums 2, 3, and 4 were prepared in 2011, 2015, and 2016 to address development of the Phase 3B lands at the corner of Kanata Avenue and the former Richardson Side Road (revised SP D07-12-15-0150).

The proposed development is a retail plaza, featuring approximately 23,000 ft² of retail space and a 3,315 ft² gas station with car wash. The development will provide 112 surface parking spaces, with 96 spaces serving the retail uses and 16 spaces serving the gas station.

The subject site is surrounded by the following:

- Residences to the north;
- Kanata Avenue, residences and vacant land to the east;
- Terry Fox Drive and vacant land to the south;
- Tillsonburg Street and residences to the west.

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

2.0 PROPOSED DEVELOPMENT

The subject site is designated as 'General Urban Area' on Schedule B of the City of Ottawa's Official Plan. The implemented zoning for the property is 'Local Commercial Zone' (LC), and there are no Secondary Plans or Community Design Plans applicable to the site. A minor rezoning application is required to permit the location of building setbacks closer to Terry Fox Drive and Tillsonburg Street.

The proposed development will feature a retail building with a total of 22,437 ft² of leasable space and 23,000 ft² of floor space, and a 3,315 ft² gas station with car wash. A total of 112 parking spaces will be provided, with 96 parking spaces serving the retail building and 16 parking spaces serving the gas station.

The proposed accesses to the site include a full-movement access on Tillsonburg Street, a right-in/right-out (RIRO) access on Kanata Avenue and a RIRO access on Terry Fox Drive. The full-movement access on Tillsonburg Street will serve the retail building, the RIRO access on Kanata Avenue will serve the gas station, and the RIRO access on Terry Fox Drive will serve both uses.

A copy of the conceptual site plan is included in **Appendix A**.

A site plan context figure, which includes details of the boundary streets such as pavement markings, sidewalks, accesses, and right-of-way locations, is included in **Figure 2**.

Figure 1: View of the Subject Site

3.0 SCREENING

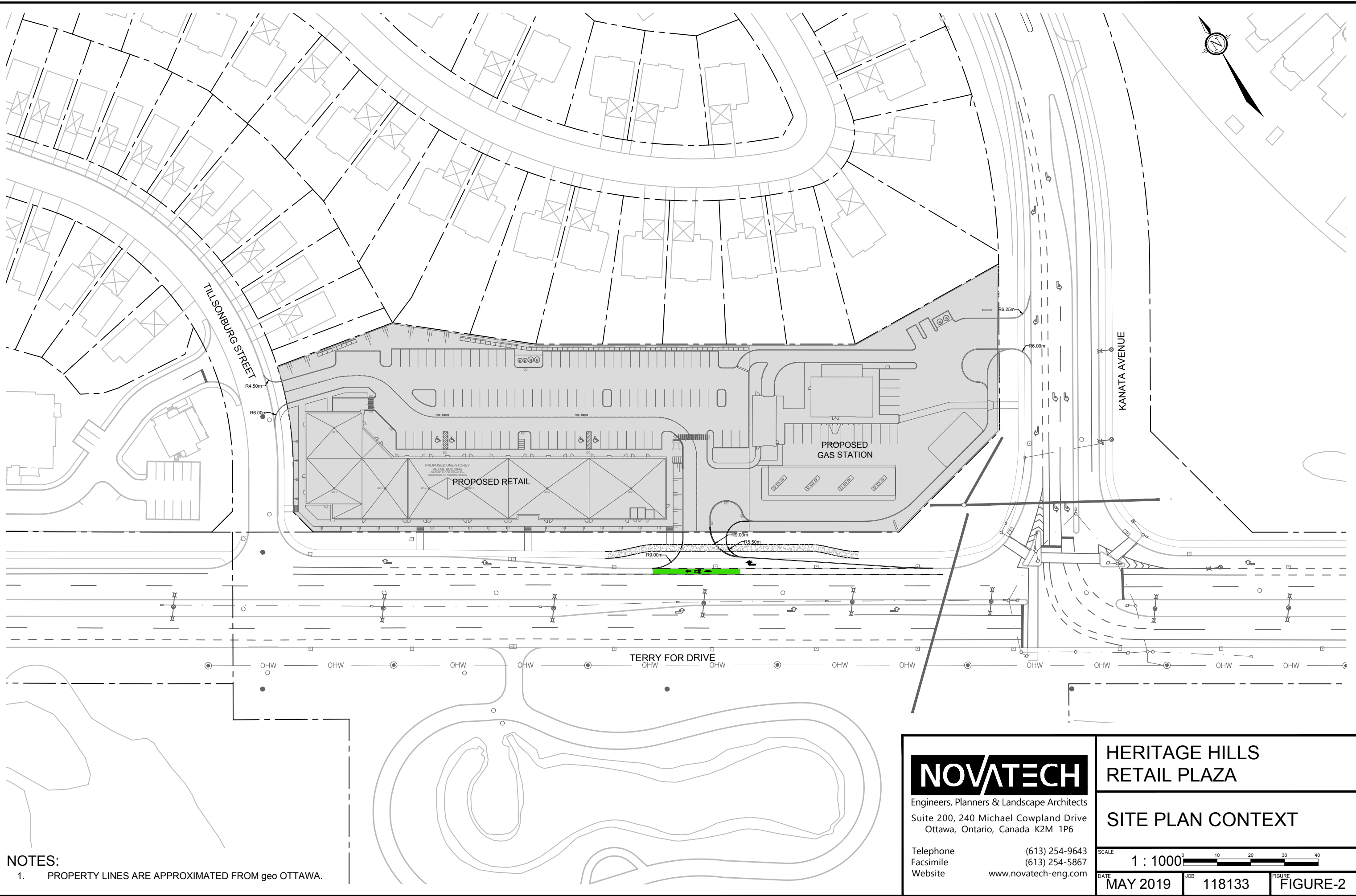
3.1 Screening Form

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. The trigger results are as follows:

- Trip Generation Trigger – The development is expected to generate over 60 person trips/peak hour; further assessment is required based on this trigger.
- Location Triggers – The development is located along a Spine Cycling Route; further assessment is required based on this trigger.
- Safety Triggers – Multiple accesses have limited sight lines due to vertical and horizontal curvatures (Tillsonburg Street and Kanata Avenue), are within 150m of a traffic signal (Terry Fox Drive and Kanata Avenue), and are within auxiliary lanes of other intersections (Kanata Avenue). For these reasons, further assessment is required based on this trigger.

A copy of the TIA Screening Form is included in **Appendix B**.

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- NOTES:
1. PROPERTY LINES ARE APPROXIMATED FROM geo OTTAWA.

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**HERITAGE HILLS
RETAIL PLAZA**

SITE PLAN CONTEXT

SCALE 1 : 1000

DATE MAY 2019 JOB 118133 FIGURE-2

CUT11V17 DWG 270mm X 122mm

4.0 SCOPING

4.1 Existing Conditions

4.1.1 Roadways

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

Terry Fox Drive is an arterial roadway that runs on a north-south alignment within the study area. Overall, Terry Fox Drive runs generally on a north-south alignment between Herzberg Road and Eagleson Road. Within the study area, Terry Fox Drive has a four-lane divided urban cross-section, sidewalks on the east side of the roadway, and a posted speed limit of 70 km/h. Terry Fox Drive is classified as a truck route, allowing full loads. Street parking is not permitted. The right-of-way (ROW) at the subject site is approximately 44.5m, equal to the ROW protection identified in the City of Ottawa's Official Plan. No widening is required.

Kanata Avenue is a major collector roadway that runs generally on an east-west alignment within the study area. Kanata Avenue runs between Terry Fox Drive and Aird Place, where it continues south as Castlefrank Road. Castlefrank Road continues on a generally north-south alignment until terminating at Terry Fox Drive. Within the study area, Kanata Avenue has a two-lane divided urban cross-section, sidewalks on both sides of the roadway, and a posted speed limit of 60 km/h. Kanata Avenue is not classified as a truck route, and street parking is not permitted. The ROW at the subject site is approximately 40m, and no ROW protection is identified in the Official Plan.

Tillsonburg Street is a local roadway that runs on an east-west, then north-south alignment between Terry Fox Drive and Wallaceburg Court. Within the study area, Tillsonburg Street has a two-lane undivided urban cross-section, sidewalks on the south/east side of the roadway, and an unposted regulatory speed limit of 50 km/h under the Highway Traffic Act. Tillsonburg Street is not classified as a truck route. Street parking is permitted. The ROW at the subject site is approximately 18m, and no ROW protection is identified in the Official Plan.

Huntsville Drive is a local roadway that runs generally on an east-west alignment between Kanata Avenue and Ingersoll Crescent, then runs north-south to Terry Fox Drive. Within the study area, Huntsville Drive has a two-lane undivided urban cross-section, sidewalks on both sides of the roadway, and an unposted regulatory speed limit of 50 km/h. Huntsville Drive is not classified as a truck route. Street parking is permitted.

4.1.2 Intersections

Terry Fox Drive/Tillsonburg Street

- Unsignalized three-legged intersection
- North Approach: two through lanes
- South Approach: two through lanes and one right turn lane
- East Approach: one right turn lane
- Bike lanes on north and south approaches



Terry Fox Drive/Kanata Avenue

- Signalized three-legged intersection
- North Approach: one left turn lane and two through lanes
- South Approach: two through lanes and one channelized right turn lane
- East Approach: two left turn lanes and one channelized right turn lane
- Bike lanes on all approaches



Kanata Avenue/Huntsville Drive

- Signalized three-legged intersection
- North Approach: one shared left turn/right turn lane
- East Approach: one through lane and one right turn lane
- West Approach: one left turn lane and one through lane
- Bike lanes on east and west approaches



4.1.3 Driveways

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

Tillsonburg Street, North Side:

- 12 driveways to residences on Tillsonburg Street
- Driveway to Guelph Private, which provides access to 96 condominiums (offset approximately 10m to the east of the proposed access)

Tillsonburg Street, South Side:

- 17 driveways to residences on Tillsonburg Street

Kanata Avenue, South Side:

- Driveway to commercial property at 475 Terry Fox Drive (development has not proceeded)

4.1.4 Pedestrian and Cycling Facilities

Concrete sidewalks are provided on both sides of Kanata Avenue and Huntsville Drive, the east side of Terry Fox Drive, and the south side of Tillsonburg Street.

Terry Fox Drive is classified as part of Ottawa's primary cycling network as a Spine Route, and Kanata Avenue is classified as a Local Route. Tillsonburg Street and Huntsville Drive have no cycling route designation. Multiple pathways connect Kanata Avenue to various portions of the surrounding neighbourhood. Bike lanes have been implemented in both directions on Terry Fox Drive and Kanata Avenue. The 2013 Ottawa Cycling Plan identifies no further improvements to the cycling network within the study area.

4.1.5 Area Traffic Management

There are no Area Traffic Management (ATM) studies within the study area that have been completed or are currently in progress.

4.1.6 Transit

Bus stops within 400m walking distance of the subject site are listed as follows:

- Stop #1554 – for route 165
(located at the northeast corner of Huntsville Drive/Ingersoll Crescent)
- Stop #1557 – for route 165
(located at the southeast corner of Huntsville Drive/Ingersoll Crescent)
- Stop #6050 – for routes 165 and 264
(located at the northwest corner of Kanata Avenue/Huntsville Drive)
- Stop #6051 – for routes 165 and 264
(located at the northeast corner of Kanata Avenue/Huntsville Drive)
- Stop #7572 – for route 264
(located at the southwest corner of Kanata Avenue/Huntsville Drive)

- Stop #7569 – for route 264
(located at the northeast corner of Terry Fox Drive/Richardson Side Road)
- Stop #7573 – for route 264
(located at the northwest corner of Terry Fox Drive/Tillsonburg Street)

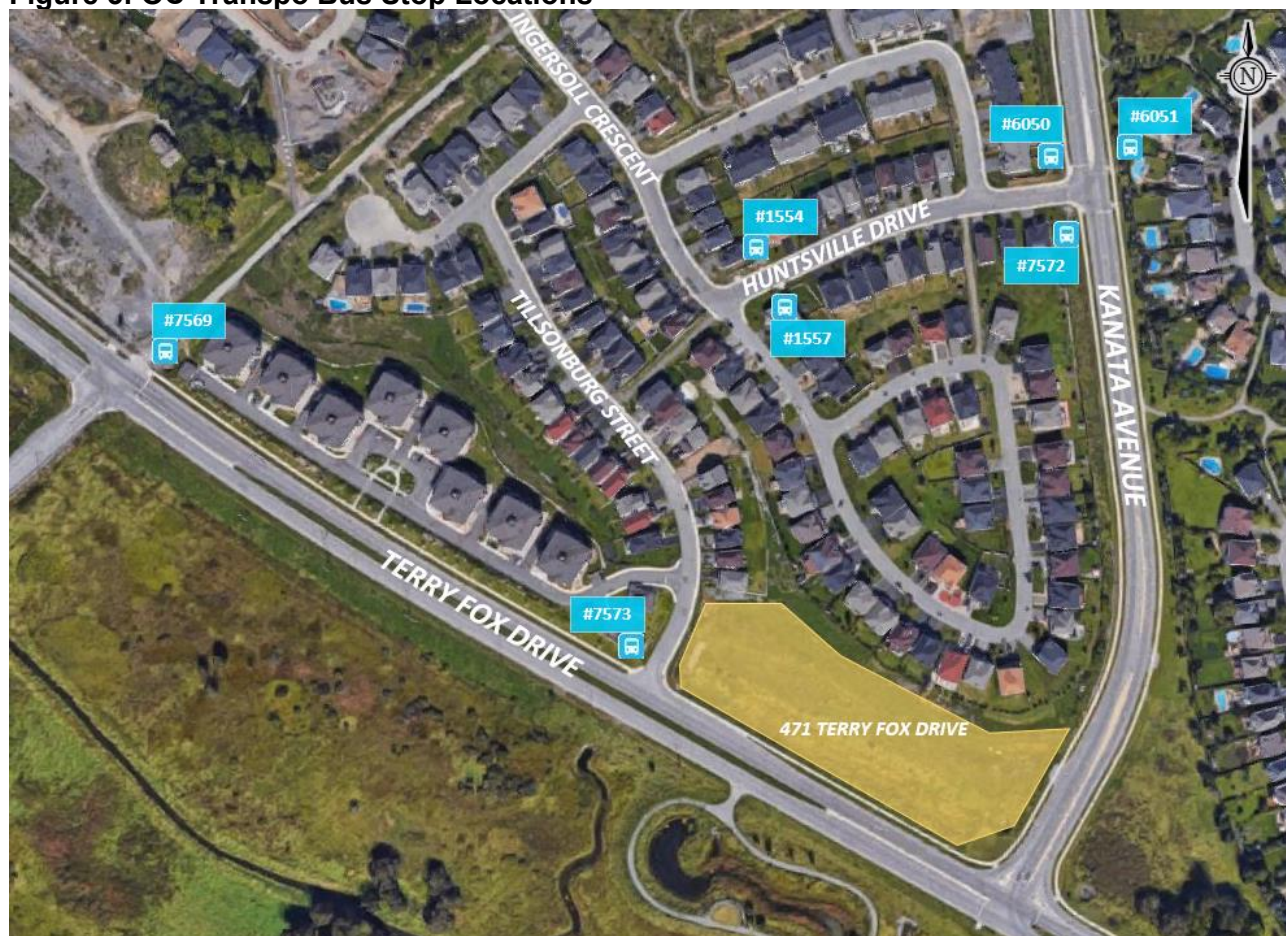
Locations of these bus stops are shown in **Figure 3**.

OC Transpo Route 165 travels between Terry Fox Station and Innovation Station. On weekdays, the route operates every 60 minutes from 9:00am to 2:00pm and 7:00pm to 10:00pm. The route does not operate outside of these hours, or on weekends.

OC Transpo Route 264 travels between either Terry Fox/Tillsonburg or Huntsville/Ingersoll and Mackenzie King Station. During the weekday AM peak period, the route operates from Terry Fox/Tillsonburg toward Mackenzie King Station every 20-30 minutes between 5:30am and 8:30am. During the weekday PM peak period, the route operates from Mackenzie King Station toward Huntsville/Ingersoll every 20-30 minutes between 4:00pm and 7:00pm. The route does not operate outside of these hours, or on weekends.

OC Transpo maps for the routes outlined above are included in **Appendix C**.

Figure 3: OC Transpo Bus Stop Locations



4.1.7 Existing Traffic Volumes

Weekday and Saturday traffic counts completed by the City of Ottawa, IBI Group, or Novatech were used to determine the existing pedestrian, cyclist and vehicular traffic volumes at the study area intersections.

While an April 2018 traffic count at Terry Fox Drive/Kanata Avenue was conducted by the City, it was completed after the closure of Goulbourn Forced Road in February 2018. Goulbourn Forced Road is a roadway connecting the Kanata Lakes area to the Kanata North Technology Park, and is being realigned to intersect with Terry Fox Drive west of the technology park. The 2018 traffic count reflects that with the closure, substantial traffic volumes are rerouted to the intersection of Terry Fox Drive/Kanata Avenue. The next most recent count was conducted by the City in June 2014.

Comparing the 2014 and 2018 counts, two-way traffic volumes on Kanata Avenue at Terry Fox Drive increased by the following amounts:

- AM Peak Hour: 550 vehicles in 2014, compared to 1,079 vehicles in 2018 (96% increase)
- PM Peak Hour: 673 vehicles in 2014, compared to 961 vehicles in 2018 (43% increase)

Nearly all of the development between the 2014 and 2018 counts took place north of the study area, but accounts for only a small portion of the increase in traffic on Kanata Avenue. The 2014 count at Terry Fox/Kanata Avenue will be used in this TIA for the reasons listed above. As the City has no counts on file at Kanata Avenue/Huntsville Drive, and weekday counts conducted while Goulbourn Forced Road is closed are considered to be unreliable, this TIA will use a 2015 count conducted by IBI Group as part of the Richardson Ridge Transportation Impact Study (September 2015).

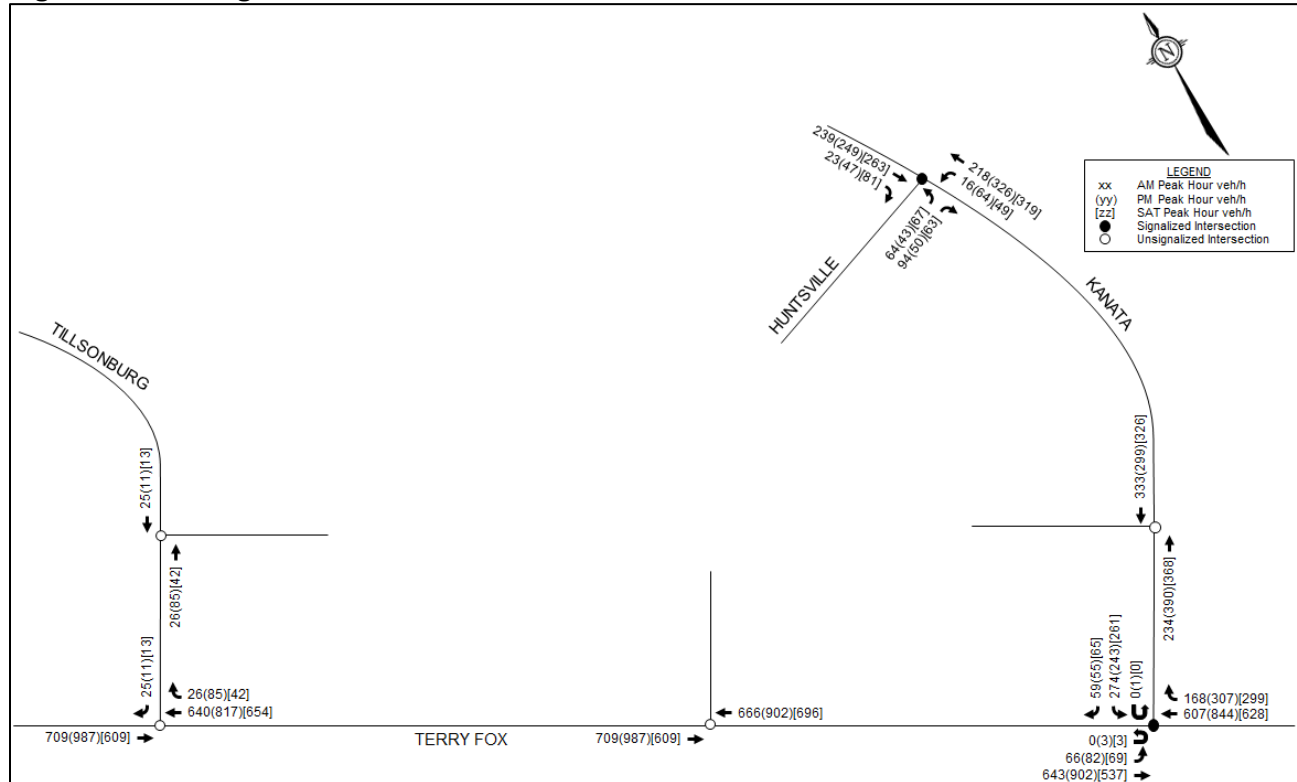
Weekday traffic counts were completed on the dates listed below by the following sources:

- | | | |
|--------------------------------------|--------------------|------------------|
| • Terry Fox Drive/Tillsonburg Street | May 27, 2015 | (City of Ottawa) |
| • Terry Fox Drive/Kanata Avenue | June 27, 2014 | (City of Ottawa) |
| • Kanata Avenue/Huntsville Drive | September 17, 2015 | (IBI Group) |

All Saturday traffic counts were coordinated by Novatech, and were completed on September 15, 2018. It is anticipated that the closure of Goulbourn Forced Road does not have as significant of an impact to the traffic operations on Kanata Avenue and Terry Fox Drive during the weekend, due to the general lack of commuter traffic. Saturday peak hour volumes for the southbound left turn and westbound right turn movements have been reduced by 50%, as they represent traffic that may use Goulbourn Forced Road upon reopening.

Based on the count data, Terry Fox Drive has an annual average daily traffic (AADT) of 18,200 vehicles/day, Tillsonburg Street has an AADT of 600 vehicles/day, Kanata Avenue has an AADT of 3,100 vehicles/day, and Huntsville Drive has an AADT of 2,040 vehicles/day.

All traffic count data previously discussed is included in **Appendix D**. Traffic volumes within the study area are shown in **Figure 4**.

Figure 4: Existing Network Traffic Volumes

4.1.8 Collision Records

Historical collision data from the last five years was obtained from the City's Public Works and Service Department for the study area intersections. Copies of the collision summary reports are included in **Appendix E**.

The collision data has been evaluated to determine if there are any identifiable collision patterns. The number of collisions at each intersection from January 1, 2013 to December 31, 2017 is summarized in **Table 1**.

Table 1: Reported Collisions

Intersection	Number of Reported Collisions
Terry Fox Drive/Tillsonburg Street	0
Terry Fox Drive/Kanata Avenue	39
Kanata Avenue/Huntsville Drive	1

Terry Fox Drive/Kanata Avenue

To remain consistent with the previous Broughton Subdivision TIS, traffic on Terry Fox Drive is considered to travel northbound and southbound, while traffic on Kanata Avenue is considered to travel westbound. The collision data provided by the City was not always consistent regarding vehicle directions at this intersection, requiring some estimations regarding the direction of vehicles involved in collisions.

A total of 39 collisions were reported at this intersection over the last five years, of which there were 11 rear-end impacts, 11 turning movement impacts, two sideswipe impacts, eight angle impacts, and seven single-vehicle/other impacts. Eleven of the collisions caused injuries, but none caused fatalities.

Of the 11 rear-end impacts, two occurred at the northbound approach (two through vehicle incidents), three occurred at the southbound approach (one left turn and two through vehicle incidents), and six at the westbound approach (three left turn and three right turn incidents). Three of the 11 impacts occurred in poor driving conditions.

All 11 turning movement impacts involved left turns at the southbound approach. Seven of the 11 impacts occurred in poor driving conditions. Left turns at this approach are permitted but not protected at any time. The posted speed limit of Terry Fox Drive is 70 km/h and traffic volumes are heavy during the peak hours, which may lead to drivers misjudging gaps in incoming traffic or taking more risks when attempting a left turn.

A process for determining whether a left-turn phase is warranted is outlined in the *Ontario Traffic Manual – Book 12*, and has been reviewed as part of the scoping section of this TIA. The process identifies multiple possible justifications for a left-turn phase, including over-capacity left-turn volumes (calculated using the Ontario Capacity Analysis Method shown in the *Ontario Traffic Manual*), and over-representation of turning movement collisions. While the left-turn volumes have not been found to be over capacity, southbound left-turning vehicles may be over-represented in the collision history at this intersection (11 out of 39 collisions, or 28% of all impacts). Therefore, consideration could be given to implementing a protected left-turn phase for this movement.

Of the eight angle impacts, seven involved a northbound vehicle and a westbound vehicle, and one involved an southbound vehicle and a westbound vehicle. Five of the eight impacts occurred in poor driving conditions. The heavy traffic volumes and posted speed limit of 70 km/h on Terry Fox Drive may result in more collisions of this type. There are no sightline obstructions or other geometric features of the intersection that appear to cause angle impacts.

Of the seven single-vehicle/other impacts, four occurred at the northbound approach and three occurred at the westbound approach (including one cyclist). Four of the seven impacts occurred in poor driving conditions.

Kanata Avenue/Huntsville Drive

One collision was reported at this intersection over the last five years, a rear-end impact in poor driving conditions. The collision did not cause any injuries.

4.2 Planned Conditions

The City's 2013 Transportation Master Plan (TMP) does not identify any roadway projects within the study area in its Affordable Road Network or its Rapid Transit and Transit Priority (RTTP) Network. The 2013 Ottawa Cycling Plan does not identify any cycling infrastructure projects within the study area.

Construction of the Richardson Ridge subdivision west of the subject site is ongoing, which consists of a mix of single-detached housing, semi-detached housing, and apartments. Transportation Impact Studies (TIS) were completed by IBI Group in September 2015 (Phases 1-3) and August 2016 (Phase 4). The assumed buildout year of Phases 1-3 is 2018, and the assumed buildout year of

Phase 4 is 2021. Traffic generated by the residences built since 2015 have been added to the existing weekday traffic conditions, as the available traffic counts would not have accounted for these trips.

Construction of Phase 3B of the Broughton subdivision north of the subject site is ongoing, which consists of four condominium buildings. The most recent revisions to the TIS for this subdivision was completed by Novatech in July 2017, and anticipates full buildout of the subdivision by 2019.

Applications in support of phases 1 and 2 of the Kanata Highlands subdivision are currently in the approval process, and will consist of a mix of single-detached housing, semi-detached housing, and condominiums. A TIS for Phase 1 and a TIA Strategy Report for Phase 2 were completed by Parsons in January 2017 and June 2018, respectively. The studies project Phase 1 to be built out in 2021, however Phase 2 is anticipated to be constructed beyond the 2024 horizon year.

Further discussion of the above subdivisions is included in the forecasting section of this TIA.

4.3 Study Area and Time Periods

The study area for this report includes Terry Fox Drive, Kanata Avenue, Tillsonburg Street, and Huntsville Drive. The study area includes the signalized intersections at Terry Fox Drive/Kanata Avenue and Kanata Avenue/Huntsville Drive, as well as the unsignalized intersection at Terry Fox Drive/Tillsonburg Street.

The selected time periods for the analysis are the weekday AM and PM peak hours and the Saturday peak hour, as they represent the 'worst case' combination of site generated traffic and adjacent street traffic. The proposed development is expected to be completed in one phase, with full occupancy by the year 2019. Therefore, the analysis considers the buildout year 2019 and the horizon year 2024.

4.4 Exemptions Review

This module reviews possible exemptions from the final Transportation Impact Assessment, as outlined in the TIA guidelines. The applicable exemptions for this site are shown in **Table 2**.

Table 2: TIA Exemptions

Module	Element	Exemption Criteria	Exemption Status
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	• Only required for site plans	Not Exempt
	4.1.3 New Street Networks	• Only required for plans of subdivision	Exempt
4.2 Parking	4.2.1 Parking Supply	• Only required for site plans	Not Exempt
	4.2.2 Spillover Parking	• Only required for site plans where parking supply is 15% below unconstrained demand	Exempt
Network Impact Component			
4.5 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	Exempt
4.6 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	Exempt
4.8 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	Exempt

Based on the foregoing, the following modules will be included in the TIA report:

- Module 4.1: Development Design
- Module 4.2: Parking
- Module 4.3: Boundary Streets
- Module 4.4: Access Design
- Module 4.7: Transit
- Module 4.9: Intersection Design

5.0 FORECASTING

5.1 Development-Generated Travel Demand

5.1.1 Trip Generation

The proposed development will include two retail buildings with a total of 22,437 ft² of leasable retail space, and a 3,315 ft² gas station with eight fuel pumps, a convenience store, and a car wash. Trips generated by the proposed land uses have been estimated using the *ITE Trip Generation Manual, 10th Edition*. Retail trips have been estimated based on the Shopping Centre data (land use 820) and gas station trips have been estimated based on the Gasoline/Service Station data (land use 944). Land use code 945 (Gasoline/Service Station with Convenience Market) was not used, as it applies only to stations with ten or more vehicle fueling positions.

The *ITE Trip Generation Handbook* outlines a recommended procedure for selecting between the average rate and the regression equation for the Shopping Centre land use. Based on the recommended procedure, there is a sufficient number of data points that the regression equations should be used. However, the average rates outlined in the *ITE Trip Generation Manual* have been used for the Shopping Centre land use rather than the regression equations, as the data for developments around 25,000 ft² is closer to the average rates. The regression equations are more suitable for larger shopping centre developments, such as malls.

The estimated number of trips generated by the proposed development is shown in **Table 3**.

Table 3: Person Trip Generation

Land Use	ITE Code	GLA/Fuel Pumps	AM Peak (PPH) ⁽¹⁾			PM Peak (PPH)			SAT Peak (PPH)		
			IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
Shopping Centre	820	22,437 ft ²	17	11	28	56	60	116	71	66	137
Gasoline/Service Station	944	8 pumps	52	52	104	72	72	144	65	65	130
Total			70	62	132	128	132	260	136	131	267

1. PPH: Persons Per Hour – Calculated using an ITE Trip to Person Trip Factor of 1.28, consistent with the 2018 TIA Guidelines

From the previous table, the proposed development is projected to generate 132 person trips during the AM peak hour, 260 person trips during the PM peak hour, and 267 person trips during the Saturday peak hour.

The modal shares for the proposed development are anticipated to be consistent with the modal shares outlined in the *2011 TRANS O-D Survey Report*, specific to the Kanata/Stittsville region. The modal share values applied to the retail trips are based on all observed trips within the Kanata/Stittsville district. The modal share assigned to transit has been added to the auto driver share on Saturdays, as there is no transit service within the study area on weekends. Due to the nature of gas stations, a higher auto driver share, lower transit share, and lower non-auto share have been assumed for all trips generated by the proposed gas station.

A full breakdown of the projected site-generated person trips by modal share is shown in **Table 4**.

Table 4: Person Trips by Modal Share

Travel Mode	Modal Share		AM Peak			PM Peak			SAT Peak		
	A/P	SAT	IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
Retail Person Trips			17	11	28	56	60	116	71	66	137
Auto Driver	70%	75%	12	7	19	39	42	81	53	49	102
Auto Passenger	15%	15%	3	2	5	8	9	17	11	10	21
Transit	5%	0%	1	1	2	3	3	6	0	0	0
Non-Auto	10%	10%	1	1	2	6	6	11	7	7	14
Gas Station Person Trips			52	52	104	72	72	144	65	65	130
Auto Driver	80%		42	42	84	58	58	116	52	52	104
Auto Passenger	15%		8	8	16	11	11	22	10	10	20
Transit	0%		0	0	0	0	0	0	0	0	0
Non-Auto	5%		2	2	4	3	3	6	3	3	6
Auto Driver (Total)			54	49	103	97	100	197	105	101	206
Auto Passenger (Total)			11	10	21	19	20	39	21	20	41
Transit (Total)			1	1	2	3	3	6	0	0	0
Non-Auto (Total)			3	3	6	9	9	18	10	10	20

From the previous table, the proposed development is projected to generate 103 vehicle trips during the AM peak hour, 197 vehicle trips during the PM peak hour, and 206 vehicle trips during the Saturday peak hour.

Some trips are anticipated to be internally captured within the subject site (for example, drivers who enter the gas station for fuel may then go to the retail section of the site for food or other purchases). The *ITE Trip Generation Handbook* does not identify internal capture rates specific to gas stations. Therefore, internal capture rates between two retail land uses has been assumed. The methodology used to determine the amount of internally captured trips follows the methodology outlined in Chapter 7 of the *ITE Trip Generation Handbook*. Internal capture worksheets are included in **Appendix F**.

The number of internally captured trips generated by the proposed development is presented in **Table 5**.

Table 5: Internally Captured Trips

Trip Type	AM Peak			PM Peak			SAT Peak		
	IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
<i>Retail Trips</i>	12	7	19	39	42	81	53	49	102
Internal	2	1	3	8	8	16	10	10	20
External	10	6	16	31	34	65	43	39	82
<i>Gas Station Trips</i>	42	42	84	58	58	116	52	52	104
Internal	1	2	3	8	8	16	10	10	20
External	41	40	81	50	50	100	42	42	84

The proposed land uses are also expected to generate two types of external peak hour trips: primary and pass-by trips. Primary trips are made for the specific purpose of visiting the site, while pass-by trips are made as intermediate stops on the way to another destination.

For the proposed land uses, peak hour pass-by trips have been estimated based on the average rates identified in the *ITE Trip Generation Handbook* for the Shopping Centre land use (34% during the PM peak hour and 26% during the Saturday peak hour), and the Gasoline/Service Station land use (58% during the AM peak hour and 42% during the PM peak hour). It has been assumed that there are no pass-by retail trips during the AM peak hour, and pass-by gas station trips during the Saturday peak hour follow the PM peak hour rate of 42%.

The primary and pass-by trip generation for the proposed development is presented in **Table 6**.

Table 6: Primary and Pass-by Trips

Trip Type	AM Peak			PM Peak			SAT Peak		
	IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
<i>External Retail Trips</i>	10	6	16	31	34	65	43	39	82
Pass-by	0	0	0	11	11	22	11	11	22
Primary	10	6	16	20	23	43	32	28	60
<i>External Gas Station Trips</i>	41	40	81	50	50	100	42	42	84
Pass-by	23	23	46	21	21	42	18	18	36
Primary	18	17	35	29	29	58	24	24	48
Primary Total	28	23	51	49	52	101	56	52	108

From the previous tables, the proposed development is projected to generate 51 primary vehicle trips during the AM peak hour, 101 primary vehicle trips during the PM peak hour, and 108 primary vehicle trips during the Saturday peak hour.

5.1.2 Trip Distribution

The assumed distribution of trips generated by the subject site has been derived from existing traffic patterns within the study area. Primary trips generated by the retail and gas station land uses are not anticipated to follow the traffic patterns associated with the typical commute. To best approximate this, the distribution of site-generated primary trips is based on the Saturday peak hour traffic counts within the study area, and can be described as follows:

- 30% to/from the north via Terry Fox Drive
- 30% to/from the south via Terry Fox Drive
- 30% to/from the east via Kanata Avenue and Tillsonburg Street
- 10% to/from the east via Tillsonburg Street (within the Broughton Subdivision)

All trips destined to the east via Kanata Avenue are assumed to depart the study area by heading east on Tillsonburg Street, north on Wallaceburg Court and Huntsville Drive, and east on Kanata Avenue.

The distribution of pass-by trips is assumed to follow the existing commuter traffic pattern. Further discussion is included in the following section.

5.1.3 Trip Assignment

The proposed accesses on Terry Fox Drive and Kanata Avenue are RIRO accesses only. While the access on Tillsonburg Street allows for full movement, access to Tillsonburg Street from Terry Fox Drive is RIRO only. Due to these turning restrictions, the trip assignment does not assume that all

trips will enter and exit the site using the same access. All trips arriving from the north via Terry Fox Drive requires a southbound U-turn at Terry Fox Drive/Kanata Avenue. Trips generated by the proposed development are assigned to the accesses as follows.

Full-Movement Access – Tillsonburg Street

- 20% of retail trips arriving from the north and south via Terry Fox Drive, and east via Kanata Avenue;
- 50% of retail trips departing to the north via Terry Fox Drive;
- 100% of retail trips arriving and departing to the east via Tillsonburg Street;
- 100% of gas station trips arriving and departing to the east via Tillsonburg Street.

RIRO Access – Terry Fox Drive

- 80% of retail trips arriving from the north and south via Terry Fox Drive, and east via Kanata Avenue;
- 50% of retail trips departing to the north via Terry Fox Drive;
- 100% of gas station trips arriving from the north and south via Terry Fox Drive;
- 100% of gas station trips departing to the north via Terry Fox Drive.

RIRO Access – Kanata Avenue

- 100% of retail trips departing to the south via Terry Fox Drive;
- 100% of gas station trips arriving from the east via Kanata Avenue;
- 100% of gas station trips departing to the south via Terry Fox Drive.

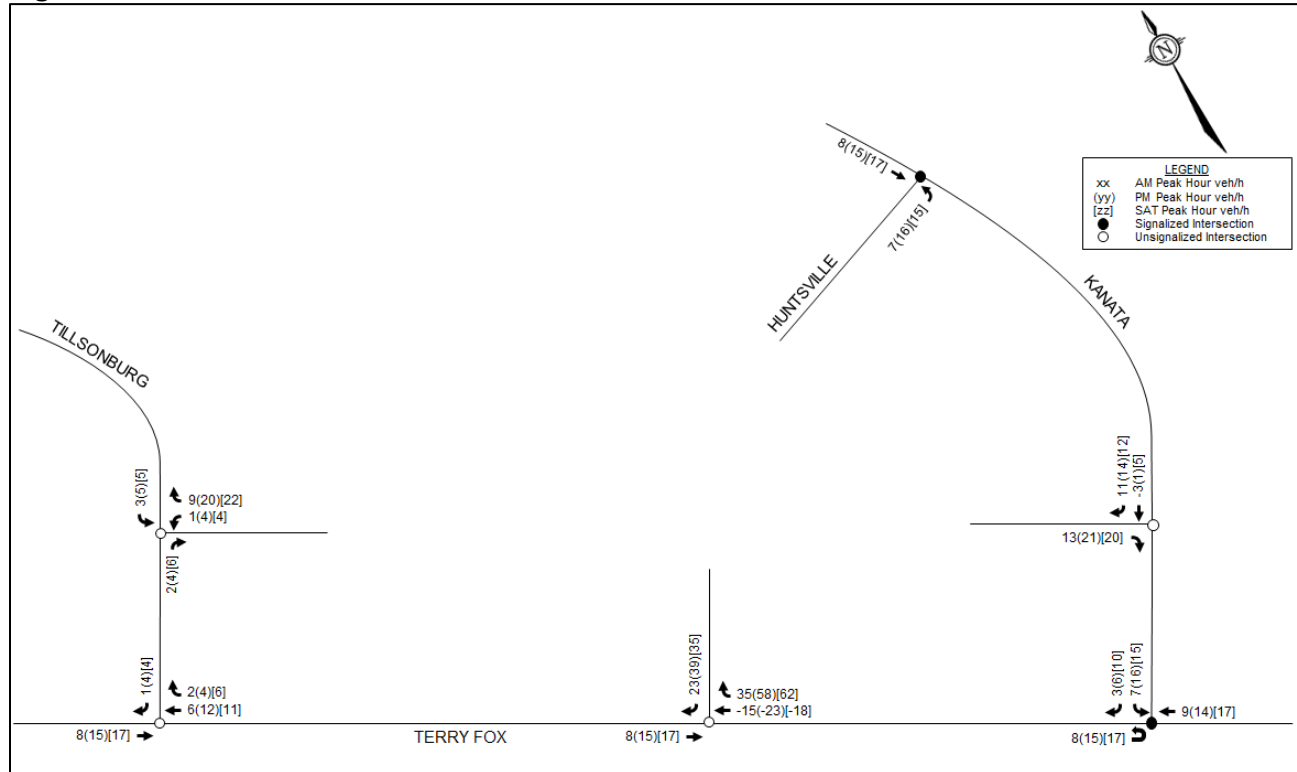
Pass-by trips generated by the proposed retail development have been distributed to the access on Terry Fox Drive. Pass-by trips generated by the proposed gas station have been distributed proportionately, with 75% assigned to the access on Terry Fox Drive and 25% assigned to the access on Kanata Avenue. No retail or gas station pass-by trips have been assigned to traffic entering the study area from the north, as the Kanata Centrum and multiple gas stations are approximately two kilometres downstream and can be accessed more easily than the subject site.

Trips generated by the proposed development are shown in **Figure 5**.

5.2 Background Traffic

5.2.1 General Background Growth Rate

A rate of background growth has been established through a review of the City of Ottawa's Strategic Long Range Model and transportation impact studies in support of other proposed developments within the vicinity of the subject site. As development within the area continues, traffic volumes on Terry Fox Drive will continue to increase. Consistent with the transportation studies discussed in the following section, a 2% annual background growth rate has been assumed for Terry Fox Drive and a 1% annual growth rate has been assumed for Kanata Avenue. Growth on Tillsonburg Street and Huntsville Drive is assumed to be fully accounted for by considering the other proposed developments discussed below, and therefore no growth rate has been applied.

Figure 5: Site-Generated Traffic

5.2.2 Other Area Developments

Multiple residential developments are either being constructed or are in the approval process. The following developments will be added to the background traffic to maintain a conservative analysis.

Richardson Ridge Subdivision, Phases 1-4

Two Transportation Impact Studies were prepared by IBI Group in support of the Richardson Ridge subdivision in September 2015 (Phases 1-3) and August 2016 (Phase 4). Phases 1-3 consist of 434 single-detached homes, 131 semi-detached/townhomes, and 112 apartments, with 174 single-detached homes being occupied at the time of the September 2015 report. For simplicity, 50% of the projected traffic generated by these phases is assumed to be accounted for in the 2014 weekday counts, while the 2018 Saturday counts represent full buildout.

Phase 4 consists of 41 single-detached homes and 156 semi-detached/townhomes. It is estimated that buildout of Phase 4 will occur in 2021. Therefore, all projected traffic generated by this phase has been added to the 2024 background conditions.

Broughton Subdivision, Phase 3B

A TIS was prepared by Novatech in support of Phase 3B of the Broughton Subdivision, with the latest revisions being submitted in July 2017. Phase 3B consists of 186 condominiums, and it is assumed that 107 of these units are accounted for in the 2018 Saturday counts. The revised addendum submitted in July 2017 estimated that buildout of Phase 3B will occur in 2019. Therefore, traffic generated by this phase has been added to both the 2019 and 2024 background conditions.

Kanata Highlands, Phases 1 and 2

A TIS for Phase 1 and a TIA for Phase 2 were prepared by Parsons in support of the Kanata Highlands subdivision in January 2017 and June 2018, respectively. Phase 1 consists of 159 single-detached homes and 276 semi-detached/townhomes. The TIS prepared in January 2017 estimated that buildout of Phase 1 will occur in 2021. Therefore, traffic generated by this phase has been added to the 2024 background conditions.

Phase 2 consists of 370 single-detached homes, 190 semi-detached/townhomes, and 120 condominiums. The TIA Strategy Report was prepared in June 2018. For the purposes of this study, it is assumed that the timing of this development is beyond the 2024 horizon year. Therefore, traffic generated by this phase has not been included in the 2024 background conditions.

The weekday AM and PM peak hour trips generated by the subdivisions outlined above are taken directly from the corresponding transportation study, and applied to the existing and background traffic conditions as appropriate. These traffic studies did not consider the Saturday peak hour in the analysis. Trips generated on Saturdays by these developments have been estimated using the *ITE Trip Generation Manual, 10th Edition*.

The land use codes used are Single-Family Detached Housing (land use 210), Multifamily Housing Low-Rise (land use 220), and Multifamily Housing Mid-Rise (land use 221). As with the trip generation projections presented in Section 5.1.1, all ITE trips have been converted to person trips using a factor of 1.28, consistent with the 2017 TIA Guidelines. Person trips generated by the developments outlined above during the Saturday peak hour are shown in **Table 7**.

Relevant excerpts from the studies described above are included in **Appendix G**.

Table 7: Saturday Trip Generation - Other Area Developments

Land Use	ITE Code	Units	SAT Peak (PPH)		
			IN	OUT	TOT
Richardson Ridge Subdivision, Phase 4 (197 units in total)					
Single-Family Detached Housing	210	41	26	23	49
Multifamily Housing (Low-Rise)	220	156	75	64	139
Total			101	87	188
Broughton Subdivision, Phase 3B (186 units in total, 79 units to be constructed)					
Multifamily Housing (Mid-Rise)	221	79	22	23	45
Total			22	23	45
Kanata Highlands Subdivision, Phase 1 (435 units in total)					
Single-Family Detached Housing	210	159	105	90	195
Multifamily Housing (Low-Rise)	220	276	133	114	247
Total			238	204	442

The number of vehicle trips that the developments will generate during the Saturday peak hour has been estimated by categorizing the person trips by modal share. The modal shares are anticipated to be consistent with the modal shares outlined in the *2011 TRANS O-D Survey Report*, specific to the Kanata/Stittsville region. The modal share values applied are based on all observed trips within the Kanata/Stittsville district. As there is no transit service in the area on weekends, a transit share of 0% has been applied to all developments. A full breakdown of the projected Saturday peak person trips is shown in **Table 8**.

Table 8: Saturday Trips by Modal Share - Other Area Developments

Travel Mode	Modal Share	SAT Peak		
		IN	OUT	TOT
<i>Richardson Ridge Subdivision, Phase 4</i>		101	87	188
Auto Driver	75%	76	65	141
Auto Passenger	15%	15	13	28
Transit	0%	0	0	0
Non-Auto	10%	10	9	19
<i>Broughton Subdivision, Phase 3B</i>		22	23	45
Auto Driver	75%	17	17	34
Auto Passenger	15%	3	4	7
Transit	0%	0	0	0
Non-Auto	10%	2	2	4
<i>Kanata Highlands Subdivision, Phase 1</i>		238	204	442
Auto Driver	75%	179	153	332
Auto Passenger	15%	35	31	66
Transit	0%	0	0	0
Non-Auto	10%	24	20	44

Considering the weekday AM peak and PM peak trip generation projections of the previous transportation studies and the foregoing table for Saturday peak trips, a full breakdown of the vehicle trips projected for each development is shown in **Table 9**.

Table 9: Vehicle Trips Generated by Other Area Developments

Development	AM Peak (VPH)			PM Peak (VPH)			SAT Peak (VPH)		
	IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
Richardson Ridge (Phases 1-3)	43	154	197	158	89	247	-	-	-
Richardson Ridge (Phase 4)	18	75	93	70	37	107	76	65	141
Broughton Subdivision (Phase 3B)	15	75	90	70	35	105	17	17	34
Kanata Highlands (Phase 1)	39	146	185	150	82	232	179	153	332

Trips were distributed in a manner consistent with the assumptions outlined in each transportation study. Trips generated by other area developments for the 2019 buildout year and 2024 horizon year are shown in **Figure 6** and **Figure 7**, respectively. Background traffic volumes for 2019 and 2024 are shown in **Figure 8** and **Figure 9**, respectively. Total traffic volumes for 2019 and 2024 are shown in **Figure 10** and **Figure 11**, respectively.

