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39 Years

Carré Saint-Louis

1050 Canadian Shield Avenue

Transportation Impact Assessment

Carré Saint-Louis

1050 Canadian Shield Avenue

Transportation Impact Assessment

Prepared By:

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

July 1, 2021

Novatech File: 120191
Ref: R-2021-098

NOVATECH
Engineers, Planners & Landscape Architects

July 1, 2021

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

Attention: **Ms. Josiane Gervais**
Project Manager, Infrastructure Approvals

Dear Ms. Gervais:

Reference: **Carré Saint-Louis, 1050 Canadian Shield Avenue**
Transportation Impact Assessment Report
Novatech File No. 120191

We are pleased to submit the following Transportation Impact Assessment Report in support of Zoning By-law Amendment and Site Plan Control applications for a mixed-use development at the above noted address. The structure and format of this report is in accordance with the City of Ottawa Transportation Impact Assessment Guidelines (June 2017).

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

Yours truly,

NOVATECH

Rochelle Fortier, E.I.T
Engineering Intern | Transportation/Traffic

Suite 200, 240 Michael Cowpland Drive, Ottawa ON K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

TIA Plan Reports

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

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

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

CERTIFICATION

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

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

Ville d'Ottawa
Services d 'infrastructure et Viabilité des collectivités
Urbanisme et Gestion de la croissance
110, avenue Laurier Ouest
Ottawa (Ontario) K1P 1J1
Tél. : 613-580-2424
Télécopieur: 613-560-6006

Dated at ____Ottawa_____ this __1__ day of ____July_ _____, 2021.
(City)

Name: _____Brad Byvelds, P.Eng._____
(Please Print)

Professional Title: _____Project Coordinator, Transportation/Traffic_____

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

Office Contact Information (Please Print)	
Address:	240 Michael Cowpland Drive, Suite 200
City / Postal Code:	Ottawa, ON, K2M 1P6
Telephone / Extension:	613-254-9643 x 286
E-Mail Address:	b.byvelds@novatech-eng.com

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EXECUTIVE SUMMARY

This Transportation Impact Assessment (TIA) Report has been prepared in support of Zoning By-law Amendment and Site Plan Control applications for a mixed-use development at 1050 Canadian Shield Avenue.

The proposed development consists of a six-storey apartment building with approximately 244 residential units and 275m^2 of ground floor commercial. A total of 348 parking spaces are proposed in two levels of underground parking. Access to the underground parking is proposed on Canadian Shield Avenue. The development is anticipated to be constructed in one phase with an assumed build-out year of 2022.

The main conclusions and recommendations of the TIA are summarized below.

Demand Rationalization

- Under existing traffic conditions, all intersections meet the City's target Auto LOS during the AM and PM peak hours. A 15m westbound left turn lane is warranted at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection under existing traffic conditions.
- Under 2022 background traffic conditions, all intersections anticipated to meet the City's target Auto LOS during the AM and PM peak hours. A 15m westbound left turn lane and a 15m eastbound left turn lane are warranted at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection under 2022 background traffic conditions
- Under 2027 background traffic conditions, all intersections anticipated to meet the City's target Auto LOS during the AM and PM peak hours. A 25m westbound left turn lane and a 25m eastbound left turn lane are warranted at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection under 2027 background traffic conditions

Development Design

- Pedestrian facilities will be provided between the main building entrances and the existing sidewalks along Canadian Shield Avenue and Great Lakes Avenue. A connection to the Multi-Use Pathway along Campeau Drive is also proposed. A courtyard will be provided internal to the site, with pathways linking each building entrance.
- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.

Circulation and Parking

- Waste will be stored internally to the building. A garbage room is located next to the parking garage ramp and will allow easy access to the curb.
- The fire route will be curbside along Canadian Shield Avenue and Great Lakes Avenue.
- The proposed number of vehicular and bicycle parking spaces will adhere to the requirements of the City's Zoning By-law.
- Secure bicycle parking will be located in the underground parking garage.

Boundary Streets

- Campeau Drive does not meet the target PLOS. Based on the current operating speed and AADT, a maximum PLOS D can be achieved based on the criteria in Exhibit 4 of the MMLOS guidelines. As the existing pedestrian facilities along Campeau Drive achieve the maximum PLOS D, no modifications are proposed.
- All other MMLOS targets for the boundary roadways are met for roadways within a Mixed-Use Center.

Access Intersections Design

- A new access is proposed to Canadian Shield Avenue. The proposed access will be approximately 9m in width and located 10m from the eastern property line.
- The width and location of the proposed access will adhere to the requirements of the Private Approach By-Law and Zoning By-Law.
- A waiver to the Private Approach By-Law is required for the proposed driveway grading. A maximum grade of 6% will be provided for the first 9m within the property. A grade of 6% is not anticipated to have a significant impact on sight lines for vehicles exiting the site.
- The access is anticipated to operate acceptably under side street stop control. Delays of less than ten seconds are anticipated at the site access.