Figure 6: Other Area Developments - 2019 Traffic

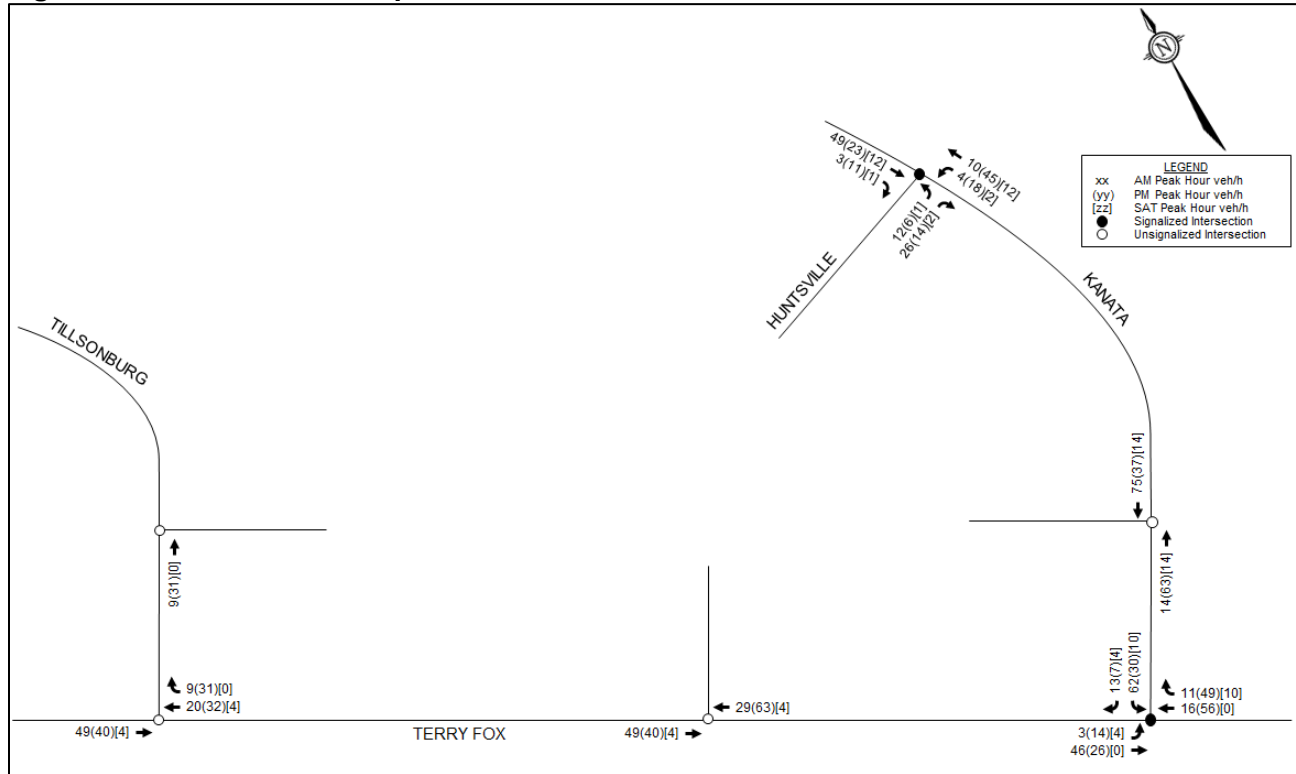


Figure 7: Other Area Developments - 2024 Traffic

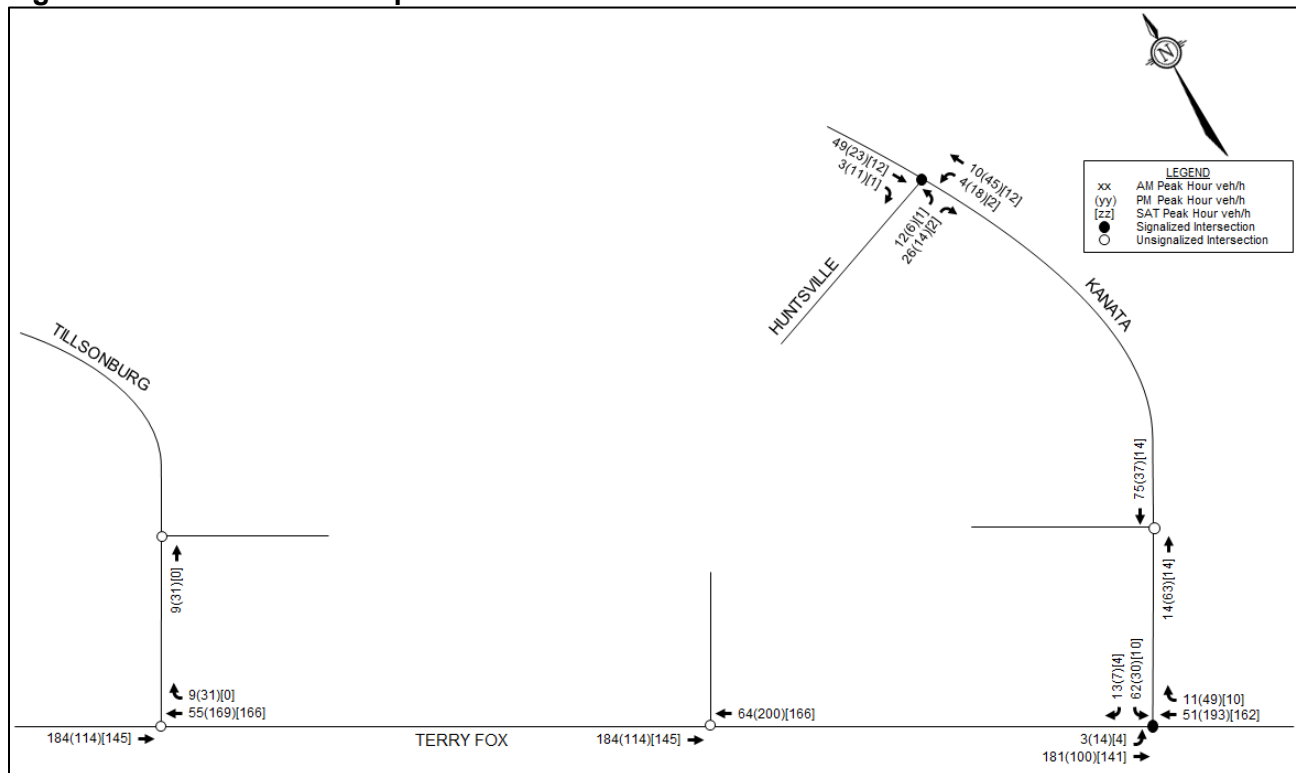


Figure 8: 2019 Background Traffic

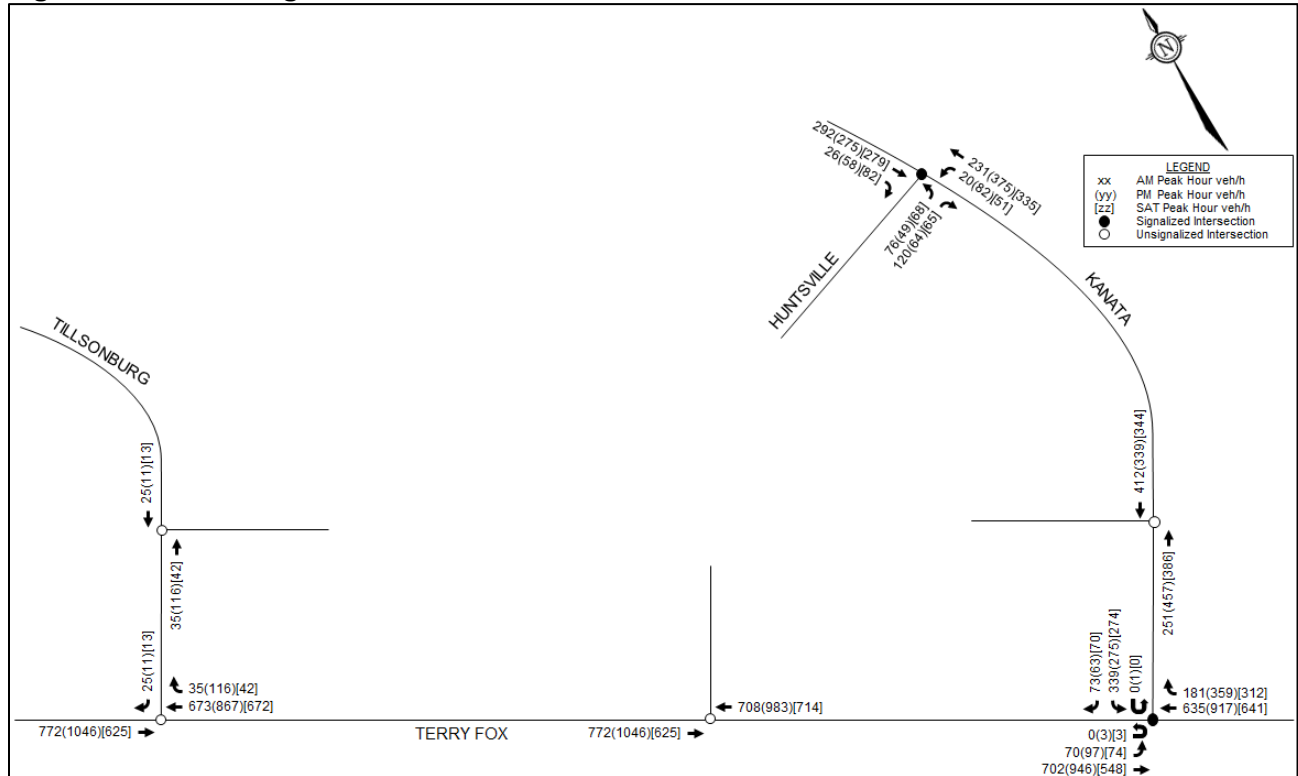


Figure 9: 2024 Background Traffic

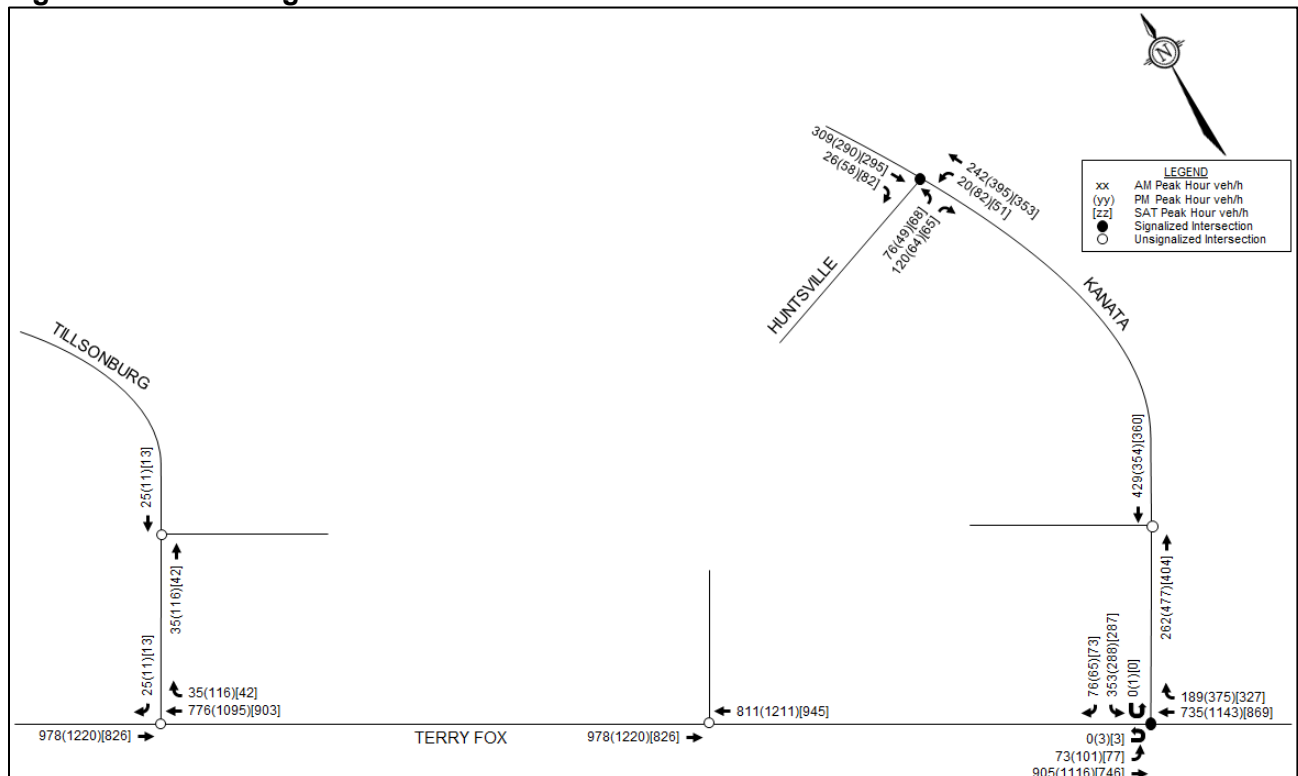


Figure 10: 2019 Total Traffic

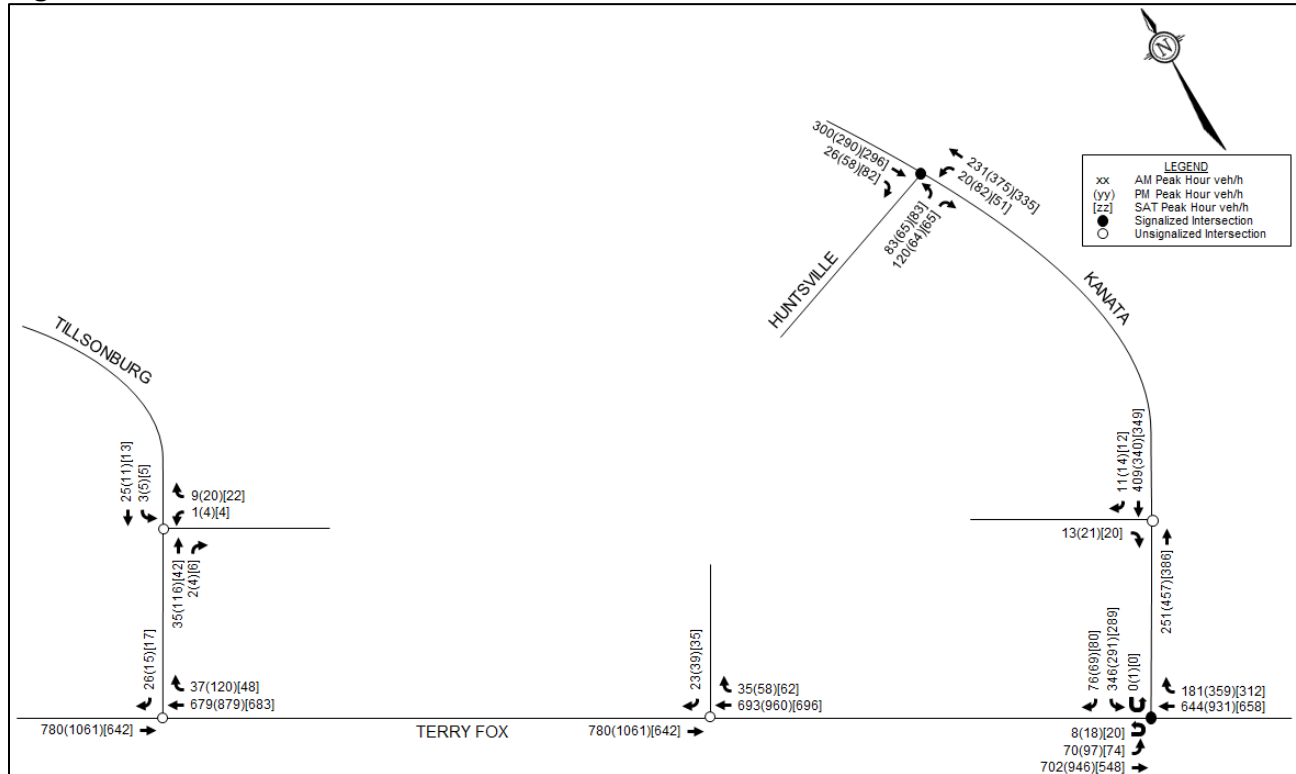
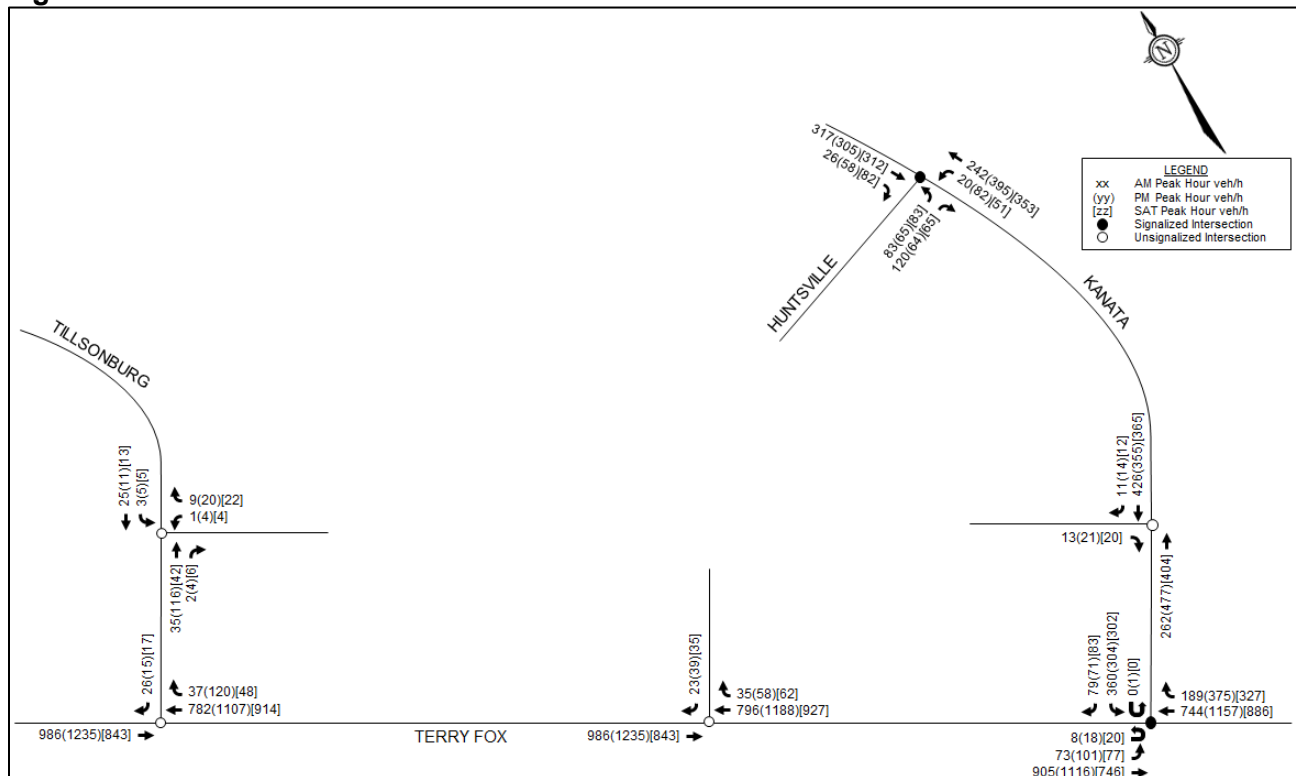


Figure 11: 2024 Total Traffic



6.0 ANALYSIS

6.1 Development Design

6.1.1 Design for Sustainable Modes

Pedestrian facilities will be provided between the building entrances and the parking areas. Additionally, pedestrian facilities will connect the retail buildings to the existing sidewalks along Terry Fox Drive and Tillsonburg Street. Sidewalks will be depressed and continuous across the accesses, in accordance with City standards. A barrier-free pedestrian pathway is proposed on-site between the retail building and gas station, to provide pedestrian connectivity throughout the site. Due to the grading of the subject site, this area was chosen as the most appropriate.

The nearest bus stops to the subject site are reviewed in Section 4.1.6 and shown in **Figure 3**. All entrances are within 400m walking distance of stops for both OC Transpo routes 165 and 264. Entrances to both proposed retail buildings are approximately within 200m of stop #7573 at Terry Fox Drive/Tillsonburg Street, and 350m of stops #1554 and #1557 at Huntsville Drive/Ingersoll Crescent. The entrance to the proposed gas station is approximately within 400m of stops #6050, #6051, and #7572 at Kanata Avenue/Huntsville Drive.

A total of ten bicycle parking spaces will be provided for the retail building, and a total of six bicycle parking spaces will be provided for the gas station and convenience store. Further review of the minimum bicycle parking requirements is included in Section 6.2.

A review of the Transportation Demand Management (TDM) – *Supportive Development Design and Infrastructure Checklist* has been conducted. A copy of the TDM checklist is included in **Appendix H**. All required TDM-supportive design and infrastructure measures in the TDM checklist are met.

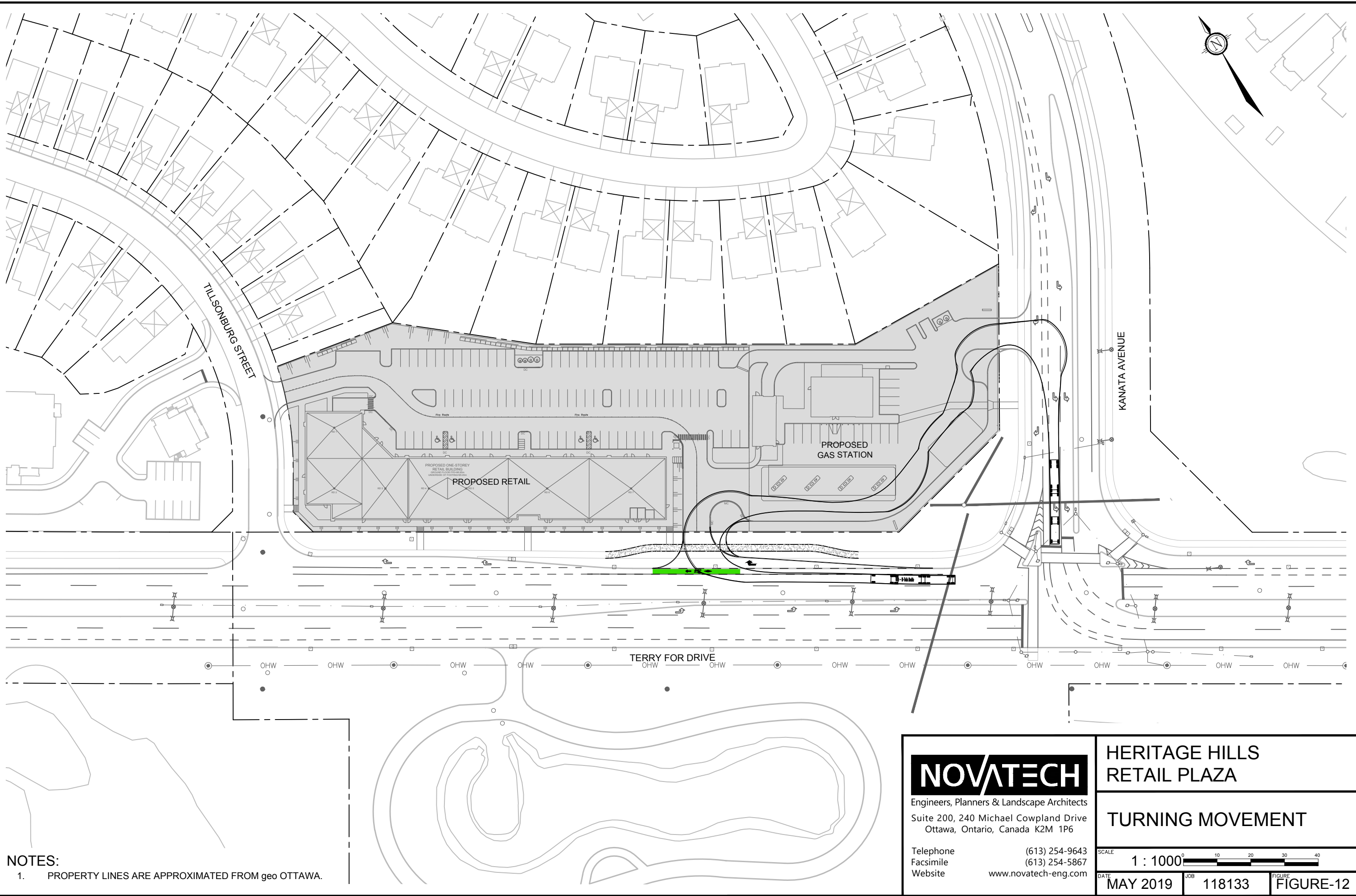
6.1.2 Circulation and Access

Retail garbage collection will take place approximately 80m south of the full-movement access on Tillsonburg Street. Gas station garbage collection will take place south of the car wash area, approximately 15m north of the access on Kanata Avenue. Loading and delivery spaces for the retail uses are provided to the east and west of the full-movement access on Tillsonburg Street.

The accesses to the gas station are sufficient to accommodate a fuel tanker, the largest vehicle to enter and exit the site. Mountable curb is required at the access on Terry Fox Drive and the access on Kanata Avenue, for fuel tankers to negotiate turning into/out of the accesses. A turning template for a fuel delivery truck, represented by a B-Train Double Trailer design vehicle entering the site via the Terry Fox Drive access and exiting via the Kanata Avenue access, is included in **Figure 12**.

The fire route for the proposed development accesses the site from the full-movement access on Tillsonburg Street and the RIRO access on Terry Fox Drive, as shown on the site plan.

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- NOTES:
1. PROPERTY LINES ARE APPROXIMATED FROM geo OTTAWA.

NOVATECH

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HERITAGE HILLS RETAIL PLAZA

TURNING MOVEMENT

SCALE 1 : 1000

DATE MAY 2019 JOB 118133 FIGURE-12

CUT11V17 DWG 270mm X 122mm

6.2 Parking

The subject site is located in Area C of Schedules 1 and 1A of the City of Ottawa's ZBL. Minimum vehicular and bicycle parking rates for the proposed development are identified in the ZBL, and summarized in **Table 10**.

Table 10: Parking Requirements Per Zoning By-Law

Land Use	Rate	GFA	Required	Provided
<i>Vehicle Parking</i>				
Retail Store	3.4 spaces per 100 m ² GFA	2,137 m ²	73	96
Convenience Store ⁽¹⁾	3.4 spaces per 100 m ² GFA	211 m ²	7	16
Total			80	112
<i>Bicycle Parking</i>				
Retail Store	1 space per 250 m ² GFA	2,137 m ²	9	10
Convenience Store	1 space per 250 m ² GFA	211 m ²	1	6
Total			10	16

1. Parking rates for the gas station apply only to the convenience store, as standalone gas bars have no parking requirement

Based on the foregoing table, both the vehicular and bicycle parking provided for the proposed development will meet the minimum requirements of the ZBL.

The City of Ottawa's *Accessibility Design Standards* outline minimum requirements for the number of accessible parking spaces that must be provided, based on the total number of parking spaces. For a total number of parking spaces between 76 and 100, four accessible spaces are required. For a total number of parking spaces between 13 and 25, one accessible space is required. Four of the 96 retail parking spaces and one of the 16 gas station parking spaces are accessible spaces, thereby meeting the minimum requirements.

Table 112 of the ZBL identifies the minimum off-street motor vehicle queueing space required for automatic car washes to be ten vehicles before/in each wash bay and one vehicle after each wash bay. These minimum requirements are provided for the on-site car wash bay.

The minimum number of loading spaces for the proposed development are identified in the ZBL, based on the land use and gross floor area. The gross floor area of the proposed retail buildings and gas station is approximately 2,137 m² and 211 m², respectively.

Table 113A of the ZBL identifies a minimum of one loading space for 'retail stores' or 'shopping centres' between 2,000 and 4,999 m² GFA, and identifies no requirement for any land uses with less than 1,000 m² GFA (gas stations). As the proposed development provides two loading spaces for retail, the minimum requirements are met.

6.3 Boundary Streets

This section provides a review of the boundary streets using complete streets principles. The *Multi-Modal Levels of Service* (MMLOS) Guidelines produced by IBI Group in October 2015 were used to evaluate the levels of service of Terry Fox Drive, Tillsonburg Street, and Kanata Avenue, for each mode of transportation. Schedule B of the City of Ottawa's Official Plan identifies all boundary streets as being within the General Urban Area. The boundary between the General Urban and General Rural Areas follows Terry Fox Drive within the study area. The boundary streets review evaluates Terry Fox Drive, Tillsonburg Street, and Kanata Avenue based on existing conditions.

6.3.1 Pedestrian Level of Service (PLOS)

Exhibit 4 of the MMLOS guidelines has been used to evaluate the segment PLOS of the boundary streets. Exhibit 22 of the MMLOS guidelines suggest a target PLOS C for all roadways within the General Urban Area (Tillsonburg Street, Kanata Avenue, and the east side of Terry Fox Drive), and no target for roadways within the General Rural Area (west side of Terry Fox Drive). As such, the west side of Terry Fox Drive has not been evaluated for PLOS.

The results of the segment PLOS analysis are summarized in **Table 11**.

Table 11: PLOS Segment Analysis

Sidewalk Width	Boulevard Width	Avg. Daily Curb Lane Traffic Volume	Presence of On-Street Parking	Operating Speed ⁽¹⁾	Segment PLOS
Terry Fox Drive (east side)					
2.0m	> 2.0m	> 3000 vpd	No	80 km/h	D
Tillsonburg Street (north side)					
No sidewalk		N/A	N/A	60 km/h	F
Tillsonburg Street (south side)					
2.0m	0m	≤ 3000 vpd	N/A	60 km/h	C
Kanata Avenue (north side)					
2.0m	0.5 to 2.0m	≤ 3000 vpd	N/A	70 km/h	B
Kanata Avenue (south side)					
2.0m	0.5 to 2.0m	≤ 3000 vpd	N/A	70 km/h	B

1. Operating speed on Terry Fox Drive, Tillsonburg Street, and Kanata Avenue taken as the posted speed limit plus 10 km/h.

6.3.2 Bicycle Level of Service (BLOS)

Exhibit 11 of the MMLOS guidelines has been used to evaluate the segment BLOS of the boundary streets. For the General Urban Area, Exhibit 22 of the MMLOS guidelines suggest a target BLOS B for Local Routes (Kanata Avenue), a target BLOS C for Spine Routes (Terry Fox Drive), and a target BLOS D for roadways with no bike classification (Tillsonburg Street).

The results of the segment BLOS analysis are summarized in **Table 12**.

Table 12: BLOS Segment Analysis

Road Class	Bike Route	Type of Bikeway	Bike Lane Width	Bike Lane Blockage	Travel Lanes	Center-line Type	Operating Speed	Segment BLOS
Terry Fox Drive (Tillsonburg Street to Kanata Avenue)								
Arterial	Spine Route	Bike Lane	2.0m	Rare	4	Raised Median	80 km/h	E
Tillsonburg Street (Terry Fox Drive to Wallaceburg Court)								
Local	No Class	Mixed Traffic	-	-	2	None (Residential)	60 km/h	F
Kanata Avenue (Terry Fox Drive to Huntsville Drive)								
Major Collector	Local Route	Bike Lane	2.0m	Rare	2	Line Markings	70 km/h	E

6.3.3 Transit Level of Service (TLOS)

Exhibit 15 of the MMLOS guidelines has been used to evaluate the segment TLOS of the boundary streets. Exhibit 22 of the MMLOS guidelines does not identify any targets for roadways without a Rapid Transit or Transit Priority designation. As transit operates on Terry Fox Drive and Kanata Avenue, these roadways have been evaluated regardless. Tillsonburg Street has not been evaluated for TLOS.

The results of the segment MMLOS analysis are summarized in **Table 13**.

Table 13: TLOS Segment Analysis

Facility Type	Level/Exposure to Congestion Delay, Friction and Incidents			Segment TLOS
	Congestion	Friction	Incident Potential	
Terry Fox Drive (Tillsonburg Street to Kanata Avenue)				
Mixed Traffic – Limited Parking/Driveway Friction	Yes	Low	Medium	D
Kanata Avenue (Terry Fox Drive to Huntsville Drive)				
Mixed Traffic – Limited Parking/Driveway Friction	Yes	Low	Medium	D

6.3.4 Truck Level of Service (TkLOS)

Exhibit 20 of the MMLOS guidelines has been used to evaluate the segment TkLOS of the boundary streets. For the General Urban Area, Exhibit 22 of the MMLOS guidelines suggests a target TkLOS D for arterial truck routes (Terry Fox Drive), and no target for collector and local roadways that are not designated as truck routes (Kanata Avenue and Tillsonburg Street). Kanata Avenue has been evaluated for TkLOS despite having no target, as transit operates on this roadway. Tillsonburg Street has not been evaluated for TkLOS.

The results of the segment TkLOS analysis are summarized in **Table 14**.

Table 14: TkLOS Segment Analysis

Curb Lane Width	Number of Travel Lanes Per Direction	Segment TkLOS
Terry Fox Drive (Tillsonburg Street to Kanata Avenue)		
≤ 3.5m	2	A
Kanata Avenue (Terry Fox Drive to Huntsville Drive)		
≤ 3.5m	1	C

6.3.5 Vehicular Level of Service (Auto LOS)

Exhibit 22 of the MMLOS guidelines suggests a target Auto LOS D for all roadways within the General Urban Area. The typical lane capacity along the study area roadways are based on the City's guidelines for the TRANS Long-Range Transportation Model. The lane capacity along the boundary streets have been estimated based on road classification and general characteristics (i.e. suburban with limited access, urban with on-street parking, etc.).

The results of the Auto LOS analysis are summarized in **Table 15**.

Table 15: Auto LOS Segment Analysis

Direction	Directional Capacity	Traffic Volumes			v/c Ratio and LOS					
		AM Peak	PM Peak	SAT Peak	AM Peak		PM Peak		SAT Peak	
					v/c	LOS	v/c	LOS	v/c	LOS
Terry Fox Drive (Tillsonburg Street to Kanata Avenue)										
Northbound	2,000 vph	666	902	696	0.33	A	0.45	A	0.35	A
Southbound	2,000 vph	709	984	609	0.35	A	0.49	A	0.30	A
Tillsonburg Street (Terry Fox Drive to Wallaceburg Court)										
Eastbound	400 vph	26	85	42	0.07	A	0.21	A	0.11	A
Westbound	400 vph	25	11	13	0.06	A	0.03	A	0.03	A
Kanata Avenue (Terry Fox Drive to Huntsville Drive)										
Eastbound	600 vph	234	389	368	0.39	A	0.65	B	0.61	B
Westbound	600 vph	333	298	326	0.56	A	0.50	A	0.54	A

6.3.6 Segment MMLOS Summary

Results of the segment multi-modal level of service (MMLOS) analysis can be summarized as follows:

- Kanata Avenue meets the target pedestrian level of service (PLOS), while Terry Fox Drive and Tillsonburg Street do not;
- No boundary streets meet the target bicycle level of service (BLOS);
- No boundary streets have targets for transit level of service (TLOS), however Terry Fox Drive and Kanata Avenue both currently meet the target for Transit Priority Corridors with Isolated Measures;
- Terry Fox Drive meets the target truck level of service (TkLOS);
- All boundary streets meet the target vehicular level of service (Auto LOS).

A summary of the segment MMLOS analysis for the boundary streets is also provided in **Table 16**.

Table 16: Segment MMLOS Summary

Segment		Terry Fox Drive	Tillsonburg Street	Kanata Avenue
Pedestrian	Sidewalk Width	2.0m	0m	2.0m
	Boulevard Width	> 2.0m	0m	0.5m to 2.0m
	Average Daily Curb Lane Traffic Volume	> 3000 vpd	≤ 3000 vpd	≤ 3000 vpd
	On-Street Parking	No	-	-
	Operating Speed	80 km/h	60 km/h	70 km/h
	Level of Service	D	F	B
	Target	C	C	C
Cyclist	Road Classification	Arterial	Local	Major Collector
	Bike Route Classification	Spine Route	No Classification	Local Route
	Type of Bikeway	Bike Lane	Mixed Traffic	Bike Lane
	Bike Lane Width	2.0m	-	2.0m
	Bike Lane Blocking	Rare	-	Rare
	Travel Lanes	4	2	2
	Centerline Type	Raised Median	No Markings	Centerline Markings
	Operating Speed	80 km/h	60 km/h	70 km/h
	Level of Service	E	F	E
	Target	C	D	B
Transit	Facility Type	Mixed Traffic	-	Mixed Traffic
	Friction/Congestion/Incident Potential	Limited	-	Limited
	Level of Service	D	-	D
	Target	-	-	-
Truck	Lane Width	≤ 3.5m	-	≤ 3.5m
	Travel Lanes (per direction)	2	-	1
	Level of Service	A	-	C
	Target	D	-	-
Auto	Level of Service	A	A	B
	Target	D	D	D

The east side of Terry Fox Drive achieves a PLOS E. The target PLOS C can only be achieved by reducing the operating speed significantly, from 80 km/h to 60 km/h (i.e. reducing the posted speed limit from 70 km/h to 50 km/h). Therefore, no recommendations have been made in improving the PLOS on Terry Fox Drive.

The north side of Tillsonburg Street achieves a PLOS F, as there are no pedestrian facilities. Current City standards suggest that if required, sidewalks can be provided on one side of local roadways. Any potential pedestrian traffic generated by the proposed development are anticipated to use the sidewalk on the south side of Tillsonburg Street, as that sidewalk is adjacent to the subject site. The existing sidewalk sufficiently connects to the network of pedestrian facilities within the subdivision north of the subject site, and meets the target PLOS C. Therefore, no recommendations have been made in improving the PLOS on Tillsonburg Street.

Terry Fox Drive achieves a BLOS E. The target BLOS C can only be achieved through either a reduction in the operating speed to 60 km/h or implementation of a physically separated bikeway (such as a multi-use pathway). Site observations during the Saturday traffic counts conducted by Novatech on September 15, 2018 included noting that the majority of cyclists during the count rode on the east sidewalk on Terry Fox Drive, rather than the bike lanes. This is likely because an existing multi-use pathway on the east side of Terry Fox Drive north of Richardson Side Road ties into the sidewalk south of Richardson Side Road. Consideration could be given to extending the multi-use pathway on the east side of Terry Fox Drive. This is identified for the City's consideration as funding becomes available.

Tillsonburg Street achieves a BLOS F. If classified as a residential street with an operating speed of 50 km/h (i.e. a posted speed limit of 40 km/h), Tillsonburg Street achieves a BLOS B. The desirable cycling facility selection tool included in *Ontario Traffic Manual (OTM) – Book 18* indicates that based on the operating speed and traffic volumes on Tillsonburg Street, shared use lanes are acceptable. As such, no recommendations have been made in improving the BLOS on Tillsonburg Street.

Kanata Avenue achieves a BLOS E. The target BLOS B can be achieved through either a reduction in the operating speed to 50 km/h and a raised median, or implementation of a physically separated bikeway. A nearby alternate local route is Richardson Side Road east of Terry Fox Drive, which is closed to vehicular traffic. Therefore, no recommendations have been made in improving the BLOS on Kanata Avenue.

6.4 Access Design

The development will be served by three accesses: a 6.7m-wide retail access on Tillsonburg Street, an 8.0m-wide shared retail/gas station access on Terry Fox Drive with a 5m mountable truck apron, and a 9.0m-wide gas station access on Kanata Avenue with a 1.5m mountable truck apron.

Section 25 (a) of the City of Ottawa's *Private Approach By-Law* identifies a maximum requirement for the number of approaches based on the amount of frontage. Section 25 (b) identifies that the provisions of Section 25 (a) shall be applied separately for each roadway that the site fronts onto. For 46m to 150m of frontage (Tillsonburg Street and Kanata Avenue), up to two two-way approaches are permitted. For an additional 90m of frontage in excess of 150m (Terry Fox Drive), another two-way approach is permitted. Based on the foregoing, the proposed accesses meet this requirement.

Section 25 (c) of the *Private Approach By-Law* identifies a maximum width requirement of 9m for two-way private approaches, as measured at the street line. Section 107 (1)(a) of the *Zoning By-*

Law identifies a minimum width requirement of 6.7m for two-way approaches to a parking lot. Based on the foregoing, the proposed accesses meet this requirement.

In the case of a shopping centre with 50 to 99 parking spaces, Section 25 (l) of the *Private Approach By-Law* identifies, as measured at the street line, minimum separation distances of 30m between a two-way approach and the nearest intersecting street line, and between a two-way approach and any other private approach. The access on Tillsonburg Street is approximately 40m from Terry Fox Drive, the access on Kanata Avenue is approximately 50m from Terry Fox Drive, and the access on Terry Fox Drive is approximately 60m from Kanata Avenue. Based on the foregoing, all accesses meet the requirements outlined in Section 25 (l).

The retail and gas station parking spaces have been considered separately, as retail customers are unlikely to park at the gas station and vice versa, based on the site layout. If considered as a whole, the minimum separation distance requirement increases to 45m between a two-way approach and the nearest intersecting street line. In this case, the proposed access to Tillsonburg Street would not meet the requirement and a waiver would be required. However, this access is located as far from Terry Fox Drive as possible, and the retail and gas station uses are anticipated to function somewhat independently. In addition, the long throat length will help to mitigate any concerns with regards to queueing back to Terry Fox Drive.

The Transportation Association of Canada (TAC) *Geometric Design Guide for Canadian Roads* identifies a minimum corner clearance of 70m on arterial roadways, 25m on collector roadways divided with a raised median, and 15m on local roadways, measuring between the private approach and the nearest intersecting street line (from Figure 8.8.2). Based on the separation distances outlined previously, all accesses meet this requirement.

Section 25 (o) of the *Private Approach By-Law* identifies a minimum distance requirement of 3m between a private approach and the nearest property line, as measured at the street line. The spacing between the access on Tillsonburg Street and the property line to the north is approximately 4.2m, thereby meeting this requirement. The spacing between the access on Kanata Avenue and the property line to the north is approximately 15.5m, thereby meeting this requirement.

Using the equations and tables shown in Section 2.5.3 of the *Geometric Design Guide*, TAC identifies minimum stopping sight distance (SSD) requirements based on the roadway grade and design speed (taken as the speed limit plus 10 km/h). Taking the design speed directly, the SSD requirements are approximately 130m on Terry Fox Drive, 115m on Kanata Avenue, 95m on Tillsonburg Street (traffic heading toward Terry Fox Drive), and 80m on Tillsonburg Street (traffic coming from Terry Fox Drive). There is sufficient SSD at each access, except for traffic on Tillsonburg Street coming from Terry Fox Drive. However, vehicles travelling eastbound on Tillsonburg Street will be travelling significantly slower than 60 km/h, as motorists will be required to navigate the right turn from Terry Fox Drive. Based on a speed of 40 km/h for eastbound traffic on Tillsonburg Street, there is sufficient SSD at all accesses.

The Terry Fox Drive access is critical to the proposed development for the following reasons. Connectivity between the retail and gas station areas is important due to the turning restrictions at the accesses, and each land use depends on the other use's access for at least one movement (for example, westbound left turns to the gas station can only enter the site via the Tillsonburg Street access and southbound left turns from the retail building can only exit the site via the Kanata Avenue access). Additionally, providing an access on Terry Fox Drive allows fuel trucks to enter the site without navigating the entire retail parking lot first.

As requested by City staff, a right turn taper for the Terry Fox Drive access will be provided. The northbound bike lane will be maintained in its current location (i.e. to the left of the proposed right turn taper).

A road modification approval (RMA) package for the right turn taper at the proposed Terry Fox Drive access has been submitted concurrently with this TIA. The 1:500 functional design of the proposed road modification is included in **Appendix L**, at the back of this report.

For approaches to shopping centres less than 25,000 m², TAC identifies a minimum clear throat length requirement of 8m for collector roadways and 15m for arterial roadways (from Table 8.9.3). No clear throat length requirement is explicitly stated for gas stations. The access on Kanata Avenue achieves a clear throat length of 15m, thereby meeting the requirements. Measured from the end of the curb radius, the access on Terry Fox Drive achieves a clear throat length of approximately 10m, in addition to the required right turn taper. Additionally, there is a significant amount of open paved area on-site, which is anticipated to contain any inbound queueing.

6.5 Transit

Section 5.1 of the report projected site-generated totals of one transit trip during the AM peak hour and five during the PM peak hour. No transit service is provided anywhere within the study area on Saturdays. As the number of transit trips generated by the proposed development are so low, no capacity problems are anticipated on any of the adjacent bus routes or at any of the nearby bus stops. No mitigation measures have been recommended, as none are required.

6.6 Intersection Design

6.6.1 Intersection MMLOS Analysis

This section provides a review of the study area intersections using complete streets principles. The MMLOS guidelines produced by IBI Group in October 2015 were used to evaluate the multi-modal levels of service for each signalized intersection. As first discussed in Section 6.3, all study area roadways have been evaluated using the targets associated with the General Urban Area designation. The full intersection MMLOS analysis is included in **Appendix I**. A summary of the results is shown in **Table 17**.

Table 17: Intersection MMLOS Summary

Intersection	PLOS		BLOS		TLOS		TkLOS		Auto LOS	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target
Terry Fox Drive/ Kanata Avenue	F	C	F	B	E	-	C	D	B	D
Kanata Avenue/ Huntsville Drive	D	C	E	B	C	-	F	-	A	D
Terry Fox Drive/ Tillsonburg Street ⁽¹⁾	-	-	-	-	-	-	-	-	A	D

1. Unsignalized intersection, evaluated for Auto LOS only

Based on the results of the intersection MMLOS analysis:

- Neither intersection meets the target pedestrian level of service (PLOS);
- Neither intersection meets the target bicycle level of service (BLOS);
- Neither intersection has a target transit level of service (TLOS), however all approaches achieve a TLOS E or better;
- Terry Fox Drive/Kanata Avenue meets the target truck level of service (TkLOS);
- All intersections meet the target vehicular level of service (Auto LOS).

The following sections outline a further discussion for each intersection.

6.6.1.1 Terry Fox Drive/Kanata Avenue

Terry Fox Drive/Kanata Avenue does not meet the target PLOS C or BLOS B.

Both crosswalks do not achieve the target PLOS C, due to crossing distances equivalent to at least eight lanes. There are limited opportunities in improving the PLOS without reducing the number of travel lanes on Terry Fox Drive and Kanata Avenue, and as such, no recommendations have been made in improving the PLOS at this intersection.

The south and east approaches do not achieve the target BLOS B based on right turn characteristics, and the north approach does not achieve the target BLOS B based on left turn characteristics. The east approach does not meet the target, as the pocket bike lane is adjacent to a right turn lane greater than 50m. Bike access to Terry Fox Drive is also provided at Richardson Side Road, where the east approach is closed to vehicular traffic. Exhibit 12 of the MMLOS guidelines suggests no impact if the bike lane is to the right of any turn lane. For the south and east approaches, this would require removal of the existing channelized right turn lanes, which is not recommended based on the right turn volumes at these approaches. Therefore, no recommendations have been made in improving the BLOS for the south and east approaches. A jug handle and crossride for cyclists coming from the north approach can feasibly be implemented along with the installation of a bicycle traffic signal. Further analysis of this intersection with a jug handle and cyclist-exclusive phase implemented is presented in Section 6.6.2.

6.6.1.2 Kanata Avenue/Huntsville Drive

Kanata Avenue/Huntsville Drive does not meet the target PLOS C or BLOS B.

The east crosswalk does not achieve the target PLOS C based on PETSI score, due to a crossing distance equivalent to five lanes. Additionally, the east and west crosswalks do not achieve the target

PLOS C based on delay score. There are limited opportunities in improving the PLOS at the east approach without reducing the number of travel lanes on Kanata Avenue, with the only possible modification being the removal of the westbound right turn lane. To achieve the target PLOS C based on delay score, the effective walk time for pedestrians would require an increase of approximately three seconds. This would come at the expense of eastbound and westbound traffic on Kanata Avenue, which already includes the critical movements for this intersection. The potential impacts of increasing the green time for vehicles coming from Huntsville Drive is presented in Section 6.6.2.

The east approach does not achieve the target BLOS B based on right turn characteristics, and the west approach does not achieve the target BLOS B based on left turn characteristics. Consideration could be given to shifting the location of the bike lane to the curb at the east approach or removing the westbound right turn lane, which would improve the BLOS of the approach to a BLOS A. In addition, a crossride could be considered to improve cyclist visibility through the intersection.

With respect to left turns, a jug handle and crossride for cyclists coming from the west approach can feasibly be implemented along with the installation of a bicycle traffic signal. The potential impacts of removing the westbound right turn lane, and implementing a jug handle and cyclist-exclusive phase at this intersection is presented in Section 6.6.2.

6.6.2 Intersection Operations with Identified Modifications

As described in the MMLOS review of Terry Fox Drive/Kanata Avenue and Kanata Avenue/Huntsville Drive, this section will analyze the traffic impacts of the following modifications, based on existing conditions:

- A jug handle and crossride for southbound cyclists at Terry Fox Drive/Kanata Avenue;
- A jug handle and crossride for eastbound cyclists at Kanata Avenue/Huntsville Drive;
- Removal of the westbound right turn lane at Kanata Avenue/Huntsville Drive;
- A southbound green time adjustment at Kanata Avenue/Huntsville Drive, such that the intersection achieves the target PLOS C.

These measures have been evaluated for consideration by the City as funding becomes available. Detailed Synchro reports with the above modifications implemented is included in **Appendix K**.

Terry Fox Drive/Kanata Avenue

To minimize the delays and queueing experienced by all traffic at this intersection, the cycle length of 100 seconds in the weekday AM and PM peak hours, and 90 seconds in the Saturday peak hour will be maintained. In the following analysis, a ten-second actuated bicycle crossing phase will be implemented, and will borrow time from the northbound/southbound phase, as this phase is not identified as the critical movement during any peak hour. To maximize the effect of the bicycle crossing phase and maintain a conservative analysis, maximum recall is assumed.

A comparison of the intersection's performance with and without the bicycle crossing phase is shown in **Table 18**.

Table 18: Terry Fox Drive/Kanata Avenue – Bicycle Crossing

Mvmt	AM Peak				PM Peak				SAT Peak			
	Existing		Jug Handle		Existing		Jug Handle		Existing		Jug Handle	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
NBT	0.29	A	0.35	A	0.39	A	0.46	A	0.31	A	0.38	A
NBR	0.18	A	0.20	A	0.30	A	0.33	A	0.31	A	0.35	A
SBL	0.15	A	0.19	A	0.26	A	0.34	A	0.18	A	0.23	A
SBT	0.31	A	0.37	A	0.41	A	0.49	A	0.26	A	0.33	A
WBL	0.62	B	0.62	B	0.58	A	0.58	A	0.50	A	0.50	A
WBT	0.24	A	0.24	A	0.23	A	0.23	A	0.22	A	0.22	A
Int Delay	10.5 s	B	14.0 s	B	8.8 s	A	12.9 s	B	9.4 s	A	13.1 s	B

Based on the previous table, the intersection operations at Terry Fox Drive/Kanata Avenue are marginally affected with the addition of a ten-second bicycle crossing phase, and all movements maintain the same level of service. Overall intersection delays increase by approximately three to four seconds. Implementation of a jug handle on the west side of Terry Fox Drive at Kanata Avenue appears feasible based on the existing ROW, however modifications to the existing traffic signal will be required.

Kanata Avenue/Huntsville Drive

To minimize the delays and queueing experienced by all traffic at this intersection, the cycle length of 80 seconds in the weekday AM and PM peak hours, and 70 seconds in the Saturday peak hour will be maintained. In the following analysis, a ten-second actuated bicycle crossing phase will be implemented, and will borrow time from the eastbound/westbound phase, as this phase is not identified as the critical movement during any peak hour. To maximize the effect of the bicycle crossing phase and maintain a conservative analysis, maximum recall is assumed.

A comparison of the intersection's performance with and without the bicycle crossing phase, with and without the westbound right turn lane, and with and without an increased southbound green time is shown in **Table 19** through **Table 21**, respectively. To represent a 'worst case' for vehicular level of service, a final comparison with all modifications implemented is shown in **Table 22**.

Table 19: Kanata Avenue/Huntsville Drive – Bicycle Crossing

Mvmt	AM Peak				PM Peak				SAT Peak			
	Existing		Jug Handle		Existing		Jug Handle		Existing		Jug Handle	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	0.03	A	0.03	A	0.09	A	0.12	A	0.07	A	0.10	A
EBT	0.20	A	0.26	A	0.27	A	0.35	A	0.28	A	0.40	A
WBT	0.22	A	0.29	A	0.20	A	0.27	A	0.23	A	0.33	A
WBR	0.03	A	0.03	A	0.05	A	0.06	A	0.08	A	0.12	A
SBL/R	0.55	A	0.53	A	0.46	A	0.43	A	0.42	A	0.39	A
Int Delay	8.4 s	A	12.1 s	B	5.8 s	A	9.9 s	A	6.4 s	A	11.3 s	B

Based on the previous table, the intersection operations at Kanata Avenue/Huntsville Drive are marginally affected with the addition of a ten-second bicycle crossing phase, and all movements maintain the same level of service. Overall intersection delays increase by approximately three to five seconds.

Implementation of a jug handle on the south side of Kanata Avenue at Huntsville Drive appears feasible based on the existing ROW, however modifications to the existing traffic signal will be required.

Table 20: Kanata Avenue/Huntsville Drive – Removal of WBR Lane

Mvmt	AM Peak				PM Peak				SAT Peak			
	Existing		Removal		Existing		Removal		Existing		Removal	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	0.03	A	0.03	A	0.09	A	0.09	A	0.07	A	0.08	A
EBT	0.20	A	0.20	A	0.27	A	0.27	A	0.28	A	0.28	A
WBT	0.22	A	0.25	A	0.20	A	0.25	A	0.23	A	0.31	A
WBR	0.03	A	-	-	0.05	A	-	-	0.08	A	-	-
SBL/R	0.55	A	0.55	A	0.46	A	0.46	A	0.42	A	0.42	A
Int Delay	8.4 s	A	8.5 s	A	5.8 s	A	5.9 s	A	6.4 s	A	6.8 s	A

Based on the previous table, the intersection operations at Kanata Avenue/Huntsville Drive are marginally affected with the removal of the westbound right turn lane, and all movements maintain the same level of service. Overall intersection delays are approximately equal. However, it has been confirmed by City staff that the westbound right turn lane will not be removed.

Table 21: Kanata Avenue/Huntsville Drive – Increased SB Green Time

Mvmt	AM Peak				PM Peak				SAT Peak			
	Existing		Adj. Timing		Existing		Adj. Timing		Existing		Adj. Timing	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	0.03	A	0.03	A	0.09	A	0.09	A	0.07	A	0.07	A
EBT	0.20	A	0.20	A	0.27	A	0.27	A	0.28	A	0.28	A
WBT	0.22	A	0.23	A	0.20	A	0.21	A	0.23	A	0.23	A
WBR	0.03	A	0.03	A	0.05	A	0.05	A	0.08	A	0.09	A
SBL/R	0.55	A	0.53	A	0.46	A	0.45	A	0.42	A	0.40	A
Int Delay	8.4 s	A	8.0 s	A	5.8 s	A	5.7 s	A	6.4 s	A	6.5 s	A

Based on the previous table, the intersection operations at Kanata Avenue/Huntsville Drive are marginally affected by adjusting the green times to add three seconds for the southbound phase, and all movements maintain the same level of service. Overall intersection delays are approximately equal.

Table 22: Kanata Avenue/Huntsville Drive – All Identified Modifications

Mvmt	AM Peak				PM Peak				SAT Peak			
	Existing		Modified		Existing		Modified		Existing		Modified	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	0.03	A	0.03	A	0.09	A	0.13	A	0.07	A	0.13	A
EBT	0.20	A	0.27	A	0.27	A	0.37	A	0.28	A	0.42	A
WBT	0.22	A	0.33	A	0.20	A	0.34	A	0.23	A	0.47	A
WBR	0.03	A	-	-	0.05	A	-	-	0.08	A	-	-
SBL/R	0.55	A	0.52	A	0.46	A	0.42	A	0.42	A	0.38	A
Int Delay	8.4 s	A	12.2 s	B	5.8 s	A	10.5 s	B	6.4 s	A	12.8 s	B

Based on the previous table, the intersection operations at Kanata Avenue/Huntsville Drive are marginally affected with the implementation of all three modifications analyzed above. All v/c ratios continue to equate to an Auto LOS A, and the performance of the westbound through/right turn movement is the only movement to downgrade noticeably. Overall intersection delays increase by approximately four to six seconds.

6.6.3 2019 Background Traffic – Intersection Operations

Intersection capacity analysis has been completed for the 2019 background traffic conditions. The intersection parameters used in the analysis are consistent with the 2017 TIA Guidelines (Saturation Flow Rate: 1800 vphpl, Peak Hour Factor: 1.0). The results of the Synchro 10 analysis for the AM, PM, and Saturday peak hours are summarized in **Table 23**. Signal timing plans are included in **Appendix J**. Detailed reports are included in **Appendix K**.

Table 23: 2019 Background – Intersection Operations

Intersection	AM Peak			PM Peak			SAT Peak		
	Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt
Terry Fox Drive/ Kanata Avenue	0.64	B	WBL	0.59	A	WBL	0.49	A	WBL
Kanata Avenue/ Huntsville Drive	0.59	A	SBL/R	0.40	A	SBL/R	0.41	A	SBL/R
Terry Fox Drive/ Tillsonburg Street ⁽¹⁾	10 sec	A	WBR	10 sec	A	WBR	10 sec	A	WBR

1. Unsignalized intersection

Based on the previous table, movements at all intersections within the study area are projected to operate acceptably, surpassing the target Auto LOS D during the AM, PM, and Saturday peak hours. There are no queueing issues identified in Synchro for the 2019 background traffic conditions.

6.6.4 2024 Background Traffic – Intersection Operations

Intersection capacity analysis has been completed for the 2024 background traffic conditions. The intersection parameters used in the analysis are consistent with the 2017 TIA Guidelines (Saturation Flow Rate: 1800 vphpl, Peak Hour Factor: 1.0). The results of the Synchro 10 analysis for the AM, PM, and Saturday peak hours are summarized in **Table 24**. Signal timing plans are included in **Appendix J**. Detailed reports are included in **Appendix K**.

Table 24: 2024 Background – Intersection Operations

Intersection	AM Peak			PM Peak			SAT Peak		
	Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt
Terry Fox Drive/ Kanata Avenue	0.65	B	WBL	0.60	A	WBL	0.51	A	WBL
Kanata Avenue/ Huntsville Drive	0.59	A	SBL/R	0.40	A	SBL/R	0.41	A	SBL/R
Terry Fox Drive/ Tillsonburg Street ⁽¹⁾	10 sec	A	WBR	10 sec	A	WBR	10 sec	A	WBR

Based on the previous table, marginal increases in the v/c ratios at the study area intersections are anticipated as a result of background growth and other developments in the vicinity of the subject

site. All study area intersections are projected to continue operating acceptably during the AM, PM, and Saturday peak hours. There are no queueing issues identified in Synchro for the 2024 background conditions.

6.6.5 2019 Total Traffic – Intersection Operations

Intersection capacity analysis has been completed for the 2019 total traffic conditions. The intersection parameters used in the analysis are consistent with the 2017 TIA Guidelines (Saturation Flow Rate: 1800 vphpl, Peak Hour Factor: 1.0). The results of the Synchro 10 analysis for the AM, PM, and Saturday peak hours are summarized in **Table 25**. Signal timing plans are included in **Appendix J**. Detailed reports are included in **Appendix K**.

Table 25: 2019 Total – Intersection Operations

Intersection	AM Peak			PM Peak			SAT Peak		
	Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt
Terry Fox Drive/ Kanata Avenue	0.65	B	WBL	0.60	A	WBL	0.51	A	WBL
Kanata Avenue/ Huntsville Drive	0.60	A	SBL/R	0.44	A	SBL/R	0.44	A	SBL/R
Terry Fox Drive/ Tillsonburg Street ⁽¹⁾	11 sec	B	WBR	11 sec	B	WBR	11 sec	B	WBR
Tillsonburg Street/ Site Access ⁽¹⁾	9 sec	A	NBL/R	9 sec	A	NBL/R	9 sec	A	NBL/R
Terry Fox Drive/ Site Access ⁽¹⁾	10 sec	A	WBR	10 sec	A	WBR	10 sec	A	WBR
Kanata Avenue/ Site Access ⁽¹⁾	9 sec	A	SBR	9 sec	A	SBR	9 sec	A	SBR

Based on the previous table, marginal increases in the v/c ratios at the study area intersections are anticipated as a result of background growth and site-generated traffic. All study area intersections are projected to continue operating acceptably during the AM, PM, and Saturday peak hours. There are no queueing issues identified in Synchro for the 2019 total traffic conditions.

6.6.6 2024 Total Traffic – Intersection Operations

Intersection capacity analysis has been completed for the 2024 total traffic conditions. The intersection parameters used in the analysis are consistent with the 2017 TIA Guidelines (Saturation Flow Rate: 1800 vphpl, Peak Hour Factor: 1.0). The results of the Synchro 10 analysis for the AM, PM, and Saturday peak hours are summarized in **Table 26**. Signal timing plans are included in **Appendix J**. Detailed reports are included in **Appendix K**.

Table 26: 2024 Total – Intersection Operations

Intersection	AM Peak			PM Peak			SAT Peak		
	Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt
Terry Fox Drive/ Kanata Avenue	0.66	B	WBL	0.62	B	WBL	0.53	A	WBL
Kanata Avenue/ Huntsville Drive	0.60	A	SBL/R	0.44	A	SBL/R	0.44	A	SBL/R
Terry Fox Drive/ Tillsonburg Street ⁽¹⁾	11 sec	B	WBR	10 sec	A	WBR	10 sec	A	WBR
Tillsonburg Street/ Site Access ⁽¹⁾	9 sec	A	NBL/R	9 sec	A	NBL/R	9 sec	A	NBL/R
Terry Fox Drive/ Site Access ⁽¹⁾	10 sec	A	WBR	11 sec	B	WBR	10 sec	A	WBR
Kanata Avenue/ Site Access ⁽¹⁾	9 sec	A	SBR	9 sec	A	SBR	9 sec	A	SBR

Based on the previous table, marginal increases in the v/c ratios at the study area intersections are anticipated as a result of background growth and site-generated traffic. All study area intersections are projected to continue operating acceptably during the AM, PM, and Saturday peak hours. There are no queueing issues identified in Synchro for the 2024 total traffic conditions.

7.0 CONCLUSIONS AND RECOMMENDATIONS

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

Forecasting

- The proposed development is projected to generate approximately 132 person trips during the AM peak hour, 260 person trips during the PM peak hour, and 267 person trips during the Saturday peak hour.
- The proposed development is projected to generate 103 vehicle trips during the AM peak hour, 197 vehicle trips during the PM peak hour, and 206 vehicle trips during the Saturday peak hour.

Development Design and Parking

- Pedestrian facilities will be provided between the building entrances and the parking areas. Additionally, pedestrian facilities will connect the retail buildings to the existing sidewalks along Terry Fox Drive and Tillsonburg Street. Sidewalks will be depressed and continuous across the accesses, in accordance with City standards. A barrier-free pedestrian pathway is proposed on-site between the retail building and gas station, to provide pedestrian connectivity throughout the site.
- All building entrances are within 400m walking distances of stops for both OC Transpo routes 165 and 264.
- Retail garbage collection will take place approximately 80m south of the full-movement access on Tillsonburg Street. Gas station garbage collection will take place south of the proposed car wash, approximately 15m north of the RIRO access on Kanata Avenue.

- Loading and delivery spaces for the retail uses are provided adjacent to the east and west of the full-movement access on Tillsonburg Street.
- The accesses to the gas station are sufficient to accommodate a fuel tanker, the largest vehicle to enter and exit the site. Some mountable curb is required for the tanker to negotiate turning into/out of the accesses.
- The fire route for the proposed development accesses the site from the full-movement access on Tillsonburg Street and the RIRO access on Terry Fox Drive.
- Approximately 112 vehicle parking spaces and 16 bicycle parking spaces are proposed for the development, meeting the minimum requirements of the ZBL. Four of the 96 retail parking spaces and one of the 16 gas station parking spaces are accessible spaces, meeting the minimum requirements of the City's *Accessibility Design Standards*.
- A total of ten bicycle parking spaces will be provided for the retail building, and a total of six bicycle parking spaces will be provided for the gas station and convenience store, thereby meeting the requirements of the ZBL.
- The proposed car wash provides queueing space for ten vehicles before/in the car wash bay, and one vehicle after the bay, thereby meeting the minimum requirements of the ZBL.
- Two retail loading spaces are proposed, thereby meeting the minimum requirements of the ZBL.

Boundary Streets

- The results of the segment MMLOS analysis can be summarized as follows:
 - Kanata Avenue meets the target pedestrian level of service (PLOS), while Terry Fox Drive and Tillsonburg Street do not;
 - No boundary streets meet the target bicycle level of service (BLOS);
 - No boundary streets have targets for transit level of service (TLOS), however Terry Fox Drive and Kanata Avenue both currently meet the target for Transit Priority Corridors with Isolated Measures;
 - Terry Fox Drive meets the target truck level of service (TkLOS);
 - All boundary streets meet the vehicular level of service (Auto LOS).
- The east side of Terry Fox Drive does not achieve the target PLOS C. The target PLOS can only be achieved by reducing the operating speed significantly (i.e. reducing the posted speed limit from 70 km/h to 50 km/h). Therefore, no recommendations have been made in improving the PLOS on Terry Fox Drive.
- The north side of Tillsonburg Street has no pedestrian facilities. Current City standards suggest that if required, sidewalks can be provided on one side of local roadways. Any potential pedestrian traffic generated by the proposed development are anticipated to use the sidewalk on the south side of Tillsonburg Street, which meets the target PLOS C. Therefore, no recommendations have been made in improving the PLOS on Tillsonburg Street.

- Terry Fox Drive does not achieve the target BLOS E, despite the existing bike lanes. The target BLOS can only be achieved by reducing the operating speed to 60 km/h or implementing a physically separated bikeway (such as a multi-use pathway). Site observations indicate that the majority of cyclists likely use the east sidewalk on Terry Fox Drive rather than the bike lanes, as an existing multi-use pathway ties into this sidewalk north of Richardson Side Road. Consideration could be given to extending the multi-use pathway on the east side of Terry Fox Drive. This is identified for the City's consideration as funding becomes available.
- Tillsonburg Street does not achieve the target BLOS D. If classified as a residential street with an operating speed of 50 km/h, Tillsonburg Street achieves a BLOS B. Book 18 of the *Ontario Traffic Manual* indicates that shared use lanes are acceptable for Tillsonburg Street, given the operating speed and traffic volumes. Therefore, no recommendations have been made in improving the BLOS on Tillsonburg Street.
- Kanata Avenue does not achieve the target BLOS B. The target BLOS can only be achieved through either a reduction in the operating speed to 50 km/h and a raised median, or implementation of a physically separated bikeway. A nearby alternate local route is Richardson Side Road east of Terry Fox Drive, which is closed to vehicular traffic. Therefore, no recommendations have been made in improving the BLOS on Kanata Avenue.

Access Design

- Section 25 (a) of the *Private Approach By-Law* identifies a maximum requirement for the number of approaches based on the amount of frontage, and Section 25 (b) identifies that each roadway shall be evaluated separately. For 46m to 150m of frontage (Tillsonburg Street and Kanata Avenue), up to two two-way approaches are permitted. For every additional 90m in excess of 150m (Terry Fox Drive), another two-way approach is permitted. This requirement is met by the proposed accesses.
- Section 25 (c) of the *Private Approach By-Law* identifies a maximum width requirement of 9m for two-way private approaches, and Section 107 (1)(a) of the *Zoning By-Law* identifies a minimum width requirement of 6.7m for two-way private approaches to a parking lot. These requirements are met by the proposed accesses.
- Section 25 (l) of the *Private Approach By-Law* identifies minimum separation distances of 30m between a two-way approach and the nearest intersecting street line, and between a two-way approach and any other private approach. These requirements are met by the proposed accesses.
- If all parking spaces are considered rather than dividing the retail and gas station parking, the minimum separation distance requirement increases to 45m between a two-way approach and the nearest intersecting street line. In this case, the Tillsonburg Street access would not meet the requirement and a waiver would be required. However, this access is located as far from Terry Fox Drive as possible, and the retail and gas station uses are anticipated to function somewhat independently. In addition, the long throat length will help to mitigate any concerns with regards to queueing back to Terry Fox Drive.

- Figure 8.8.2 of the *Geometric Design Guide* identifies minimum corner clearance distances of 70m on arterial roadways, 25m on collector roadways divided with a raised median, and 15m on local roadways. These requirements are met by the proposed accesses.
- Section 25 (o) of the *Private Approach By-Law* identifies a minimum distance requirement of 3m between a private approach and the nearest property line. The spacing between the Tillsonburg Street access and the property line is approximately 4.2m and the spacing between the Kanata Avenue access and the property line is approximately 15.5m, thereby meeting this requirement.
- Section 2.5.3 of the *Geometric Design Guide* identifies minimum stopping sight distance (SSD) requirements based on the roadway grade and design speed. Adjusting the design speed for traffic turning onto Tillsonburg Street from Terry Fox Drive to reflect a lower operating speed, all accesses meet the minimum SSD requirements.
- The Terry Fox Drive access is critical to the proposed development. Connectivity between the retail and gas station areas is important due to the turning restrictions at the accesses, and each land use depends on the other use's access for at least one movement. Additionally, providing an access on Terry Fox Drive allows fuel trucks to enter the site without navigating the entire retail parking lot first.
- A right turn taper is included for the Terry Fox Drive access, to accommodate vehicles entering the site.
- Table 8.9.3 of the *Geometric Design Guide* identifies a minimum clear throat length requirement of 8m for collector roadways and 15m for arterial roadways, for shopping centres less than 25,000 m². No clear throat length requirement is explicitly stated for gas stations. The access on Kanata Avenue achieves a clear throat length of 15m, thereby meeting the requirements. Measured from the end of the curb radius, the access on Terry Fox Drive achieves a clear throat length of approximately 10m, in addition to the required right turn taper. Additionally, there is a significant amount of open paved area on-site, which is anticipated to contain any inbound queueing.

Transit

- The transit trips generated by the proposed development are not anticipated to have a significant impact on the operations of OC Transpo routes 165 and 264. No mitigation measures have been recommended, as none are required.

Intersection Design

- Based on the results of the intersection MMLOS analysis:
 - Neither intersection meets the target pedestrian level of service (PLOS);
 - Neither intersection meets the target bicycle level of service (BLOS);
 - Neither intersection has a target transit level of service (TLOS), however all approaches achieve a TLOS E or better;
 - Terry Fox Drive/Kanata Avenue meets the target truck level of service (TkLOS);
 - All intersections meet the vehicular level of service (Auto LOS).

- Pedestrian Level of Service:
 - Both crosswalks of Terry Fox Drive/Kanata Avenue do not achieve the target PLOS C, due to crossing distances equivalent to at least eight lanes. There are limited opportunities in improving the PLOS without reducing the number of travel lanes on Terry Fox Drive and Kanata Avenue, and as such, no recommendations have been made in improving the PLOS at this intersection.
 - At Kanata Avenue/Huntsville Drive, the east crosswalk does not achieve the target PLOS C based on PETSI score, due to a crossing distance equivalent to five lanes. Additionally, the east and west crosswalks do not achieve the target PLOS C based on delay score. There are limited opportunities in improving the PLOS at the east approach without reducing the number of travel lanes on Kanata Avenue, with the only possible modification being the removal of the westbound right turn lane. To achieve the target PLOS C based on delay score, the effective walk time for pedestrians would require an increase of approximately three seconds.
- Bicycle Level of Service:
 - At Terry Fox Drive/Kanata Avenue, the south and east approaches do not achieve the target BLOS B based on right turn characteristics, and the north approach does not achieve the target BLOS B based on left turn characteristics. The east approach does not meet the target, as the pocket bike lane is adjacent to a right turn lane greater than 50m. Bike access to Terry Fox Drive is also provided at Richardson Side Road, where the east approach is closed to vehicular traffic.
 - For the south and east approaches, this would require removal of the existing channelized right turn lanes, which is not recommended based on the right turn volumes. Therefore, no recommendations have been made in improving the BLOS for the south and east approaches. A jug handle and crossride for cyclists coming from the north approach can feasibly be implemented along with the installation of a bicycle traffic signal.
 - At Kanata Avenue/Huntsville Drive, the east approach does not achieve the target BLOS B based on right turn characteristics, and the west approach does not achieve the target BLOS B based on left turn characteristics. Consideration could be given to shifting the location of the bike lane to the curb at the east approach or removing the westbound right turn lane, which would improve the BLOS of the approach to a BLOS A. In addition, a crossride could be considered to improve cyclist visibility through the intersection. City staff have confirmed that the westbound right turn lane will not be removed.
 - With respect to left turns, a jug handle and crossride for cyclists coming from the west approach can feasibly be implemented along with the installation of a bicycle traffic signal.
- The following modifications can be accommodated at the intersections of Terry Fox Drive/Kanata Avenue and Kanata Avenue/Huntsville Drive, and are identified for the City's consideration:
 - A jug handle and crossride for southbound cyclists at Terry Fox Drive/Kanata Avenue;
 - A jug handle and crossride for eastbound cyclists at Kanata Avenue/Huntsville Drive;

- Removal of the westbound right turn lane at Kanata Avenue/Huntsville Drive;
 - A southbound green time increase of three seconds at Kanata Avenue/Huntsville Drive, such that the intersection achieves the target PLOS C.
- Compared to existing conditions, marginal increases in the v/c ratios and delays at the study area intersections are anticipated as a result of background growth and site-generated traffic.
- All study area intersections are projected to continue operating acceptably during the AM, PM, and Saturday peak hours (Auto LOS B or better). There are no queueing issues identified in Synchro for the 2024 total traffic conditions, which can be considered the 'worst case' scenario analyzed in this TIA.
- Based on the foregoing, the proposed development is recommended from a transportation perspective.

NOVATECH

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APPENDIX A

Conceptual Site Plan

APPENDIX B

TIA Screening Form

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	471 Terry Fox Drive
Description of Location	The approximately 1.19-hectare property is located east of Terry Fox Drive between Kanata Avenue and Tillsonburg Street
Land Use Classification	Retail + Gas Station with Car Wash
Development Size (units)	-
Development Size (m ²)	Retail: 23,000 ft² (2,137 m²) Gas Station: 3,315 ft² (308 m²)
Number of Accesses and Locations	- One access to Tillsonburg Street - One access to Kanata Avenue - One access to Terry Fox Drive
Phase of Development	1
Buildout Year	2019

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

2. Trip Generation Trigger

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

Land Use Type	Minimum Development Size
Single-family homes	40 units
Townhomes or apartments	90 units
Office	3,500 m ²
Industrial	5,000 m ²
Fast-food restaurant or coffee shop	100 m ²
Destination retail	1,000 m²
Gas station or convenience market	75 m ²

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

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?	✓	

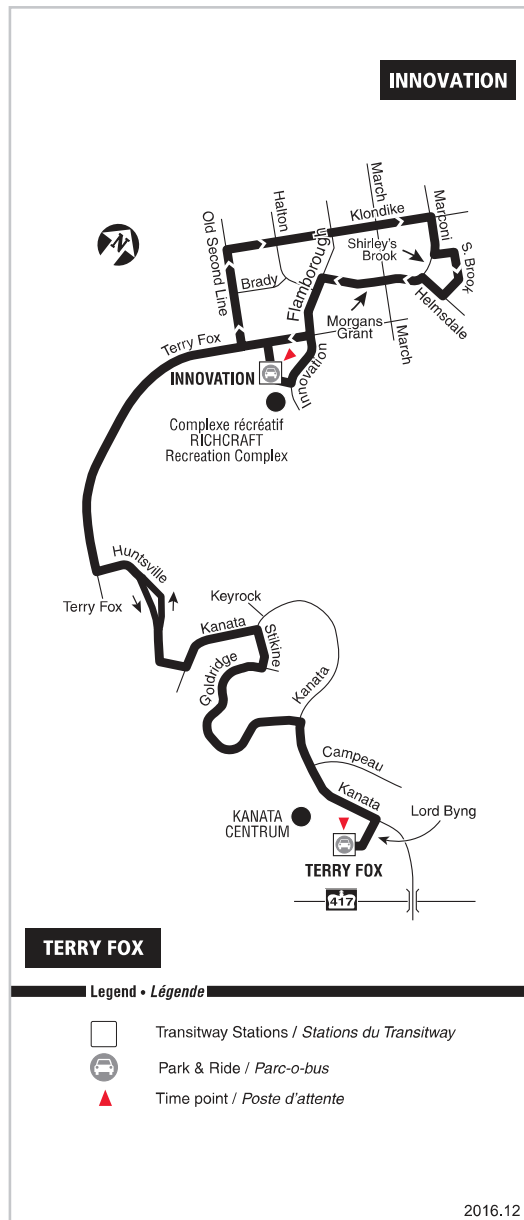
If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).

APPENDIX C

OC Transpo Route Maps

165 INNOVATION TERRY FOX

Monday to Friday / Lundi au vendredi
Selected time periods
Périodes sélectionnées



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 Dec. 25 déc. 2016

264

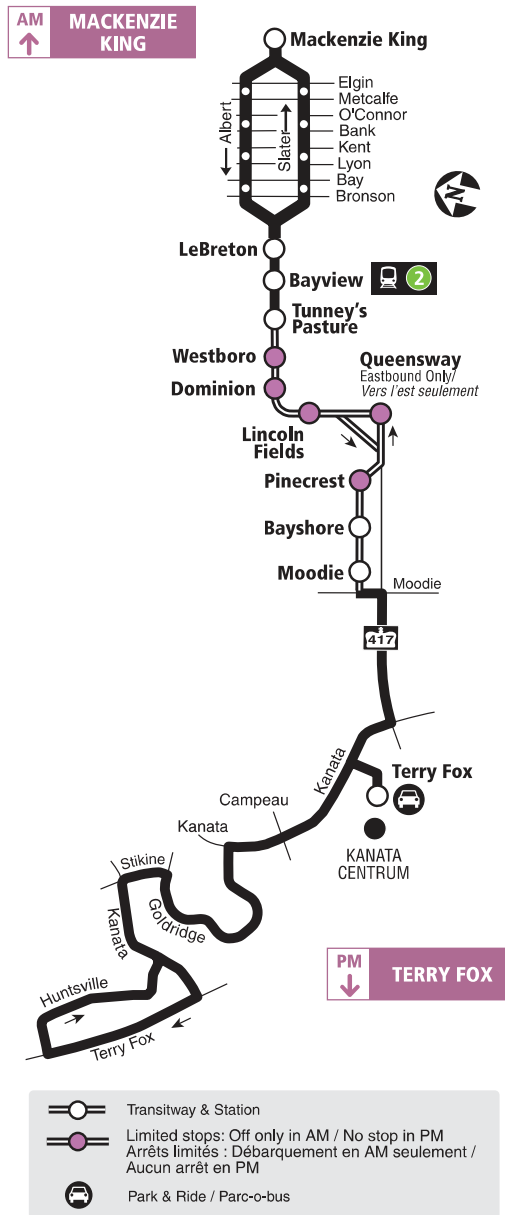
MACKENZIE KING TERRY FOX

Connexion

Monday to Friday / Lundi au vendredi

Peak periods only

Périodes de pointe seulement



2017.12



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

Text / Texto560560

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

KANATA

303 Carp, Dunrobin
 Wednesday only
 Mercredi seulement

C. Canadian Tire C. - 3059

Event Service to the Canadian Tire Centre
Service aux événements du Centre Canadian Tire
 401 402 403 404 405 406

Terry Fox - 3058

61 62 88 161 162
 164 165 167 168 264
 301 303 404 454

Innovation - 3057

63 64 66 165 166

Teron - 3018

62 63 64 164 166 168 265 268

Eagleson - 3055

61 164 166 168 265 267 268 269
 301 303 404 454
 62 63 64 Eastbound only
 Vers l'est seulement

Hazeldean Mall

88 161
 164 168

APPENDIX D

Traffic Count Data



Public Works - Traffic Services

Work Order
1140

Turning Movement Count - Full Study Summary Report

KANATA AVE @ TERRY FOX DR

Survey Date: Friday, June 27, 2014

Total Observed U-Turns

Northbound: 0 Southbound: 3
Eastbound: 14 Westbound: 2

AADT Factor

.80

Full Study

TERRY FOX DR											KANATA AVE										
Period	Northbound					Southbound					Eastbound					Westbound					Grand Total
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT			
07:00 08:00	0	0	0	0	181	0	34	215	215	46	498	0	544	0	344	129	473	1017	1232		
08:00 09:00	0	0	0	0	250	0	56	306	306	63	572	0	635	0	575	156	731	1366	1672		
09:00 10:00	0	0	0	0	243	0	67	310	310	52	620	0	672	0	509	142	651	1323	1633		
11:30 12:30	0	0	0	0	215	0	41	256	256	36	792	0	828	0	608	208	816	1644	1900		
12:30 13:30	0	0	0	0	169	0	41	210	210	49	584	0	633	0	732	206	938	1571	1781		
15:00 16:00	0	0	0	0	184	0	69	253	253	55	630	0	685	0	750	207	957	1642	1895		
16:00 17:00	0	0	0	0	238	0	57	295	295	68	858	0	926	0	791	277	1068	1994	2289		
17:00 18:00	0	0	0	0	200	0	61	261	261	84	789	0	873	0	724	340	1064	1937	2198		
Total	0	0	0	0	1680	0	426	2106	2106	453	5343	0	5796	0	5033	1665	6698	12494	14600		
Equ 12Hr	0	0	0	0	2335	0	592	2927	2927	629	7426	0	8055	0	6995	2314	9309	17364	20291		
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														1.39							
Avg 12Hr	0	0	0	0	1867	0	473	2341	2341	503	5940	0	6443	0	5595	1851	7447	13891	16232		
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														.80							
Avg 24Hr	0	0	0	0	2445	0	619	3066	3066	658	7781	0	8440	0	7329	2424	9755	18197	21263		
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														1.31							

Comments:

Note: U-Turns are included in Totals.



Public Works - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

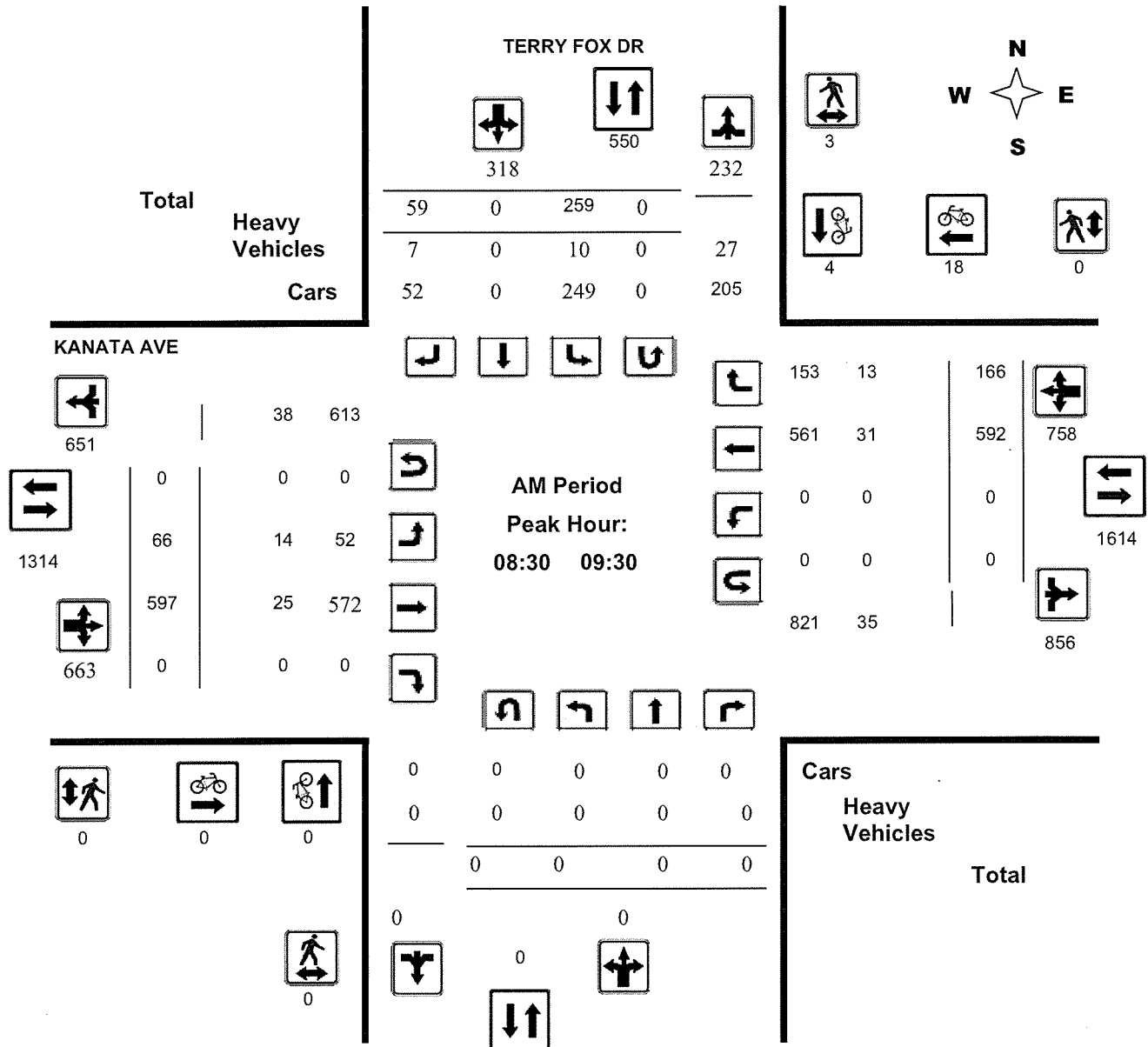
KANATA AVE @ TERRY FOX DR

Survey Date: Friday, June 27, 2014

Start Time: 07:00

WO No: 1140

Device: Jamar Technologies, Inc





Public Works - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

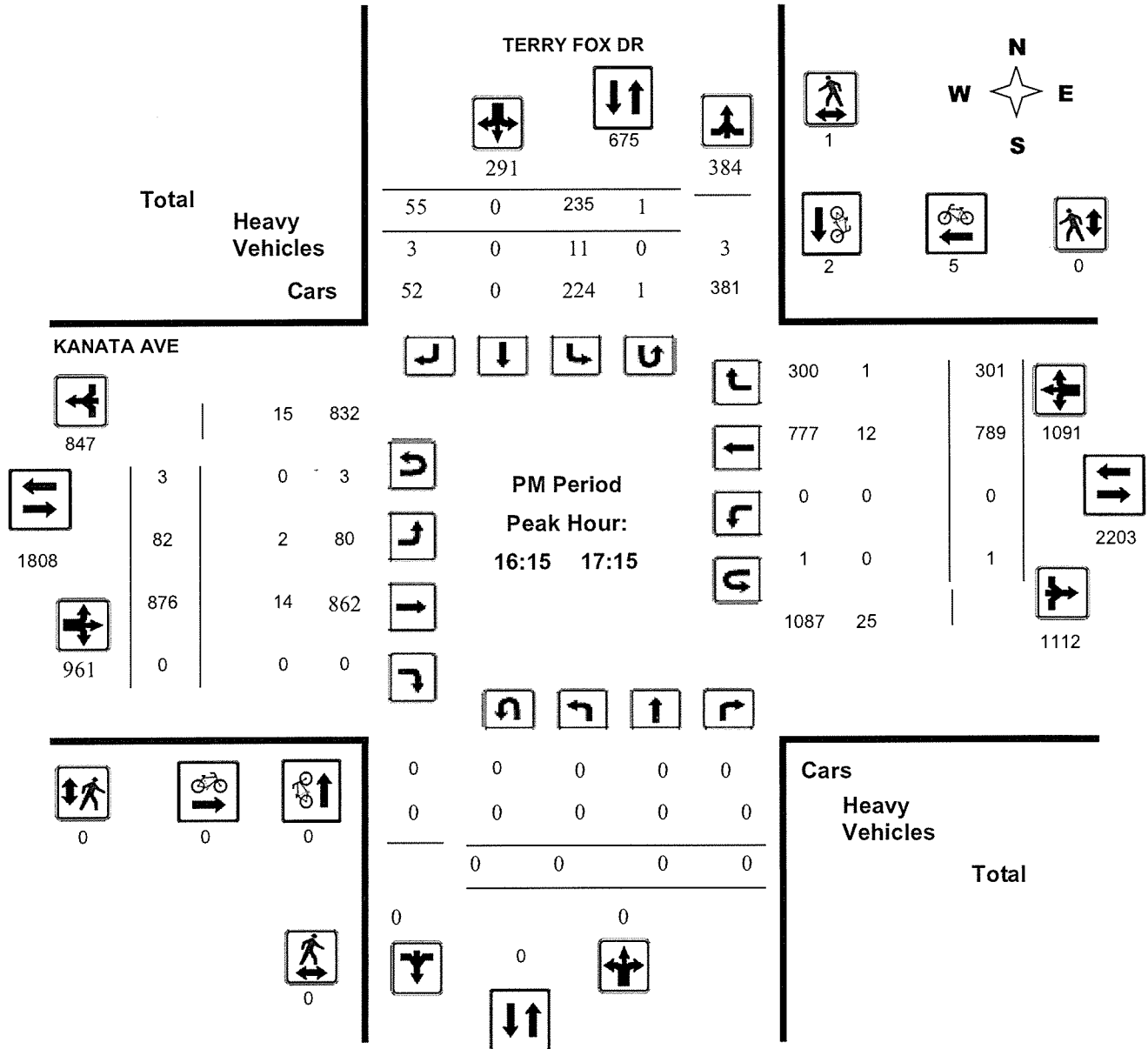
KANATA AVE @ TERRY FOX DR

Survey Date: Friday, June 27, 2014

Start Time: 07:00

WO No: 1140

Device: Jamar Technologies, Inc



Turning Movement Count - Full Study Summary Report

KANATA AVE @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018

Total Observed U-Turns

Northbound: 1 Southbound: 7
Eastbound: 0 Westbound: 1

AADT Factor

.90

Full Study
TERRY FOX DR
KANATA AVE

		Northbound				Southbound				Eastbound				Westbound									
Period		LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total			
07:00	08:00	0	365	123	488	218	410	0	628	1116	0	0	0	0	242	0	209	451	451	1567			
08:00	09:00	0	641	166	807	220	463	0	683	1490	0	0	0	0	306	0	336	642	642	2132			
09:00	10:00	0	462	92	554	93	444	0	537	1091	0	0	0	0	190	0	230	420	420	1511			
11:30	12:30	0	469	141	610	106	557	0	663	1273	0	0	0	0	129	0	68	197	197	1470			
12:30	13:30	0	592	162	754	94	485	0	579	1333	0	0	0	0	138	0	108	246	246	1579			
15:00	16:00	0	575	234	809	136	477	0	613	1422	0	0	0	0	186	0	155	341	341	1763			
16:00	17:00	0	608	294	902	212	723	0	935	1837	0	0	0	0	192	0	197	389	389	2226			
17:00	18:00	0	655	335	990	264	687	0	951	1941	0	0	0	0	216	0	146	362	362	2303			
Sub Total		0	4367	1547	5914	1343	4246	0	5589	11503	0	0	0	0	1599	0	1449	3048	3048	14551			
U Turns		1				7				8				0				1				1	9
Total		0	4367	1547	5915	1343	4246	0	5596	11511	0	0	0	0	1599	0	1449	3049	3049	14560			
EQ 12Hr		0	6070	2150	8222	1867	5902	0	7778	16000	0	0	0	0	2223	0	2014	4238	4238	20238			
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														1.39									
AVG 12Hr		0	5463	1935	7400	1680	5312	0	7001	14401	0	0	0	0	2000	0	1813	3814	3814	18215			
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														.90									
AVG 24Hr		0	7157	2535	9694	2201	6958	0	9171	18865	0	0	0	0	2620	0	2375	4997	4997	23862			
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														1.31									

Comments:

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



Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

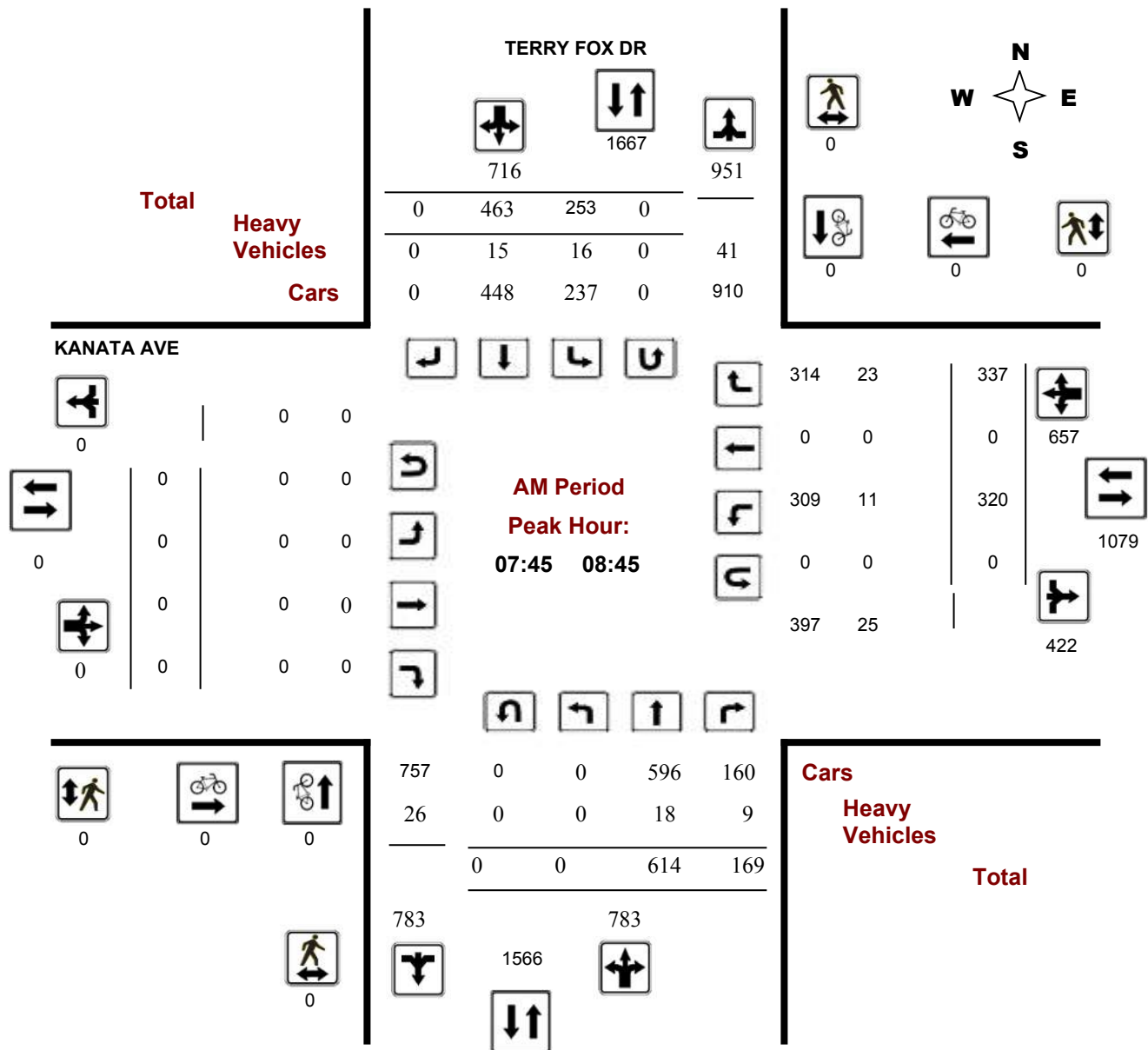
KANATA AVE @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018

Start Time: 07:00

WO No: 37662

Device: Miovision





Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

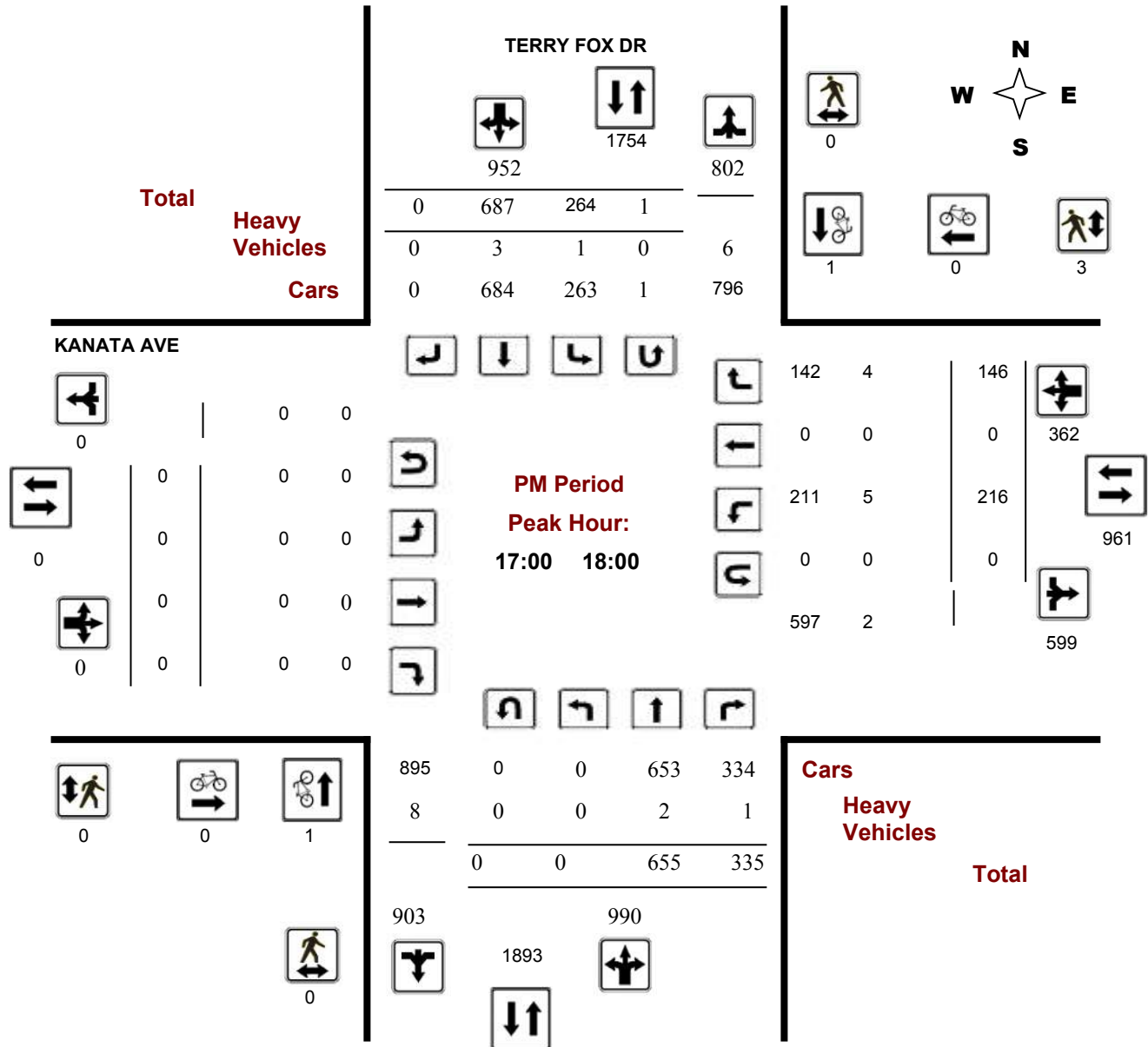
KANATA AVE @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018

Start Time: 07:00

WO No: 37662

Device: Miovision



Turning Movement Count - Full Study Summary Report

TERRY FOX DR @ TILLSONBURG ST

Survey Date: Wednesday, May 27, 2015

Total Observed U-Turns

Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0

AADT Factor

.90

Full Study

TERRY FOX DR										TILLSONBURG ST									
Northbound					Southbound					Eastbound					Westbound				
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	0	386	12	398	0	522	0	522	920	0	0	0	0	0	0	21	21	21	941
08:00 09:00	0	619	18	637	0	599	0	599	1236	0	0	0	0	0	0	25	25	25	1261
09:00 10:00	0	420	15	435	1	504	0	505	940	0	0	0	0	0	0	23	23	23	963
11:30 12:30	0	504	25	529	0	726	0	726	1255	0	0	0	0	0	0	10	10	10	1265
12:30 13:30	0	636	15	651	0	540	0	540	1191	0	0	0	0	0	0	10	10	10	1201
15:00 16:00	0	656	30	686	0	591	0	591	1277	0	0	0	0	0	0	22	22	22	1299
16:00 17:00	0	731	51	782	0	846	0	846	1628	0	0	0	0	0	0	15	15	15	1643
17:00 18:00	0	749	55	804	0	936	0	936	1740	0	0	0	0	0	0	15	15	15	1755
Sub Total	0	4701	221	4922	1	5264	0	5265	10187	0	0	0	0	0	0	141	141	141	10328
U Turns				0				0	0				0				0	0	0
Total	0	4701	221	4922	1	5264	0	5265	10187	0	0	0	0	0	0	141	141	141	10328
EQ 12Hr	0	6534	307	6842	1	7317	0	7318	14160	0	0	0	0	0	0	196	196	196	14356
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													1.39						
AVG 12Hr	0	5881	276	6157	1	6585	0	6587	12744	0	0	0	0	0	0	176	176	176	12920
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													.90						
AVG 24Hr	0	7704	362	8066	2	8627	0	8628	16694	0	0	0	0	0	0	231	231	231	16925
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													1.31						