Transportation Demand Management

- The proposed development conforms to the City's TDM initiatives by providing easy access to the local pedestrian, bicycle and transit systems. At this point in time, the proponent does not agree to implement TDM measures within the development.
- Transit service along Maritime Way would provide improved service to residents of the proposed development as well as other developments within the Kanata Town Centre. The provision of local transit would make transit more attractive to residents of the area and help achieve the target transit modal share. When transit is extended into the Kanata Town Center (along Maritime Way), the developer will consider implementing transit incentives for residents, such as displaying transit schedules and route maps at entrances.

Neighbourhood Traffic Management

- The 2027 background and total traffic volumes along Maritime Way at Kanata Avenue and Campeau Drive exceed the ATM threshold of 120 vehicles during the peak hour for a local roadway.
- The 2027 total traffic volumes along Great Lakes Avenue at Campeau Drive exceed the ATM threshold in the PM peak hour.
- There is sufficient capacity along Maritime Way and Great Lakes Avenue to accommodate traffic generated by the development and no changes to the existing roadway classification are required.

Transit

- The proposed development is anticipated to generate 30 transit trips (9 in, 21 out) during the weekday AM peak hour and 22 transit trips (13 in, 9 out) during the weekday PM peak hour.
- It is anticipated that most transit trips will arrive/depart using OC Transpo stops #1137 and #1138, which serves routes 62, 164, and 268.
- Bus stops and pads have been constructed along Maritime Way but are not currently in use. These bus stops will provide improved transit service to the residents of the proposed development as well as other developments within the Kanata Town Centre. As a number of developments within the Kanata Town Centre have been constructed, are under construction, or going through the approval process, consideration should be given by the City to providing local transit along Maritime Way.

Intersection MMLOS

- *Kanata Avenue/Maritime Way/Lord Byng Way*
    - The Kanata Avenue/Maritime Way/Lord Byng Way intersection currently meets the target Auto LOS E. As this intersection is not along a transit priority corridor, no target TLOS is identified.
    - This intersection does not currently meet the target PLOS A. As part of the Kanata Avenue road widening project, the crossing distance on the east and west legs of the intersection (Maritime Way/Lord Byng Way) are anticipated to be reduced by shifting the crosswalk back from the corner radii to accommodate east-west cross rides. The north and south approaches are anticipated to increase slightly to accommodate additional north-south travel lanes. Zebra striped crosswalks will be implemented on all legs.
    - This intersection does not currently meet the target BLOS B. As part of the Kanata Avenue road widening project, cycle tracks will be provided on Kanata Avenue and this intersection will be converted into a protected intersection design. This modification will improve the BLOS at this intersection.
    - This intersection does not currently meet the target TkLOS D. However, since Maritime Way and Lord Byng Way are not classified as a truck route, the provided TkLOS E is considered acceptable. As part of the Kanata Avenue road widening project, two receiving lanes will be provided for the eastbound and westbound right turn movement and will improve the TkLOS for these movements.
- *Kanata Avenue/Highway 417 Westbound Off-Ramp*
    - The Kanata Avenue/Highway 417 Westbound Off-Ramp intersection currently meets the City's target TkLOS D and Auto LOS E. As this intersection is not along a transit priority corridor, no target TLOS is identified.
    - This intersection does not currently meet the target PLOS A. A reduction in the crossing distance on all legs of the intersection would provide the greatest improvement to the PLOS at this intersection. However, based on the existing intersection operations, a reduction in the number of travel lanes is not recommended.
- *Kanata Avenue/Highway 417 Eastbound On-Ramp*
    - The Kanata Avenue/Highway 417 Eastbound On-Ramp intersection currently meets the City's target TkLOS D and Auto LOS E. As bicycles are not permitted on Highway 417, the BLOS was excluded from this analysis. As this intersection is not along a transit priority corridor, no target TLOS is identified.
    - This intersection does not currently meet the target PLOS A. A reduction in the crossing distance on all legs of the intersection would provide the greatest improvement to the PLOS at this intersection. Based on the existing northbound right turning volumes (170-195 vehicles during peak hours), removal of the northbound right turn lane is not recommended. As the width of the east leg (Highway 417 eastbound on-ramp) is required to accommodate turning movements of heavy vehicles, a reduction in width is not recommended.
    - This intersection does not currently meet the target BLOS B. As cyclists are not permitted on Highway 417, the left turn characteristics on the north approach and left/right turn characteristics on the east approach were excluded from the analysis. Based on the right turn characteristics on the south approach, the intersection is operating with a BLOS D. To achieve the target BLOS B, either removal or a reduction in the length of the northbound right turn lane is required. As identified above, removal in the length of the northbound right turn lane is not recommended due to the high northbound right turning volumes (180-195 vehicles during peak

hours). Based on the Synchro analysis in the following sections, the 95th percentile northbound right turn queue is anticipated to be approximately 15m. Based on the foregoing, consideration could be given by the City to reducing the length of the northbound right turn lane at this intersection.