Comments:

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

Turning Movement Count - Peak Hour Diagram

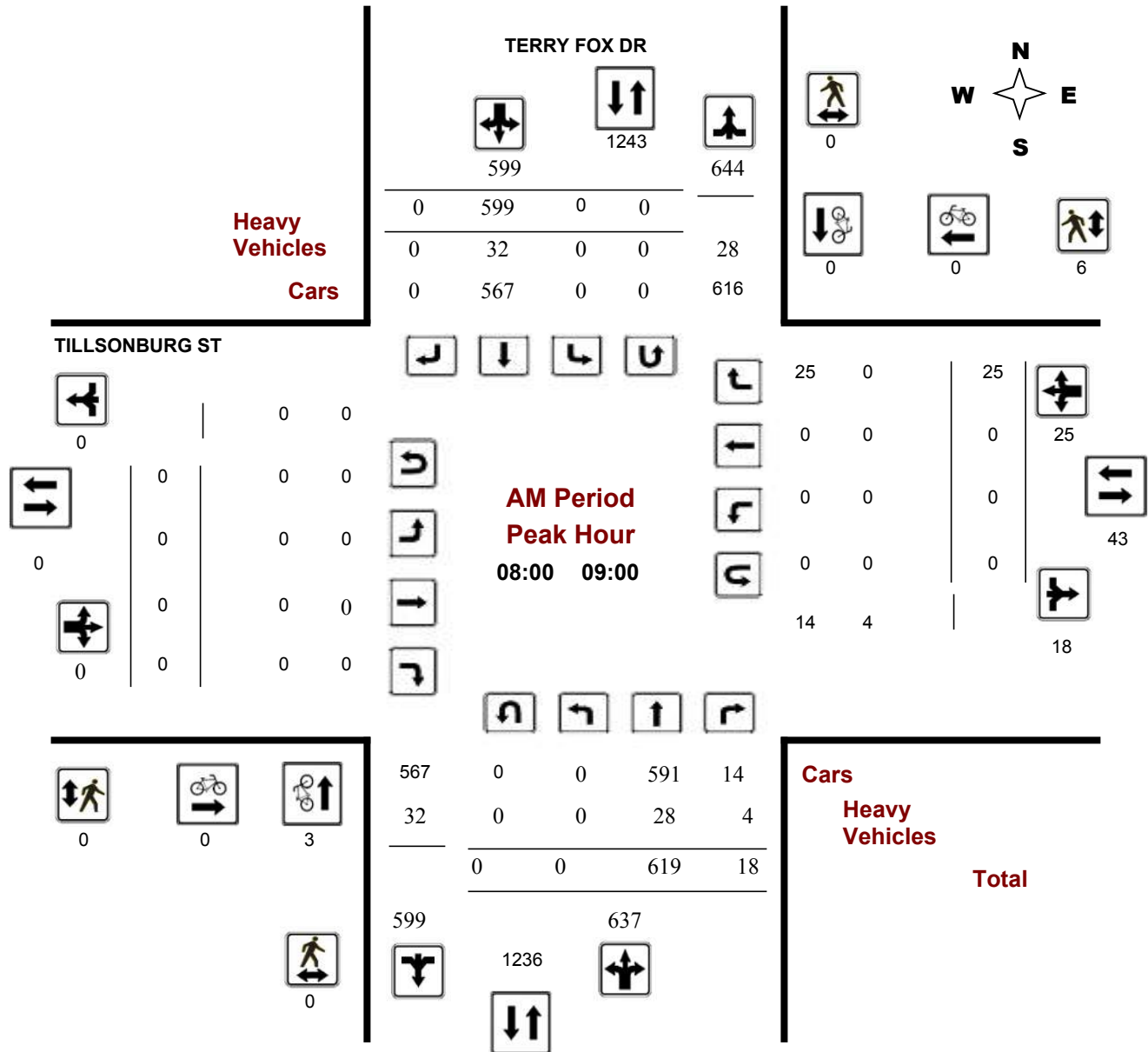
TERRY FOX DR @ TILLSONBURG ST

Survey Date: Wednesday, May 27, 2015

Start Time: 07:00

WO No: 35084

Device: Miovision



Turning Movement Count - Peak Hour Diagram

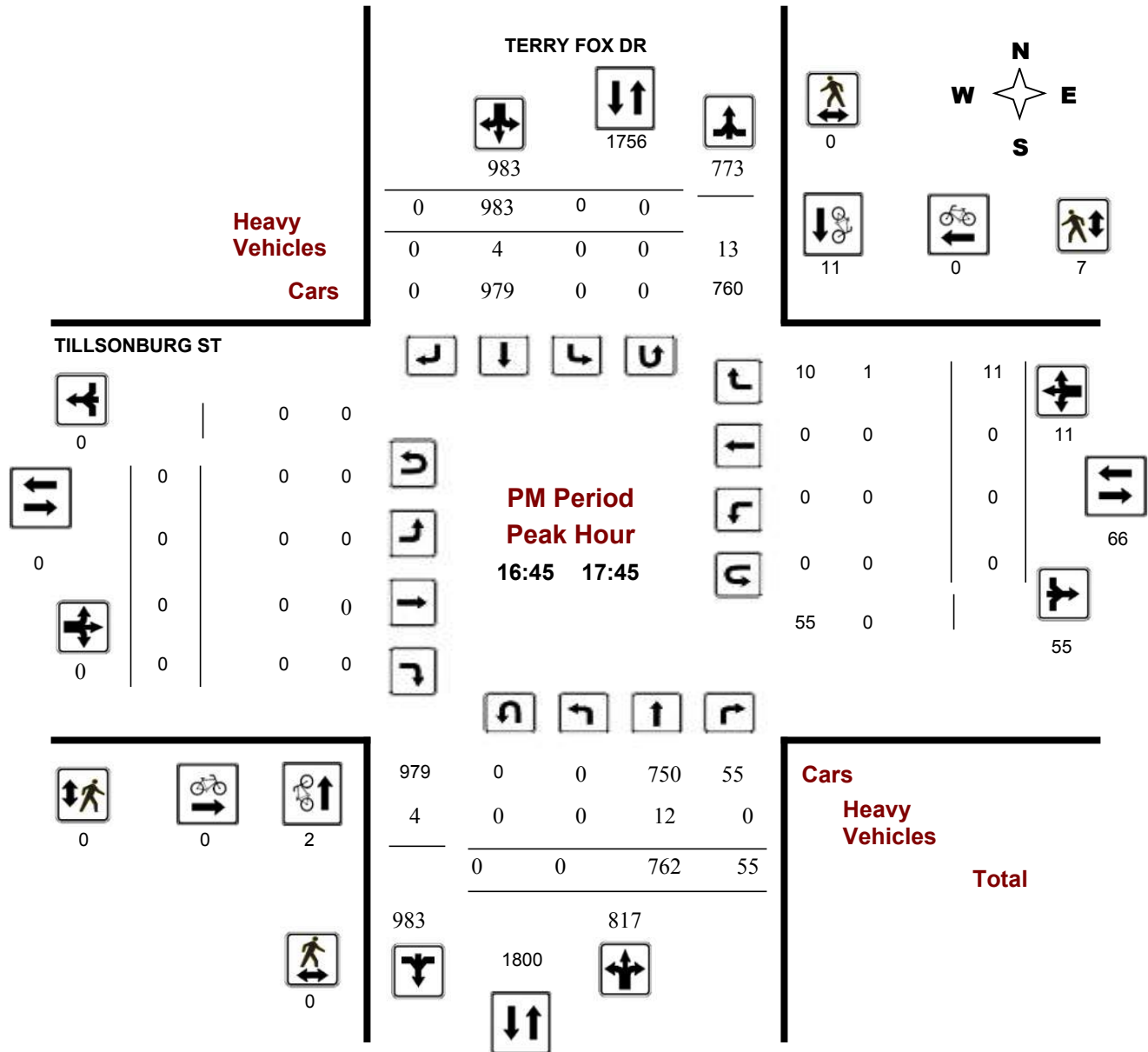
TERRY FOX DR @ TILLSONBURG ST

Survey Date: Wednesday, May 27, 2015

Start Time: 07:00

WO No: 35084

Device: Miovision



Intersection: _____

Kanata Avenue & Huntsville Drive

Survey Date: _____

Thursday, September 17, 2015

Weather: _____

Sunny

Time	Kanata Avenue		Huntsville Drive		total	15-Minute Total
	NBL	SBR	EBL	EBR		
7:00	5	0	7	13	25	
7:15	7	2	9	20	38	
7:30	4	5	19	14	42	
7:45	2	4	14	25	45	150
8:00	1	10	15	20	46	171
8:15	4	1	7	9	21	154
8:30	6	3	9	13	31	143
8:45	4	3	1	6	14	112
AM Peak (7:15-8:15)	14	21	57	79		
15:30	3	7	6	13	29	
15:45	10	11	5	15	41	
16:00	11	8	2	10	31	
16:15	9	11	12	16	48	149
16:30	14	6	10	11	41	161
16:45	18	11	10	9	48	168
17:00	17	12	7	6	42	179
17:15	12	7	4	11	34	165
PM Peak (16:15-17:15)	58	40	39	42		

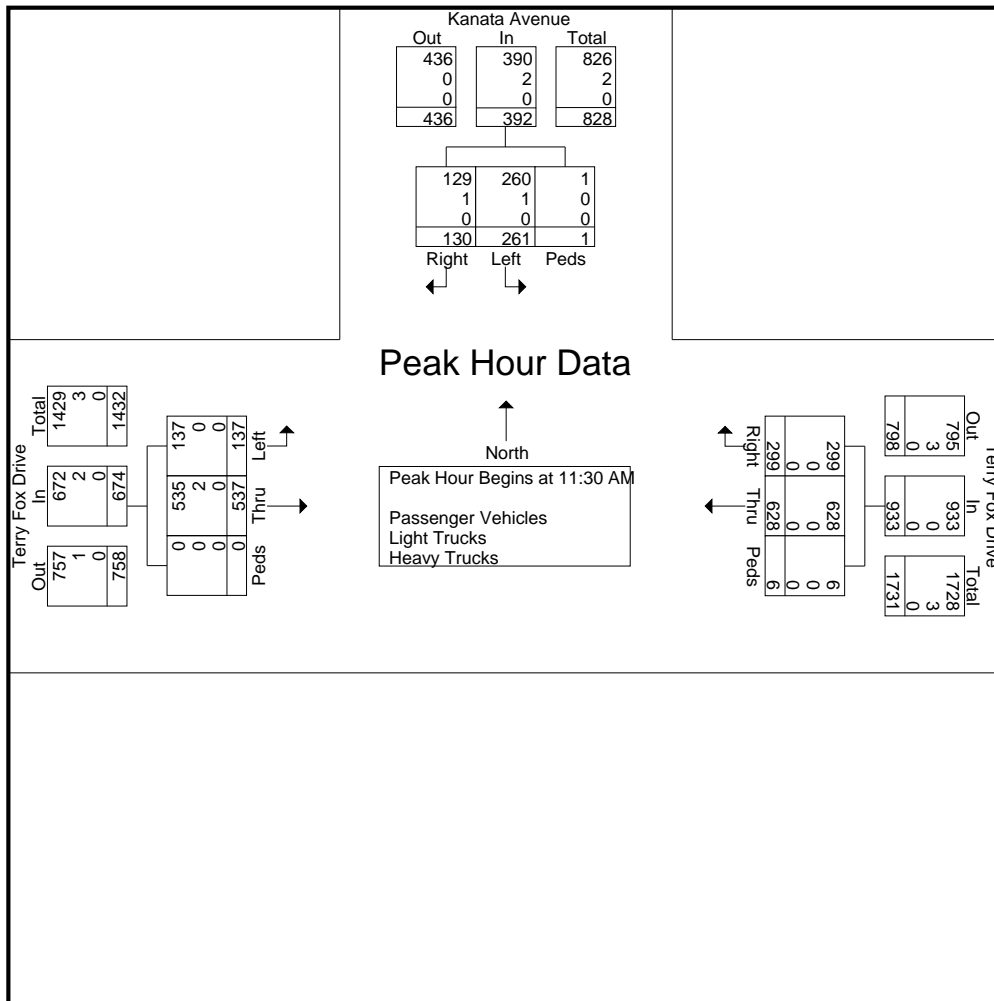
Weather: Clear
 Serial #: T12-1612&1614
 Counted by: Brad Smith & Moodie Allam
 Location: Terry Fox Dr/Kanata Ave

File Name : Kanata_TFox
 Site Code : 11813302
 Start Date : 9/15/2018
 Page No : 1

Groups Printed- Passenger Vehicles - Light Trucks - Heavy Trucks

	Kanata Avenue Southbound				Terry Fox Drive Westbound				Terry Fox Drive Eastbound				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	26	51	1	78	58	125	2	185	153	30	0	183	446
11:15 AM	16	52	0	68	58	128	2	188	148	36	0	184	440
11:30 AM	20	65	0	85	90	162	2	254	149	37	0	186	525
11:45 AM	28	56	0	84	70	143	0	213	123	53	0	176	473
Total	90	224	1	315	276	558	6	840	573	156	0	729	1884
12:00 PM	50	69	1	120	69	159	2	230	136	21	0	157	507
12:15 PM	32	71	0	103	70	164	2	236	129	26	0	155	494
12:30 PM	20	65	3	88	65	134	1	200	116	25	0	141	429
12:45 PM	20	64	0	84	50	116	1	167	129	30	0	159	410
Total	122	269	4	395	254	573	6	833	510	102	0	612	1840
01:00 PM	20	44	3	67	38	142	1	181	130	30	0	160	408
01:15 PM	13	62	0	75	48	143	4	195	138	26	0	164	434
01:30 PM	23	64	1	88	54	150	2	206	139	23	0	162	456
01:45 PM	24	66	0	90	50	138	1	189	140	15	0	155	434
Total	80	236	4	320	190	573	8	771	547	94	0	641	1732
02:00 PM	25	56	2	83	53	133	1	187	142	35	0	177	447
02:15 PM	32	49	0	81	53	115	1	169	131	41	0	172	422
02:30 PM	44	70	0	114	68	133	2	203	141	15	0	156	473
02:45 PM	31	59	2	92	54	144	1	199	128	20	0	148	439
Total	132	234	4	370	228	525	5	758	542	111	0	653	1781
03:00 PM	26	49	0	75	58	151	1	210	131	15	0	146	431
03:15 PM	18	40	0	58	63	153	3	219	125	31	0	156	433
03:30 PM	13	44	0	57	80	143	2	225	120	29	0	149	431
03:45 PM	16	48	0	64	49	138	0	187	116	22	0	138	389
Total	73	181	0	254	250	585	6	841	492	97	0	589	1684
Grand Total	497	1144	13	1654	1198	2814	31	4043	2664	560	0	3224	8921
Apprch %	30	69.2	0.8		29.6	69.6	0.8		82.6	17.4	0		
Total %	5.6	12.8	0.1	18.5	13.4	31.5	0.3	45.3	29.9	6.3	0	36.1	
Passenger Vehicles	496	1142	8	1646	1196	2810	19	4025	2654	557	0	3211	8882
% Passenger Vehicles	99.8	99.8	61.5	99.5	99.8	99.9	61.3	99.6	99.6	99.5	0	99.6	99.6
Light Trucks	1	2	5	8	2	3	12	17	9	2	0	11	36
% Light Trucks	0.2	0.2	38.5	0.5	0.2	0.1	38.7	0.4	0.3	0.4	0	0.3	0.4
Heavy Trucks	0	0	0	0	0	1	0	1	1	1	0	2	3
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0.2	0	0.1	0

File Name : Kanata_TFox
Site Code : 11813302
Start Date : 9/15/2018
Page No : 4





Weather: Clear
Serial #: N/A
Counted by: Josh Audia
Location: Terry Fox Dr/Tillsonburg St

File Name : TFox_Tillsonburg
Site Code : 11813303
Start Date : 9/15/2018
Page No : 1

Groups Printed- Passenger Vehicles - Light Trucks - Heavy Trucks

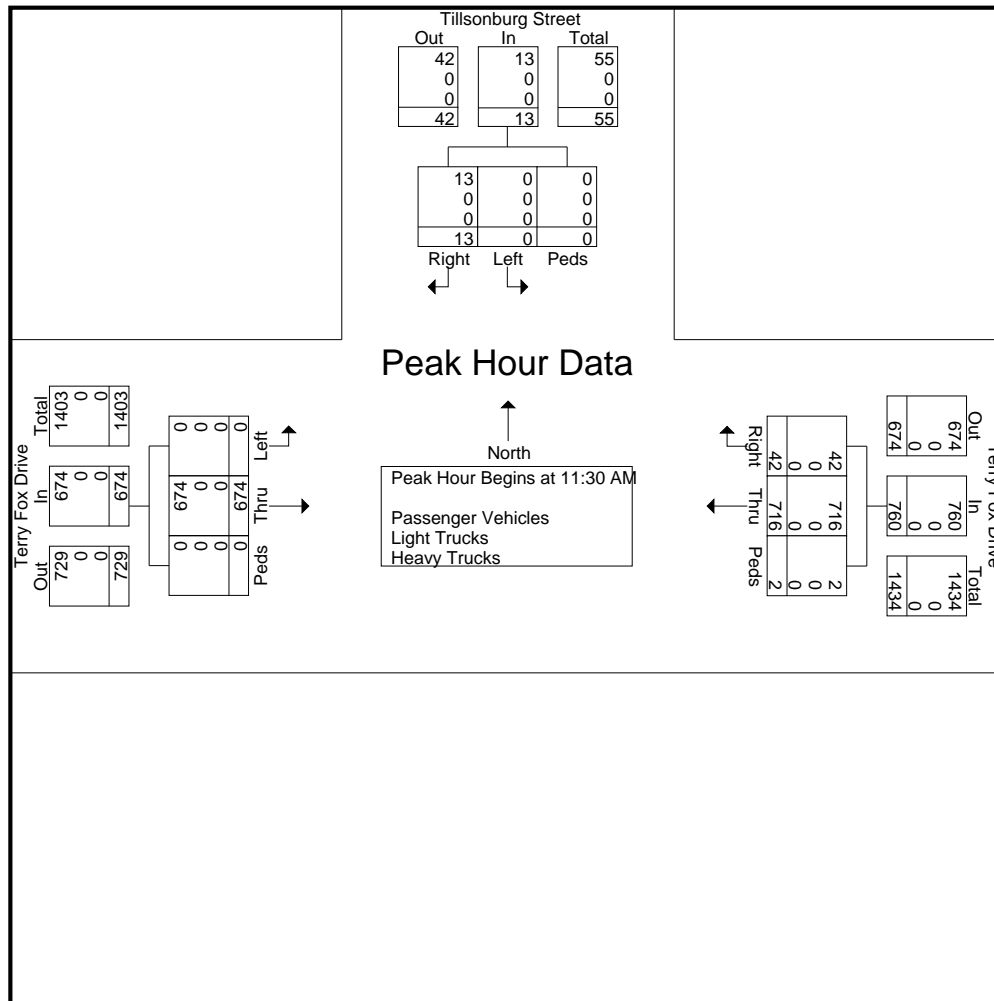
[illegible]

File Name : TFox_Tillsonburg

Site Code : 11813303

Start Date : 9/15/2018

Page No : 4



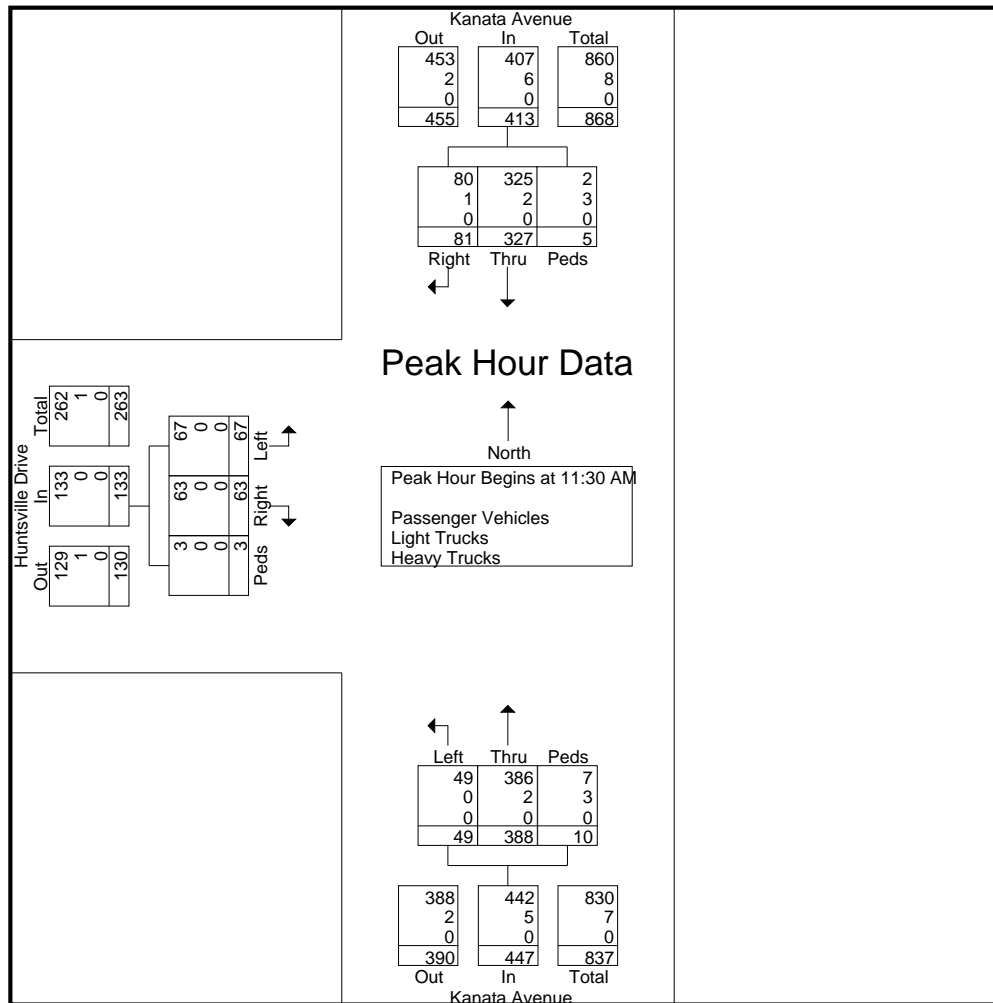
Weather: Clear
 Serial #: T12-1613
 Counted by: Cameron Chown
 Location: Kanata Ave/Huntsville Dr

File Name : kanata_huntsville
 Site Code : 11813301
 Start Date : 9/15/2018
 Page No : 1

Groups Printed- Passenger Vehicles - Light Trucks - Heavy Trucks

	Kanata Avenue Southbound				Kanata Avenue Northbound				Huntsville Drive Eastbound				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
11:00 AM	7	59	0	66	75	10	3	88	12	6	0	18	172
11:15 AM	3	59	1	63	83	13	3	99	13	10	1	24	186
11:30 AM	3	63	1	67	106	11	2	119	21	10	1	32	218
11:45 AM	12	70	3	85	130	8	3	141	12	36	0	48	274
Total	25	251	5	281	394	42	11	447	58	62	2	122	850
12:00 PM	45	93	1	139	82	10	2	94	11	11	2	24	257
12:15 PM	21	101	0	122	70	20	3	93	19	10	0	29	244
12:30 PM	6	53	0	59	91	17	2	110	23	4	1	28	197
12:45 PM	6	61	0	67	65	14	0	79	25	11	1	37	183
Total	78	308	1	387	308	61	7	376	78	36	4	118	881
01:00 PM	6	47	0	53	71	11	0	82	15	8	0	23	158
01:15 PM	7	59	2	68	76	6	0	82	17	9	3	29	179
01:30 PM	2	67	1	70	61	9	0	70	17	0	0	17	157
01:45 PM	5	70	0	75	72	10	1	83	24	7	2	33	191
Total	20	243	3	266	280	36	1	317	73	24	5	102	685
02:00 PM	7	71	2	80	92	7	0	99	12	6	2	20	199
02:15 PM	3	61	0	64	102	8	0	110	18	6	0	24	198
02:30 PM	5	77	2	84	70	9	1	80	24	3	0	27	191
02:45 PM	7	84	1	92	65	15	0	80	12	5	1	18	190
Total	22	293	5	320	329	39	1	369	66	20	3	89	778
03:00 PM	7	58	1	66	76	17	0	93	17	5	0	22	181
03:15 PM	5	52	1	58	77	19	0	96	9	9	0	18	172
03:30 PM	5	55	0	60	94	11	0	105	14	10	1	25	190
03:45 PM	8	49	0	57	76	10	1	87	18	11	0	29	173
Total	25	214	2	241	323	57	1	381	58	35	1	94	716
Grand Total	170	1309	16	1495	1634	235	21	1890	333	177	15	525	3910
Apprch %	11.4	87.6	1.1		86.5	12.4	1.1		63.4	33.7	2.9		
Total %	4.3	33.5	0.4	38.2	41.8	6	0.5	48.3	8.5	4.5	0.4	13.4	
Passenger Vehicles	169	1305	3	1477	1620	234	13	1867	332	176	7	515	3859
% Passenger Vehicles	99.4	99.7	18.8	98.8	99.1	99.6	61.9	98.8	99.7	99.4	46.7	98.1	98.7
Light Trucks	1	4	13	18	14	1	8	23	1	0	8	9	50
% Light Trucks	0.6	0.3	81.2	1.2	0.9	0.4	38.1	1.2	0.3	0	53.3	1.7	1.3
Heavy Trucks	0	0	0	0	0	0	0	0	0	1	0	1	1
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0.6	0	0.2	0

File Name : kanata_huntsville
Site Code : 11813301
Start Date : 9/15/2018
Page No : 4



APPENDIX E

Collision Records



City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2013 **To:** December 31, 2017

Location: HUNTSVILLE DR @ KANATA AVE

Traffic Control:

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2013-Dec-14, Sat,23:50	Snow	Rear end	P.D. only	Loose snow	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					East	Unknown	Pick-up truck	Other motor vehicle	

Location: KANATA AVE @ TERRY FOX DR

Traffic Control: Traffic signal

Total Collisions: 39

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Jan-10, Fri,08:09	Clear	Turning movement	P.D. only	Loose snow	South	Turning left	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-May-29, Thu,16:53	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2014-May-23, Fri,22:00	Clear	Rear end	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Aug-21, Thu,21:48	Clear	Rear end	P.D. only	Wet	West	Turning right	Automobile, station wagon	Other motor vehicle	
					West	Turning right	Pick-up truck	Other motor vehicle	

2014-Sep-05, Fri,16:26	Rain	Angle	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Turning left	Pick-up truck	Other motor vehicle
2014-Oct-28, Tue,20:14	Rain	Turning movement	P.D. only	Wet	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2015-May-13, Wed,08:59	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Pick-up truck	Other motor vehicle
2015-May-02, Sat,16:05	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Pick-up truck	Other motor vehicle
2015-Mar-10, Tue,19:06	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Pick-up truck	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Jan-13, Tue,07:17	Clear	Angle	Non-fatal injury	Slush	North	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle
2015-Aug-21, Fri,21:39	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle

2015-Jun-09, Tue,11:13	Rain	Angle	Non-fatal injury	Wet	North	Going ahead	Pick-up truck	Other motor vehicle
					West	Turning left	Pick-up truck	Other motor vehicle
2016-Sep-16, Fri,08:36	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2015-Oct-28, Wed,13:54	Rain	Rear end	P.D. only	Wet	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2015-Nov-25, Wed,18:12	Clear	Angle	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2015-Nov-27, Fri,15:38	Rain	Turning movement	P.D. only	Wet	South	Turning left	School bus	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Dec-10, Thu,13:34	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2016-Jan-17, Sun,11:21	Clear	Sideswipe	P.D. only	Wet	South	Changing lanes	Unknown	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle

2016-Jun-29, Wed,15:52	Rain	Rear end	P.D. only	Wet	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2016-Feb-22, Mon,13:49	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	School bus	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Oct-15, Sat,14:00	Clear	Angle	Non-fatal injury	Dry	West	Turning right	Automobile, station wagon	Cyclist
					North	Going ahead	Bicycle	Other motor vehicle
2017-Aug-18, Fri,15:23	Clear	SMV other	Non-fatal injury	Dry	North	Slowing or stopping	Pick-up truck	Ran off road
2017-Aug-12, Sat,15:06	Rain	Turning movement	P.D. only	Wet	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Oct-08, Sun,09:13	Clear	SMV other	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Pole (utility, power)
2016-Sep-11, Sun,16:35	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Nov-30, Wed,18:06	Rain	Turning movement	P.D. only	Wet	North	Going ahead	Pick-up truck	Other motor vehicle
					South	Turning left	Pick-up truck	Other motor vehicle

2016-Dec-12, Mon,14:16	Snow	SMV other	P.D. only	Loose snow	West	Turning right	Automobile, station wagon	Curb
2017-Mar-06, Mon,19:13	Freezing Rain	Turning movement	Non-fatal injury	Ice	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Oct-27, Thu,16:44	Snow	SMV other	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Skidding/sliding
2017-May-12, Fri,21:30	Clear	SMV other	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Curb
2017-May-02, Tue,14:55	Clear	Rear end	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					South	Turning left	Automobile, station wagon	Other motor vehicle
2017-Jul-24, Mon,16:17	Rain	Angle	Non-fatal injury	Wet	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Nov-21, Tue,18:20	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Dec-23, Sat,18:31	Snow	Turning movement	Non-fatal injury	Packed snow	East	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Sep-23, Sat,09:29	Clear	Angle	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle

					West	Turning left	Automobile, station wagon	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle
2017-Oct-09, Mon,12:45	Rain	Angle	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle
2013-Feb-06, Wed,18:07	Clear	Angle	P.D. only	Dry	West	Turning right	Pick-up truck	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Feb-09, Sat,00:00	Snow	SMV other	P.D. only	Loose snow	North	Turning right	Automobile, station wagon	Skidding/sliding
2013-Sep-09, Mon,12:27	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Passenger van	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle

APPENDIX F

Internal Capture Summary Sheets

Analyst A
 Date 11/15/18

MULTI-USE DEVELOPMENT TRIP GENERATION AND INTERNAL CAPTURE SUMMARY

Name of Dvlpt HERITAGE HILLS
 Time Period AM PEAK

LAND USE A 820

ITE LU Code RETAIL
 Size 23,849 SF

	Total	Internal	External
Enter	12	2	10
Exit	7	1	6
Total	19	3	16
%	100%	16%	84%

Exit to External
 Enter from External

20% 1 Demand 1 Balanced	20% 2 Demand 2 Balanced	% Demand <input type="text"/> Balanced	% Demand <input type="text"/> Balanced
20% 8 Demand	20% 8 Demand	% Demand	% Demand

LAND USE B 944

ITE LU Code GAS STATION
 Size 8 PUMPS

	Total	Internal	External
Enter	42	1	41
Exit	42	2	40
Total	84	3	81
%	100%	1%	9%

Exit to External
 Enter from External

LAND USE C _____

ITE LU Code _____
 Size _____

	Total	Internal	External
Enter			
Exit			
Total			
%			

Enter from External
 Exit to External

Net External Trips for Multi-Use Development

	LAND USE A	LAND USE B	LAND USE C	TOTAL
Enter				
Exit				
Total				
Single-Use Trip Gen Est				

Source: Kaku Associates, Inc.

INTERNAL CAPTURE

Analyst
 Date 11/15/18

MULTI-USE DEVELOPMENT TRIP GENERATION AND INTERNAL CAPTURE SUMMARY

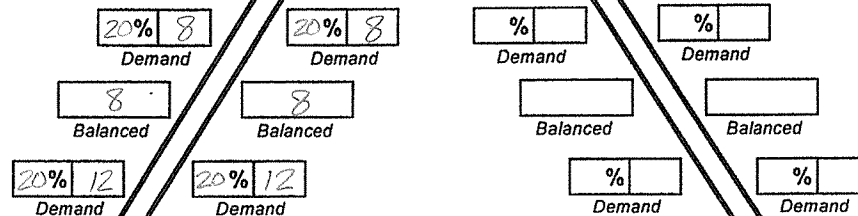
Name of Dvlpt HERITAGE HILLS
 Time Period PM PEAK

LAND USE A 820

ITE LU Code <u>RETAIL</u>			
Size <u>23,849</u> ft^2			
	Total	Internal	External
Enter	39	8	31
Exit	42	8	34
Total	81	16	65
%	100%	19%	81%

Exit to External

 Enter from External

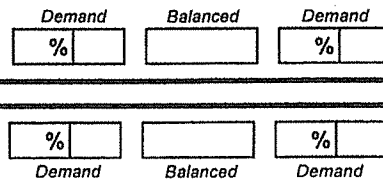


LAND USE B 944

ITE LU Code <u>GAS STATION</u>			
Size <u>8 PUMPS</u>			
	Total	Internal	External
Enter	58	8	50
Exit	58	8	50
Total	116	16	100
%	100%	13%	87%

Exit to External

 Enter from External



LAND USE C

ITE LU Code <u> </u>			
Size <u> </u>			
	Total	Internal	External
Enter			
Exit			
Total			
%			

Enter from External

 Exit to External

Net External Trips for Multi-Use Development

	LAND USE A	LAND USE B	LAND USE C	TOTAL
Enter				
Exit				
Total				
Single-Use Trip Gen Est				

Source: Kaku Associates, Inc.
 INTERNAL CAPTURE

Analyst K
Date 11/15/18

MULTI-USE DEVELOPMENT TRIP GENERATION AND INTERNAL CAPTURE SUMMARY

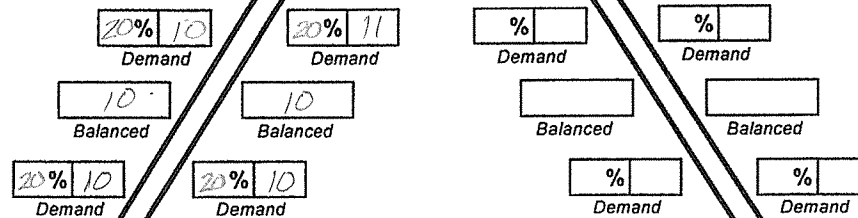
Name of Dvlpt HERITAGE HILLS
Time Period SAT PEAK

LAND USE A 820

ITE LU Code RETAIL
Size 23,849 FT²

	Total	Internal	External
Enter	53	10	43
Exit	49	10	39
Total	102	20	82
%	100%	19%	81%

Exit to External
Enter from External



LAND USE B 944

ITE LU Code GAS STATION
Size 8 PUMPS

	Total	Internal	External
Enter	52	10	42
Exit	52	10	42
Total	104	20	84
%	100%	19%	81%

Exit to External
Enter from External

LAND USE C _____

ITE LU Code _____
Size _____

	Total	Internal	External
Enter			
Exit			
Total			
%			

Enter from External
Exit to External

Net External Trips for Multi-Use Development

	LAND USE A	LAND USE B	LAND USE C	TOTAL
Enter				
Exit				
Total				
Single-Use Trin Gen Est				

Source: Kaku Associates, Inc.

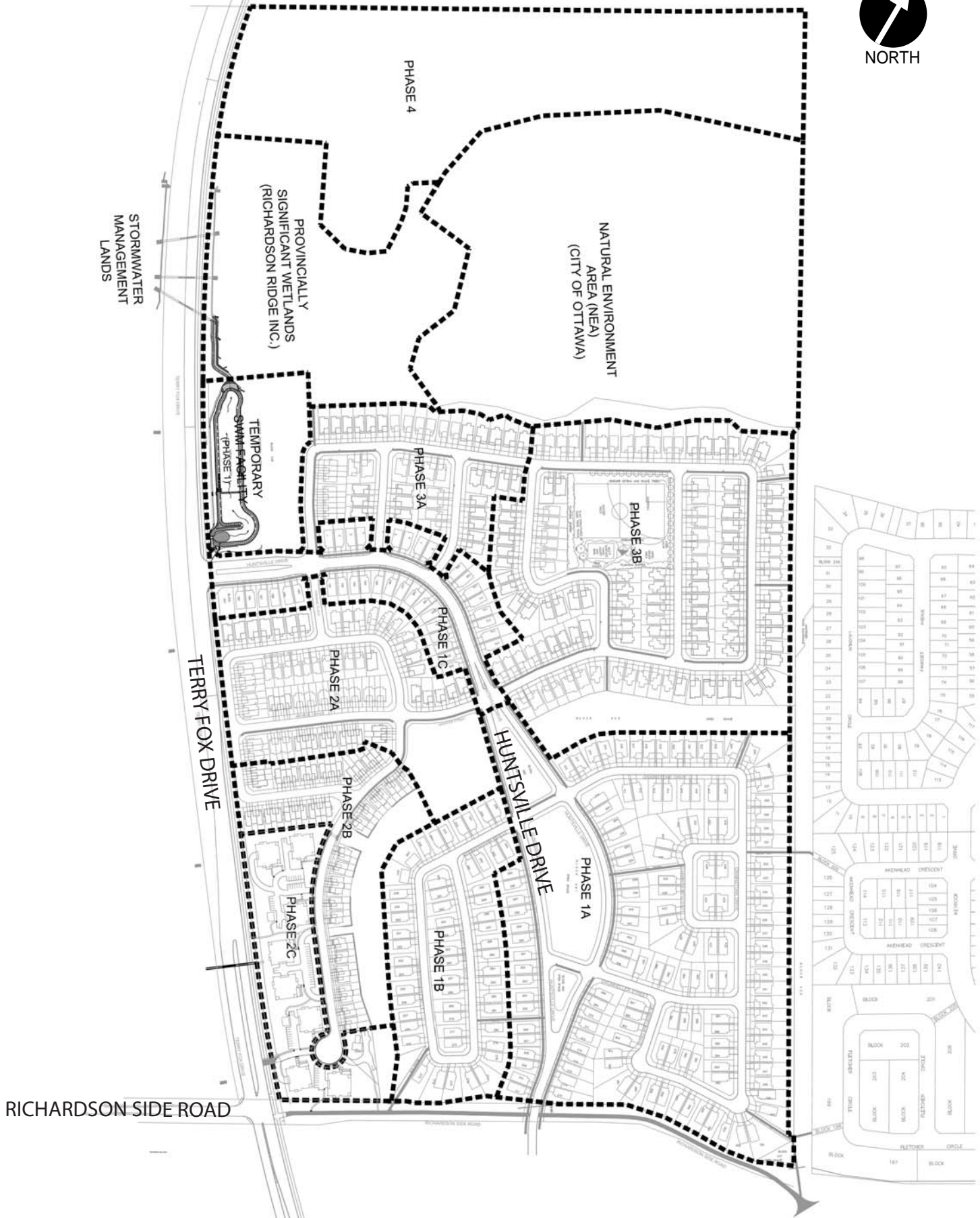
INTERNAL CAPTURE

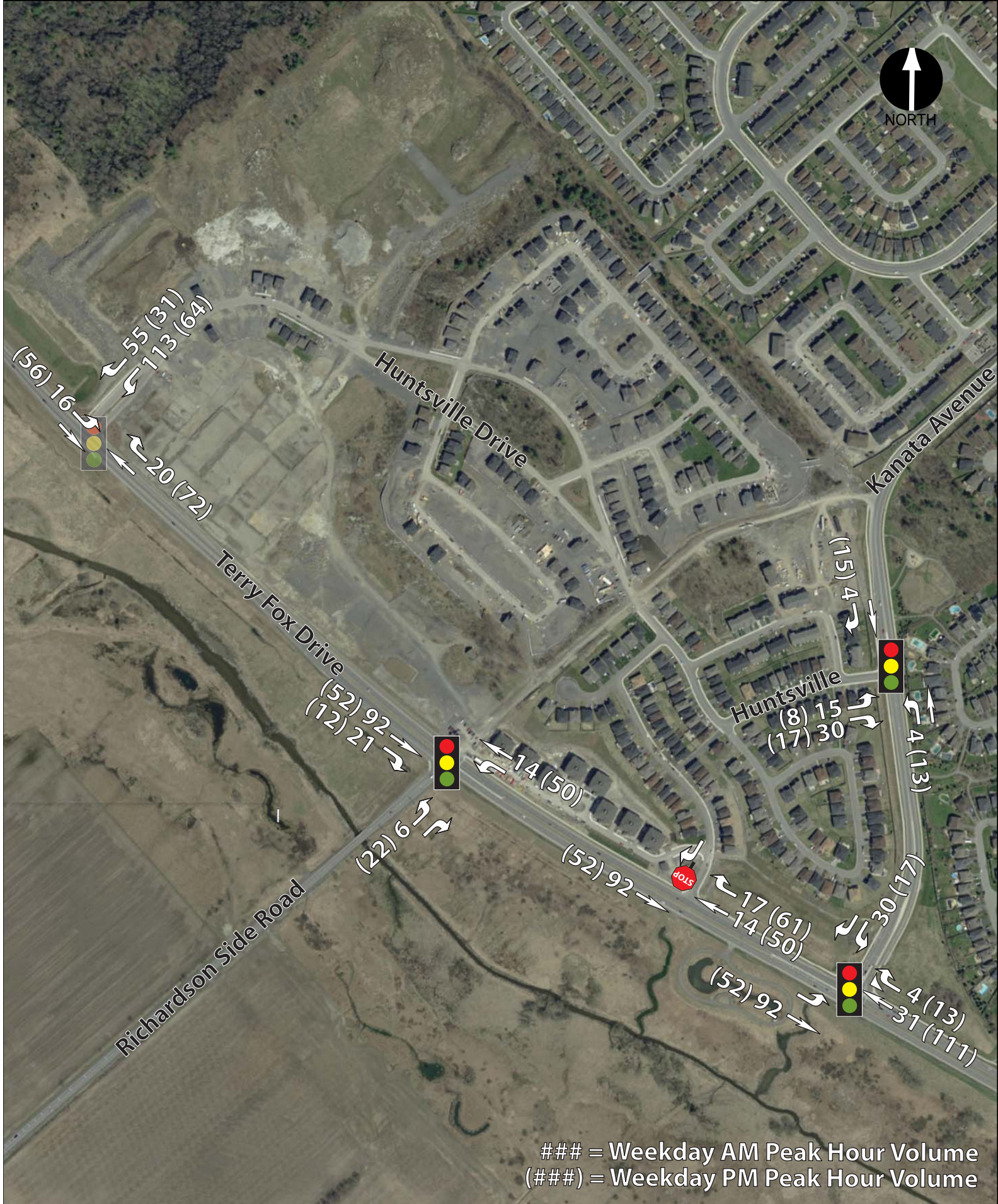
APPENDIX G

Other Area Developments

Other Area Developments

Richardson Ridge Subdivision (Phases 1-3)





= Weekday AM Peak Hour Volume
(###) = Weekday PM Peak Hour Volume



Other Area Developments

Richardson Ridge Subdivision (Phase 4)



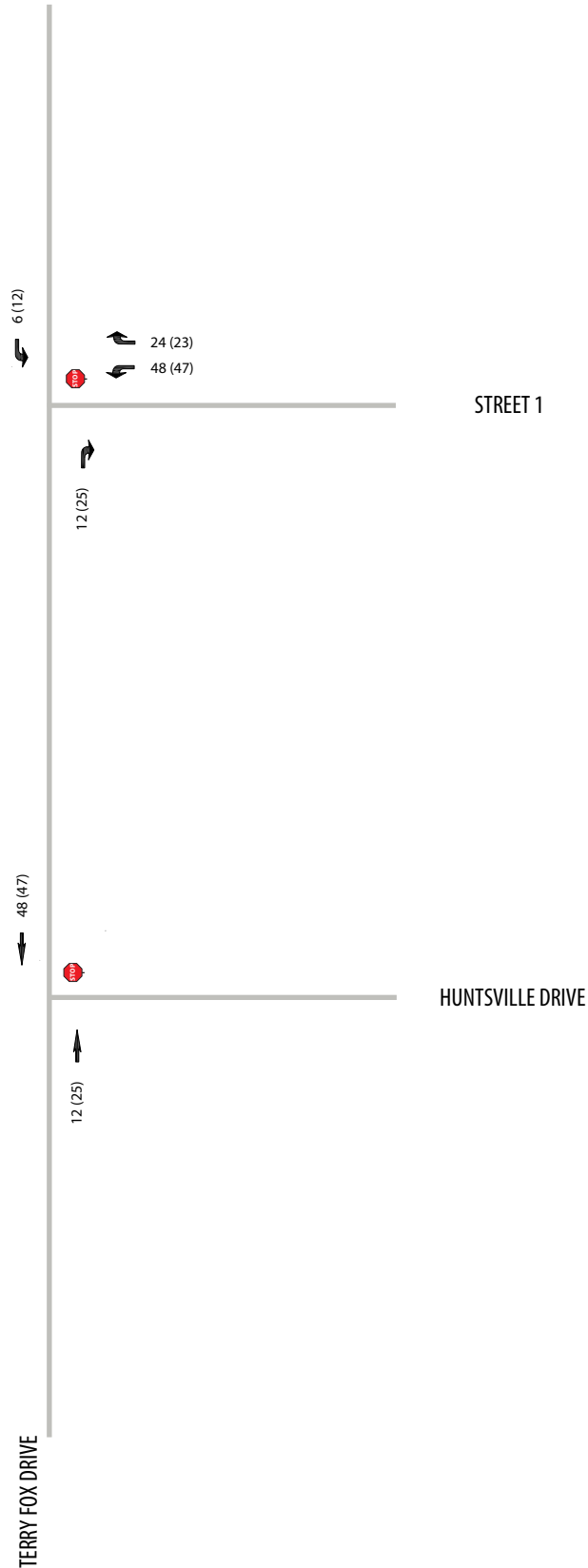
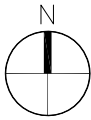
Richardson Ridge Phase 4
Transportation Impact Study

Exhibit 1
Site Location

PROJECT No. 39606
DATE: JULY 2016
SCALE:



PHASES 4 VOLUMES



LEGEND

XX (XX) - AM (PM) PEAK HOUR TRAFFIC VOLUMES



Other Area Developments

Broughton Subdivision (Phase 3B)



GENERAL NOTES

Every visitor parking will be clearly visible with signage in front of every parking space.

LEGEND

Amenity area
Bicycle parking
Fence
Retaining wall
Fire truck path

PROPERTY INFORMATION

PIN 04510 - 0303
BLOCK 181
REGISTERED PLAN 4M-1413
CITY OF OTTAWA
Surveyed by Ament, O'Sullivan, Vallabekki Ltd.

Item	Description	Quantity	Unit
1	Concrete sidewalk	120.00	m ²
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RICHARDSON SIDE ROAD
(CLOSED)

BUILDING 3
4 storey
79 units
93 interior parking (2 levels)

UNDERGROUND PARKING

BICYCLE PARKING (24)

T/SLAB=116.16
USF=115.81
EXISTING BUILDING 2
3 storey
12 units

PLAN

EXISTING BUILDING 1
3 storey
16 units

T/SLAB=114.04
USF=114.00

EXISTING BUILDING 4
4 storey
79 units
59 interior parking (1 level)

T/SLAB=113.30
USF=112.22

BLOCK 185
RESERVE

BLOCK 185
RESERVE

BLOCK 177
RESIDENTIAL TOWNHOUSES
IN DEVELOPMENT

NOTES GÉNÉRALES General Notes

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SCAU Scau

CLIENT Client

OUVRAGE Project
Kanata Lakes
124 Battersea Crescent

EMPLACEMENT Location
OTTAWA

NO PROJET No.
10883

NO	REVISION	DATE (aa.mm.jj)
A	Site plan Pre-consultation	2016-12-08
B	City preliminary comments	2017-04-04
C	Site Plan Revision	2017-08-XX

DESIGNER PAR Drawn by
A.B.

DATE (aa.mm.jj)
17.01.25

TITRE DU Dessin Drawing Title
Site plan

VÉRIFIÉ PAR Checked by
A.B.

ÉCHELLE Scale
1:250

REVISION Revision
C

NO. Dessin Drawing Number
A100

The estimated vehicle trip rates with access to Kanata Avenue have been summarized in the following table. A marginal number of trips will be added to the Battersea Crescent access as 10 surface parking spaces are to be provided in the Battersea Crescent parking lot. These spaces represent 9% of the total parking associated with the new building and will likely result in less than 5 new vehicle trips per hour in the a.m. and p.m. peaks. The trips to/from Battersea Crescent are not significantly influenced by the additional building, and therefore have not been included in this summary. Trips to/from Battersea Crescent will continue to be significantly less than the 2013 approved site plan.

Table 1 | Broughton Subdivision Phase 3B Trip Generation (Revised)

Land Use	ITE Code	Units	AM Peak	PM Peak
Phase 3B Development Based on Approved Site Plan (Addendum 3)				
Condominiums (Kanata Ave.)	230	75	41 vph 7 in / 34 out	47 vph 31 in / 16 out
Phase 3B Development Based on an Additional Building				
Condominiums (Kanata Ave.)	230	150	71 vph 12 in / 59 out	84 vph 56 in / 28 out
Net difference in trips generated (from Addendum 3)			5 in / 25 out	25 in / 12 out

Note: The relationship identified by ITE between condominium units and vehicle trips is not linear resulting in fewer vehicle trips for the additional 75 units than was estimated for the initial 75 units.

The proposed revision to the Phase 3B site plan is expected to result in 30 to 40 additional vehicle trips at the Kanata Avenue access in the weekday a.m. and p.m. peaks. This amounts to an additional vehicle every 1.5 to two minutes.

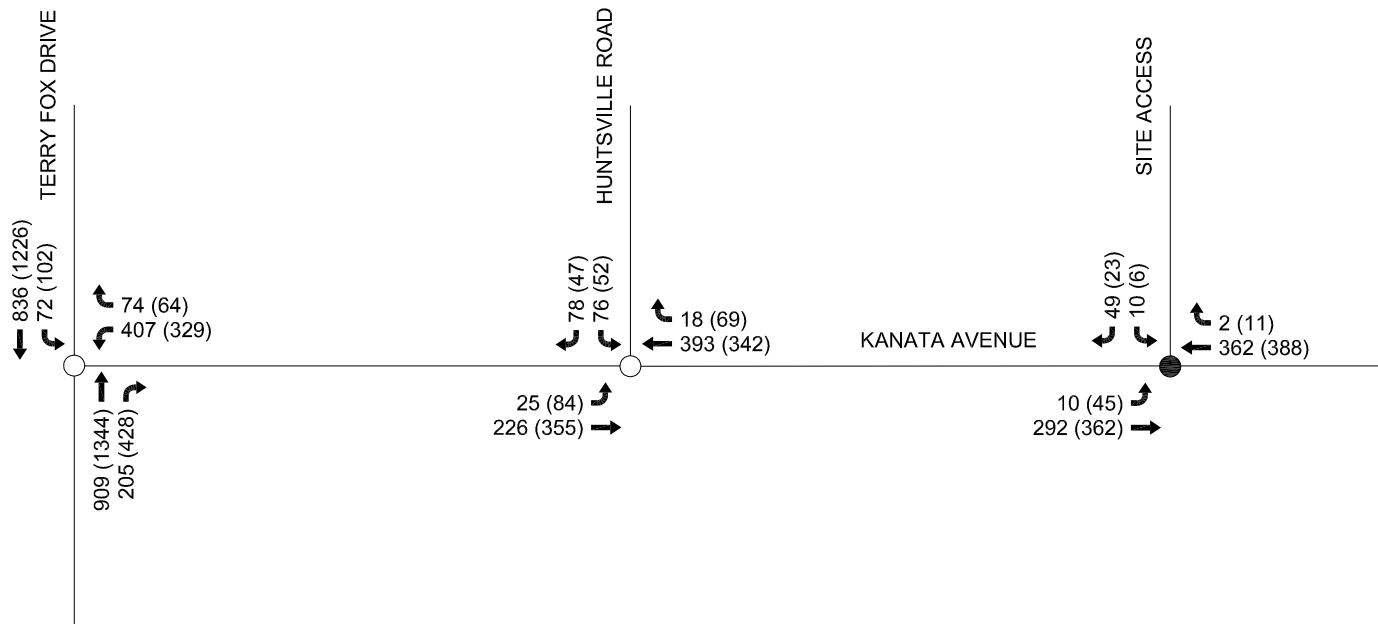
3.3.2 Trip Assignment

The trip assignment of the Phase 3B site traffic has been carried forward from the original TIS. A review of the 2011 OD data for the Kanata-Stittsville district was undertaken which confirmed the trip assignment applied in the original TIS remains reasonable. The trip assignment parameters for the Phase 3B trips are outlined as follows:

- **AM Peak Hour**
 - 35% to/from the north (evenly split between Terry Fox Drive and Kanata Avenue)
 - 65% to/from the south via Terry Fox Drive
- **PM Peak Hour**
 - 40% to/from the north (evenly split between Terry Fox Drive and Kanata Avenue)
 - 60% to/from the south via Terry Fox Drive.

3.4 Intersection Capacity Analysis

Revised 2018 and 2023 total traffic volumes for the full build-out scenario are shown in **Figure 3** and **Figure 4**.



Engineers, Planners & Landscape Architects

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Ottawa, Ontario, Canada K2M 1P6

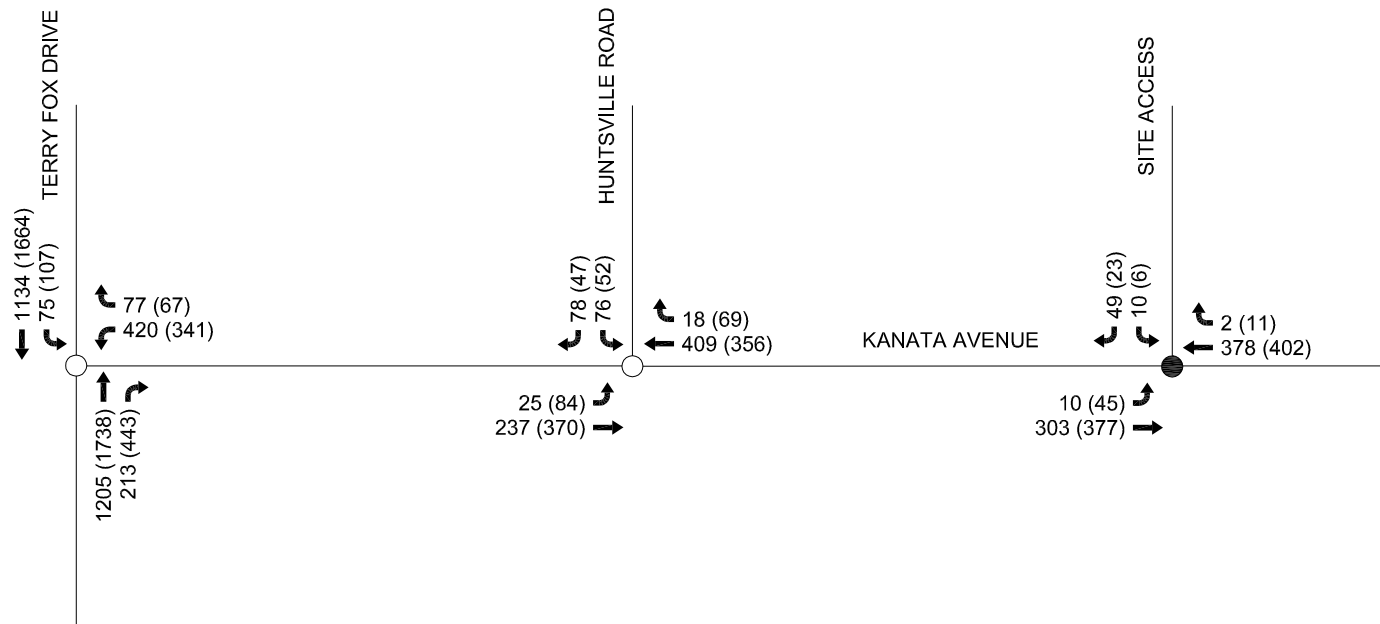
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LEGEND

- Unsignalized Intersection
- Signalized Intersection
- xx VPH AM Peak Hour
- (xx) VPH PM Peak Hour

KANATA LAKES 124 BATTERSEA CRESCENT 2018 TOTAL TRAFFIC

12/21/2016 110105 FIGURE 3



Engineers, Planners & Landscape Architects

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LEGEND

- Unsignalized Intersection
- Signalized Intersection
- xx VPH AM Peak Hour
- (xx) VPH PM Peak Hour

KANATA LAKES
124 BATTERSEA CRESCENT

2023 TOTAL TRAFFIC

12/21/2016 110105 **FIGURE 4**

Other Area Developments

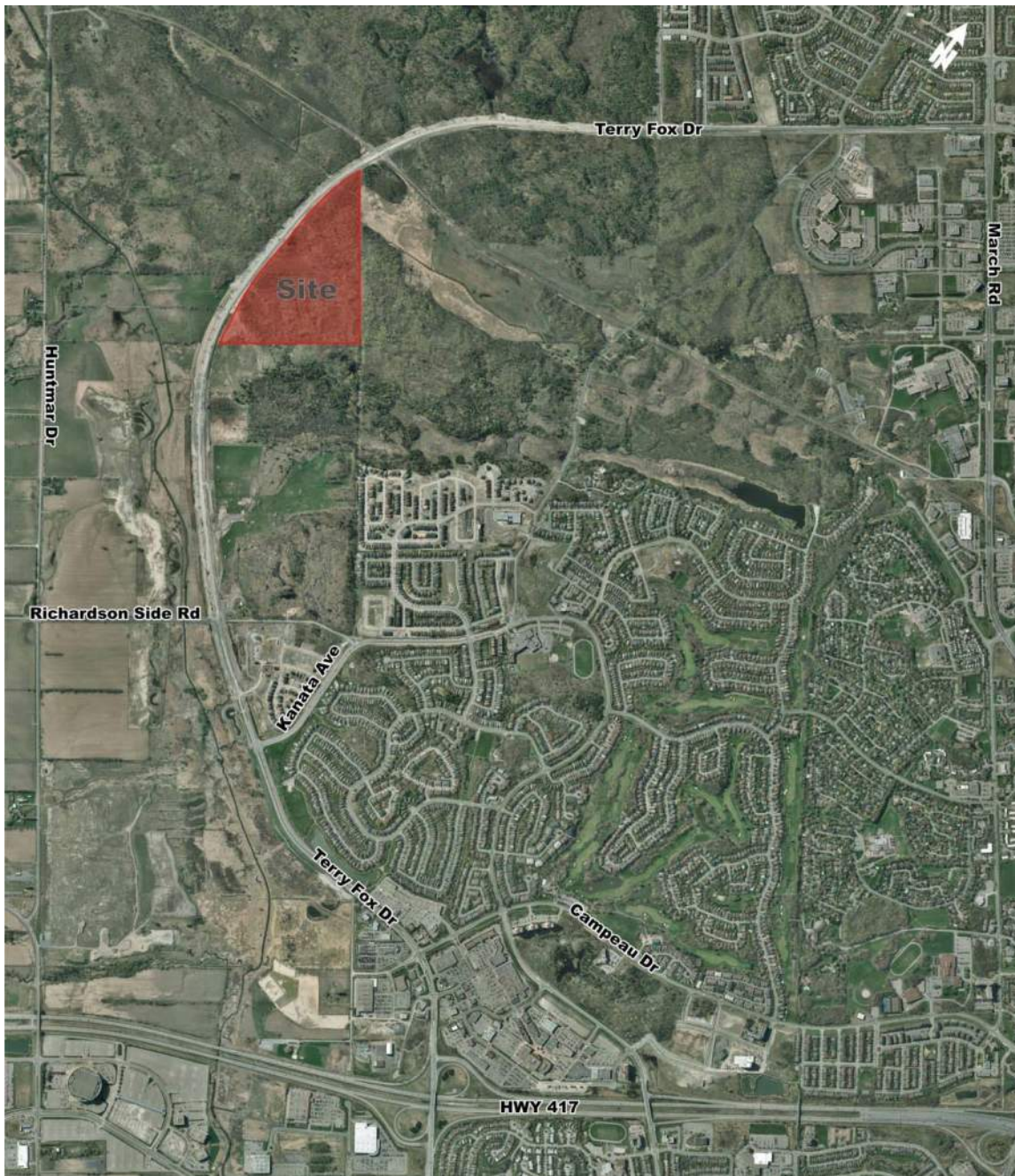
Kanata Highlands (Phase 1)

Traffic Impact Study

1. INTRODUCTION

Richcraft is proposing a 435 unit residential subdivision on the lands in Kanata located adjacent to Terry Fox Drive between Richardson Side Road and Second Line Road approximately midway. The site's context is shown in Figure 1 and the Site Plan is shown on Figure 2. As shown on the Site Plan, two roadway connections are proposed to Terry Fox Drive and one is shown connecting to the residential subdivision to the south.

Figure 1: Local Context



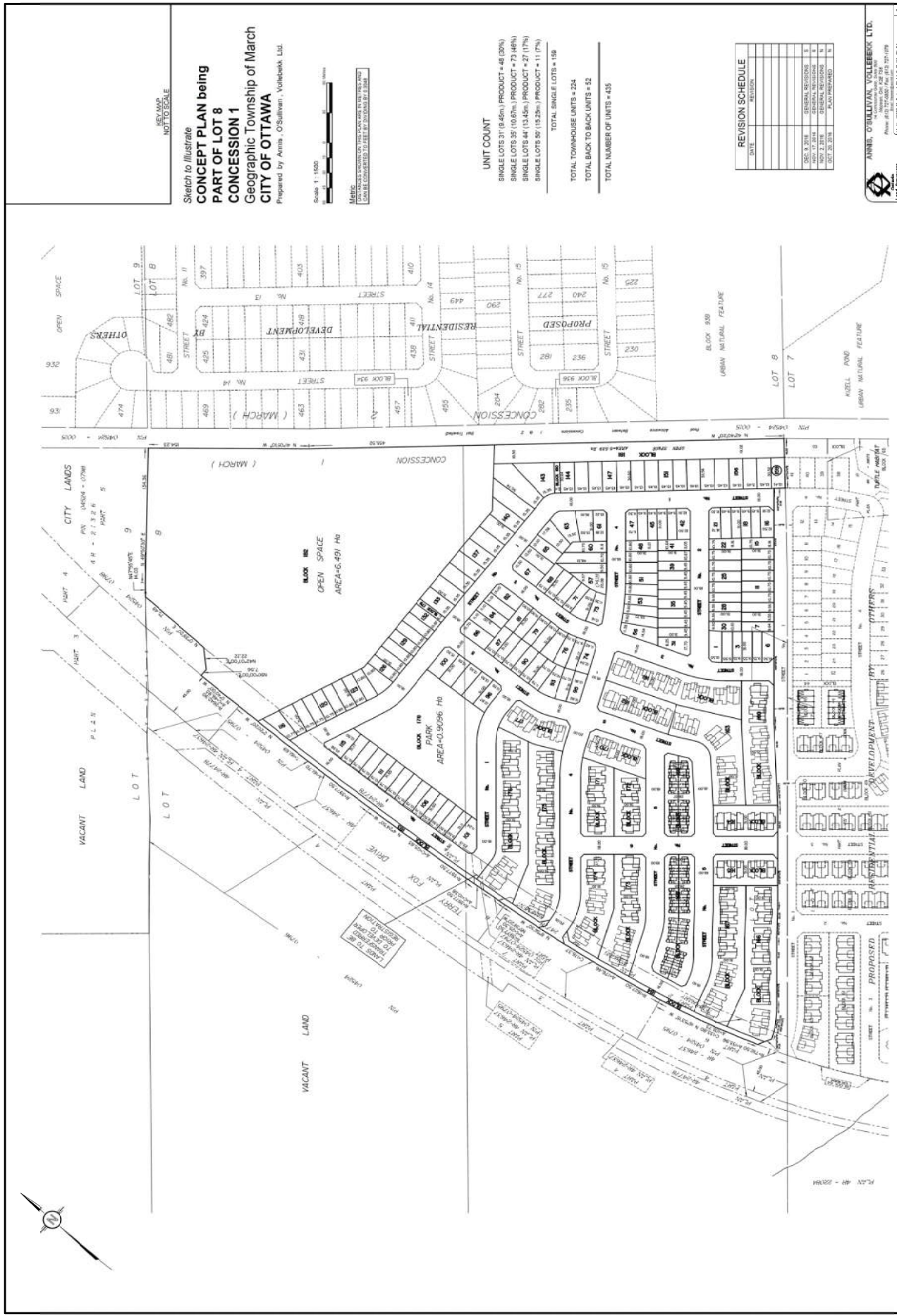


Figure 2: Proposed Plan of Subdivision

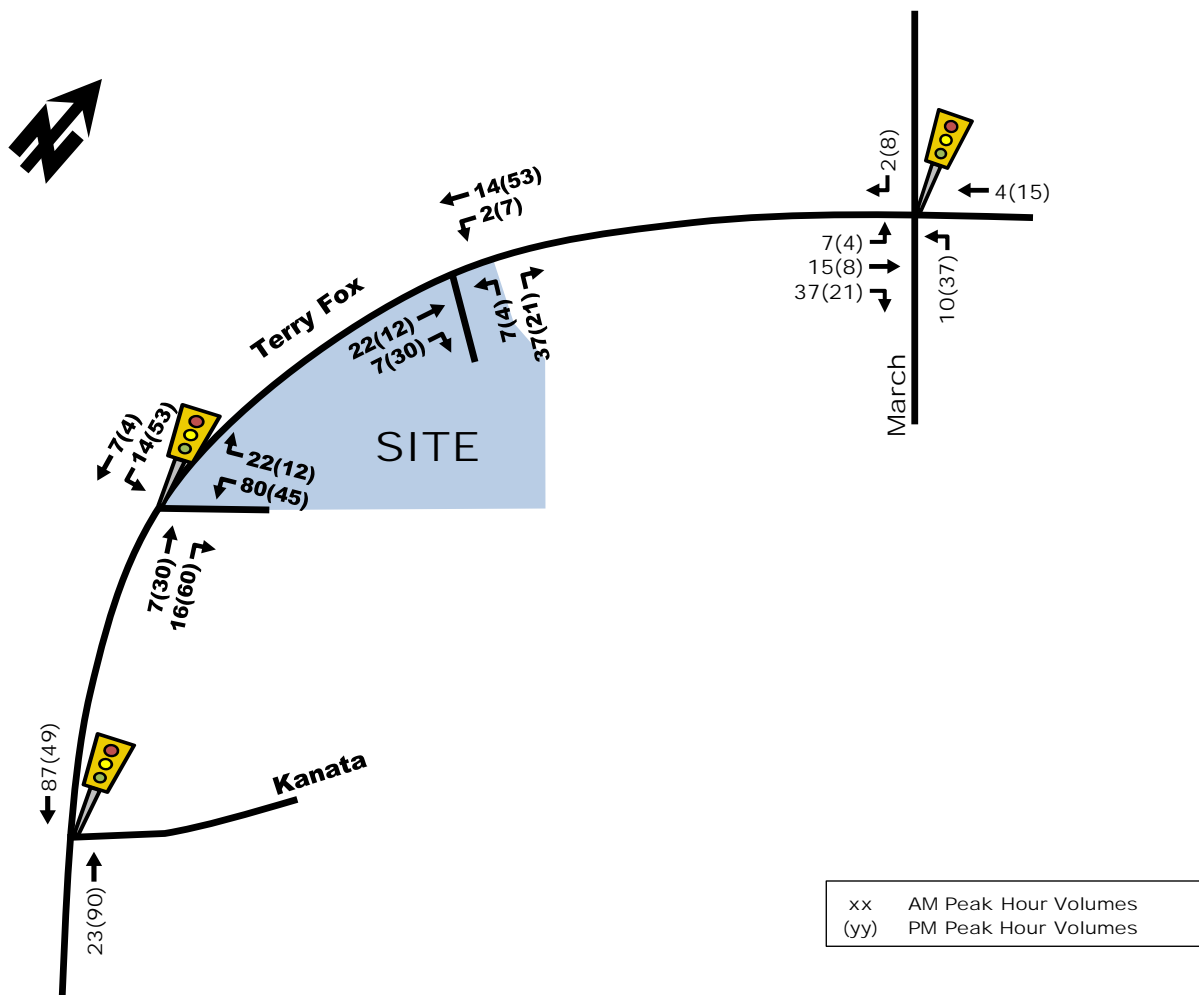
As shown in Table 4, the resulting number of potential “new” two-way vehicle trips generated by the proposed subdivision and approximately 185 veh/h and 230 veh/h during the morning and afternoon peak hours, respectively. It is these volumes that will be assigned to the proposed site intersections and the study area’s signalized intersections to determine impacts and requirements.

4.5. TRAFFIC DISTRIBUTION AND ASSIGNMENT

Traffic distribution is impacted by a number of factors when considering a residential site plan. Included are locations of employment and retail, subdivision driveway connections to adjacent arterial roads and connectivity to the area’s main commuter/highway routes. Given the location of the proposed subdivision, located between two major arterials (Terry Fox Drive and March Road) that both provide access to HWY 417, the distribution to/from the site is estimated to be 60% to the south via Terry Fox Drive and 40% to the east towards March Road. Applying this distribution to the Table 4 projected peak hour traffic generation and assigning it to the subdivision’s two proposed roadway connections to Terry Fox Drive results in the traffic assignment depicted in Figure 6. It is noteworthy that the percentage distribution at the Terry Fox/March intersection is approximately the same as existing conditions.

With regard to subdivision access to Terry Fox Drive, given the southern driveway connection will be shared with the Richardson Ridge subdivision to the south, it is likely this access will warrant signalization. As such, a greater percentage of left-turning vehicles into and out of the site were assigned to the southern intersection under the assumption it will be signalized.

Figure 6: Site-Generated Peak Hour Traffic Assignment



Other Area Developments

Kanata Highlands (Phase 2)

TIA Forecasting Report

1. SCREENING FORM

The screening form was completed to assess the need for a Transportation Impact Assessment (TIA) and is provided in Appendix A. The Trip Generation, Location and Safety triggers were met based on the unit count of 680 single family homes, townhomes, condos, cycling spine network, and road speed/geometry.

2. DESCRIPTION OF PROPOSED DEVELOPMENT

2.1. PROPOSED DEVELOPMENT

The proposed Official Plan Amendment (OPA) for the development at 820 Huntmar Drive is a greenfield development, forming part of the Kanata Lakes-Marchwood Lakeside-Morgan's Grant and Carp community along Terry Fox Drive. The current zoning for the developable portion is Rural Countryside (RU), permitting agricultural use, animal care establishment, animal hospital, artist studio, bed and breakfast, cemetery, detached dwelling, equestrian establishment, environmental preserve and educational area, forestry operation, group home, home-based business, home-based day care, kennel, converted retirement home, or secondary dwelling unit. The proposed OPA will redesignate these lands to Residential once they are brought into the General Urban Area. The site's local context is illustrated in Figure 1.

The development will include approximately 680 residential units, including 370 single family homes, 190 townhomes and 120 condominium units. The development will access Terry Fox Drive directly through two proposed accesses. The estimated date of occupancy is 2022 with one phase of development. The site plan is illustrated in Figure 2.

The Zoning By-Law will be the City regulatory documents primarily used for analysis of the OPA.

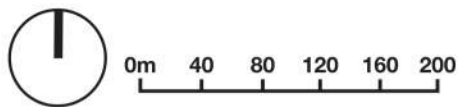
Figure 1: Local Context



KANATA HIGHLANDS / HAUTES TERRES DE KANATA PHASE 2

PREFERRED PLAN / PLAN PRIVILÉGIÉ

- LEGEND / LÉGENDE
- RICHCRAFT PROPERTY BOUNDARY / LIMITES DE LA PROPRIÉTÉ DE RICHCRAFT
 - DEVELOPABLE AREA / SECTEUR D'AMÉNAGEMENT
 - STORMWATER MANAGEMENT FACILITY / INSTALLATION DE GESTION DES EAUX PLUVIALES
 - FORMER FLOODPLAIN / ANCIENNE PLAINE INONDABLE
 - FORMER FLOODPLAIN 15M BUFFER / ZONE TAMPON DE 15M DE L'ANCIENNE PLAINE INONDABLE
 - UPDATED FLOODPLAIN / CARTOGRAPHIE À JOUR DES PLAINES INONDABLES
 - UPDATED FLOODPLAIN 15M BUFFER / ZONE TAMPON DE 15M DES PLAINES INONDABLES REVUE
 - MEANDER BELT / LIT DES MÉANDRES
 - MEANDER BELT 15m BUFFER / ZONE TAMPON DE 15 M DU LIT DES MÉANDRES
 - REGULATORY LIMIT / LIMITE RÉGLEMENTAIRE
 - STREET / RUE
 - PARK / PARC
 - OPEN SPACE / ESPACE LIBRE
 - PATHWAY / SENTIER
 - SERVICING CORRIDOR / COULOIR DE VIABILISATION
 - HIGH-DENSITY RESIDENTIAL / ZONE RÉSIDENTIELLE DE HAUTE DENSITÉ
 - LOW-MEDIUM DENSITY RESIDENTIAL / ZONE RÉSIDENTIELLE DE DENSITÉ MOYENNE À FAIBLE
 - CARP RIVER / RIVIÈRE CARP
 - TURTLE CORRIDOR / COULOIR DE MIGRATION DES TORTUES

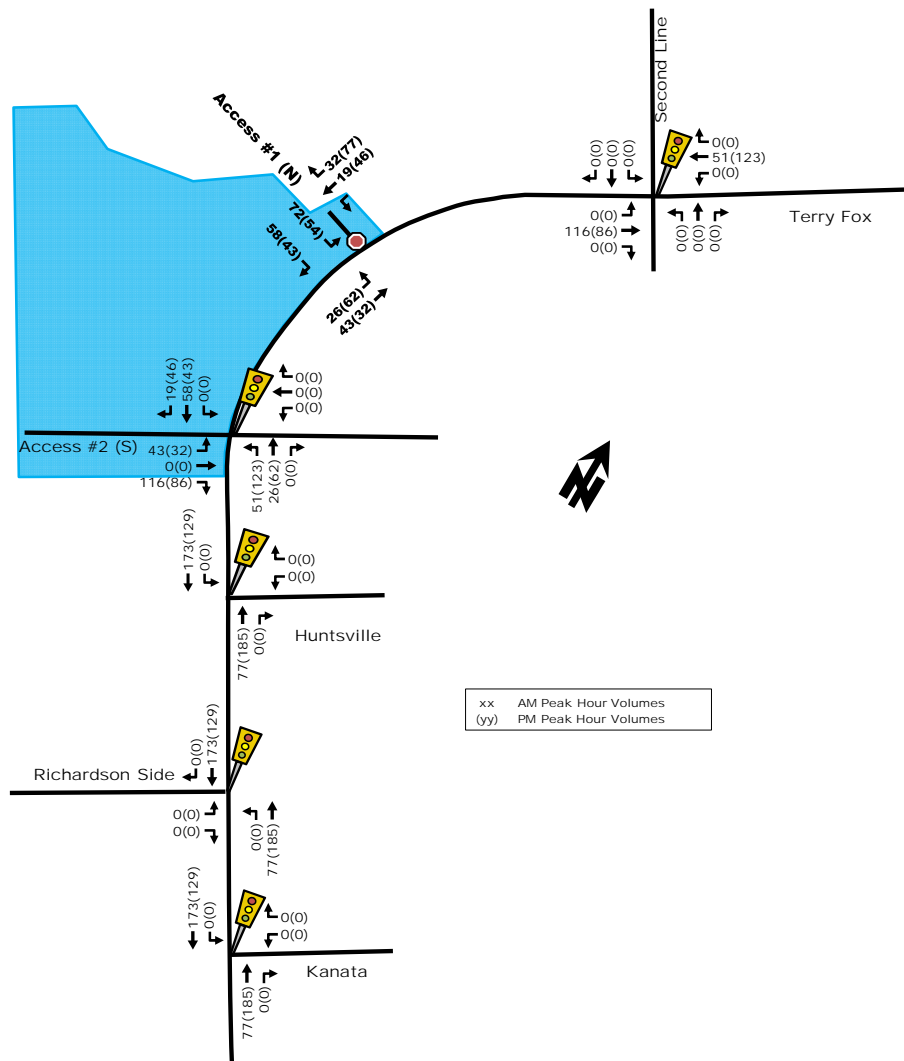


DATE
MAY 29, 2018

FOTENN
Planning + Design



Figure 9: Site Trip Generated Trip Volumes



10. BACKGROUND NETWORK TRAVEL DEMANDS

10.1. TRANSPORTATION NETWORK PLANS

The transportation network changes have been discussed within Section 4.1 and none are anticipated to impact the transportation analysis for this development.

10.2. BACKGROUND GROWTH

Within the vicinity of the subject development is expected to continue to develop and use of Terry Fox Drive as an arterial route will also continue. As such, a 2% annual background traffic growth rate for the mainline volumes along Terry Fox Drive.

As the subject development will share the access road to Terry Fox Drive with the Richardson Ridge Phase 4 subdivision, traffic volume projections from the Richardson Ridge Subdivision are included in the background traffic growth analysis. The resultant traffic volumes for the years 2024, representing full built-out and occupancy and 2029 representing 5-years

APPENDIX H

Transportation Demand Management Checklist

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

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

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
1. WALKING & CYCLING: ROUTES		
1.1 Building location & access points		
BASIC	1.1.1 Locate building close to the street, and do not locate parking areas between the street and building entrances	<input checked="" type="checkbox"/>
BASIC	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	<input checked="" type="checkbox"/>
BASIC	1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	<input checked="" type="checkbox"/>
1.2 Facilities for walking & cycling		
REQUIRED	1.2.1 Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations (<i>see Official Plan policy 4.3.3</i>)	<input type="checkbox"/> - N/A, no rapid transit routes in area
REQUIRED	1.2.2 Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible (<i>see Official Plan policy 4.3.12</i>)	<input checked="" type="checkbox"/>

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

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

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

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

APPENDIX I

Intersection MMLOS Analysis

Pedestrian Level of Service (PLOS)

Exhibit 5 of the Addendum to the MMLOS guidelines has been used to evaluate the PLOS at all signalized intersections within the study area. Exhibit 22 of the MMLOS guidelines suggests a target PLOS C for all roadways within the General Urban Area.

The results of the intersection PLOS analysis are summarized in **Table 1** and **Table 2**.

Bicycle Level of Service (BLOS)

Exhibit 12 of the MMLOS guidelines has been used to evaluate the BLOS at all signalized intersections within the study area. For the General Urban Area, Exhibit 22 of the MMLOS guidelines suggests a target BLOS B for Local Routes (Kanata Avenue), a target BLOS C for Spine Routes (Terry Fox Drive), and a target BLOS D for roadways with no bike classification (Huntsville Drive).

The results of the intersection BLOS are summarized in **Table 3**.

Transit Level of Service (TLOS)

Exhibit 16 of the MMLOS guidelines has been used to evaluate the existing TLOS at all signalized intersections within the study area. Exhibit 22 of the MMLOS guidelines does not identify any targets for roadways without a Rapid Transit or Transit Priority designation. Terry Fox Drive, Kanata Avenue, and Huntsville Drive have been evaluated regardless, as transit operates on these roadways.

The results of the intersection TLOS are summarized in **Table 4**.

Truck Level of Service (TkLOS)

Exhibit 21 of the MMLOS guidelines has been used to evaluate the TkLOS at all intersections within the study area. Exhibit 22 of the MMLOS guidelines suggests a target TkLOS D for arterial truck routes within the General Urban Area (Terry Fox Drive). Kanata Avenue and Huntsville Drive have also been evaluated for TkLOS despite having no target, as transit operates on these roadways.

The results of the intersection TkLOS analysis are summarized in **Table 5**.

Vehicular Level of Service (Auto LOS)

Exhibit 22 of the MMLOS guidelines suggests a target Auto LOS D for all roadways within the General Urban Area. Synchro analysis was performed to evaluate the performance of all intersections during the AM, PM, and Saturday peak hours. Signal timing plans are included in **Appendix J**. Detailed Synchro reports are included in **Appendix K**.

The results of the intersection Auto LOS analysis are summarized in **Table 6**.

Intersection MMLOS Summary

A summary of the results of the intersection MMLOS analysis is provided in **Table 7**.

Table 1: PLOS Intersection Analysis – Terry Fox Drive/Kanata Avenue

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSİ SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	23	N/A	0	No	6	N/A	0
Lanes Crossed (3.5m Lane Width)	8		N/A		9		N/A	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	No Left Turn/Prohibited	0	N/A	0	Permissive	-8	N/A	0
Right Turn Conflict	Permissive or Yield	-5	N/A	0	Permissive or Yield	-5	N/A	0
Right Turn on Red	N/A	0	N/A	0	N/A	0	N/A	0
Leading Pedestrian Interval	No	-2	N/A	0	No	-2	N/A	0
CORNER RADIUS								
Parallel Radius	> 15m to 25m	-8	N/A	0	> 15m to 25m	-8	N/A	0
Parallel Right Turn Channel	Smart Channel	2	N/A	0	Smart Channel	2	N/A	0
Perpendicular Radius	N/A	0	N/A	0	> 15m to 25m	-8	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	Smart Channel	2	N/A	0
CROSSING TREATMENT								
Treatment	Standard	-7	N/A	0	Standard	-7	N/A	0
PETSİ SCORE		3		-		-28		-
LOS		F		-		F		-
DELAY SCORE								
Cycle Length		100		0		90		100
Pedestrian Walk Time		7.8		0		40		7.8
DELAY SCORE		42.5		-		13.9		-
LOS		E		-		B		-
OVERALL		F		-		F		-

Table 2: PLOS Intersection Analysis – Kanata Avenue/Huntsville Drive

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSİ SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	105	N/A	0	No	72	No	88
Lanes Crossed (3.5m Lane Width)	3		N/A		5		4	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Permissive	-8	N/A	0	Permissive	-8	No Left Turn/Prohibited	0
Right Turn Conflict	Permissive or Yield	-5	N/A	0	No Right Turn/Prohibited	0	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	N/A	0	N/A	0	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	N/A	0	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	> 5m to 10m	-5	N/A	0	N/A	0	> 5m to 10m	-5
Parallel Right Turn Channel	No Right Turn Channel	-4	N/A	0	N/A	0	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
CROSSING TREATMENT								
Treatment	Standard	-7	N/A	0	Standard	-7	Standard	-7
PETSİ SCORE		71		-		55		62
LOS		C		-		D		C
DELAY SCORE								
Cycle Length		70		0		80		80
Pedestrian Walk Time		28.3		0		7.9		7.9
DELAY SCORE		12.4		-		32.5		32.5
LOS		B		-		D		D
OVERALL		C		-		D		D

Table 3: BLOS Intersection Analysis

Approach	Bikeway Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
Terry Fox Drive/Kanata Avenue				
North Approach	Curbside Bike Lane	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	2 lanes crossed; ≥ 50 km/h	F
South Approach	Pocket Bike Lane	Right Turn Lane Characteristics	Right turn lane > 50m and introduced to the right	D
		Left Turn Accommodation	No left turn	-
East Approach	Pocket Bike Lane	Right Turn Lane Characteristics	Right turn lane > 50m and introduced to the right	D
		Left Turn Accommodation	0 lanes crossed; ≥ 60 km/h	C
Kanata Avenue/Huntsville Drive				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared left turn/right turn lane	A
		Left Turn Accommodation	0 lanes crossed; ≥ 60 km/h	D
East Approach	Pocket Bike Lane	Right Turn Lane Characteristics	Right turn lane > 50m and introduced to the right	D
		Left Turn Accommodation	No left turn	-
West Approach	Curbside Bike Lane	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	1 lane crossed; ≥ 60 km/h	E

Table 4: TLOS Intersection Analysis

Approach	Delay ⁽¹⁾	TLOS
Terry Fox Drive/Kanata Avenue		
North Approach	5 sec	B
South Approach	5 sec	B
East Approach	35 sec	E
Kanata Avenue/Huntsville Drive		
North Approach	20 sec	C
East Approach	5 sec	B
West Approach	5 sec	B

1. Delay based on existing traffic outputs from Synchro analysis

Table 5: TkLOS Intersection Analysis

Approach	Effective Corner Radius	Number of Receiving Lanes on Departure from Intersection	TkLOS
Terry Fox Drive/Kanata Avenue			
South Approach	> 15m	1	C
East Approach	> 15m	2	A
Kanata Avenue/Huntsville Drive			
North Approach	< 10m	1	F
East Approach	< 10m	1	F

Table 6: Auto LOS Intersection Analysis – Existing

Intersection	AM Peak			PM Peak			SAT Peak		
	Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt
Terry Fox Drive/Kanata Avenue	0.62	B	WBL	0.58	A	WBL	0.50	A	WBL
Kanata Avenue/Huntsville Drive	0.55	A	SBL/R	0.46	A	SBL/R	0.42	A	SBL/R
Terry Fox Drive/Tillsonburg Street ⁽¹⁾	10 sec	A	WBR	10 sec	A	WBR	10 sec	A	WBR

1. Unsignalized intersection

Table 7: Intersection MMLOS Summary

Intersection		Terry Fox Drive/Kanata Avenue			Kanata Avenue/Huntsville Drive		
		North	South	East	North	East	West
Pedestrian	Island Refuge	No	-	No	No	No	No
	Lanes Crossed (3.5m Width)	8	-	9	3	5	4
	Conflicting Left Turns	No Left Turn	-	Permissive	Permissive	Permissive	No Left Turn
	Conflicting Right Turns	Permissive	-	Permissive	Permissive	No Right Turn	Permissive
	Right Turn on Red	-	-	-	Allowed	-	Allowed
	Ped Leading Interval	No	-	No	No	No	No
	Parallel Radius	15m to 25m	-	15m to 25m	5m to 10m	-	5m to 10m
	Parallel Channel	Smart Channel	-	Smart Channel	No Channel	-	No Channel
	Perpendicular Radius	-	-	15m to 25m	-	-	-
	Perpendicular Channel	-	-	Smart Channel	-	-	-
	Crosswalk Type	Standard	-	Standard	Standard	Standard	Standard
	PETSI Score	3	-	-28	71	55	62
	Delay Score	42.5	-	13.9	12.4	32.5	32.5
	Level of Service	F	-	F	C	D	D
	Target	F			D		
	Target	C			C		
Cyclist	Type of Bikeway	Curb Lane	Pocket Lane	Pocket Lane	Mixed Traffic	Pocket Lane	Curb Lane
	Turning Speed	-	Slow	Slow	Slow	Slow	-
	Right Turn Storage	-	> 50m	> 50m	0m	> 50m	-
	Dual Right Turn Lanes	-	No	No	No	No	-
	Shared Through-Right Lane	-	No	No	Yes	No	-
	Two-Stage Bike Box	No	-	No	No	-	No
	Lanes Crossed for Left Turns	2	-	0	0	-	1
	Dual Left Turn Lanes	No	-	Yes	No	-	No
	Approach Speed	80 km/h	80 km/h	70 km/h	60 km/h	70 km/h	70 km/h
	Level of Service	F	D	D	D	D	E
	Target	F			E		
	Target	B			B		
Transit	Average Signal Delay	5 sec	5 sec	35 sec	20 sec	5 sec	5 sec
	Level of Service	B	B	E	C	B	B
	Target	E			C		
Truck	Turning Radius	-	> 15m	> 15m	< 10m	< 10m	-
	Receiving Lanes	-	1	2	1	1	-
	Level of Service	-	C	A	F	F	-
	Target	C			F		
	Target	D			-		
Auto	Level of Service	B			A		
	Target	D			D		

APPENDIX J

Signal Timing Plans

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

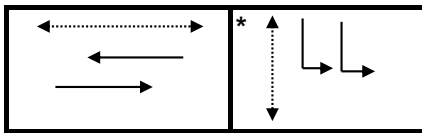
Intersection:	Main: Terry Fox	Side: Kanata
Controller:	ATC-3	TSD: 6586
Author:	Yassine Bennani	Date: 07-Sep-2018

Existing Timing Plans[†]

	Plan				Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Walk	DW	A+R
Cycle	100	90	100	70			
Offset	X	X	X	X			
EB Thru	68	58	68	38	-	-	4.2+1.8
WB Thru	68	58	68	38	7	12	4.2+1.8
SB Left	32	32	32	32	7	18	3.7+2.5

Phasing Sequence[‡]

Plan: All



Schedule

Weekday

Time	Plan
0:10	4
6:30	1
9:30	2
15:00	3
19:00	2
23:00	4

Saturday

Time	Plan
0:10	4
9:00	2
22:30	4

Sunday

Time	Plan
0:10	4
8:00	2
22:30	4

Notes

[†]: Time for each direction includes amber and all red intervals

[‡]: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄.....► Pedestrian signal

Cost is \$56.50 (\$50 + HST)

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

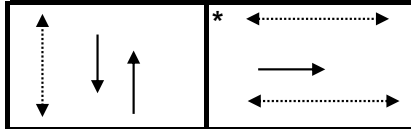
Intersection:	Main: Kanata	Side: Huntsville
Controller:	MS-3200	TSD: 6812
Author:	Yassine Bennani	Date: 07-Sep-2018

Existing Timing Plans†

	Plan				Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Walk	DW	A+R
Cycle	80	70	80	70			
Offset	X	X	X	X			
NB Thru	53	43	53	43	15	9	3.7+2.0
SB Thru	53	43	53	43	15	9	3.7+2.0
EB Thru	27	27	27	27	7	14	3.3+1.8

Phasing Sequence‡

Plan: All



Schedule

Weekday

Time	Plan
0:10	4
6:30	1
9:30	2
15:00	3
19:00	2
23:00	4

Saturday

Time	Plan
0:10	4
9:00	2
22:30	4

Sunday

Time	Plan
0:10	4
8:00	2
22:30	4

Notes

†: Time for each direction includes amber and all red intervals

‡: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄.....► Pedestrian signal

Cost is \$56.50 (\$50 + HST)

APPENDIX K

Synchro Analysis



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	66	643	607	168	274	59
Future Volume (vph)	66	643	607	168	274	59
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	95.0			100.0	70.0	110.0
Storage Lanes	1			1	1	1
Taper Length (m)	45.0				80.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Ped Bike Factor	1.00			0.96		0.98
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1647	3293	3293	1473	3195	1473
Flt Permitted	0.393				0.950	
Satd. Flow (perm)	679	3293	3293	1417	3195	1451
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				187		66
Link Speed (k/h)		70	70		50	
Link Distance (m)		234.5	343.0		421.6	
Travel Time (s)		12.1	17.6		30.4	
Confl. Peds. (#/hr)	3			3		
Confl. Bikes (#/hr)				18		4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	73	714	674	187	304	66
Shared Lane Traffic (%)						
Lane Group Flow (vph)	73	714	674	187	304	66
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		6.0	5.0		9.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	18.6	93.0	93.0	18.6	18.6	18.6
Trailing Detector (m)	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
Detector 1 Size(m)	18.6	5.5	5.5	18.6	18.6	18.6
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)		87.5	87.5			
Detector 2 Size(m)		5.5	5.5			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	25.0	25.0	31.2	31.2
Total Split (s)	68.0	68.0	68.0	68.0	32.0	32.0
Total Split (%)	68.0%	68.0%	68.0%	68.0%	32.0%	32.0%
Maximum Green (s)	62.0	62.0	62.0	62.0	25.8	25.8
Yellow Time (s)	4.2	4.2	4.2	4.2	3.7	3.7
All-Red Time (s)	1.8	1.8	1.8	1.8	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.2	6.2
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	18.0	18.0
Pedestrian Calls (#/hr)	0	0	3	3	0	0
Act Effct Green (s)	62.0	62.0	62.0	62.0	13.6	13.6
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.15	0.15
v/c Ratio	0.15	0.31	0.29	0.18	0.62	0.24
Control Delay	5.7	5.5	5.4	1.2	40.4	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.7	5.5	5.4	1.2	40.4	10.8
LOS	A	A	A	A	D	B
Approach Delay		5.5	4.5		35.1	
Approach LOS		A	A		D	
Queue Length 50th (m)	3.1	18.4	17.1	0.0	22.9	0.0
Queue Length 95th (m)	8.5	29.7	27.7	5.4	34.5	9.6
Internal Link Dist (m)		210.5	319.0		397.6	
Turn Bay Length (m)	95.0			100.0	70.0	110.0
Base Capacity (vph)	479	2326	2326	1055	939	473
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.31	0.29	0.18	0.32	0.14

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 87.8

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 10.5

Intersection LOS: B

Intersection Capacity Utilization 49.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Terry Fox & Kanata

 02 68 s	 04 32 s
 06 68 s	

2: Kanata & Huntsville
AM Peak Hour

471 Terry Fox Drive
Existing Traffic

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	64	94	16	218	239	23
Future Volume (vph)	64	94	16	218	239	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	40.0			65.0
Storage Lanes	1	0	1			1
Taper Length (m)	10.0		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98
Frt	0.920					0.850
Flt Protected	0.980		0.950			
Satd. Flow (prot)	1563	0	1647	1733	1733	1473
Flt Permitted	0.980		0.595			
Satd. Flow (perm)	1563	0	1031	1733	1733	1440
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	91					26
Link Speed (k/h)	50			50	50	
Link Distance (m)	223.0			421.6	166.2	
Travel Time (s)	16.1			30.4	12.0	
Confl. Bikes (#/hr)						4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	71	104	18	242	266	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	175	0	18	242	266	26
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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
Number of Detectors	1		1	2	2	1
Detector Template	Left		Left	Thru	Thru	Right
Leading Detector (m)	18.6		18.6	93.0	93.0	18.6
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	18.6		18.6	5.5	5.5	18.6
Detector 1 Type	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
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)				87.5	87.5	
Detector 2 Size(m)				5.5	5.5	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Split (s)	26.1		29.7	29.7	29.7	29.7
Total Split (s)	27.0		53.0	53.0	53.0	53.0
Total Split (%)	33.8%		66.3%	66.3%	66.3%	66.3%
Maximum Green (s)	21.9		47.3	47.3	47.3	47.3
Yellow Time (s)	3.3		3.7	3.7	3.7	3.7
All-Red Time (s)	1.8		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1		5.7	5.7	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		15.0	15.0	15.0	15.0
Flash Dont Walk (s)	14.0		9.0	9.0	9.0	9.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	11.3		50.2	50.2	50.2	50.2
Actuated g/C Ratio	0.16		0.69	0.69	0.69	0.69
v/c Ratio	0.55		0.03	0.20	0.22	0.03
Control Delay	20.2		4.2	4.8	4.9	1.9
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	20.2		4.2	4.8	4.9	1.9
LOS	C		A	A	A	A
Approach Delay	20.2			4.7	4.6	
Approach LOS	C			A	A	
Queue Length 50th (m)	9.0		0.5	8.1	9.0	0.0
Queue Length 95th (m)	24.2		2.5	18.7	20.6	2.0
Internal Link Dist (m)	199.0			397.6	142.2	
Turn Bay Length (m)			40.0			65.0
Base Capacity (vph)	538		715	1201	1201	1006
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.33		0.03	0.20	0.22	0.03

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 72.4

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 8.4

Intersection LOS: A







Intersection Capacity Utilization 32.9%

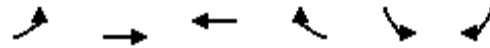
ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Kanata & Huntsville



						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Volume (vph)	0	709	640	26	0	25
Future Volume (vph)	0	709	640	26	0	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3293	3293	1473	0	1499
Flt Permitted						
Satd. Flow (perm)	0	3293	3293	1473	0	1499
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	234.5		319.8	
Travel Time (s)		19.8	16.9		23.0	
Confl. Peds. (#/hr)	6			6		
Confl. Bikes (#/hr)				3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	788	711	29	0	28
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	788	711	29	0	28
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	28.7%			ICU Level of Service A		
Analysis Period (min)	15					



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	66	643	607	168	274	59	
Future Volume (vph)	66	643	607	168	274	59	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	95.0			100.0	70.0	110.0	
Storage Lanes	1			1	1	1	
Taper Length (m)	45.0				80.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00	
Ped Bike Factor	1.00			0.96		0.98	
Frt				0.850		0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1647	3293	3293	1473	3195	1473	
Flt Permitted	0.374				0.950		
Satd. Flow (perm)	647	3293	3293	1414	3195	1451	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				187		66	
Link Speed (k/h)		70	70		50		
Link Distance (m)		234.5	343.0		421.6		
Travel Time (s)		12.1	17.6		30.4		
Confl. Peds. (#/hr)	3			3			
Confl. Bikes (#/hr)				18		4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	73	714	674	187	304	66	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	73	714	674	187	304	66	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(m)		6.0	5.0		9.0		
Link Offset(m)		0.0	0.0		0.0		
Crosswalk Width(m)		2.0	2.0		2.0		
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	
Number of Detectors	1	2	2	1	1	1	
Detector Template	Left	Thru	Thru	Right	Left	Right	
Leading Detector (m)	18.6	93.0	93.0	18.6	18.6	18.6	
Trailing Detector (m)	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	
Detector 1 Size(m)	18.6	5.5	5.5	18.6	18.6	18.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
Detector 2 Position(m)		87.5	87.5				
Detector 2 Size(m)		5.5	5.5				
Detector 2 Type		CI+Ex	CI+Ex				
Detector 2 Channel							
Detector 2 Extend (s)		0.0	0.0				
Turn Type	Perm	NA	NA	Perm	Prot	Perm	
Protected Phases		2	6		4		3
Permitted Phases	2			6		4	
Detector Phase	2	2	6	6	4	4	
Switch Phase							



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	25.0	25.0	25.0	25.0	31.2	31.2	10.0
Total Split (s)	58.0	58.0	58.0	58.0	32.0	32.0	10.0
Total Split (%)	58.0%	58.0%	58.0%	58.0%	32.0%	32.0%	10%
Maximum Green (s)	52.0	52.0	52.0	52.0	25.8	25.8	5.0
Yellow Time (s)	4.2	4.2	4.2	4.2	3.7	3.7	2.0
All-Red Time (s)	1.8	1.8	1.8	1.8	2.5	2.5	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.2	6.2	
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
Recall Mode	Max	Max	Max	Max	None	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	18.0	18.0	
Pedestrian Calls (#/hr)	0	0	3	3	0	0	
Act Effct Green (s)	52.0	52.0	52.0	52.0	13.6	13.6	
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.15	0.15	
v/c Ratio	0.19	0.37	0.35	0.20	0.62	0.24	
Control Delay	10.6	10.3	10.1	2.0	40.4	10.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	10.6	10.3	10.1	2.0	40.4	10.8	
LOS	B	B	B	A	D	B	
Approach Delay		10.3	8.4		35.1		
Approach LOS		B	A		D		
Queue Length 50th (m)	4.8	27.7	25.7	0.0	22.9	0.0	
Queue Length 95th (m)	12.3	42.2	39.4	7.7	34.5	9.6	
Internal Link Dist (m)		210.5	319.0		397.6		
Turn Bay Length (m)	95.0			100.0	70.0	110.0	
Base Capacity (vph)	383	1951	1951	914	939	473	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.19	0.37	0.35	0.20	0.32	0.14	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 87.8