- *Kanata Avenue/Castlefrank Road/Aird Place*
    - The Kanata Avenue/Castlefrank Road/Aird Place intersection currently meets the target Auto LOS E. As this intersection is not along a transit priority corridor or a truck route, no target TLOS or TkLOS is identified.
    - This intersection does not currently meet the target PLOS A. A reduction in the crossing distance on all legs of the intersection would provide the greatest improvement to the PLOS at this intersection.
    - This intersection does not currently meet the target BLOS B. To achieve the target BLOS B, the implementation of two-stage northbound/southbound left turn bike boxes is required. This is identified for the City's consideration.
- *Campeau Drive/Maritime Way/Knudson Drive*
    - The Campeau Drive/Maritime Way/Knudson Drive intersection currently meets the target BLOS B and Auto LOS E. As this intersection is not along a transit priority corridor or a truck route, no target TLOS or TkLOS is identified.
    - This intersection does not currently meet the target PLOS A. A reduction in the crossing distance on all legs of the intersection would provide the greatest improvement to the PLOS at this intersection.
    - This intersection currently meets the target BLOS B. However it is noted that cyclists are required to dismount and use the pedestrian crosswalks on the north, east, and west legs of the intersection.

<u>Total Intersection Operations</u>

- Under 2022 total traffic conditions, all intersections are anticipated to meet the City's target Auto LOS during the AM and PM peak hours.
    - No additional modifications are required to accommodate site generated traffic.
    - The proposed development is only anticipated to add two westbound left turning vehicles to the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection during the PM peak hour, equating to one vehicle every 30 minutes. As the requirement for a westbound left turn lane is a result of background traffic conditions, and not attributable to traffic generated by the site, this is identified for the City's consideration as funding permits and is not attributable to the proposed development.
- Under 2027 total traffic conditions, the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection is anticipated to operate with a LOS E in the AM and PM peak hours. All other study area intersections are anticipated to meet the City's target Auto LOS during the AM and PM peak hours.
    - Based on the OTM traffic signalization warrant, traffic signals at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection are 29% warranted. Given that the OTM traffic signalization warrant is only 29% met, and projected delay only marginally exceeds the threshold for acceptable operating conditions, side street stop-control is recommended at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection.
    - No additional modifications are required to accommodate site generated traffic. As the requirement for a westbound left turn lane at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection is a result of background traffic conditions, and not attributable to traffic generated by the site, this is identified for the City's

consideration as funding permits and is not attributable to the proposed development.

1.0 SCREENING

1.1 Introduction

This Transportation Impact Assessment (TIA) Report has been prepared in support of Zoning By-law Amendment and Site Plan Control applications for a mixed-use development at 1050 Canadian Shield Avenue.

The subject site is surrounded by the following:

- Campeau Drive and residential to the north;
- Canadian Shield Avenue and office/hotel/residential uses to the south;
- A retirement home and Maritime Way to the east; and
- Great Lakes Avenue and a hotel to the west.

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

Figure 1: View of the Subject Site

The approved Kanata Town Centre Community Transportation Study (CTS), dated July 2012, considered the transportation impacts of 100,000 square feet of office for the subject site. As the report is now more than 5 years old and the concept for the site has changed, new analysis will be required.

1.2 Proposed Development

The subject property is currently zoned Mixed-Use Centre Zone, Subzone 15 - MC15 [2027]. The purpose of the MC15 [2027] zone is to ensure the accommodation of a combination of transit-supportive uses such as offices, secondary and post-secondary schools, hotels, hospitals, large institutional buildings, community recreation and leisure centers, day care centers, retail uses, entertainment uses, service uses such as restaurants and personal service businesses, and high- and medium-density residential uses, as well as to allow the permitted uses in a compact and pedestrian-oriented built form in mixed-use buildings or side by side in separate buildings. An amendment to Zoning By-law 2008-250 is proposed in order modify the existing zoning to accommodate additional site-specific provisions.

The proposed development consists of a six-storey apartment building with approximately 244 residential units and 275m^2 of ground floor commercial. A total of 348 parking spaces are proposed in two levels of underground parking. Access to the underground parking is proposed on Canadian Shield Avenue. The development is anticipated to be constructed in one phase with an assumed build-out year of 2022.