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 14.0

Intersection LOS: B

Intersection Capacity Utilization 49.5%

ICU Level of Service A

Analysis Period (min) 15


Splits and Phases: 1: Terry Fox & Kanata

58 s	10 s	32 s
58 s		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	64	94	16	218	239	23	
Future Volume (vph)	64	94	16	218	239	23	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	0.0	0.0	40.0			65.0	
Storage Lanes	1	0	1			0	
Taper Length (m)	10.0		30.0				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor					1.00		
Frt	0.920				0.988		
Flt Protected	0.980		0.950				
Satd. Flow (prot)	1563	0	1647	1733	1709	0	
Flt Permitted	0.980		0.574				
Satd. Flow (perm)	1563	0	995	1733	1709	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	96				8		
Link Speed (k/h)	50			50	50		
Link Distance (m)	223.0			421.6	166.2		
Travel Time (s)	16.1			30.4	12.0		
Confl. Bikes (#/hr)						4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	71	104	18	242	266	26	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	175	0	18	242	292	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	2.0			2.0	2.0		
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	
Number of Detectors	1		1	2	2		
Detector Template	Left		Left	Thru	Thru		
Leading Detector (m)	18.6		18.6	93.0	93.0		
Trailing Detector (m)	0.0		0.0	0.0	0.0		
Detector 1 Position(m)	0.0		0.0	0.0	0.0		
Detector 1 Size(m)	18.6		18.6	5.5	5.5		
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex		
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0		
Detector 1 Queue (s)	0.0		0.0	0.0	0.0		
Detector 1 Delay (s)	0.0		0.0	0.0	0.0		
Detector 2 Position(m)				87.5	87.5		
Detector 2 Size(m)				5.5	5.5		
Detector 2 Type				CI+Ex	CI+Ex		
Detector 2 Channel							
Detector 2 Extend (s)				0.0	0.0		
Turn Type	Prot		Perm	NA	NA		
Protected Phases	4			2	6	3	
Permitted Phases			2				
Detector Phase	4		2	2	6		
Switch Phase							
Minimum Initial (s)	10.0		10.0	10.0	10.0	5.0	

2: Kanata & Huntsville
AM Peak Hour

471 Terry Fox Drive
Existing Traffic - Identified Modifications

							
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3
Minimum Split (s)	26.1		29.7	29.7	29.7		10.0
Total Split (s)	30.0		40.0	40.0	40.0		10.0
Total Split (%)	37.5%		50.0%	50.0%	50.0%		13%
Maximum Green (s)	24.9		34.3	34.3	34.3		5.0
Yellow Time (s)	3.3		3.7	3.7	3.7		2.0
All-Red Time (s)	1.8		2.0	2.0	2.0		3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0		
Total Lost Time (s)	5.1		5.7	5.7	5.7		
Lead/Lag	Lag						Lead
Lead-Lag Optimize?	Yes						Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0
Recall Mode	None		Max	Max	Max		Max
Walk Time (s)	7.0		15.0	15.0	15.0		
Flash Dont Walk (s)	14.0		9.0	9.0	9.0		
Pedestrian Calls (#/hr)	0		0	0	0		
Act Effct Green (s)	11.0		34.3	34.3	34.3		
Actuated g/C Ratio	0.17		0.52	0.52	0.52		
v/c Ratio	0.52		0.03	0.27	0.33		
Control Delay	18.1		8.7	10.2	10.5		
Queue Delay	0.0		0.0	0.0	0.0		
Total Delay	18.1		8.7	10.2	10.5		
LOS	B		A	B	B		
Approach Delay	18.1			10.1	10.5		
Approach LOS	B			B	B		
Queue Length 50th (m)	8.0		0.9	13.6	16.4		
Queue Length 95th (m)	22.6		3.7	27.8	33.3		
Internal Link Dist (m)	199.0			397.6	142.2		
Turn Bay Length (m)			40.0				
Base Capacity (vph)	649		516	899	891		
Starvation Cap Reductn	0		0	0	0		
Spillback Cap Reductn	0		0	0	0		
Storage Cap Reductn	0		0	0	0		
Reduced v/c Ratio	0.27		0.03	0.27	0.33		

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 66.1

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 12.2





Intersection LOS: B

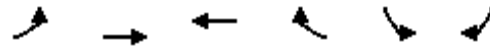
Intersection Capacity Utilization 33.6%

ICU Level of Service A

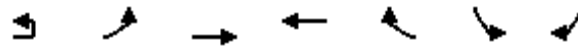
Analysis Period (min) 15

Splits and Phases: 2: Kanata & Huntsville

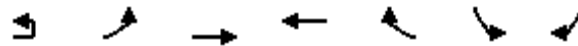
 <p>Ø2</p>	 <p>Ø3</p>	 <p>Ø4</p>
40 s	10 s	30 s
 <p>Ø6</p>		
40 s		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑	↑		↑
Traffic Volume (vph)	0	709	640	26	0	25
Future Volume (vph)	0	709	640	26	0	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3293	3293	1473	0	1499
Flt Permitted						
Satd. Flow (perm)	0	3293	3293	1473	0	1499
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	234.5		319.8	
Travel Time (s)		19.8	16.9		23.0	
Confl. Peds. (#/hr)	6			6		
Confl. Bikes (#/hr)				3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	788	711	29	0	28
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	788	711	29	0	28
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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 28.7%				ICU Level of Service A		
Analysis Period (min) 15						



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	3	82	902	844	307	243	55
Future Volume (vph)	3	82	902	844	307	243	55
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		95.0			100.0	70.0	110.0
Storage Lanes		1			1	1	1
Taper Length (m)		45.0				80.0	
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	0.97	1.00
Ped Bike Factor		1.00			0.97		0.99
Frt					0.850		0.850
Flt Protected		0.950				0.950	
Satd. Flow (prot)	0	1696	3390	3390	1517	3195	1473
Flt Permitted		0.288				0.950	
Satd. Flow (perm)	0	514	3390	3390	1478	3195	1453
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					341		61
Link Speed (k/h)			70	70		50	
Link Distance (m)			234.5	343.0		421.6	
Travel Time (s)			12.1	17.6		30.4	
Confl. Peds. (#/hr)		1			1		
Confl. Bikes (#/hr)					5		2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	2%	2%	5%	5%
Adj. Flow (vph)	3	91	1002	938	341	270	61
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	94	1002	938	341	270	61
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Left	Right	Left	Right
Median Width(m)			6.0	5.0		9.0	
Link Offset(m)			0.0	0.0		0.0	
Crosswalk Width(m)			2.0	2.0		2.0	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14	24			14	24	14
Number of Detectors	1	1	2	2	1	1	1
Detector Template	Left	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	18.6	18.6	93.0	93.0	18.6	18.6	18.6
Trailing Detector (m)	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
Detector 1 Size(m)	18.6	18.6	5.5	5.5	18.6	18.6	18.6
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)			87.5	87.5			
Detector 2 Size(m)			5.5	5.5			
Detector 2 Type			Cl+Ex	Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)			0.0	0.0			
Turn Type	Perm	Perm	NA	NA	Perm	Prot	Perm
Protected Phases			2	6		4	
Permitted Phases	2	2			6		4
Detector Phase	2	2	2	6	6	4	4



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	31.2	31.2
Total Split (s)	68.0	68.0	68.0	68.0	68.0	32.0	32.0
Total Split (%)	68.0%	68.0%	68.0%	68.0%	68.0%	32.0%	32.0%
Maximum Green (s)	62.0	62.0	62.0	62.0	62.0	25.8	25.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	3.7	3.7
All-Red Time (s)	1.8	1.8	1.8	1.8	1.8	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.2	6.2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	18.0	18.0
Pedestrian Calls (#/hr)	0	0	0	1	1	0	0
Act Effct Green (s)		62.5	62.5	62.5	62.5	12.7	12.7
Actuated g/C Ratio		0.71	0.71	0.71	0.71	0.15	0.15
v/c Ratio		0.26	0.41	0.39	0.30	0.58	0.23
Control Delay		7.0	5.9	5.7	1.3	40.0	11.3
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		7.0	5.9	5.7	1.3	40.0	11.3
LOS		A	A	A	A	D	B
Approach Delay			6.0	4.5		34.7	
Approach LOS			A	A		C	
Queue Length 50th (m)		4.2	27.2	24.8	0.0	20.1	0.0
Queue Length 95th (m)		11.7	42.6	39.0	6.7	30.8	9.3
Internal Link Dist (m)			210.5	319.0		397.6	
Turn Bay Length (m)		95.0			100.0	70.0	110.0
Base Capacity (vph)		367	2423	2423	1153	942	471
Starvation Cap Reductn		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0
Reduced v/c Ratio		0.26	0.41	0.39	0.30	0.29	0.13

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 87.5

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 8.8

Intersection LOS: A

Intersection Capacity Utilization 56.5%


ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Terry Fox & Kanata



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	43	50	64	326	248	47
Future Volume (vph)	43	50	64	326	248	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	45.0			65.0
Storage Lanes	1	0	1			1
Taper Length (m)	10.0		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98
Frt	0.927					0.850
Flt Protected	0.977		0.950			
Satd. Flow (prot)	1570	0	1647	1733	1733	1473
Flt Permitted	0.977		0.590			
Satd. Flow (perm)	1570	0	1023	1733	1733	1442
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	56					52
Link Speed (k/h)	50			50	50	
Link Distance (m)	223.0			421.6	166.2	
Travel Time (s)	16.1			30.4	12.0	
Confl. Bikes (#/hr)						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	48	56	71	362	276	52
Shared Lane Traffic (%)						
Lane Group Flow (vph)	104	0	71	362	276	52
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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
Number of Detectors	1		1	2	2	1
Detector Template	Left		Left	Thru	Thru	Right
Leading Detector (m)	18.6		18.6	93.0	93.0	18.6
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	18.6		18.6	5.5	5.5	18.6
Detector 1 Type	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
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)				87.5	87.5	
Detector 2 Size(m)				5.5	5.5	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Split (s)	26.1		29.7	29.7	29.7	29.7
Total Split (s)	27.0		53.0	53.0	53.0	53.0
Total Split (%)	33.8%		66.3%	66.3%	66.3%	66.3%
Maximum Green (s)	21.9		47.3	47.3	47.3	47.3
Yellow Time (s)	3.3		3.7	3.7	3.7	3.7
All-Red Time (s)	1.8		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1		5.7	5.7	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		15.0	15.0	15.0	15.0
Flash Dont Walk (s)	14.0		9.0	9.0	9.0	9.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	8.0		55.0	55.0	55.0	55.0
Actuated g/C Ratio	0.11		0.78	0.78	0.78	0.78
v/c Ratio	0.46		0.09	0.27	0.20	0.05
Control Delay	21.6		3.6	3.9	3.6	1.3
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	21.6		3.6	3.9	3.6	1.3
LOS	C		A	A	A	A
Approach Delay	21.6			3.9	3.2	
Approach LOS	C			A	A	
Queue Length 50th (m)	5.3		1.8	10.9	7.9	0.0
Queue Length 95th (m)	16.4		5.8	24.0	17.9	2.4
Internal Link Dist (m)	199.0			397.6	142.2	
Turn Bay Length (m)			45.0			65.0
Base Capacity (vph)	529		798	1352	1352	1137
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.20		0.09	0.27	0.20	0.05

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 70.4

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.46

Intersection Signal Delay: 5.8

Intersection LOS: A

Intersection Capacity Utilization 37.4%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Kanata & Huntsville

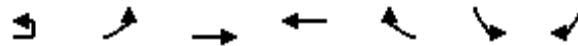




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Traffic Volume (vph)	0	987	817	85	0	11
Future Volume (vph)	0	987	817	85	0	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3293	3293	1473	0	1499
Flt Permitted						
Satd. Flow (perm)	0	3293	3293	1473	0	1499
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	234.5		319.8	
Travel Time (s)		19.8	16.9		23.0	
Confl. Peds. (#/hr)	1					
Confl. Bikes (#/hr)				5		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1097	908	94	0	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1097	908	94	0	12
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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 33.8%				ICU Level of Service A		
Analysis Period (min) 15						

1: Terry Fox & Kanata
PM Peak Hour

471 Terry Fox Drive
Existing Traffic - Identified Modifications



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Lane Configurations		↰	↰↰	↰↰	↰	↰↰	↰	
Traffic Volume (vph)	3	82	902	844	307	243	55	
Future Volume (vph)	3	82	902	844	307	243	55	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	
Storage Length (m)		95.0			100.0	70.0	110.0	
Storage Lanes		1			1	1	1	
Taper Length (m)		45.0				80.0		
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	0.97	1.00	
Ped Bike Factor		1.00			0.97		0.99	
Frt					0.850		0.850	
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1696	3390	3390	1517	3195	1473	
Flt Permitted		0.263				0.950		
Satd. Flow (perm)	0	469	3390	3390	1477	3195	1453	
Right Turn on Red					Yes		Yes	
Satd. Flow (RTOR)					341		61	
Link Speed (k/h)			70	70		50		
Link Distance (m)			234.5	343.0		421.6		
Travel Time (s)			12.1	17.6		30.4		
Confl. Peds. (#/hr)		1			1			
Confl. Bikes (#/hr)					5		2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehicles (%)	0%	2%	2%	2%	2%	5%	5%	
Adj. Flow (vph)	3	91	1002	938	341	270	61	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	94	1002	938	341	270	61	
Enter Blocked Intersection	No	No	No	No	No	No	No	
Lane Alignment	R NA	Left	Left	Left	Right	Left	Right	
Median Width(m)			6.0	5.0		9.0		
Link Offset(m)			0.0	0.0		0.0		
Crosswalk Width(m)			2.0	2.0		2.0		
Two way Left Turn Lane								
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)	14	24			14	24	14	
Number of Detectors	1	1	2	2	1	1	1	
Detector Template	Left	Left	Thru	Thru	Right	Left	Right	
Leading Detector (m)	18.6	18.6	93.0	93.0	18.6	18.6	18.6	
Trailing Detector (m)	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	
Detector 1 Size(m)	18.6	18.6	5.5	5.5	18.6	18.6	18.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
Detector 2 Position(m)			87.5	87.5				
Detector 2 Size(m)			5.5	5.5				
Detector 2 Type			Cl+Ex	Cl+Ex				
Detector 2 Channel								
Detector 2 Extend (s)			0.0	0.0				
Turn Type	Perm	Perm	NA	NA	Perm	Prot	Perm	
Protected Phases			2	6		4		3
Permitted Phases	2	2			6		4	
Detector Phase	2	2	2	6	6	4	4	



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	31.2	31.2	10.0
Total Split (s)	58.0	58.0	58.0	58.0	58.0	32.0	32.0	10.0
Total Split (%)	58.0%	58.0%	58.0%	58.0%	58.0%	32.0%	32.0%	10%
Maximum Green (s)	52.0	52.0	52.0	52.0	52.0	25.8	25.8	5.0
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	3.7	3.7	2.0
All-Red Time (s)	1.8	1.8	1.8	1.8	1.8	2.5	2.5	3.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.2	6.2	
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
Recall Mode	Max	Max	Max	Max	Max	None	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	18.0	18.0	
Pedestrian Calls (#/hr)	0	0	0	1	1	0	0	
Act Effct Green (s)		52.0	52.0	52.0	52.0	12.7	12.7	
Actuated g/C Ratio		0.60	0.60	0.60	0.60	0.15	0.15	
v/c Ratio		0.34	0.49	0.46	0.33	0.58	0.23	
Control Delay		13.6	11.3	10.9	2.0	39.8	11.3	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		13.6	11.3	10.9	2.0	39.8	11.3	
LOS		B	B	B	A	D	B	
Approach Delay			11.5	8.5		34.5		
Approach LOS			B	A		C		
Queue Length 50th (m)		6.6	41.7	38.1	0.0	20.1	0.0	
Queue Length 95th (m)		17.8	61.6	56.3	9.7	30.8	9.3	
Internal Link Dist (m)			210.5	319.0		397.6		
Turn Bay Length (m)		95.0			100.0	70.0	110.0	
Base Capacity (vph)		280	2027	2027	1020	948	474	
Starvation Cap Reductn		0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	
Reduced v/c Ratio		0.34	0.49	0.46	0.33	0.28	0.13	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 87

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 12.9





Intersection LOS: B

Intersection Capacity Utilization 56.5%

ICU Level of Service B

Analysis Period (min) 15







Splits and Phases: 1: Terry Fox & Kanata

 Ø2	 Ø3	 Ø4
58 s	10 s	32 s
 Ø6		
58 s		

2: Kanata & Huntsville
PM Peak Hour

471 Terry Fox Drive
Existing Traffic - Identified Modifications

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	43	50	64	326	248	47	
Future Volume (vph)	43	50	64	326	248	47	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	0.0	0.0	45.0			65.0	
Storage Lanes	1	0	1			0	
Taper Length (m)	10.0		30.0				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor					1.00		
Frt	0.927				0.979		
Flt Protected	0.977		0.950				
Satd. Flow (prot)	1570	0	1647	1733	1691	0	
Flt Permitted	0.977		0.557				
Satd. Flow (perm)	1570	0	965	1733	1691	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	56				15		
Link Speed (k/h)	50			50	50		
Link Distance (m)	223.0			421.6	166.2		
Travel Time (s)	16.1			30.4	12.0		
Confl. Bikes (#/hr)						2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	48	56	71	362	276	52	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	104	0	71	362	328	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	2.0			2.0	2.0		
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	
Number of Detectors	1		1	2	2		
Detector Template	Left		Left	Thru	Thru		
Leading Detector (m)	18.6		18.6	93.0	93.0		
Trailing Detector (m)	0.0		0.0	0.0	0.0		
Detector 1 Position(m)	0.0		0.0	0.0	0.0		
Detector 1 Size(m)	18.6		18.6	5.5	5.5		
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex		
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0		
Detector 1 Queue (s)	0.0		0.0	0.0	0.0		
Detector 1 Delay (s)	0.0		0.0	0.0	0.0		
Detector 2 Position(m)				87.5	87.5		
Detector 2 Size(m)				5.5	5.5		
Detector 2 Type				CI+Ex	CI+Ex		
Detector 2 Channel							
Detector 2 Extend (s)				0.0	0.0		
Turn Type	Prot		Perm	NA	NA		
Protected Phases	4			2	6	3	
Permitted Phases			2				
Detector Phase	4		2	2	6		
Switch Phase							
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0	

							
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3
Minimum Split (s)	26.1		29.7	29.7	29.7		10.0
Total Split (s)	30.0		40.0	40.0	40.0		10.0
Total Split (%)	37.5%		50.0%	50.0%	50.0%		13%
Maximum Green (s)	24.9		34.3	34.3	34.3		5.0
Yellow Time (s)	3.3		3.7	3.7	3.7		2.0
All-Red Time (s)	1.8		2.0	2.0	2.0		3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0		
Total Lost Time (s)	5.1		5.7	5.7	5.7		
Lead/Lag	Lag						Lead
Lead-Lag Optimize?	Yes						Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0
Recall Mode	None		Max	Max	Max		Max
Walk Time (s)	7.0		15.0	15.0	15.0		
Flash Dont Walk (s)	14.0		9.0	9.0	9.0		
Pedestrian Calls (#/hr)	0		0	0	0		
Act Effct Green (s)	7.6		34.6	34.6	34.6		
Actuated g/C Ratio	0.13		0.57	0.57	0.57		
v/c Ratio	0.42		0.13	0.37	0.34		
Control Delay	19.4		8.4	9.7	9.0		
Queue Delay	0.0		0.0	0.0	0.0		
Total Delay	19.4		8.4	9.7	9.0		
LOS	B		A	A	A		
Approach Delay	19.4			9.5	9.0		
Approach LOS	B			A	A		
Queue Length 50th (m)	4.7		3.3	19.7	16.5		
Queue Length 95th (m)	15.7		9.4	38.9	33.7		
Internal Link Dist (m)	199.0			397.6	142.2		
Turn Bay Length (m)			45.0				
Base Capacity (vph)	683		550	988	971		
Starvation Cap Reductn	0		0	0	0		
Spillback Cap Reductn	0		0	0	0		
Storage Cap Reductn	0		0	0	0		
Reduced v/c Ratio	0.15		0.13	0.37	0.34		

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 60.7

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 10.5

Intersection LOS: B

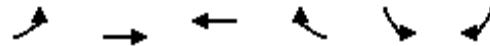
Intersection Capacity Utilization 40.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Kanata & Huntsville

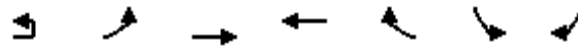
40 s	10 s
40 s	30 s



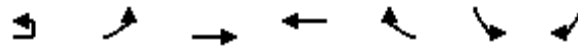
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑	↑		↑
Traffic Volume (vph)	0	987	817	85	0	11
Future Volume (vph)	0	987	817	85	0	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3293	3293	1473	0	1499
Flt Permitted						
Satd. Flow (perm)	0	3293	3293	1473	0	1499
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	234.5		319.8	
Travel Time (s)		19.8	16.9		23.0	
Confl. Peds. (#/hr)	1					
Confl. Bikes (#/hr)				5		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1097	908	94	0	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1097	908	94	0	12
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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 33.8%				ICU Level of Service A		
Analysis Period (min) 15						

1: Terry Fox & Kanata
SAT Peak Hour

471 Terry Fox Drive
Existing Traffic



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↰↰	↰↰	↰	↰↰	↰
Traffic Volume (vph)	3	69	537	628	299	261	65
Future Volume (vph)	3	69	537	628	299	261	65
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		95.0			100.0	70.0	110.0
Storage Lanes		1			1	1	1
Taper Length (m)		45.0				80.0	
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	0.97	1.00
Ped Bike Factor		1.00			0.97		0.99
Frt					0.850		0.850
Flt Protected		0.950				0.950	
Satd. Flow (prot)	0	1695	3390	3390	1517	3288	1517
Flt Permitted		0.381				0.950	
Satd. Flow (perm)	0	677	3390	3390	1465	3288	1497
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					332		72
Link Speed (k/h)			70	70		50	
Link Distance (m)			234.5	343.0		421.6	
Travel Time (s)			12.1	17.6		30.4	
Confl. Peds. (#/hr)		6			6		1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	3	77	597	698	332	290	72
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	80	597	698	332	290	72
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Left	Right	Left	Right
Median Width(m)			6.0	5.0		9.0	
Link Offset(m)			0.0	0.0		0.0	
Crosswalk Width(m)			2.0	2.0		2.0	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14	24			14	24	14
Number of Detectors	1	1	2	2	1	1	1
Detector Template	Left	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	18.6	18.6	93.0	93.0	18.6	18.6	18.6
Trailing Detector (m)	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
Detector 1 Size(m)	18.6	18.6	5.5	5.5	18.6	18.6	18.6
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)			87.5	87.5			
Detector 2 Size(m)			5.5	5.5			
Detector 2 Type			CI+Ex	CI+Ex			
Detector 2 Channel							
Detector 2 Extend (s)			0.0	0.0			
Turn Type	Perm	Perm	NA	NA	Perm	Prot	Perm
Protected Phases			2	6		4	
Permitted Phases	2	2			6		4
Detector Phase	2	2	2	6	6	4	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	31.2	31.2
Total Split (s)	58.0	58.0	58.0	58.0	58.0	32.0	32.0
Total Split (%)	64.4%	64.4%	64.4%	64.4%	64.4%	35.6%	35.6%
Maximum Green (s)	52.0	52.0	52.0	52.0	52.0	25.8	25.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	3.7	3.7
All-Red Time (s)	1.8	1.8	1.8	1.8	1.8	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.2	6.2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	18.0	18.0
Pedestrian Calls (#/hr)	0	0	0	6	6	1	1
Act Effct Green (s)		52.5	52.5	52.5	52.5	13.8	13.8
Actuated g/C Ratio		0.67	0.67	0.67	0.67	0.18	0.18
v/c Ratio		0.18	0.26	0.31	0.31	0.50	0.22
Control Delay		7.5	6.3	6.6	1.7	31.8	8.6
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		7.5	6.3	6.6	1.7	31.8	8.6
LOS		A	A	A	A	C	A
Approach Delay			6.5	5.0		27.2	
Approach LOS			A	A		C	
Queue Length 50th (m)		3.2	13.4	16.3	0.0	18.5	0.0
Queue Length 95th (m)		12.3	31.6	37.7	9.3	28.1	8.7
Internal Link Dist (m)			210.5	319.0		397.6	
Turn Bay Length (m)		95.0			100.0	70.0	110.0
Base Capacity (vph)		452	2264	2264	1088	1083	541
Starvation Cap Reductn		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0
Reduced v/c Ratio		0.18	0.26	0.31	0.31	0.27	0.13

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 78.6

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 9.4

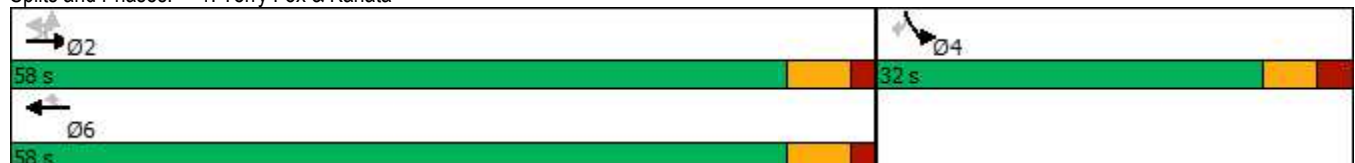
Intersection LOS: A

Intersection Capacity Utilization 50.6%


ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Terry Fox & Kanata



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	67	63	49	319	263	81
Future Volume (vph)	67	63	49	319	263	81
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	45.0			65.0
Storage Lanes	1	0	1			1
Taper Length (m)	10.0		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		1.00			0.97
Frt	0.934					0.850
Flt Protected	0.975		0.950			
Satd. Flow (prot)	1625	0	1695	1784	1784	1517
Flt Permitted	0.975		0.581			
Satd. Flow (perm)	1621	0	1032	1784	1784	1475
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	70					90
Link Speed (k/h)	50			50	50	
Link Distance (m)	223.0			421.6	166.2	
Travel Time (s)	16.1			30.4	12.0	
Confl. Peds. (#/hr)	3		5			5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	74	70	54	354	292	90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	144	0	54	354	292	90
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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
Number of Detectors	1		1	2	2	1
Detector Template	Left		Left	Thru	Thru	Right
Leading Detector (m)	18.6		18.6	93.0	93.0	18.6
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	18.6		18.6	5.5	5.5	18.6
Detector 1 Type	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
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)				87.5	87.5	
Detector 2 Size(m)				5.5	5.5	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Split (s)	26.1		29.7	29.7	29.7	29.7
Total Split (s)	27.0		43.0	43.0	43.0	43.0
Total Split (%)	38.6%		61.4%	61.4%	61.4%	61.4%
Maximum Green (s)	21.9		37.3	37.3	37.3	37.3
Yellow Time (s)	3.3		3.7	3.7	3.7	3.7
All-Red Time (s)	1.8		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1		5.7	5.7	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		15.0	15.0	15.0	15.0
Flash Dont Walk (s)	14.0		9.0	9.0	9.0	9.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	10.4		42.2	42.2	42.2	42.2
Actuated g/C Ratio	0.18		0.71	0.71	0.71	0.71
v/c Ratio	0.42		0.07	0.28	0.23	0.08
Control Delay	16.3		4.6	5.2	5.0	1.4
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	16.3		4.6	5.2	5.0	1.4
LOS	B		A	A	A	A
Approach Delay	16.3			5.2	4.1	
Approach LOS	B			A	A	
Queue Length 50th (m)	6.4		1.7	12.7	10.1	0.0
Queue Length 95th (m)	18.4		5.0	25.3	20.4	3.6
Internal Link Dist (m)	199.0			397.6	142.2	
Turn Bay Length (m)			45.0			65.0
Base Capacity (vph)	645		736	1272	1272	1077
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.22		0.07	0.28	0.23	0.08

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 59.2

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 6.4

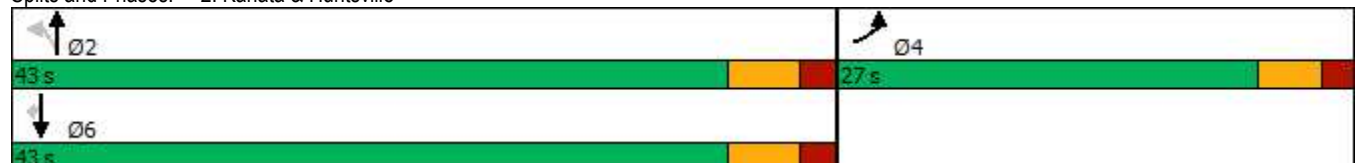
Intersection LOS: A

Intersection Capacity Utilization 50.4%

ICU Level of Service A







Analysis Period (min) 15

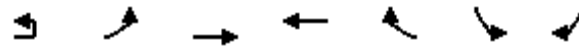
Splits and Phases: 2: Kanata & Huntsville



3: Terry Fox & Tillsonburg
SAT Peak Hour

471 Terry Fox Drive
Existing Traffic

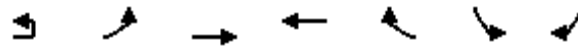
						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Volume (vph)	0	609	654	42	0	13
Future Volume (vph)	0	609	654	42	0	13
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3390	3390	1517	0	1543
Flt Permitted						
Satd. Flow (perm)	0	3390	3390	1517	0	1543
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	234.5		319.8	
Travel Time (s)		19.8	16.9		23.0	
Confl. Peds. (#/hr)	2			2		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	677	727	47	0	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	677	727	47	0	14
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	29.1%			ICU Level of Service A		
Analysis Period (min)	15					



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Lane Configurations								
Traffic Volume (vph)	3	69	537	628	299	261	65	
Future Volume (vph)	3	69	537	628	299	261	65	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	
Storage Length (m)		95.0			100.0	70.0	110.0	
Storage Lanes		1			1	1	1	
Taper Length (m)		45.0				80.0		
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	0.97	1.00	
Ped Bike Factor		1.00			0.97		0.99	
Frt					0.850		0.850	
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1695	3390	3390	1517	3288	1517	
Flt Permitted		0.357				0.950		
Satd. Flow (perm)	0	634	3390	3390	1465	3288	1497	
Right Turn on Red					Yes		Yes	
Satd. Flow (RTOR)					332		72	
Link Speed (k/h)			70	70		50		
Link Distance (m)			234.5	343.0		421.6		
Travel Time (s)			12.1	17.6		30.4		
Confl. Peds. (#/hr)		6			6		1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	3	77	597	698	332	290	72	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	80	597	698	332	290	72	
Enter Blocked Intersection	No	No	No	No	No	No	No	
Lane Alignment	R NA	Left	Left	Left	Right	Left	Right	
Median Width(m)			6.0	5.0		9.0		
Link Offset(m)			0.0	0.0		0.0		
Crosswalk Width(m)			2.0	2.0		2.0		
Two way Left Turn Lane								
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)	14	24			14	24	14	
Number of Detectors	1	1	2	2	1	1	1	
Detector Template	Left	Left	Thru	Thru	Right	Left	Right	
Leading Detector (m)	18.6	18.6	93.0	93.0	18.6	18.6	18.6	
Trailing Detector (m)	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	
Detector 1 Size(m)	18.6	18.6	5.5	5.5	18.6	18.6	18.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
Detector 2 Position(m)			87.5	87.5				
Detector 2 Size(m)			5.5	5.5				
Detector 2 Type			CI+Ex	CI+Ex				
Detector 2 Channel								
Detector 2 Extend (s)			0.0	0.0				
Turn Type	Perm	Perm	NA	NA	Perm	Prot	Perm	
Protected Phases			2	6		4		3
Permitted Phases	2	2			6		4	
Detector Phase	2	2	2	6	6	4	4	
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	5.0

1: Terry Fox & Kanata
SAT Peak Hour

471 Terry Fox Drive
Existing Traffic - Identified Modifications



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	31.2	31.2	10.0
Total Split (s)	48.0	48.0	48.0	48.0	48.0	32.0	32.0	10.0
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%	35.6%	35.6%	11%
Maximum Green (s)	42.0	42.0	42.0	42.0	42.0	25.8	25.8	5.0
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	3.7	3.7	2.0
All-Red Time (s)	1.8	1.8	1.8	1.8	1.8	2.5	2.5	3.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.2	6.2	
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
Recall Mode	Max	Max	Max	Max	Max	None	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	18.0	18.0	
Pedestrian Calls (#/hr)	0	0	0	6	6	1	1	
Act Effct Green (s)		42.2	42.2	42.2	42.2	13.8	13.8	
Actuated g/C Ratio		0.54	0.54	0.54	0.54	0.18	0.18	
v/c Ratio		0.23	0.33	0.38	0.35	0.50	0.22	
Control Delay		13.6	11.5	12.0	2.7	31.7	8.6	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		13.6	11.5	12.0	2.7	31.7	8.6	
LOS		B	B	B	A	C	A	
Approach Delay			11.8	9.0		27.1		
Approach LOS			B	A		C		
Queue Length 50th (m)		5.0	20.7	25.3	0.0	18.5	0.0	
Queue Length 95th (m)		16.6	41.8	49.8	12.2	28.1	8.7	
Internal Link Dist (m)			210.5	319.0		397.6		
Turn Bay Length (m)		95.0			100.0	70.0	110.0	
Base Capacity (vph)		341	1825	1825	942	1087	543	
Starvation Cap Reductn		0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	
Reduced v/c Ratio		0.23	0.33	0.38	0.35	0.27	0.13	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 78.3

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 13.1

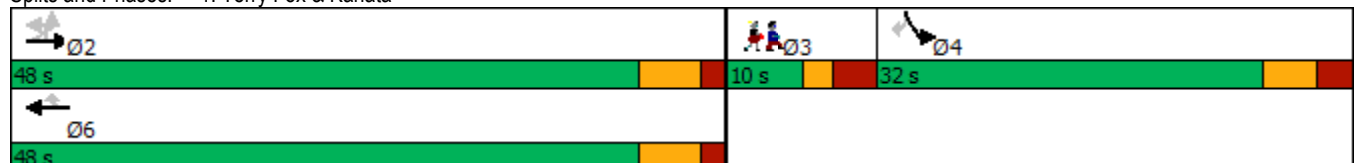
Intersection LOS: B

Intersection Capacity Utilization 50.6%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Terry Fox & Kanata



2: Kanata & Huntsville
SAT Peak Hour

471 Terry Fox Drive
Existing Traffic - Identified Modifications

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	67	63	49	319	263	81	
Future Volume (vph)	67	63	49	319	263	81	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	0.0	0.0	45.0			65.0	
Storage Lanes	1	0	1			0	
Taper Length (m)	10.0		30.0				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	1.00		1.00		0.99		
Frt	0.934				0.968		
Flt Protected	0.975		0.950				
Satd. Flow (prot)	1625	0	1695	1784	1716	0	
Flt Permitted	0.975		0.491				
Satd. Flow (perm)	1621	0	873	1784	1716	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	70				24		
Link Speed (k/h)	50			50	50		
Link Distance (m)	223.0			421.6	166.2		
Travel Time (s)	16.1			30.4	12.0		
Confl. Peds. (#/hr)	3		5			5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	74	70	54	354	292	90	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	144	0	54	354	382	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	2.0			2.0	2.0		
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	
Number of Detectors	1		1	2	2		
Detector Template	Left		Left	Thru	Thru		
Leading Detector (m)	18.6		18.6	93.0	93.0		
Trailing Detector (m)	0.0		0.0	0.0	0.0		
Detector 1 Position(m)	0.0		0.0	0.0	0.0		
Detector 1 Size(m)	18.6		18.6	5.5	5.5		
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex		
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0		
Detector 1 Queue (s)	0.0		0.0	0.0	0.0		
Detector 1 Delay (s)	0.0		0.0	0.0	0.0		
Detector 2 Position(m)				87.5	87.5		
Detector 2 Size(m)				5.5	5.5		
Detector 2 Type				CI+Ex	CI+Ex		
Detector 2 Channel							
Detector 2 Extend (s)				0.0	0.0		
Turn Type	Prot		Perm	NA	NA		
Protected Phases	4			2	6	3	
Permitted Phases			2				
Detector Phase	4		2	2	6		
Switch Phase							
Minimum Initial (s)	10.0		10.0	10.0	10.0	5.0	

2: Kanata & Huntsville
SAT Peak Hour

471 Terry Fox Drive
Existing Traffic - Identified Modifications

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3
Minimum Split (s)	26.1		29.7	29.7	29.7		10.0
Total Split (s)	30.0		30.0	30.0	30.0		10.0
Total Split (%)	42.9%		42.9%	42.9%	42.9%		14%
Maximum Green (s)	24.9		24.3	24.3	24.3		5.0
Yellow Time (s)	3.3		3.7	3.7	3.7		2.0
All-Red Time (s)	1.8		2.0	2.0	2.0		3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0		
Total Lost Time (s)	5.1		5.7	5.7	5.7		
Lead/Lag	Lag						Lead
Lead-Lag Optimize?	Yes						Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0
Recall Mode	None		Max	Max	Max		Max
Walk Time (s)	7.0		15.0	15.0	15.0		
Flash Dont Walk (s)	14.0		9.0	9.0	9.0		
Pedestrian Calls (#/hr)	0		0	0	0		
Act Effct Green (s)	10.5		24.7	24.7	24.7		
Actuated g/C Ratio	0.20		0.47	0.47	0.47		
v/c Ratio	0.38		0.13	0.42	0.47		
Control Delay	14.8		10.7	12.7	12.6		
Queue Delay	0.0		0.0	0.0	0.0		
Total Delay	14.8		10.7	12.7	12.6		
LOS	B		B	B	B		
Approach Delay	14.8			12.4	12.6		
Approach LOS	B			B	B		
Queue Length 50th (m)	5.9		2.8	21.3	21.9		
Queue Length 95th (m)	17.5		8.3	40.1	42.4		
Internal Link Dist (m)	199.0			397.6	142.2		
Turn Bay Length (m)			45.0				
Base Capacity (vph)	821		411	840	821		
Starvation Cap Reductn	0		0	0	0		
Spillback Cap Reductn	0		0	0	0		
Storage Cap Reductn	0		0	0	0		
Reduced v/c Ratio	0.18		0.13	0.42	0.47		

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 52.4

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 12.8

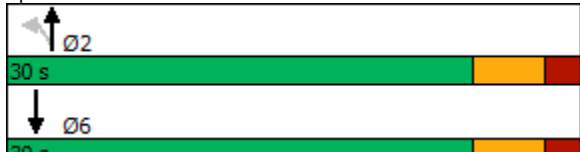

Intersection LOS: B







Intersection Capacity Utilization 50.4%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Kanata & Huntsville

	
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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Volume (vph)	0	609	654	42	0	13
Future Volume (vph)	0	609	654	42	0	13
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3390	3390	1517	0	1543
Flt Permitted						
Satd. Flow (perm)	0	3390	3390	1517	0	1543
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	234.5		319.8	
Travel Time (s)		19.8	16.9		23.0	
Confl. Peds. (#/hr)	2			2		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	677	727	47	0	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	677	727	47	0	14
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	29.1%			ICU Level of Service A		
Analysis Period (min)	15					



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	70	702	635	181	339	73
Future Volume (vph)	70	702	635	181	339	73
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			100.0	0.0	0.0
Storage Lanes	1			1	2	1
Taper Length (m)	45.0				80.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Ped Bike Factor	1.00			0.96		0.98
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1647	3293	3293	1473	3195	1473
Flt Permitted	0.410				0.950	
Satd. Flow (perm)	709	3293	3293	1417	3195	1451
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				181		73
Link Speed (k/h)		70	70		50	
Link Distance (m)		97.9	343.0		83.8	
Travel Time (s)		5.0	17.6		6.0	
Confl. Peds. (#/hr)	3			3		
Confl. Bikes (#/hr)				18		4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	702	635	181	339	73
Shared Lane Traffic (%)						
Lane Group Flow (vph)	70	702	635	181	339	73
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		6.0	5.0		10.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	18.6	93.0	93.0	18.6	18.6	18.6
Trailing Detector (m)	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
Detector 1 Size(m)	18.6	5.5	5.5	18.6	18.6	18.6
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)		87.5	87.5			
Detector 2 Size(m)		5.5	5.5			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	25.0	25.0	31.2	31.2
Total Split (s)	68.0	68.0	68.0	68.0	32.0	32.0
Total Split (%)	68.0%	68.0%	68.0%	68.0%	32.0%	32.0%
Maximum Green (s)	62.0	62.0	62.0	62.0	25.8	25.8
Yellow Time (s)	4.2	4.2	4.2	4.2	3.7	3.7
All-Red Time (s)	1.8	1.8	1.8	1.8	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.2	6.2
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	18.0	18.0
Pedestrian Calls (#/hr)	0	0	3	3	0	0
Act Effct Green (s)	62.1	62.1	62.1	62.1	14.7	14.7
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.17	0.17
v/c Ratio	0.14	0.31	0.28	0.17	0.64	0.24
Control Delay	6.1	5.9	5.8	1.3	40.5	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	5.9	5.8	1.3	40.5	10.1
LOS	A	A	A	A	D	B
Approach Delay		6.0	4.8		35.1	
Approach LOS		A	A		D	
Queue Length 50th (m)	3.2	19.0	16.7	0.0	25.9	0.0
Queue Length 95th (m)	8.9	32.0	28.4	5.8	37.9	9.9
Internal Link Dist (m)		73.9	319.0		59.8	
Turn Bay Length (m)				100.0		
Base Capacity (vph)	494	2295	2295	1042	927	472
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.31	0.28	0.17	0.37	0.15

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 89

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 11.5

Intersection LOS: B












Intersection Capacity Utilization 52.2%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Terry Fox & Kanata



						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	76	120	20	231	292	26
Future Volume (vph)	76	120	20	231	292	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	45.0			65.0
Storage Lanes	1	0	1			1
Taper Length (m)	10.0		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98
Frt	0.917					0.850
Flt Protected	0.981		0.950			
Satd. Flow (prot)	1559	0	1647	1733	1733	1473
Flt Permitted	0.981		0.581			
Satd. Flow (perm)	1559	0	1007	1733	1733	1440
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	98					26
Link Speed (k/h)	50			50	50	
Link Distance (m)	223.0			339.7	166.2	
Travel Time (s)	16.1			24.5	12.0	
Confl. Bikes (#/hr)						4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	76	120	20	231	292	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	196	0	20	231	292	26
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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
Number of Detectors	1		1	2	2	1
Detector Template	Left		Left	Thru	Thru	Right
Leading Detector (m)	18.6		18.6	93.0	93.0	18.6
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	18.6		18.6	5.5	5.5	18.6
Detector 1 Type	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
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)				87.5	87.5	
Detector 2 Size(m)				5.5	5.5	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Split (s)	26.1		29.7	29.7	29.7	29.7
Total Split (s)	27.0		53.0	53.0	53.0	53.0
Total Split (%)	33.8%		66.3%	66.3%	66.3%	66.3%
Maximum Green (s)	21.9		47.3	47.3	47.3	47.3
Yellow Time (s)	3.3		3.7	3.7	3.7	3.7
All-Red Time (s)	1.8		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1		5.7	5.7	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		15.0	15.0	15.0	15.0
Flash Dont Walk (s)	14.0		9.0	9.0	9.0	9.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	11.7		49.5	49.5	49.5	49.5
Actuated g/C Ratio	0.16		0.69	0.69	0.69	0.69
v/c Ratio	0.59		0.03	0.19	0.25	0.03
Control Delay	21.3		4.5	4.9	5.2	2.1
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	21.3		4.5	4.9	5.2	2.1
LOS	C		A	A	A	A
Approach Delay	21.3			4.9	5.0	
Approach LOS	C			A	A	
Queue Length 50th (m)	10.6		0.6	7.7	10.1	0.0
Queue Length 95th (m)	26.9		2.8	18.8	24.0	2.1
Internal Link Dist (m)	199.0			315.7	142.2	
Turn Bay Length (m)			45.0			65.0
Base Capacity (vph)	543		692	1191	1191	998
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.36		0.03	0.19	0.25	0.03

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 72

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 9.1

Intersection LOS: A







Intersection Capacity Utilization 38.8%

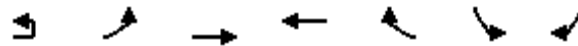
ICU Level of Service A

Analysis Period (min) 15

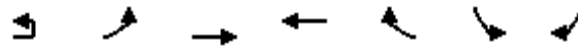
Splits and Phases: 2: Kanata & Huntsville



						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Volume (vph)	0	772	673	35	0	25
Future Volume (vph)	0	772	673	35	0	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3293	3293	1473	0	1499
Flt Permitted						
Satd. Flow (perm)	0	3293	3293	1473	0	1499
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	136.7		79.4	
Travel Time (s)		19.8	9.8		5.7	
Confl. Peds. (#/hr)	6			6		
Confl. Bikes (#/hr)				3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	772	673	35	0	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	772	673	35	0	25
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	29.6%			ICU Level of Service A		
Analysis Period (min)	15					



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	3	97	946	917	359	275	63
Future Volume (vph)	3	97	946	917	359	275	63
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0			100.0	0.0	0.0
Storage Lanes		1			1	2	1
Taper Length (m)		45.0				80.0	
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	0.97	1.00
Ped Bike Factor		1.00			0.97		0.99
Frt					0.850		0.850
Flt Protected		0.950				0.950	
Satd. Flow (prot)	0	1696	3390	3390	1517	3195	1473
Flt Permitted		0.295				0.950	
Satd. Flow (perm)	0	526	3390	3390	1478	3195	1453
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					359		63
Link Speed (k/h)			70	70		50	
Link Distance (m)			97.9	343.0		83.8	
Travel Time (s)			5.0	17.6		6.0	
Confl. Peds. (#/hr)		1			1		
Confl. Bikes (#/hr)					5		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	2%	2%	2%	5%	5%
Adj. Flow (vph)	3	97	946	917	359	275	63
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	100	946	917	359	275	63
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Left	Right	Left	Right
Median Width(m)			6.0	5.0		10.0	
Link Offset(m)			0.0	0.0		0.0	
Crosswalk Width(m)			2.0	2.0		2.0	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14	24			14	24	14
Number of Detectors	1	1	2	2	1	1	1
Detector Template	Left	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	18.6	18.6	93.0	93.0	18.6	18.6	18.6
Trailing Detector (m)	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
Detector 1 Size(m)	18.6	18.6	5.5	5.5	18.6	18.6	18.6
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)			87.5	87.5			
Detector 2 Size(m)			5.5	5.5			
Detector 2 Type			Cl+Ex	Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)			0.0	0.0			
Turn Type	Perm	Perm	NA	NA	Perm	Prot	Perm
Protected Phases			2	6		4	
Permitted Phases	2	2			6		4
Detector Phase	2	2	2	6	6	4	4



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	31.2	31.2
Total Split (s)	68.0	68.0	68.0	68.0	68.0	32.0	32.0
Total Split (%)	68.0%	68.0%	68.0%	68.0%	68.0%	32.0%	32.0%
Maximum Green (s)	62.0	62.0	62.0	62.0	62.0	25.8	25.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	3.7	3.7
All-Red Time (s)	1.8	1.8	1.8	1.8	1.8	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.2	6.2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	18.0	18.0
Pedestrian Calls (#/hr)	0	0	0	1	1	0	0
Act Effct Green (s)		62.4	62.4	62.4	62.4	12.9	12.9
Actuated g/C Ratio		0.71	0.71	0.71	0.71	0.15	0.15
v/c Ratio		0.27	0.39	0.38	0.31	0.59	0.24
Control Delay		7.1	5.8	5.7	1.3	40.0	11.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		7.1	5.8	5.7	1.3	40.0	11.2
LOS		A	A	A	A	D	B
Approach Delay			5.9	4.5		34.6	
Approach LOS			A	A		C	
Queue Length 50th (m)		4.6	25.4	24.3	0.0	20.5	0.0
Queue Length 95th (m)		12.5	39.9	38.2	6.9	31.3	9.5
Internal Link Dist (m)			73.9	319.0		59.8	
Turn Bay Length (m)					100.0		
Base Capacity (vph)		375	2418	2418	1157	942	472
Starvation Cap Reductn		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0
Reduced v/c Ratio		0.27	0.39	0.38	0.31	0.29	0.13

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 87.5

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 8.9

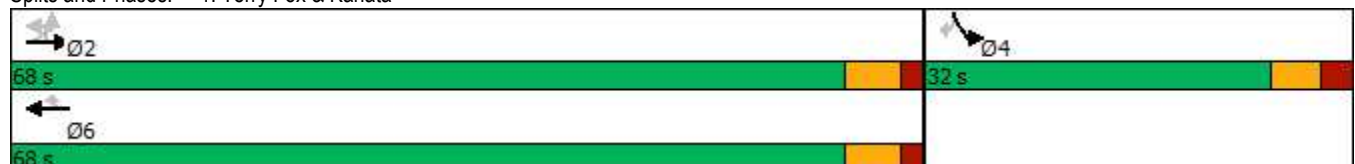
Intersection LOS: A












Intersection Capacity Utilization 58.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Terry Fox & Kanata



						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	49	64	82	375	275	58
Future Volume (vph)	49	64	82	375	275	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	45.0			65.0
Storage Lanes	1	0	1			1
Taper Length (m)	10.0		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98
Frt	0.924					0.850
Flt Protected	0.979		0.950			
Satd. Flow (prot)	1568	0	1647	1733	1733	1473
Flt Permitted	0.979		0.590			
Satd. Flow (perm)	1568	0	1023	1733	1733	1440
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	64					58
Link Speed (k/h)	50			50	50	
Link Distance (m)	223.0			339.7	166.2	
Travel Time (s)	16.1			24.5	12.0	
Confl. Bikes (#/hr)						4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	49	64	82	375	275	58
Shared Lane Traffic (%)						
Lane Group Flow (vph)	113	0	82	375	275	58
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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
Number of Detectors	1		1	2	2	1
Detector Template	Left		Left	Thru	Thru	Right
Leading Detector (m)	18.6		18.6	93.0	93.0	18.6
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	18.6		18.6	5.5	5.5	18.6
Detector 1 Type	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
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)				87.5	87.5	
Detector 2 Size(m)				5.5	5.5	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Split (s)	26.1		29.7	29.7	29.7	29.7
Total Split (s)	27.0		53.0	53.0	53.0	53.0
Total Split (%)	33.8%		66.3%	66.3%	66.3%	66.3%
Maximum Green (s)	21.9		47.3	47.3	47.3	47.3
Yellow Time (s)	3.3		3.7	3.7	3.7	3.7
All-Red Time (s)	1.8		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1		5.7	5.7	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		15.0	15.0	15.0	15.0
Flash Dont Walk (s)	14.0		9.0	9.0	9.0	9.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	10.4		53.9	53.9	53.9	53.9
Actuated g/C Ratio	0.15		0.76	0.76	0.76	0.76
v/c Ratio	0.40		0.11	0.28	0.21	0.05
Control Delay	18.1		4.0	4.5	4.1	1.3
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	18.1		4.0	4.5	4.1	1.3
LOS	B		A	A	A	A
Approach Delay	18.1			4.4	3.6	
Approach LOS	B			A	A	
Queue Length 50th (m)	5.2		2.6	13.8	9.5	0.0
Queue Length 95th (m)	16.9		6.5	25.4	18.0	2.5
Internal Link Dist (m)	199.0			315.7	142.2	
Turn Bay Length (m)			45.0			65.0
Base Capacity (vph)	531		778	1319	1319	1110
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.21		0.11	0.28	0.21	0.05

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 70.8

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 5.8

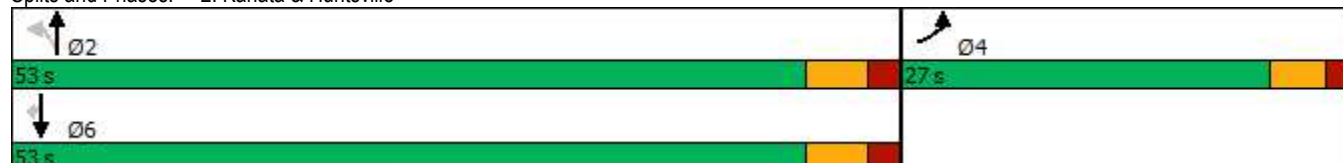
Intersection LOS: A

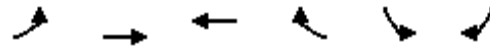
Intersection Capacity Utilization 45.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Kanata & Huntsville

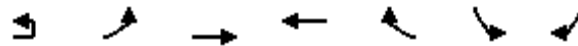




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Volume (vph)	0	1046	867	116	0	11
Future Volume (vph)	0	1046	867	116	0	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3293	3293	1473	0	1499
Flt Permitted						
Satd. Flow (perm)	0	3293	3293	1473	0	1499
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	136.7		79.4	
Travel Time (s)		19.8	9.8		5.7	
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1046	867	116	0	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1046	867	116	0	11
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	35.3%			ICU Level of Service A		
Analysis Period (min)	15					



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	3	74	548	641	312	274	70
Future Volume (vph)	3	74	548	641	312	274	70
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0			100.0	0.0	0.0
Storage Lanes		1			1	2	1
Taper Length (m)		45.0				80.0	
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	0.97	1.00
Ped Bike Factor		1.00			0.97		0.99
Frt					0.850		0.850
Flt Protected		0.950				0.950	
Satd. Flow (prot)	0	1696	3390	3390	1517	3195	1473
Flt Permitted		0.408				0.950	
Satd. Flow (perm)	0	728	3390	3390	1478	3195	1453
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					312		70
Link Speed (k/h)			70	70		50	
Link Distance (m)			97.9	343.0		83.8	
Travel Time (s)			5.0	17.6		6.0	
Confl. Peds. (#/hr)		1			1		
Confl. Bikes (#/hr)					5		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	2%	2%	2%	5%	5%
Adj. Flow (vph)	3	74	548	641	312	274	70
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	77	548	641	312	274	70
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Left	Right	Left	Right
Median Width(m)			6.0	5.0		10.0	
Link Offset(m)			0.0	0.0		0.0	
Crosswalk Width(m)			2.0	2.0		2.0	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14	24			14	24	14
Number of Detectors	1	1	2	2	1	1	1
Detector Template	Left	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	18.6	18.6	93.0	93.0	18.6	18.6	18.6
Trailing Detector (m)	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
Detector 1 Size(m)	18.6	18.6	5.5	5.5	18.6	18.6	18.6
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)			87.5	87.5			
Detector 2 Size(m)			5.5	5.5			
Detector 2 Type			Cl+Ex	Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)			0.0	0.0			
Turn Type	Perm	Perm	NA	NA	Perm	Prot	Perm
Protected Phases			2	6		4	
Permitted Phases	2	2			6		4
Detector Phase	2	2	2	6	6	4	4



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	31.2	31.2
Total Split (s)	58.0	58.0	58.0	58.0	58.0	32.0	32.0
Total Split (%)	64.4%	64.4%	64.4%	64.4%	64.4%	35.6%	35.6%
Maximum Green (s)	52.0	52.0	52.0	52.0	52.0	25.8	25.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	3.7	3.7
All-Red Time (s)	1.8	1.8	1.8	1.8	1.8	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.2	6.2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	18.0	18.0
Pedestrian Calls (#/hr)	0	0	0	6	6	1	1
Act Effct Green (s)		52.8	52.8	52.8	52.8	13.8	13.8
Actuated g/C Ratio		0.67	0.67	0.67	0.67	0.18	0.18
v/c Ratio		0.16	0.24	0.28	0.29	0.49	0.23
Control Delay		7.2	6.1	6.4	1.7	31.9	8.8
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		7.2	6.1	6.4	1.7	31.9	8.8
LOS		A	A	A	A	C	A
Approach Delay			6.3	4.8		27.2	
Approach LOS			A	A		C	
Queue Length 50th (m)		3.0	12.0	14.4	0.0	17.4	0.0
Queue Length 95th (m)		11.7	28.8	34.2	9.0	26.8	8.5
Internal Link Dist (m)			73.9	319.0		59.8	
Turn Bay Length (m)					100.0		
Base Capacity (vph)		487	2271	2271	1093	1050	524
Starvation Cap Reductn		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0
Reduced v/c Ratio		0.16	0.24	0.28	0.29	0.26	0.13

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 78.8

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.49

Intersection Signal Delay: 9.3

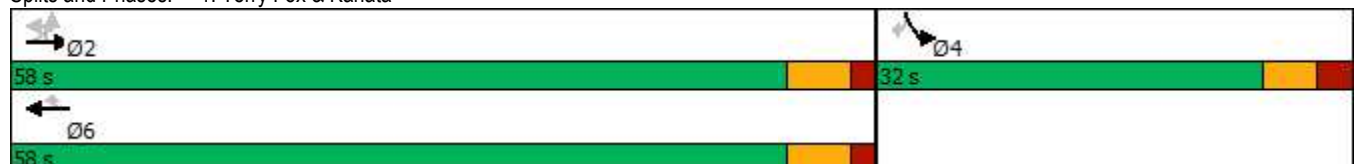
Intersection LOS: A

Intersection Capacity Utilization 50.5%







ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Terry Fox & Kanata



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	68	65	51	335	279	82
Future Volume (vph)	68	65	51	335	279	82
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	45.0			65.0
Storage Lanes	1	0	1			1
Taper Length (m)	10.0		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98
Frt	0.934					0.850
Flt Protected	0.975		0.950			
Satd. Flow (prot)	1578	0	1647	1733	1733	1473
Flt Permitted	0.975		0.588			
Satd. Flow (perm)	1578	0	1019	1733	1733	1440
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	65					82
Link Speed (k/h)	50			50	50	
Link Distance (m)	223.0			339.7	166.2	
Travel Time (s)	16.1			24.5	12.0	
Confl. Bikes (#/hr)						4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	68	65	51	335	279	82
Shared Lane Traffic (%)						
Lane Group Flow (vph)	133	0	51	335	279	82
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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
Number of Detectors	1		1	2	2	1
Detector Template	Left		Left	Thru	Thru	Right
Leading Detector (m)	18.6		18.6	93.0	93.0	18.6
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	18.6		18.6	5.5	5.5	18.6
Detector 1 Type	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
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)				87.5	87.5	
Detector 2 Size(m)				5.5	5.5	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Split (s)	26.1		29.7	29.7	29.7	29.7
Total Split (s)	27.0		43.0	43.0	43.0	43.0
Total Split (%)	38.6%		61.4%	61.4%	61.4%	61.4%
Maximum Green (s)	21.9		37.3	37.3	37.3	37.3
Yellow Time (s)	3.3		3.7	3.7	3.7	3.7
All-Red Time (s)	1.8		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1		5.7	5.7	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		15.0	15.0	15.0	15.0
Flash Dont Walk (s)	14.0		9.0	9.0	9.0	9.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	10.4		42.8	42.8	42.8	42.8
Actuated g/C Ratio	0.17		0.72	0.72	0.72	0.72
v/c Ratio	0.41		0.07	0.27	0.22	0.08
Control Delay	16.3		4.5	5.2	4.9	1.5
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	16.3		4.5	5.2	4.9	1.5
LOS	B		A	A	A	A
Approach Delay	16.3			5.1	4.1	
Approach LOS	B			A	A	
Queue Length 50th (m)	5.8		1.6	12.0	9.6	0.0
Queue Length 95th (m)	17.4		4.8	23.7	19.5	3.3
Internal Link Dist (m)	199.0			315.7	142.2	
Turn Bay Length (m)			45.0			65.0
Base Capacity (vph)	620		730	1241	1241	1054
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.21		0.07	0.27	0.22	0.08

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 59.7

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.41

Intersection Signal Delay: 6.4

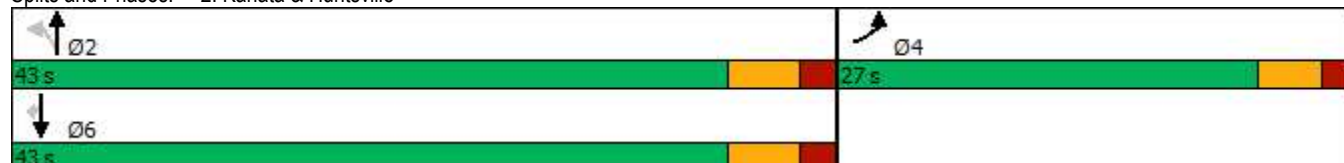
Intersection LOS: A







Intersection Capacity Utilization 45.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Kanata & Huntsville



						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Volume (vph)	0	625	672	42	0	13
Future Volume (vph)	0	625	672	42	0	13
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3293	3293	1473	0	1499
Flt Permitted						
Satd. Flow (perm)	0	3293	3293	1473	0	1499
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	136.7		79.4	
Travel Time (s)		19.8	9.8		5.7	
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	625	672	42	0	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	625	672	42	0	13
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	29.6%			ICU Level of Service A		
Analysis Period (min)	15					



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	73	905	735	189	353	76
Future Volume (vph)	73	905	735	189	353	76
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			100.0	0.0	0.0
Storage Lanes	1			1	2	1
Taper Length (m)	45.0				80.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Ped Bike Factor	1.00			0.96		0.98
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1647	3293	3293	1473	3195	1473
Flt Permitted	0.363				0.950	
Satd. Flow (perm)	628	3293	3293	1417	3195	1451
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				189		76
Link Speed (k/h)		70	70		50	
Link Distance (m)		97.9	343.0		83.8	
Travel Time (s)		5.0	17.6		6.0	
Confl. Peds. (#/hr)	3			3		
Confl. Bikes (#/hr)				18		4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	905	735	189	353	76
Shared Lane Traffic (%)						
Lane Group Flow (vph)	73	905	735	189	353	76
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		6.0	5.0		10.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	18.6	93.0	93.0	18.6	18.6	18.6
Trailing Detector (m)	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
Detector 1 Size(m)	18.6	5.5	5.5	18.6	18.6	18.6
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)		87.5	87.5			
Detector 2 Size(m)		5.5	5.5			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	25.0	25.0	31.2	31.2
Total Split (s)	68.0	68.0	68.0	68.0	32.0	32.0
Total Split (%)	68.0%	68.0%	68.0%	68.0%	32.0%	32.0%
Maximum Green (s)	62.0	62.0	62.0	62.0	25.8	25.8
Yellow Time (s)	4.2	4.2	4.2	4.2	3.7	3.7
All-Red Time (s)	1.8	1.8	1.8	1.8	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.2	6.2
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	18.0	18.0
Pedestrian Calls (#/hr)	0	0	3	3	0	0
Act Effct Green (s)	62.1	62.1	62.1	62.1	15.2	15.2
Actuated g/C Ratio	0.69	0.69	0.69	0.69	0.17	0.17
v/c Ratio	0.17	0.40	0.32	0.18	0.65	0.25
Control Delay	6.7	6.8	6.2	1.3	40.6	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	6.8	6.2	1.3	40.6	9.9
LOS	A	A	A	A	D	A
Approach Delay		6.8	5.2		35.1	
Approach LOS		A	A		D	
Queue Length 50th (m)	3.4	27.2	20.5	0.0	27.1	0.0
Queue Length 95th (m)	9.7	44.7	34.4	6.0	39.4	10.1
Internal Link Dist (m)		73.9	319.0		59.8	
Turn Bay Length (m)				100.0		
Base Capacity (vph)	435	2284	2284	1041	922	472
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.40	0.32	0.18	0.38	0.16

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 89.5

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 11.4

Intersection LOS: B












Intersection Capacity Utilization 55.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Terry Fox & Kanata

02 68 s	04 32 s
06 68 s	

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	76	120	20	242	309	26
Future Volume (vph)	76	120	20	242	309	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	45.0			65.0
Storage Lanes	1	0	1			1
Taper Length (m)	10.0		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98
Frt	0.917					0.850
Flt Protected	0.981		0.950			
Satd. Flow (prot)	1559	0	1647	1733	1733	1473
Flt Permitted	0.981		0.572			
Satd. Flow (perm)	1559	0	991	1733	1733	1440
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	98					26
Link Speed (k/h)	50			50	50	
Link Distance (m)	223.0			339.7	166.2	
Travel Time (s)	16.1			24.5	12.0	
Confl. Bikes (#/hr)						4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	76	120	20	242	309	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	196	0	20	242	309	26
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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
Number of Detectors	1		1	2	2	1
Detector Template	Left		Left	Thru	Thru	Right
Leading Detector (m)	18.6		18.6	93.0	93.0	18.6
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	18.6		18.6	5.5	5.5	18.6
Detector 1 Type	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
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)				87.5	87.5	
Detector 2 Size(m)				5.5	5.5	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Split (s)	26.1		29.7	29.7	29.7	29.7
Total Split (s)	27.0		53.0	53.0	53.0	53.0
Total Split (%)	33.8%		66.3%	66.3%	66.3%	66.3%
Maximum Green (s)	21.9		47.3	47.3	47.3	47.3
Yellow Time (s)	3.3		3.7	3.7	3.7	3.7
All-Red Time (s)	1.8		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1		5.7	5.7	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		15.0	15.0	15.0	15.0
Flash Dont Walk (s)	14.0		9.0	9.0	9.0	9.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	11.7		49.5	49.5	49.5	49.5
Actuated g/C Ratio	0.16		0.69	0.69	0.69	0.69
v/c Ratio	0.59		0.03	0.20	0.26	0.03
Control Delay	21.3		4.5	5.0	5.3	2.1
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	21.3		4.5	5.0	5.3	2.1
LOS	C		A	A	A	A
Approach Delay	21.3			5.0	5.1	
Approach LOS	C			A	A	
Queue Length 50th (m)	10.6		0.6	8.1	10.8	0.0
Queue Length 95th (m)	26.9		2.8	19.7	25.4	2.1
Internal Link Dist (m)	199.0			315.7	142.2	
Turn Bay Length (m)			45.0			65.0
Base Capacity (vph)	543		681	1191	1191	998
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.36		0.03	0.20	0.26	0.03

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 72

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 9.1

Intersection LOS: A

Intersection Capacity Utilization 38.8%

ICU Level of Service A

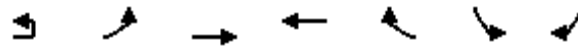
Analysis Period (min) 15

Splits and Phases: 2: Kanata & Huntsville

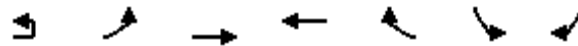




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Volume (vph)	0	978	776	35	0	25
Future Volume (vph)	0	978	776	35	0	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3293	3293	1473	0	1499
Flt Permitted						
Satd. Flow (perm)	0	3293	3293	1473	0	1499
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	136.7		79.4	
Travel Time (s)		19.8	9.8		5.7	
Confl. Peds. (#/hr)	6			6		
Confl. Bikes (#/hr)				3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	978	776	35	0	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	978	776	35	0	25
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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 32.6%				ICU Level of Service A		
Analysis Period (min) 15						



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	3	101	1116	1143	375	288	65
Future Volume (vph)	3	101	1116	1143	375	288	65
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0			100.0	0.0	0.0
Storage Lanes		1			1	2	1
Taper Length (m)		45.0				80.0	
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	0.97	1.00
Ped Bike Factor		1.00			0.97		0.99
Frt					0.850		0.850
Flt Protected		0.950				0.950	
Satd. Flow (prot)	0	1696	3390	3390	1517	3195	1473
Flt Permitted		0.222				0.950	
Satd. Flow (perm)	0	396	3390	3390	1478	3195	1453
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					375		65
Link Speed (k/h)			70	70		50	
Link Distance (m)			97.9	343.0		83.8	
Travel Time (s)			5.0	17.6		6.0	
Confl. Peds. (#/hr)		1			1		
Confl. Bikes (#/hr)					5		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	2%	2%	2%	5%	5%
Adj. Flow (vph)	3	101	1116	1143	375	288	65
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	104	1116	1143	375	288	65
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Left	Right	Left	Right
Median Width(m)			6.0	5.0		10.0	
Link Offset(m)			0.0	0.0		0.0	
Crosswalk Width(m)			2.0	2.0		2.0	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14	24			14	24	14
Number of Detectors	1	1	2	2	1	1	1
Detector Template	Left	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	18.6	18.6	93.0	93.0	18.6	18.6	18.6
Trailing Detector (m)	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
Detector 1 Size(m)	18.6	18.6	5.5	5.5	18.6	18.6	18.6
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)			87.5	87.5			
Detector 2 Size(m)			5.5	5.5			
Detector 2 Type			Cl+Ex	Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)			0.0	0.0			
Turn Type	Perm	Perm	NA	NA	Perm	Prot	Perm
Protected Phases			2	6		4	
Permitted Phases	2	2			6		4
Detector Phase	2	2	2	6	6	4	4



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	31.2	31.2
Total Split (s)	68.0	68.0	68.0	68.0	68.0	32.0	32.0
Total Split (%)	68.0%	68.0%	68.0%	68.0%	68.0%	32.0%	32.0%
Maximum Green (s)	62.0	62.0	62.0	62.0	62.0	25.8	25.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	3.7	3.7
All-Red Time (s)	1.8	1.8	1.8	1.8	1.8	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.2	6.2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	18.0	18.0
Pedestrian Calls (#/hr)	0	0	0	1	1	0	0
Act Effct Green (s)		62.2	62.2	62.2	62.2	13.2	13.2
Actuated g/C Ratio		0.71	0.71	0.71	0.71	0.15	0.15
v/c Ratio		0.37	0.46	0.47	0.32	0.60	0.24
Control Delay		10.2	6.5	6.6	1.3	40.2	11.0
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		10.2	6.5	6.6	1.3	40.2	11.0
LOS		B	A	A	A	D	B
Approach Delay			6.8	5.3		34.8	
Approach LOS			A	A		C	
Queue Length 50th (m)		5.3	32.7	34.0	0.0	21.6	0.0
Queue Length 95th (m)		16.2	51.0	52.8	7.2	32.7	9.5
Internal Link Dist (m)			73.9	319.0		59.8	
Turn Bay Length (m)					100.0		
Base Capacity (vph)		281	2408	2408	1158	941	473
Starvation Cap Reductn		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0
Reduced v/c Ratio		0.37	0.46	0.47	0.32	0.31	0.14

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 87.6

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 9.3

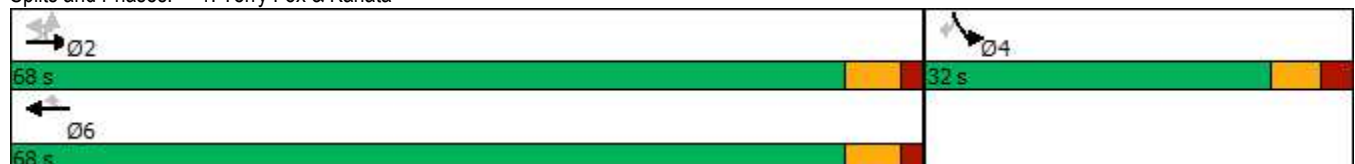
Intersection LOS: A

Intersection Capacity Utilization 65.5%

ICU Level of Service C












Analysis Period (min) 15

Splits and Phases: 1: Terry Fox & Kanata



2: Kanata & Huntsville
PM Peak Hour

471 Terry Fox Drive
2024 Background Traffic

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	49	64	82	395	290	58
Future Volume (vph)	49	64	82	395	290	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	45.0			65.0
Storage Lanes	1	0	1			1
Taper Length (m)	10.0		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98
Frt	0.924					0.850
Flt Protected	0.979		0.950			
Satd. Flow (prot)	1568	0	1647	1733	1733	1473
Flt Permitted	0.979		0.582			
Satd. Flow (perm)	1568	0	1009	1733	1733	1440
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	64					58
Link Speed (k/h)	50			50	50	
Link Distance (m)	223.0			339.7	166.2	
Travel Time (s)	16.1			24.5	12.0	
Confl. Bikes (#/hr)						4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	49	64	82	395	290	58
Shared Lane Traffic (%)						
Lane Group Flow (vph)	113	0	82	395	290	58
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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
Number of Detectors	1		1	2	2	1
Detector Template	Left		Left	Thru	Thru	Right
Leading Detector (m)	18.6		18.6	93.0	93.0	18.6
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	18.6		18.6	5.5	5.5	18.6
Detector 1 Type	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
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)				87.5	87.5	
Detector 2 Size(m)				5.5	5.5	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Split (s)	26.1		29.7	29.7	29.7	29.7
Total Split (s)	27.0		53.0	53.0	53.0	53.0
Total Split (%)	33.8%		66.3%	66.3%	66.3%	66.3%
Maximum Green (s)	21.9		47.3	47.3	47.3	47.3
Yellow Time (s)	3.3		3.7	3.7	3.7	3.7
All-Red Time (s)	1.8		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1		5.7	5.7	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		15.0	15.0	15.0	15.0
Flash Dont Walk (s)	14.0		9.0	9.0	9.0	9.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	10.4		53.9	53.9	53.9	53.9
Actuated g/C Ratio	0.15		0.76	0.76	0.76	0.76
v/c Ratio	0.40		0.11	0.30	0.22	0.05
Control Delay	18.1		4.0	4.6	4.1	1.3
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	18.1		4.0	4.6	4.1	1.3
LOS	B		A	A	A	A
Approach Delay	18.1			4.5	3.6	
Approach LOS	B			A	A	
Queue Length 50th (m)	5.2		2.6	14.7	10.0	0.0
Queue Length 95th (m)	16.9		6.6	27.1	19.1	2.5
Internal Link Dist (m)	199.0			315.7	142.2	
Turn Bay Length (m)			45.0			65.0
Base Capacity (vph)	531		768	1319	1319	1110
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.21		0.11	0.30	0.22	0.05

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 70.8

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 5.8

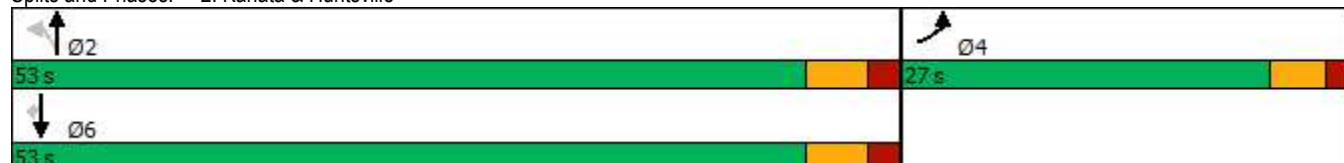
Intersection LOS: A







Intersection Capacity Utilization 46.5%

ICU Level of Service A

Analysis Period (min) 15

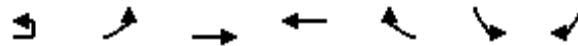
Splits and Phases: 2: Kanata & Huntsville



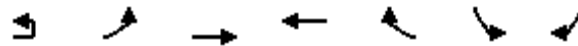
						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Volume (vph)	0	1220	1095	116	0	11
Future Volume (vph)	0	1220	1095	116	0	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3293	3293	1473	0	1499
Flt Permitted						
Satd. Flow (perm)	0	3293	3293	1473	0	1499
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	136.7		79.4	
Travel Time (s)		19.8	9.8		5.7	
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1220	1095	116	0	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1220	1095	116	0	11
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	42.0%			ICU Level of Service A		
Analysis Period (min)	15					

1: Terry Fox & Kanata
SAT Peak Hour

471 Terry Fox Drive
2024 Background Traffic



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	3	77	746	869	327	287	73
Future Volume (vph)	3	77	746	869	327	287	73
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0			100.0	0.0	0.0
Storage Lanes		1			1	2	1
Taper Length (m)		45.0				80.0	
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	0.97	1.00
Ped Bike Factor		1.00			0.97		0.99
Frt					0.850		0.850
Flt Protected		0.950				0.950	
Satd. Flow (prot)	0	1696	3390	3390	1517	3195	1473
Flt Permitted		0.308				0.950	
Satd. Flow (perm)	0	550	3390	3390	1478	3195	1453
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					327		73
Link Speed (k/h)			70	70		50	
Link Distance (m)			97.9	343.0		83.8	
Travel Time (s)			5.0	17.6		6.0	
Confl. Peds. (#/hr)		1			1		
Confl. Bikes (#/hr)					5		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	2%	2%	2%	5%	5%
Adj. Flow (vph)	3	77	746	869	327	287	73
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	80	746	869	327	287	73
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Left	Right	Left	Right
Median Width(m)			6.0	5.0		10.0	
Link Offset(m)			0.0	0.0		0.0	
Crosswalk Width(m)			2.0	2.0		2.0	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14	24			14	24	14
Number of Detectors	1	1	2	2	1	1	1
Detector Template	Left	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	18.6	18.6	93.0	93.0	18.6	18.6	18.6
Trailing Detector (m)	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
Detector 1 Size(m)	18.6	18.6	5.5	5.5	18.6	18.6	18.6
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)			87.5	87.5			
Detector 2 Size(m)			5.5	5.5			
Detector 2 Type			Cl+Ex	Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)			0.0	0.0			
Turn Type	Perm	Perm	NA	NA	Perm	Prot	Perm
Protected Phases			2	6		4	
Permitted Phases	2	2			6		4
Detector Phase	2	2	2	6	6	4	4



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	31.2	31.2
Total Split (s)	58.0	58.0	58.0	58.0	58.0	32.0	32.0
Total Split (%)	64.4%	64.4%	64.4%	64.4%	64.4%	35.6%	35.6%
Maximum Green (s)	52.0	52.0	52.0	52.0	52.0	25.8	25.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	3.7	3.7
All-Red Time (s)	1.8	1.8	1.8	1.8	1.8	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.2	6.2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	18.0	18.0
Pedestrian Calls (#/hr)	0	0	0	6	6	1	1
Act Effct Green (s)		52.5	52.5	52.5	52.5	13.9	13.9
Actuated g/C Ratio		0.67	0.67	0.67	0.67	0.18	0.18
v/c Ratio		0.22	0.33	0.38	0.30	0.51	0.23
Control Delay		8.4	6.8	7.2	1.7	32.0	8.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		8.4	6.8	7.2	1.7	32.0	8.7
LOS		A	A	A	A	C	A
Approach Delay			6.9	5.7		27.3	
Approach LOS			A	A		C	
Queue Length 50th (m)		3.3	17.8	21.8	0.0	18.4	0.0
Queue Length 95th (m)		13.2	40.8	49.2	9.2	28.0	8.7
Internal Link Dist (m)			73.9	319.0		59.8	
Turn Bay Length (m)					100.0		
Base Capacity (vph)		367	2262	2262	1095	1051	527
Starvation Cap Reductn		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0
Reduced v/c Ratio		0.22	0.33	0.38	0.30	0.27	0.14

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 78.7

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 9.4

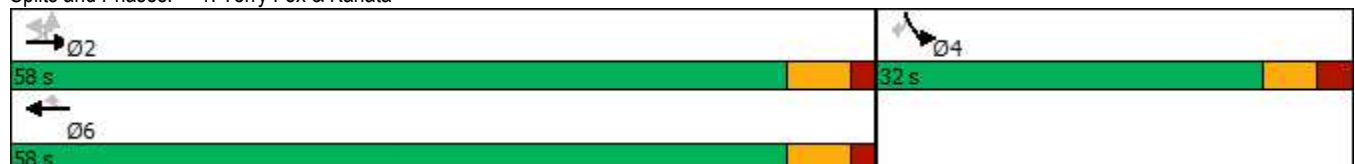
Intersection LOS: A

Intersection Capacity Utilization 57.5%

ICU Level of Service B












Analysis Period (min) 15


Splits and Phases: 1: Terry Fox & Kanata



2: Kanata & Huntsville
SAT Peak Hour

471 Terry Fox Drive
2024 Background Traffic

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	68	65	51	353	295	82
Future Volume (vph)	68	65	51	353	295	82
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	45.0			65.0
Storage Lanes	1	0	1			1
Taper Length (m)	10.0		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98
Frt	0.934					0.850
Flt Protected	0.975		0.950			
Satd. Flow (prot)	1578	0	1647	1733	1733	1473
Flt Permitted	0.975		0.580			
Satd. Flow (perm)	1578	0	1005	1733	1733	1440
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	65					82
Link Speed (k/h)	50			50	50	
Link Distance (m)	223.0			339.7	166.2	
Travel Time (s)	16.1			24.5	12.0	
Confl. Bikes (#/hr)						4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	68	65	51	353	295	82
Shared Lane Traffic (%)						
Lane Group Flow (vph)	133	0	51	353	295	82
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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
Number of Detectors	1		1	2	2	1
Detector Template	Left		Left	Thru	Thru	Right
Leading Detector (m)	18.6		18.6	93.0	93.0	18.6
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	18.6		18.6	5.5	5.5	18.6
Detector 1 Type	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
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)				87.5	87.5	
Detector 2 Size(m)				5.5	5.5	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Split (s)	26.1		29.7	29.7	29.7	29.7
Total Split (s)	27.0		43.0	43.0	43.0	43.0
Total Split (%)	38.6%		61.4%	61.4%	61.4%	61.4%
Maximum Green (s)	21.9		37.3	37.3	37.3	37.3
Yellow Time (s)	3.3		3.7	3.7	3.7	3.7
All-Red Time (s)	1.8		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1		5.7	5.7	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		15.0	15.0	15.0	15.0
Flash Dont Walk (s)	14.0		9.0	9.0	9.0	9.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	10.4		42.8	42.8	42.8	42.8
Actuated g/C Ratio	0.17		0.72	0.72	0.72	0.72
v/c Ratio	0.41		0.07	0.28	0.24	0.08
Control Delay	16.3		4.5	5.3	5.0	1.5
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	16.3		4.5	5.3	5.0	1.5
LOS	B		A	A	A	A
Approach Delay	16.3			5.2	4.2	
Approach LOS	B			A	A	
Queue Length 50th (m)	5.8		1.6	12.8	10.3	0.0
Queue Length 95th (m)	17.4		4.8	25.2	20.7	3.3
Internal Link Dist (m)	199.0			315.7	142.2	
Turn Bay Length (m)			45.0			65.0
Base Capacity (vph)	620		719	1241	1241	1054
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.21		0.07	0.28	0.24	0.08

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 59.7

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.41

Intersection Signal Delay: 6.4

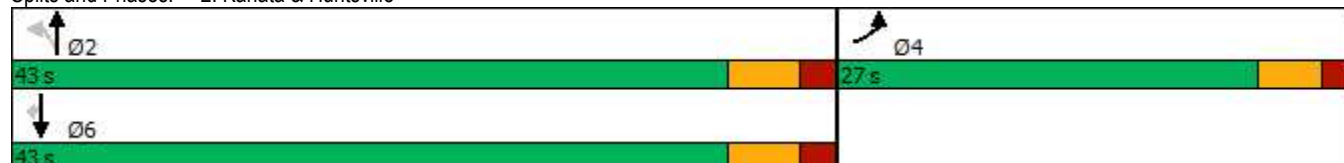
Intersection LOS: A







Intersection Capacity Utilization 46.8%

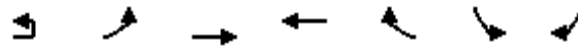
ICU Level of Service A

Analysis Period (min) 15

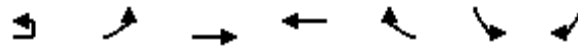
Splits and Phases: 2: Kanata & Huntsville



						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Volume (vph)	0	826	903	42	0	13
Future Volume (vph)	0	826	903	42	0	13
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3293	3293	1473	0	1499
Flt Permitted						
Satd. Flow (perm)	0	3293	3293	1473	0	1499
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	136.7		79.4	
Travel Time (s)		19.8	9.8		5.7	
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	826	903	42	0	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	826	903	42	0	13
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	36.3%			ICU Level of Service A		
Analysis Period (min)	15					



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	8	70	702	644	181	346	76
Future Volume (vph)	8	70	702	644	181	346	76
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0			100.0	0.0	0.0
Storage Lanes		1			1	2	1
Taper Length (m)		45.0				80.0	
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	0.97	1.00
Ped Bike Factor		1.00			0.96		0.98
Frt					0.850		0.850
Flt Protected		0.950				0.950	
Satd. Flow (prot)	0	1647	3293	3293	1473	3195	1473
Flt Permitted		0.405				0.950	
Satd. Flow (perm)	0	700	3293	3293	1417	3195	1451
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					181		76
Link Speed (k/h)			70	70		50	
Link Distance (m)			97.9	343.0		83.8	
Travel Time (s)			5.0	17.6		6.0	
Confl. Peds. (#/hr)		3			3		
Confl. Bikes (#/hr)					18		4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	8	70	702	644	181	346	76
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	78	702	644	181	346	76
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Left	Right	Left	Right
Median Width(m)			6.0	5.0		10.0	
Link Offset(m)			0.0	0.0		0.0	
Crosswalk Width(m)			2.0	2.0		2.0	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14	24			14	24	14
Number of Detectors	1	1	2	2	1	1	1
Detector Template	Left	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	18.6	18.6	93.0	93.0	18.6	18.6	18.6
Trailing Detector (m)	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
Detector 1 Size(m)	18.6	18.6	5.5	5.5	18.6	18.6	18.6
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)			87.5	87.5			
Detector 2 Size(m)			5.5	5.5			
Detector 2 Type			CI+Ex	CI+Ex			
Detector 2 Channel							
Detector 2 Extend (s)			0.0	0.0			
Turn Type	Perm	Perm	NA	NA	Perm	Prot	Perm
Protected Phases			2	6		4	
Permitted Phases	2	2			6		4
Detector Phase	2	2	2	6	6	4	4
Switch Phase							



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	31.2	31.2
Total Split (s)	68.0	68.0	68.0	68.0	68.0	32.0	32.0
Total Split (%)	68.0%	68.0%	68.0%	68.0%	68.0%	32.0%	32.0%
Maximum Green (s)	62.0	62.0	62.0	62.0	62.0	25.8	25.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	3.7	3.7
All-Red Time (s)	1.8	1.8	1.8	1.8	1.8	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.2	6.2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	18.0	18.0
Pedestrian Calls (#/hr)	0	0	0	3	3	0	0
Act Effct Green (s)		62.1	62.1	62.1	62.1	15.0	15.0
Actuated g/C Ratio		0.70	0.70	0.70	0.70	0.17	0.17
v/c Ratio		0.16	0.31	0.28	0.17	0.65	0.25
Control Delay		6.4	6.0	5.9	1.3	40.5	9.9
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		6.4	6.0	5.9	1.3	40.5	9.9
LOS		A	A	A	A	D	A
Approach Delay			6.1	4.9		35.0	
Approach LOS			A	A		C	
Queue Length 50th (m)		3.6	19.2	17.2	0.0	26.5	0.0
Queue Length 95th (m)		10.0	32.3	29.3	5.9	38.8	10.2
Internal Link Dist (m)			73.9	319.0		59.8	
Turn Bay Length (m)					100.0		
Base Capacity (vph)		486	2289	2289	1040	924	473
Starvation Cap Reductn		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0
Reduced v/c Ratio		0.16	0.31	0.28	0.17	0.37	0.16

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 89.3

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 11.6

Intersection LOS: B

Intersection Capacity Utilization 52.7%







ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Terry Fox & Kanata

02 68 s	04 32 s
06 68 s	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	83	120	20	231	300	26
Future Volume (vph)	83	120	20	231	300	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	45.0			65.0
Storage Lanes	1	0	1			1
Taper Length (m)	10.0		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98
Frt	0.920					0.850
Flt Protected	0.980		0.950			
Satd. Flow (prot)	1563	0	1647	1733	1733	1473
Flt Permitted	0.980		0.577			
Satd. Flow (perm)	1563	0	1000	1733	1733	1440
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	90					26
Link Speed (k/h)	50			50	50	
Link Distance (m)	223.0			339.7	166.2	
Travel Time (s)	16.1			24.5	12.0	
Confl. Bikes (#/hr)						4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	120	20	231	300	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	203	0	20	231	300	26
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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
Number of Detectors	1		1	2	2	1
Detector Template	Left		Left	Thru	Thru	Right
Leading Detector (m)	18.6		18.6	93.0	93.0	18.6
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	18.6		18.6	5.5	5.5	18.6
Detector 1 Type	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
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)				87.5	87.5	
Detector 2 Size(m)				5.5	5.5	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Split (s)	26.1		29.7	29.7	29.7	29.7
Total Split (s)	27.0		53.0	53.0	53.0	53.0
Total Split (%)	33.8%		66.3%	66.3%	66.3%	66.3%
Maximum Green (s)	21.9		47.3	47.3	47.3	47.3
Yellow Time (s)	3.3		3.7	3.7	3.7	3.7
All-Red Time (s)	1.8		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1		5.7	5.7	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		15.0	15.0	15.0	15.0
Flash Dont Walk (s)	14.0		9.0	9.0	9.0	9.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	12.1		49.2	49.2	49.2	49.2
Actuated g/C Ratio	0.17		0.68	0.68	0.68	0.68
v/c Ratio	0.60		0.03	0.20	0.25	0.03
Control Delay	22.9		4.8	5.2	5.5	2.2
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	22.9		4.8	5.2	5.5	2.2
LOS	C		A	A	A	A
Approach Delay	22.9			5.1	5.2	
Approach LOS	C			A	A	
Queue Length 50th (m)	12.3		0.6	7.9	10.8	0.0
Queue Length 95th (m)	29.3		2.9	19.5	25.6	2.2
Internal Link Dist (m)	199.0			315.7	142.2	
Turn Bay Length (m)			45.0			65.0
Base Capacity (vph)	538		682	1182	1182	990
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.38		0.03	0.20	0.25	0.03

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 72.1

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 9.8

Intersection LOS: A







Intersection Capacity Utilization 39.2%

ICU Level of Service A

Analysis Period (min) 15










Splits and Phases: 2: Kanata & Huntsville



						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Volume (vph)	0	780	679	37	0	26
Future Volume (vph)	0	780	679	37	0	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3293	3293	1473	0	1499
Flt Permitted						
Satd. Flow (perm)	0	3293	3293	1473	0	1499
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	136.7		79.4	
Travel Time (s)		19.8	9.8		5.7	
Confl. Peds. (#/hr)	6			6		
Confl. Bikes (#/hr)				3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	780	679	37	0	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	780	679	37	0	26
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	29.8%			ICU Level of Service A		
Analysis Period (min)	15					










4: Tillsonburg & Full Access
AM Peak Hour







471 Terry Fox Drive
2019 Total Traffic

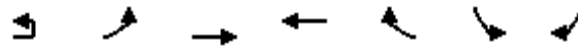
						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	9	35	2	3	25
Future Volume (vph)	1	9	35	2	3	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.878		0.993			
Flt Protected	0.995					0.995
Satd. Flow (prot)	1514	0	1721	0	0	1725
Flt Permitted	0.995					0.995
Satd. Flow (perm)	1514	0	1721	0	0	1725
Link Speed (k/h)	50		50			50
Link Distance (m)	52.0		79.4			246.5
Travel Time (s)	3.7		5.7			17.7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	9	35	2	3	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	0	37	0	0	28
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	2.0		2.0			2.0
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	14.0%			ICU Level of Service A		
Analysis Period (min)	15					

5: Terry Fox & RIRO Access
AM Peak Hour

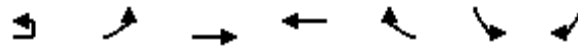
471 Terry Fox Drive
2019 Total Traffic

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	780	693	35	0	23
Future Volume (vph)	0	780	693	35	0	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	1.0			0.0	0.0	0.0
Storage Lanes	1			0	0	1
Taper Length (m)	45.0				10.0	
Lane Util. Factor	1.00	0.91	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.993			0.865
Flt Protected						
Satd. Flow (prot)	0	4732	3270	0	0	1499
Flt Permitted						
Satd. Flow (perm)	0	4732	3270	0	0	1499
Link Speed (k/h)		70	50		50	
Link Distance (m)		136.7	97.9		60.2	
Travel Time (s)		7.0	7.0		4.3	
Confl. Peds. (#/hr)	6			6		
Confl. Bikes (#/hr)				18		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	780	693	35	0	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	780	728	0	0	23
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.0	3.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	31.4%			ICU Level of Service A		
Analysis Period (min)	15					

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations					  	
Traffic Volume (vph)	0	13	0	251	409	11
Future Volume (vph)	0	13	0	251	409	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	0.0			25.0
Storage Lanes	0	1	0			1
Taper Length (m)	10.0		10.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91
Ped Bike Factor						
Frt		0.865			0.996	
Flt Protected						
Satd. Flow (prot)	0	1499	0	1733	4713	0
Flt Permitted						
Satd. Flow (perm)	0	1499	0	1733	4713	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	62.5			83.8	339.7	
Travel Time (s)	4.5			6.0	24.5	
Confl. Bikes (#/hr)						4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	13	0	251	409	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	13	0	251	420	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			2.0	2.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 18.6%	ICU Level of Service A					
Analysis Period (min) 15						



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↰↰	↰↰	↰	↰↰	↰
Traffic Volume (vph)	18	97	946	931	359	291	69
Future Volume (vph)	18	97	946	931	359	291	69
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0			100.0	0.0	0.0
Storage Lanes		1			1	2	1
Taper Length (m)		45.0				80.0	
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	0.97	1.00
Ped Bike Factor		1.00			0.97		0.99
Frt					0.850		0.850
Flt Protected		0.950				0.950	
Satd. Flow (prot)	0	1700	3390	3390	1517	3195	1473
Flt Permitted		0.290				0.950	
Satd. Flow (perm)	0	519	3390	3390	1478	3195	1453
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					359		69
Link Speed (k/h)			70	70		50	
Link Distance (m)			97.9	343.0		83.8	
Travel Time (s)			5.0	17.6		6.0	
Confl. Peds. (#/hr)		1			1		
Confl. Bikes (#/hr)					5		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	2%	2%	2%	5%	5%
Adj. Flow (vph)	18	97	946	931	359	291	69
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	115	946	931	359	291	69
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Left	Right	Left	Right
Median Width(m)			6.0	5.0		10.0	
Link Offset(m)			0.0	0.0		0.0	
Crosswalk Width(m)			2.0	2.0		2.0	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14	24			14	24	14
Number of Detectors	1	1	2	2	1	1	1
Detector Template	Left	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	18.6	18.6	93.0	93.0	18.6	18.6	18.6
Trailing Detector (m)	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
Detector 1 Size(m)	18.6	18.6	5.5	5.5	18.6	18.6	18.6
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)			87.5	87.5			
Detector 2 Size(m)			5.5	5.5			
Detector 2 Type			CI+Ex	CI+Ex			
Detector 2 Channel							
Detector 2 Extend (s)			0.0	0.0			
Turn Type	Perm	Perm	NA	NA	Perm	Prot	Perm
Protected Phases			2	6		4	
Permitted Phases	2	2			6		4
Detector Phase	2	2	2	6	6	4	4



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	31.2	31.2
Total Split (s)	68.0	68.0	68.0	68.0	68.0	32.0	32.0
Total Split (%)	68.0%	68.0%	68.0%	68.0%	68.0%	32.0%	32.0%
Maximum Green (s)	62.0	62.0	62.0	62.0	62.0	25.8	25.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	3.7	3.7
All-Red Time (s)	1.8	1.8	1.8	1.8	1.8	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.2	6.2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	18.0	18.0
Pedestrian Calls (#/hr)	0	0	0	1	1	0	0
Act Effct Green (s)		62.1	62.1	62.1	62.1	13.2	13.2
Actuated g/C Ratio		0.71	0.71	0.71	0.71	0.15	0.15
v/c Ratio		0.31	0.39	0.39	0.31	0.60	0.25
Control Delay		8.1	6.0	5.9	1.3	40.2	10.9
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		8.1	6.0	5.9	1.3	40.2	10.9
LOS		A	A	A	A	D	B
Approach Delay			6.2	4.6		34.6	
Approach LOS			A	A		C	
Queue Length 50th (m)		5.6	25.8	25.4	0.0	21.9	0.0
Queue Length 95th (m)		15.2	40.9	40.0	7.1	33.0	9.9
Internal Link Dist (m)			73.9	319.0		59.8	
Turn Bay Length (m)					100.0		
Base Capacity (vph)		368	2405	2405	1152	941	477
Starvation Cap Reductn		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0
Reduced v/c Ratio		0.31	0.39	0.39	0.31	0.31	0.14

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 87.6

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 9.2

Intersection LOS: A












Intersection Capacity Utilization 59.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Terry Fox & Kanata



						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	65	64	82	375	290	58
Future Volume (vph)	65	64	82	375	290	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	45.0			65.0
Storage Lanes	1	0	1			1
Taper Length (m)	10.0		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98
Frt	0.933					0.850
Flt Protected	0.975		0.950			
Satd. Flow (prot)	1577	0	1647	1733	1733	1473
Flt Permitted	0.975		0.582			
Satd. Flow (perm)	1577	0	1009	1733	1733	1440
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	61					58
Link Speed (k/h)	50			50	50	
Link Distance (m)	223.0			339.7	166.2	
Travel Time (s)	16.1			24.5	12.0	
Confl. Bikes (#/hr)						4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	65	64	82	375	290	58
Shared Lane Traffic (%)						
Lane Group Flow (vph)	129	0	82	375	290	58
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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
Number of Detectors	1		1	2	2	1
Detector Template	Left		Left	Thru	Thru	Right
Leading Detector (m)	18.6		18.6	93.0	93.0	18.6
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	18.6		18.6	5.5	5.5	18.6
Detector 1 Type	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
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)				87.5	87.5	
Detector 2 Size(m)				5.5	5.5	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Split (s)	26.1		29.7	29.7	29.7	29.7
Total Split (s)	27.0		53.0	53.0	53.0	53.0
Total Split (%)	33.8%		66.3%	66.3%	66.3%	66.3%
Maximum Green (s)	21.9		47.3	47.3	47.3	47.3
Yellow Time (s)	3.3		3.7	3.7	3.7	3.7
All-Red Time (s)	1.8		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1		5.7	5.7	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		15.0	15.0	15.0	15.0
Flash Dont Walk (s)	14.0		9.0	9.0	9.0	9.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	10.6		52.9	52.9	52.9	52.9
Actuated g/C Ratio	0.15		0.76	0.76	0.76	0.76
v/c Ratio	0.44		0.11	0.29	0.22	0.05
Control Delay	20.5		4.2	4.7	4.3	1.4
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	20.5		4.2	4.7	4.3	1.4
LOS	C		A	A	A	A
Approach Delay	20.5			4.6	3.8	
Approach LOS	C			A	A	
Queue Length 50th (m)	7.2		2.6	13.8	10.0	0.0
Queue Length 95th (m)	20.0		7.0	27.2	20.3	2.7
Internal Link Dist (m)	199.0			315.7	142.2	
Turn Bay Length (m)			45.0			65.0
Base Capacity (vph)	536		761	1308	1308	1101
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.24		0.11	0.29	0.22	0.05

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 70

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.44

Intersection Signal Delay: 6.5

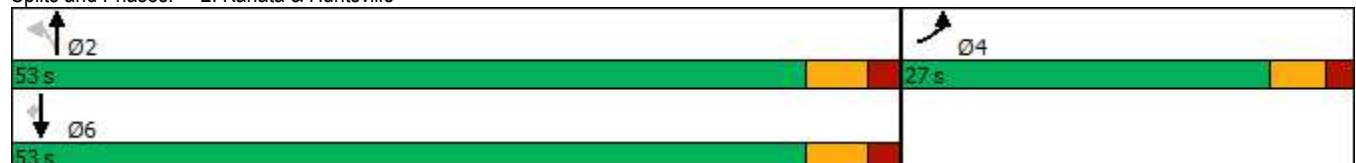
Intersection LOS: A







Intersection Capacity Utilization 46.5%

ICU Level of Service A

Analysis Period (min) 15










Splits and Phases: 2: Kanata & Huntsville



						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Volume (vph)	0	1061	879	120	0	15
Future Volume (vph)	0	1061	879	120	0	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3293	3293	1473	0	1499
Flt Permitted						
Satd. Flow (perm)	0	3293	3293	1473	0	1499
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	136.7		79.4	
Travel Time (s)		19.8	9.8		5.7	
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1061	879	120	0	15
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1061	879	120	0	15
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	35.6%			ICU Level of Service A		
Analysis Period (min)	15					










4: Tillsonburg & Full Access
PM Peak Hour












471 Terry Fox Drive
2019 Total Traffic

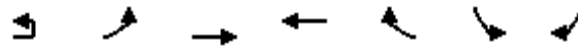
						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	20	116	4	5	11
Future Volume (vph)	4	20	116	4	5	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.887		0.995			
Flt Protected	0.992					0.985
Satd. Flow (prot)	1525	0	1725	0	0	1707
Flt Permitted	0.992					0.985
Satd. Flow (perm)	1525	0	1725	0	0	1707
Link Speed (k/h)	50		50			50
Link Distance (m)	52.0		79.4			246.5
Travel Time (s)	3.7		5.7			17.7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	4	20	116	4	5	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	0	120	0	0	16
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	2.0		2.0			2.0
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 16.7%	ICU Level of Service A					
Analysis Period (min) 15						

5: Terry Fox & RIRO Access
PM Peak Hour

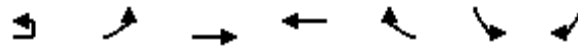
471 Terry Fox Drive
2019 Total Traffic

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1061	960	58	0	39
Future Volume (vph)	0	1061	960	58	0	39
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	1.0			0.0	0.0	0.0
Storage Lanes	1			0	0	1
Taper Length (m)	45.0				10.0	
Lane Util. Factor	1.00	0.91	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.991			0.865
Flt Protected						
Satd. Flow (prot)	0	4732	3264	0	0	1499
Flt Permitted						
Satd. Flow (perm)	0	4732	3264	0	0	1499
Link Speed (k/h)		70	50		50	
Link Distance (m)		136.7	97.9		60.2	
Travel Time (s)		7.0	7.0		4.3	
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1061	960	58	0	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1061	1018	0	0	39
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.0	3.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	40.0%			ICU Level of Service A		
Analysis Period (min)	15					

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations					  	
Traffic Volume (vph)	0	21	0	457	340	14
Future Volume (vph)	0	21	0	457	340	14
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	0.0			25.0
Storage Lanes	0	1	0			1
Taper Length (m)	10.0		10.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91
Ped Bike Factor						
Frt		0.865			0.994	
Flt Protected						
Satd. Flow (prot)	0	1499	0	1733	4704	0
Flt Permitted						
Satd. Flow (perm)	0	1499	0	1733	4704	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	62.5			83.8	339.7	
Travel Time (s)	4.5			6.0	24.5	
Confl. Bikes (#/hr)						2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	21	0	457	340	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	21	0	457	354	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			2.0	2.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	28.7%			ICU Level of Service A		
Analysis Period (min)	15					



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	20	74	548	658	312	289	80
Future Volume (vph)	20	74	548	658	312	289	80
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0			100.0	0.0	0.0
Storage Lanes		1			1	2	1
Taper Length (m)		45.0				80.0	
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	0.97	1.00
Ped Bike Factor		1.00			0.97		0.99
Frt					0.850		0.850
Flt Protected		0.950				0.950	
Satd. Flow (prot)	0	1702	3390	3390	1517	3195	1473
Flt Permitted		0.400				0.950	
Satd. Flow (perm)	0	716	3390	3390	1478	3195	1453
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					312		80
Link Speed (k/h)			70	70		50	
Link Distance (m)			97.9	343.0		83.8	
Travel Time (s)			5.0	17.6		6.0	
Confl. Peds. (#/hr)		1			1		
Confl. Bikes (#/hr)					5		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	2%	2%	2%	5%	5%
Adj. Flow (vph)	20	74	548	658	312	289	80
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	94	548	658	312	289	80
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Left	Right	Left	Right
Median Width(m)			6.0	5.0		10.0	
Link Offset(m)			0.0	0.0		0.0	
Crosswalk Width(m)			2.0	2.0		2.0	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14	24			14	24	14
Number of Detectors	1	1	2	2	1	1	1
Detector Template	Left	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	18.6	18.6	93.0	93.0	18.6	18.6	18.6
Trailing Detector (m)	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
Detector 1 Size(m)	18.6	18.6	5.5	5.5	18.6	18.6	18.6
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)			87.5	87.5			
Detector 2 Size(m)			5.5	5.5			
Detector 2 Type			Cl+Ex	Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)			0.0	0.0			
Turn Type	Perm	Perm	NA	NA	Perm	Prot	Perm
Protected Phases			2	6		4	
Permitted Phases	2	2			6		4
Detector Phase	2	2	2	6	6	4	4



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	31.2	31.2
Total Split (s)	58.0	58.0	58.0	58.0	58.0	32.0	32.0
Total Split (%)	64.4%	64.4%	64.4%	64.4%	64.4%	35.6%	35.6%
Maximum Green (s)	52.0	52.0	52.0	52.0	52.0	25.8	25.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	3.7	3.7
All-Red Time (s)	1.8	1.8	1.8	1.8	1.8	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.2	6.2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	18.0	18.0
Pedestrian Calls (#/hr)	0	0	0	6	6	1	1
Act Effct Green (s)		52.5	52.5	52.5	52.5	14.0	14.0
Actuated g/C Ratio		0.67	0.67	0.67	0.67	0.18	0.18
v/c Ratio		0.20	0.24	0.29	0.29	0.51	0.25
Control Delay		7.6	6.2	6.5	1.7	32.0	8.6
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		7.6	6.2	6.5	1.7	32.0	8.6
LOS		A	A	A	A	C	A
Approach Delay			6.4	5.0		26.9	
Approach LOS			A	A		C	
Queue Length 50th (m)		3.9	12.2	15.3	0.0	18.5	0.0
Queue Length 95th (m)		14.2	28.8	35.3	9.0	28.2	9.1
Internal Link Dist (m)			73.9	319.0		59.8	
Turn Bay Length (m)					100.0		
Base Capacity (vph)		477	2260	2260	1089	1051	531
Starvation Cap Reductn		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0
Reduced v/c Ratio		0.20	0.24	0.29	0.29	0.27	0.15

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 78.7

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 9.5

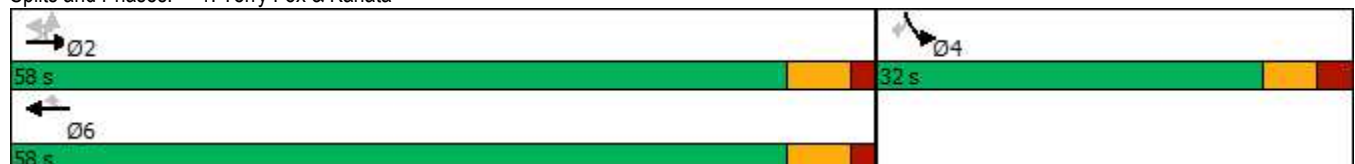
Intersection LOS: A












Intersection Capacity Utilization 51.4%







ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Terry Fox & Kanata



						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	83	65	51	335	296	82
Future Volume (vph)	83	65	51	335	296	82
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	45.0			65.0
Storage Lanes	1	0	1			1
Taper Length (m)	10.0		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98
Frt	0.941					0.850
Flt Protected	0.973		0.950			
Satd. Flow (prot)	1587	0	1647	1733	1733	1473
Flt Permitted	0.973		0.579			
Satd. Flow (perm)	1587	0	1004	1733	1733	1440
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	59					82
Link Speed (k/h)	50			50	50	
Link Distance (m)	223.0			339.7	166.2	
Travel Time (s)	16.1			24.5	12.0	
Confl. Bikes (#/hr)						4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	65	51	335	296	82
Shared Lane Traffic (%)						
Lane Group Flow (vph)	148	0	51	335	296	82
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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
Number of Detectors	1		1	2	2	1
Detector Template	Left		Left	Thru	Thru	Right
Leading Detector (m)	18.6		18.6	93.0	93.0	18.6
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	18.6		18.6	5.5	5.5	18.6
Detector 1 Type	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
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)				87.5	87.5	
Detector 2 Size(m)				5.5	5.5	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Split (s)	26.1		29.7	29.7	29.7	29.7
Total Split (s)	27.0		43.0	43.0	43.0	43.0
Total Split (%)	38.6%		61.4%	61.4%	61.4%	61.4%
Maximum Green (s)	21.9		37.3	37.3	37.3	37.3
Yellow Time (s)	3.3		3.7	3.7	3.7	3.7
All-Red Time (s)	1.8		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1		5.7	5.7	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		15.0	15.0	15.0	15.0
Flash Dont Walk (s)	14.0		9.0	9.0	9.0	9.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	10.7		42.2	42.2	42.2	42.2
Actuated g/C Ratio	0.18		0.71	0.71	0.71	0.71
v/c Ratio	0.44		0.07	0.27	0.24	0.08
Control Delay	18.3		4.8	5.4	5.2	1.6
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	18.3		4.8	5.4	5.2	1.6
LOS	B		A	A	A	A
Approach Delay	18.3			5.3	4.4	
Approach LOS	B			A	A	
Queue Length 50th (m)	7.7		1.6	12.0	10.3	0.0
Queue Length 95th (m)	20.1		5.1	25.1	22.0	3.5
Internal Link Dist (m)	199.0			315.7	142.2	
Turn Bay Length (m)			45.0			65.0
Base Capacity (vph)	622		712	1229	1229	1045
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.24		0.07	0.27	0.24	0.08

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 59.4

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.44

Intersection Signal Delay: 7.0

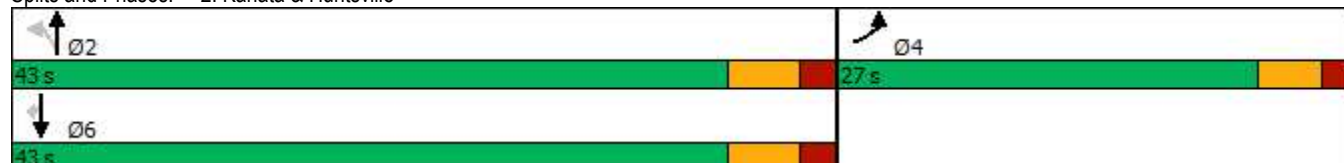
Intersection LOS: A

Intersection Capacity Utilization 47.6%

ICU Level of Service A







Analysis Period (min) 15

Splits and Phases: 2: Kanata & Huntsville












3: Terry Fox & Tillsonburg
SAT Peak Hour

471 Terry Fox Drive
2019 Total Traffic

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Volume (vph)	0	642	683	48	0	17
Future Volume (vph)	0	642	683	48	0	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3293	3293	1473	0	1499
Flt Permitted						
Satd. Flow (perm)	0	3293	3293	1473	0	1499
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	136.7		79.4	
Travel Time (s)		19.8	9.8		5.7	
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	642	683	48	0	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	642	683	48	0	17
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	29.9%			ICU Level of Service A		
Analysis Period (min)	15					







4: Tillsonburg & Full Access
SAT Peak Hour












471 Terry Fox Drive
2019 Total Traffic

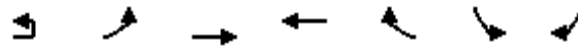
						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	22	42	6	5	13
Future Volume (vph)	4	22	42	6	5	13
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.886		0.983			
Flt Protected	0.992					0.986
Satd. Flow (prot)	1523	0	1704	0	0	1709
Flt Permitted	0.992					0.986
Satd. Flow (perm)	1523	0	1704	0	0	1709
Link Speed (k/h)	50		50			50
Link Distance (m)	52.0		79.4			246.5
Travel Time (s)	3.7		5.7			17.7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	4	22	42	6	5	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	26	0	48	0	0	18
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	2.0		2.0			2.0
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 15.4%	ICU Level of Service A					
Analysis Period (min) 15						

5: Terry Fox & RIRO Access
SAT Peak Hour

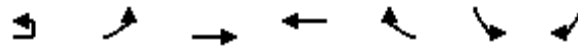
471 Terry Fox Drive
2019 Total Traffic

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑↑	↑↑↘			↗↑
Traffic Volume (vph)	0	642	696	62	0	35
Future Volume (vph)	0	642	696	62	0	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	1.0			0.0	0.0	0.0
Storage Lanes	1			0	0	1
Taper Length (m)	45.0				10.0	
Lane Util. Factor	1.00	0.91	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.988			0.865
Flt Protected						
Satd. Flow (prot)	0	4732	3254	0	0	1499
Flt Permitted						
Satd. Flow (perm)	0	4732	3254	0	0	1499
Link Speed (k/h)		70	50		50	
Link Distance (m)		136.7	97.9		60.2	
Travel Time (s)		7.0	7.0		4.3	
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	642	696	62	0	35
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	642	758	0	0	35
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.0	3.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	32.4%			ICU Level of Service A		
Analysis Period (min)	15					

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations					  	
Traffic Volume (vph)	0	20	0	386	349	12
Future Volume (vph)	0	20	0	386	349	12
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	0.0			25.0
Storage Lanes	0	1	0			1
Taper Length (m)	10.0		10.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91
Ped Bike Factor						
Frt		0.865			0.995	
Flt Protected						
Satd. Flow (prot)	0	1499	0	1733	4708	0
Flt Permitted						
Satd. Flow (perm)	0	1499	0	1733	4708	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	62.5			83.8	339.7	
Travel Time (s)	4.5			6.0	24.5	
Confl. Bikes (#/hr)						2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	20	0	386	349	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	20	0	386	361	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			2.0	2.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 24.8%	ICU Level of Service A					
Analysis Period (min) 15						



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↰↰	↰↰	↰	↰↰	↰
Traffic Volume (vph)	8	73	905	744	189	360	79
Future Volume (vph)	8	73	905	744	189	360	79
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0			100.0	0.0	0.0
Storage Lanes		1			1	2	1
Taper Length (m)		45.0				80.0	
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	0.97	1.00
Ped Bike Factor		1.00			0.96		0.98
Frt					0.850		0.850
Flt Protected		0.950				0.950	
Satd. Flow (prot)	0	1647	3293	3293	1473	3195	1473
Flt Permitted		0.359				0.950	
Satd. Flow (perm)	0	621	3293	3293	1417	3195	1451
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					189		79
Link Speed (k/h)			70	70		50	
Link Distance (m)			97.9	343.0		83.8	
Travel Time (s)			5.0	17.6		6.0	
Confl. Peds. (#/hr)		3			3		
Confl. Bikes (#/hr)					18		4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	8	73	905	744	189	360	79
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	81	905	744	189	360	79
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Left	Right	Left	Right
Median Width(m)			6.0	5.0		10.0	
Link Offset(m)			0.0	0.0		0.0	
Crosswalk Width(m)			2.0	2.0		2.0	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14	24			14	24	14
Number of Detectors	1	1	2	2	1	1	1
Detector Template	Left	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	18.6	18.6	93.0	93.0	18.6	18.6	18.6
Trailing Detector (m)	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
Detector 1 Size(m)	18.6	18.6	5.5	5.5	18.6	18.6	18.6
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)			87.5	87.5			
Detector 2 Size(m)			5.5	5.5			
Detector 2 Type			CI+Ex	CI+Ex			
Detector 2 Channel							
Detector 2 Extend (s)			0.0	0.0			
Turn Type	Perm	Perm	NA	NA	Perm	Prot	Perm
Protected Phases			2	6		4	
Permitted Phases	2	2			6		4
Detector Phase	2	2	2	6	6	4	4
Switch Phase							



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	31.2	31.2
Total Split (s)	68.0	68.0	68.0	68.0	68.0	32.0	32.0
Total Split (%)	68.0%	68.0%	68.0%	68.0%	68.0%	32.0%	32.0%
Maximum Green (s)	62.0	62.0	62.0	62.0	62.0	25.8	25.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	3.7	3.7
All-Red Time (s)	1.8	1.8	1.8	1.8	1.8	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.2	6.2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	18.0	18.0
Pedestrian Calls (#/hr)	0	0	0	3	3	0	0
Act Effct Green (s)		62.1	62.1	62.1	62.1	15.4	15.4
Actuated g/C Ratio		0.69	0.69	0.69	0.69	0.17	0.17
v/c Ratio		0.19	0.40	0.33	0.18	0.66	0.25
Control Delay		7.0	6.9	6.3	1.3	40.6	9.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		7.0	6.9	6.3	1.3	40.6	9.7
LOS		A	A	A	A	D	A
Approach Delay			6.9	5.3		35.0	
Approach LOS			A	A		D	
Queue Length 50th (m)		3.9	27.3	21.0	0.0	27.7	0.0
Queue Length 95th (m)		10.9	45.1	35.2	6.1	40.2	10.2
Internal Link Dist (m)			73.9	319.0		59.8	
Turn Bay Length (m)					100.0		
Base Capacity (vph)		429	2278	2278	1038	919	474
Starvation Cap Reductn		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0
Reduced v/c Ratio		0.19	0.40	0.33	0.18	0.39	0.17

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 89.7

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 11.5

Intersection LOS: B

Intersection Capacity Utilization 56.0%

ICU Level of Service B












Analysis Period (min) 15







Splits and Phases: 1: Terry Fox & Kanata



2: Kanata & Huntsville
AM Peak Hour

471 Terry Fox Drive
2024 Total Traffic

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	83	120	20	242	317	26
Future Volume (vph)	83	120	20	242	317	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	45.0			65.0
Storage Lanes	1	0	1			1
Taper Length (m)	10.0		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98
Frt	0.920					0.850
Flt Protected	0.980		0.950			
Satd. Flow (prot)	1563	0	1647	1733	1733	1473
Flt Permitted	0.980		0.568			
Satd. Flow (perm)	1563	0	985	1733	1733	1440
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	90					26
Link Speed (k/h)	50			50	50	
Link Distance (m)	223.0			339.7	166.2	
Travel Time (s)	16.1			24.5	12.0	
Confl. Bikes (#/hr)						4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	120	20	242	317	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	203	0	20	242	317	26
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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
Number of Detectors	1		1	2	2	1
Detector Template	Left		Left	Thru	Thru	Right
Leading Detector (m)	18.6		18.6	93.0	93.0	18.6
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	18.6		18.6	5.5	5.5	18.6
Detector 1 Type	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
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)				87.5	87.5	
Detector 2 Size(m)				5.5	5.5	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Split (s)	26.1		29.7	29.7	29.7	29.7
Total Split (s)	27.0		53.0	53.0	53.0	53.0
Total Split (%)	33.8%		66.3%	66.3%	66.3%	66.3%
Maximum Green (s)	21.9		47.3	47.3	47.3	47.3
Yellow Time (s)	3.3		3.7	3.7	3.7	3.7
All-Red Time (s)	1.8		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1		5.7	5.7	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		15.0	15.0	15.0	15.0
Flash Dont Walk (s)	14.0		9.0	9.0	9.0	9.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	12.1		49.2	49.2	49.2	49.2
Actuated g/C Ratio	0.17		0.68	0.68	0.68	0.68
v/c Ratio	0.60		0.03	0.20	0.27	0.03
Control Delay	22.9		4.8	5.2	5.6	2.2
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	22.9		4.8	5.2	5.6	2.2
LOS	C		A	A	A	A
Approach Delay	22.9			5.2	5.3	
Approach LOS	C			A	A	
Queue Length 50th (m)	12.3		0.6	8.4	11.6	0.0
Queue Length 95th (m)	29.3		2.9	20.5	27.2	2.2
Internal Link Dist (m)	199.0			315.7	142.2	
Turn Bay Length (m)			45.0			65.0
Base Capacity (vph)	538		672	1182	1182	990
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.38		0.03	0.20	0.27	0.03

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 72.1

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 9.7

Intersection LOS: A

Intersection Capacity Utilization 39.2%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Kanata & Huntsville


































Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑	↑		↑
Traffic Volume (vph)	0	986	782	37	0	26
Future Volume (vph)	0	986	782	37	0	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3293	3293	1473	0	1499
Flt Permitted						
Satd. Flow (perm)	0	3293	3293	1473	0	1499
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	136.7		79.4	
Travel Time (s)		19.8	9.8		5.7	
Confl. Peds. (#/hr)	6			6		
Confl. Bikes (#/hr)				3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	986	782	37	0	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	986	782	37	0	26
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	32.8%			ICU Level of Service A		
Analysis Period (min)	15					

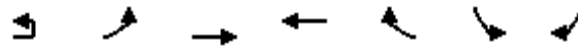
4: Tillsonburg & Full Access
AM Peak Hour

471 Terry Fox Drive
2024 Total Traffic

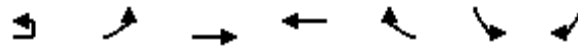
						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	9	35	2	3	25
Future Volume (vph)	1	9	35	2	3	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.878		0.993			
Flt Protected	0.995					0.995
Satd. Flow (prot)	1514	0	1721	0	0	1725
Flt Permitted	0.995					0.995
Satd. Flow (perm)	1514	0	1721	0	0	1725
Link Speed (k/h)	50		50			50
Link Distance (m)	52.0		79.4			246.5
Travel Time (s)	3.7		5.7			17.7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	9	35	2	3	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	0	37	0	0	28
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	2.0		2.0			2.0
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 14.0%	ICU Level of Service A					
Analysis Period (min) 15						

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	986	796	35	0	23
Future Volume (vph)	0	986	796	35	0	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	1.0			0.0	0.0	0.0
Storage Lanes	1			0	0	1
Taper Length (m)	45.0				10.0	
Lane Util. Factor	1.00	0.91	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.994			0.865
Flt Protected						
Satd. Flow (prot)	0	4732	3274	0	0	1499
Flt Permitted						
Satd. Flow (perm)	0	4732	3274	0	0	1499
Link Speed (k/h)		70	50		50	
Link Distance (m)		136.7	97.9		60.2	
Travel Time (s)		7.0	7.0		4.3	
Confl. Peds. (#/hr)	6			6		
Confl. Bikes (#/hr)				18		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	986	796	35	0	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	986	831	0	0	23
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.0	3.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	34.4%			ICU Level of Service A		
Analysis Period (min)	15					

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations					  	
Traffic Volume (vph)	0	13	0	262	426	11
Future Volume (vph)	0	13	0	262	426	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	0.0			25.0
Storage Lanes	0	1	0			1
Taper Length (m)	10.0		10.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91
Ped Bike Factor						
Frt		0.865			0.996	
Flt Protected						
Satd. Flow (prot)	0	1499	0	1733	4713	0
Flt Permitted						
Satd. Flow (perm)	0	1499	0	1733	4713	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	62.5			83.8	339.7	
Travel Time (s)	4.5			6.0	24.5	
Confl. Bikes (#/hr)						4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	13	0	262	426	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	13	0	262	437	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			2.0	2.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	18.9%			ICU Level of Service A		
Analysis Period (min)	15					



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	18	101	1116	1157	375	304	71
Future Volume (vph)	18	101	1116	1157	375	304	71
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0			100.0	0.0	0.0
Storage Lanes		1			1	2	1
Taper Length (m)		45.0				80.0	
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	0.97	1.00
Ped Bike Factor		1.00			0.97		0.99
Frt					0.850		0.850
Flt Protected		0.950				0.950	
Satd. Flow (prot)	0	1700	3390	3390	1517	3195	1473
Flt Permitted		0.217				0.950	
Satd. Flow (perm)	0	388	3390	3390	1478	3195	1453
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					375		71
Link Speed (k/h)			70	70		50	
Link Distance (m)			97.9	343.0		83.8	
Travel Time (s)			5.0	17.6		6.0	
Confl. Peds. (#/hr)		1			1		
Confl. Bikes (#/hr)					5		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	2%	2%	2%	5%	5%
Adj. Flow (vph)	18	101	1116	1157	375	304	71
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	119	1116	1157	375	304	71
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Left	Right	Left	Right
Median Width(m)			6.0	5.0		10.0	
Link Offset(m)			0.0	0.0		0.0	
Crosswalk Width(m)			2.0	2.0		2.0	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14	24			14	24	14
Number of Detectors	1	1	2	2	1	1	1
Detector Template	Left	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	18.6	18.6	93.0	93.0	18.6	18.6	18.6
Trailing Detector (m)	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
Detector 1 Size(m)	18.6	18.6	5.5	5.5	18.6	18.6	18.6
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)			87.5	87.5			
Detector 2 Size(m)			5.5	5.5			
Detector 2 Type			Cl+Ex	Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)			0.0	0.0			
Turn Type	Perm	Perm	NA	NA	Perm	Prot	Perm
Protected Phases			2	6		4	
Permitted Phases	2	2			6		4
Detector Phase	2	2	2	6	6	4	4



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	31.2	31.2
Total Split (s)	68.0	68.0	68.0	68.0	68.0	32.0	32.0
Total Split (%)	68.0%	68.0%	68.0%	68.0%	68.0%	32.0%	32.0%
Maximum Green (s)	62.0	62.0	62.0	62.0	62.0	25.8	25.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	3.7	3.7
All-Red Time (s)	1.8	1.8	1.8	1.8	1.8	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.2	6.2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	18.0	18.0
Pedestrian Calls (#/hr)	0	0	0	1	1	0	0
Act Effct Green (s)		62.0	62.0	62.0	62.0	13.6	13.6
Actuated g/C Ratio		0.71	0.71	0.71	0.71	0.15	0.15
v/c Ratio		0.43	0.47	0.48	0.32	0.62	0.25
Control Delay		12.3	6.7	6.9	1.4	40.4	10.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		12.3	6.7	6.9	1.4	40.4	10.7
LOS		B	A	A	A	D	B
Approach Delay			7.2	5.5		34.7	
Approach LOS			A	A		C	
Queue Length 50th (m)		6.6	33.6	35.4	0.0	22.9	0.0
Queue Length 95th (m)		20.8	52.2	55.1	7.3	34.5	9.9
Internal Link Dist (m)			73.9	319.0		59.8	
Turn Bay Length (m)					100.0		
Base Capacity (vph)		274	2395	2395	1154	939	477
Starvation Cap Reductn		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0
Reduced v/c Ratio		0.43	0.47	0.48	0.32	0.32	0.15

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 87.8

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 9.7

Intersection LOS: A

Intersection Capacity Utilization 66.4%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Terry Fox & Kanata



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	65	64	82	395	305	58
Future Volume (vph)	65	64	82	395	305	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	45.0			65.0
Storage Lanes	1	0	1			1
Taper Length (m)	10.0		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98
Frt	0.933					0.850
Flt Protected	0.975		0.950			
Satd. Flow (prot)	1577	0	1647	1733	1733	1473
Flt Permitted	0.975		0.574			
Satd. Flow (perm)	1577	0	995	1733	1733	1440
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	61					58
Link Speed (k/h)	50			50	50	
Link Distance (m)	223.0			339.7	166.2	
Travel Time (s)	16.1			24.5	12.0	
Confl. Bikes (#/hr)						4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	65	64	82	395	305	58
Shared Lane Traffic (%)						
Lane Group Flow (vph)	129	0	82	395	305	58
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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
Number of Detectors	1		1	2	2	1
Detector Template	Left		Left	Thru	Thru	Right
Leading Detector (m)	18.6		18.6	93.0	93.0	18.6
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	18.6		18.6	5.5	5.5	18.6
Detector 1 Type	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
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)				87.5	87.5	
Detector 2 Size(m)				5.5	5.5	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Split (s)	26.1		29.7	29.7	29.7	29.7
Total Split (s)	27.0		53.0	53.0	53.0	53.0
Total Split (%)	33.8%		66.3%	66.3%	66.3%	66.3%
Maximum Green (s)	21.9		47.3	47.3	47.3	47.3
Yellow Time (s)	3.3		3.7	3.7	3.7	3.7
All-Red Time (s)	1.8		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1		5.7	5.7	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		15.0	15.0	15.0	15.0
Flash Dont Walk (s)	14.0		9.0	9.0	9.0	9.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	10.6		52.9	52.9	52.9	52.9
Actuated g/C Ratio	0.15		0.76	0.76	0.76	0.76
v/c Ratio	0.44		0.11	0.30	0.23	0.05
Control Delay	20.5		4.3	4.8	4.4	1.4
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	20.5		4.3	4.8	4.4	1.4
LOS	C		A	A	A	A
Approach Delay	20.5			4.7	3.9	
Approach LOS	C			A	A	
Queue Length 50th (m)	7.2		2.6	14.7	10.6	0.0
Queue Length 95th (m)	20.0		7.0	28.8	21.6	2.7
Internal Link Dist (m)	199.0			315.7	142.2	
Turn Bay Length (m)			45.0			65.0
Base Capacity (vph)	536		751	1308	1308	1101
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.24		0.11	0.30	0.23	0.05

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 70

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.44

Intersection Signal Delay: 6.5

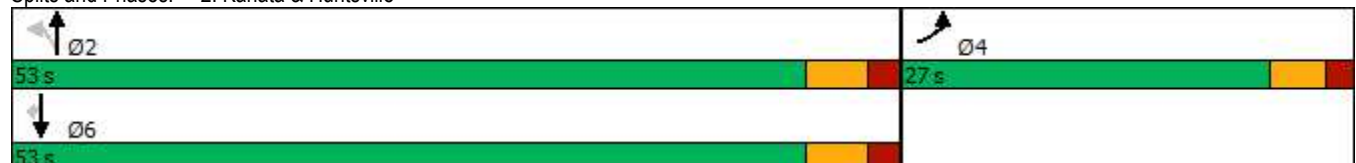
Intersection LOS: A

Intersection Capacity Utilization 47.4%

ICU Level of Service A







Analysis Period (min) 15

Splits and Phases: 2: Kanata & Huntsville












3: Terry Fox & Tillsonburg
PM Peak Hour

471 Terry Fox Drive
2024 Total Traffic

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Volume (vph)	0	1235	1107	120	0	15
Future Volume (vph)	0	1235	1107	120	0	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3293	3293	1473	0	1499
Flt Permitted						
Satd. Flow (perm)	0	3293	3293	1473	0	1499
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	136.7		79.4	
Travel Time (s)		19.8	9.8		5.7	
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1235	1107	120	0	15
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1235	1107	120	0	15
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	42.3%			ICU Level of Service A		
Analysis Period (min)	15					

4: Tillsonburg & Full Access
PM Peak Hour

471 Terry Fox Drive
2024 Total Traffic












						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	20	116	4	5	11
Future Volume (vph)	4	20	116	4	5	11
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	0.887		0.995			
Flt Protected	0.992					0.985
Satd. Flow (prot)	1525	0	1725	0	0	1707
Flt Permitted	0.992					0.985
Satd. Flow (perm)	1525	0	1725	0	0	1707
Link Speed (k/h)	50		50			50
Link Distance (m)	52.0		79.4			246.5
Travel Time (s)	3.7		5.7			17.7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	4	20	116	4	5	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	0	120	0	0	16
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	2.0		2.0			2.0
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 16.7%	ICU Level of Service A					
Analysis Period (min) 15						

5: Terry Fox & RIRO Access
PM Peak Hour

471 Terry Fox Drive
2024 Total Traffic

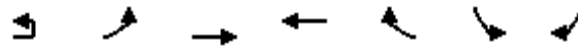


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑↑	↑↑			↑
Traffic Volume (vph)	0	1235	1188	58	0	39
Future Volume (vph)	0	1235	1188	58	0	39
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	1.0			0.0	0.0	0.0
Storage Lanes	1			0	0	1
Taper Length (m)	45.0				10.0	
Lane Util. Factor	1.00	0.91	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.993			0.865
Flt Protected						
Satd. Flow (prot)	0	4732	3270	0	0	1499
Flt Permitted						
Satd. Flow (perm)	0	4732	3270	0	0	1499
Link Speed (k/h)		70	50		50	
Link Distance (m)		136.7	97.9		60.2	
Travel Time (s)		7.0	7.0		4.3	
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1235	1188	58	0	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1235	1246	0	0	39
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.0	3.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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 46.6%				ICU Level of Service A		
Analysis Period (min) 15						

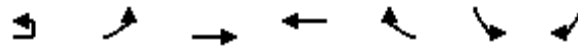
						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations					  	
Traffic Volume (vph)	0	21	0	477	355	14
Future Volume (vph)	0	21	0	477	355	14
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	0.0			25.0
Storage Lanes	0	1	0			1
Taper Length (m)	10.0		10.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91
Ped Bike Factor						
Frt		0.865			0.994	
Flt Protected						
Satd. Flow (prot)	0	1499	0	1733	4704	0
Flt Permitted						
Satd. Flow (perm)	0	1499	0	1733	4704	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	62.5			83.8	339.7	
Travel Time (s)	4.5			6.0	24.5	
Confl. Bikes (#/hr)						2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	21	0	477	355	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	21	0	477	369	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			2.0	2.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 29.8%	ICU Level of Service A					
Analysis Period (min) 15						

1: Terry Fox & Kanata
SAT Peak Hour

471 Terry Fox Drive
2024 Total Traffic



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	20	77	746	886	327	302	83
Future Volume (vph)	20	77	746	886	327	302	83
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0			100.0	0.0	0.0
Storage Lanes		1			1	2	1
Taper Length (m)		45.0				80.0	
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	0.97	1.00
Ped Bike Factor		1.00			0.97		0.99
Frt					0.850		0.850
Flt Protected		0.950				0.950	
Satd. Flow (prot)	0	1702	3390	3390	1517	3195	1473
Flt Permitted		0.301				0.950	
Satd. Flow (perm)	0	539	3390	3390	1478	3195	1453
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					327		83
Link Speed (k/h)			70	70		50	
Link Distance (m)			97.9	343.0		83.8	
Travel Time (s)			5.0	17.6		6.0	
Confl. Peds. (#/hr)		1			1		
Confl. Bikes (#/hr)					5		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	2%	2%	2%	5%	5%
Adj. Flow (vph)	20	77	746	886	327	302	83
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	97	746	886	327	302	83
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Left	Right	Left	Right
Median Width(m)			6.0	5.0		10.0	
Link Offset(m)			0.0	0.0		0.0	
Crosswalk Width(m)			2.0	2.0		2.0	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14	24			14	24	14
Number of Detectors	1	1	2	2	1	1	1
Detector Template	Left	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	18.6	18.6	93.0	93.0	18.6	18.6	18.6
Trailing Detector (m)	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
Detector 1 Size(m)	18.6	18.6	5.5	5.5	18.6	18.6	18.6
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)			87.5	87.5			
Detector 2 Size(m)			5.5	5.5			
Detector 2 Type			Cl+Ex	Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)			0.0	0.0			
Turn Type	Perm	Perm	NA	NA	Perm	Prot	Perm
Protected Phases			2	6		4	
Permitted Phases	2	2			6		4
Detector Phase	2	2	2	6	6	4	4



Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	31.2	31.2
Total Split (s)	58.0	58.0	58.0	58.0	58.0	32.0	32.0
Total Split (%)	64.4%	64.4%	64.4%	64.4%	64.4%	35.6%	35.6%
Maximum Green (s)	52.0	52.0	52.0	52.0	52.0	25.8	25.8
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	3.7	3.7
All-Red Time (s)	1.8	1.8	1.8	1.8	1.8	2.5	2.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.2	6.2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	18.0	18.0
Pedestrian Calls (#/hr)	0	0	0	6	6	1	1
Act Effct Green (s)		52.3	52.3	52.3	52.3	14.2	14.2
Actuated g/C Ratio		0.66	0.66	0.66	0.66	0.18	0.18
v/c Ratio		0.27	0.33	0.39	0.30	0.53	0.25
Control Delay		9.3	6.9	7.3	1.7	32.2	8.4
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		9.3	6.9	7.3	1.7	32.2	8.4
LOS		A	A	A	A	C	A
Approach Delay			7.1	5.8		27.1	
Approach LOS			A	A		C	
Queue Length 50th (m)		4.3	18.2	22.8	0.0	19.4	0.0
Queue Length 95th (m)		16.4	40.8	50.4	9.2	29.4	9.2
Internal Link Dist (m)			73.9	319.0		59.8	
Turn Bay Length (m)					100.0		
Base Capacity (vph)		357	2251	2251	1091	1052	534
Starvation Cap Reductn		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0
Reduced v/c Ratio		0.27	0.33	0.39	0.30	0.29	0.16

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 78.7

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 9.6

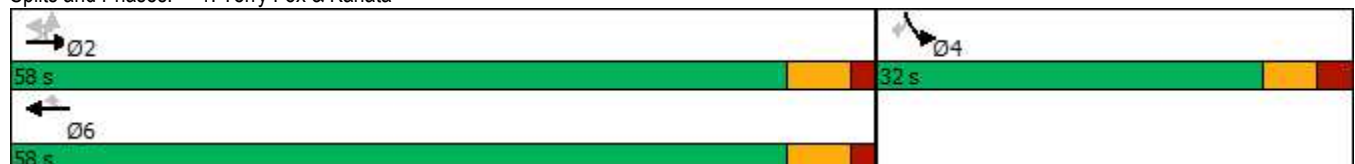
Intersection LOS: A

Intersection Capacity Utilization 58.4%


ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Terry Fox & Kanata



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	83	65	51	353	312	82
Future Volume (vph)	83	65	51	353	312	82
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	45.0			65.0
Storage Lanes	1	0	1			1
Taper Length (m)	10.0		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98
Frt	0.941					0.850
Flt Protected	0.973		0.950			
Satd. Flow (prot)	1587	0	1647	1733	1733	1473
Flt Permitted	0.973		0.571			
Satd. Flow (perm)	1587	0	990	1733	1733	1440
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	59					82
Link Speed (k/h)	50			50	50	
Link Distance (m)	223.0			339.7	166.2	
Travel Time (s)	16.1			24.5	12.0	
Confl. Bikes (#/hr)						4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	65	51	353	312	82
Shared Lane Traffic (%)						
Lane Group Flow (vph)	148	0	51	353	312	82
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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
Number of Detectors	1		1	2	2	1
Detector Template	Left		Left	Thru	Thru	Right
Leading Detector (m)	18.6		18.6	93.0	93.0	18.6
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	18.6		18.6	5.5	5.5	18.6
Detector 1 Type	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
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)				87.5	87.5	
Detector 2 Size(m)				5.5	5.5	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Split (s)	26.1		29.7	29.7	29.7	29.7
Total Split (s)	27.0		43.0	43.0	43.0	43.0
Total Split (%)	38.6%		61.4%	61.4%	61.4%	61.4%
Maximum Green (s)	21.9		37.3	37.3	37.3	37.3
Yellow Time (s)	3.3		3.7	3.7	3.7	3.7
All-Red Time (s)	1.8		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1		5.7	5.7	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		15.0	15.0	15.0	15.0
Flash Dont Walk (s)	14.0		9.0	9.0	9.0	9.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	10.7		42.2	42.2	42.2	42.2
Actuated g/C Ratio	0.18		0.71	0.71	0.71	0.71
v/c Ratio	0.44		0.07	0.29	0.25	0.08
Control Delay	18.3		4.8	5.5	5.3	1.6
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	18.3		4.8	5.5	5.3	1.6
LOS	B		A	A	A	A
Approach Delay	18.3			5.4	4.5	
Approach LOS	B			A	A	
Queue Length 50th (m)	7.7		1.6	12.8	11.0	0.0
Queue Length 95th (m)	20.1		5.1	26.7	23.3	3.5
Internal Link Dist (m)	199.0			315.7	142.2	
Turn Bay Length (m)			45.0			65.0
Base Capacity (vph)	622		702	1229	1229	1045
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.24		0.07	0.29	0.25	0.08

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 59.4

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.44

Intersection Signal Delay: 7.0

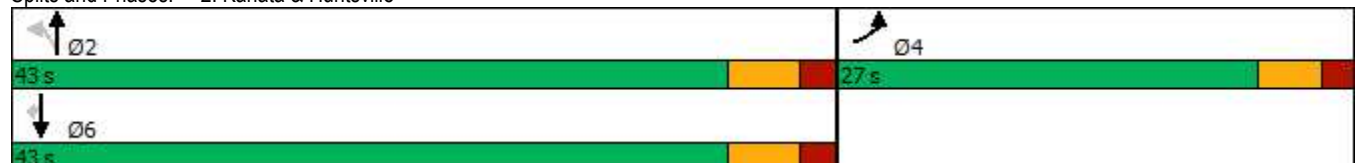
Intersection LOS: A

Intersection Capacity Utilization 48.5%

ICU Level of Service A







Analysis Period (min) 15

Splits and Phases: 2: Kanata & Huntsville












3: Terry Fox & Tillsonburg
SAT Peak Hour

471 Terry Fox Drive
2024 Total Traffic

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Traffic Volume (vph)	0	843	914	48	0	17
Future Volume (vph)	0	843	914	48	0	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			55.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	10.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	3293	3293	1473	0	1499
Flt Permitted						
Satd. Flow (perm)	0	3293	3293	1473	0	1499
Link Speed (k/h)		50	50		50	
Link Distance (m)		274.9	136.7		79.4	
Travel Time (s)		19.8	9.8		5.7	
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	843	914	48	0	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	843	914	48	0	17
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		5.0	5.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	36.7%			ICU Level of Service A		
Analysis Period (min)	15					










4: Tillsonburg & Full Access
SAT Peak Hour












471 Terry Fox Drive
2024 Total Traffic

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	22	42	6	5	13
Future Volume (vph)	4	22	42	6	5	13
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	0.886		0.983			
Flt Protected	0.992					0.986
Satd. Flow (prot)	1523	0	1704	0	0	1709
Flt Permitted	0.992					0.986
Satd. Flow (perm)	1523	0	1704	0	0	1709
Link Speed (k/h)	50		50			50
Link Distance (m)	52.0		79.4			246.5
Travel Time (s)	3.7		5.7			17.7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	4	22	42	6	5	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	26	0	48	0	0	18
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	2.0		2.0			2.0
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 15.4%	ICU Level of Service A					
Analysis Period (min) 15						

5: Terry Fox & RIRO Access
SAT Peak Hour

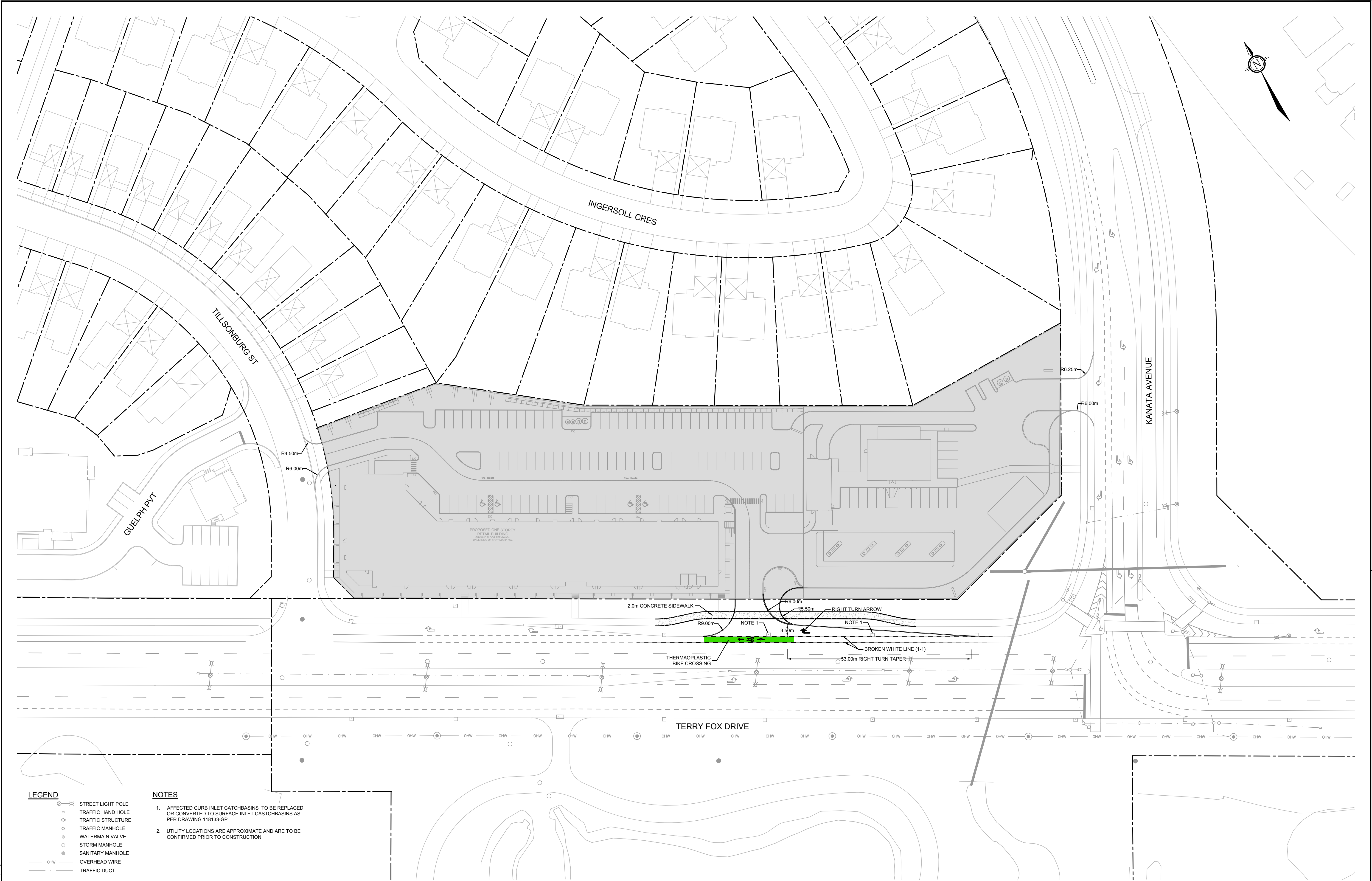
471 Terry Fox Drive
2024 Total Traffic

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	843	927	62	0	35
Future Volume (vph)	0	843	927	62	0	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	1.0			0.0	0.0	0.0
Storage Lanes	1			0	0	1
Taper Length (m)	45.0				10.0	
Lane Util. Factor	1.00	0.91	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.991			0.865
Flt Protected						
Satd. Flow (prot)	0	4732	3264	0	0	1499
Flt Permitted						
Satd. Flow (perm)	0	4732	3264	0	0	1499
Link Speed (k/h)		70	50		50	
Link Distance (m)		136.7	97.9		60.2	
Travel Time (s)		7.0	7.0		4.3	
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	843	927	62	0	35
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	843	989	0	0	35
Enter Blocked Intersection	No	Yes	Yes	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.0	3.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		2.0	2.0		2.0	
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	39.1%			ICU Level of Service A		
Analysis Period (min)	15					

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations					  	
Traffic Volume (vph)	0	20	0	404	365	12
Future Volume (vph)	0	20	0	404	365	12
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0	0.0	0.0			25.0
Storage Lanes	0	1	0			1
Taper Length (m)	10.0		10.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91
Ped Bike Factor						
Frt		0.865			0.995	
Flt Protected						
Satd. Flow (prot)	0	1499	0	1733	4708	0
Flt Permitted						
Satd. Flow (perm)	0	1499	0	1733	4708	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	62.5			83.8	339.7	
Travel Time (s)	4.5			6.0	24.5	
Confl. Bikes (#/hr)						2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	20	0	404	365	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	20	0	404	377	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			2.0	2.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	2.0			2.0	2.0	
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	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 25.8%	ICU Level of Service A					
Analysis Period (min) 15						

APPENDIX L

Road Modification Functional Design



- LEGEND**
- STREET LIGHT POLE
 - TRAFFIC HAND HOLE
 - TRAFFIC STRUCTURE
 - TRAFFIC MANHOLE
 - WATERMAIN VALVE
 - STORM MANHOLE
 - SANITARY MANHOLE
 - OVERHEAD WIRE
 - TRAFFIC DUCT

- NOTES**
- AFFECTED CURB INLET CATCHBASINS TO BE REPLACED OR CONVERTED TO SURFACE INLET CATCHBASINS AS PER DRAWING 118133-GP
 - UTILITY LOCATIONS ARE APPROXIMATE AND ARE TO BE CONFIRMED PRIOR TO CONSTRUCTION

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

1.	ISSUED FOR CITY REVIEW	MAY 09/19	JLL	
No.	REVISION	DATE	BY	

SCALE
1:500
1:500
0 5 10 15 20

DESIGN	RCH
CHECKED	JLL
DRAWN	RCH
CHECKED	JLL
APPROVED	JLL

FOR REVIEW ONLY	

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Ottawa, Ontario, Canada K2M 1P6
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Website www.novatech-eng.com

LOCATION CITY OF OTTAWA HERITAGE HILLS RETAIL PLAZA	
DRAWING NAME	
RIGHT TURN TAPER FUNCTIONAL DESIGN	
PROJECT No.	118133-00
REV	REV # 1
DRAWING No.	118133-FD