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

1.3 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 anticipated to generate over 60 peak hour person trips; further assessment is required based on this trigger.
- Location Trigger – The development is located in a Design Priority Area (Kanata Town Centre); further assessment is required based on this trigger.
- Safety Trigger – No safety triggers outlined in the TIA Screening Form are met; no further assessment is required based on this trigger.

The proposed development satisfies the Trip Generation and Location Triggers for completing a TIA. A copy of the TIA screening form is included in **Appendix B**.

2.0 SCOPING

2.1 Existing Conditions

2.1.1 Roadways

The roadway network of the greater area surrounding the subject site is illustrated in **Figure 2**.

Figure 2: Roadway Network

Highway 417 is a provincial highway travelling east-west through the City of Ottawa. All other roadways within the study area fall under the jurisdiction of the City of Ottawa.

Kanata Avenue is an arterial roadway and generally runs on a northwest-southeast alignment within the study area. It has a two-lane undivided urban cross section with a posted speed limit of 50km/hr in the vicinity of the subject site. Kanata Avenue is designated as a truck route permitting full loads.

Castlefrank Road is the extension of Kanata Avenue south of Highway 417 that travels from Aird Place to Terry Fox Drive. It is classified as an arterial roadway north of Katimavik Road and a major collector roadway south of Katimavik Road. It has a two-lane undivided urban cross section with a posted speed limit of 50km/hr.

Campeau Drive is an arterial roadway that generally runs on an east-west alignment within the study area. Campeau Drive has a two-lane undivided urban cross section with a posted speed limit of 60km/hr. The City of Ottawa Official Plan (OP) identifies a 40m right-of-way (ROW) to be protected along Campeau Drive between Didsbury Road and Teron Road. No widening will be required as part of this application.

Maritime Way is a local roadway that runs between Kanata Avenue and Campeau Drive. Maritime Way has a two-lane divided urban cross section from Kanata Avenue to approximately 70m east of the 90-degree bend where it transitions to an undivided cross section. Gateway speed limits have been installed on Maritime Way, making the speed limit 40km/h.

Lord Byng Way is a local road that commences along Kanata Avenue and terminates approximately 160m to the south. Lord Byng Way provides access to the Holiday Inn Hotel, the Kanata Centrum Shopping Centre, and the Terry Fox Transit Station.

Aird Place travels from west of Castlefrank Road to Katimavik Road and is classified as a local roadway west of Castlefrank Road and a collector roadway east of Castlefrank Road. Aird Place has a two-lane undivided urban cross section with a posted speed limit of 40km/hr.

Knudson Drive is a collector roadway that travels between Kanata Avenue and Campeau Drive. It has a two-lane undivided urban cross section with a posted speed limit of 40km/hr.

Great Lakes Avenue is a local roadway that travels between Campeau Drive and Maritime Way. It has a two-lane undivided urban cross section with a gateway posted speed limit of 40km/h.

Canadian Shield Avenue is a local roadway that runs between Cordillera Street and Maritime Way. It has a two-lane undivided urban cross section with a gateway posted speed limit of 40km/h.

Conacher Gate is a private roadway opposing Great Lakes Avenue, providing access to the residential units in Country Club Estates. It has a two-lane undivided cross section and pavement marking indicate a speed limit of 30km/h.

2.1.2 Intersections

Kanata Ave/Maritime Way/Lord Byng Way

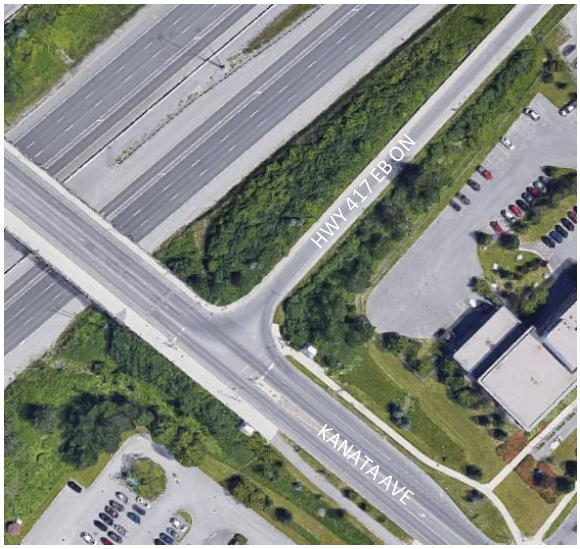
- Signalized intersection
- South, east, and west approaches: one left turn lane and one shared through/right turn lane
- North approach: one shared left/through/right turn lane on north approach
- Due to a wide lane width, the north approach functions as a two-lane approach.
- Standard crosswalks are provided on all approaches
- A bike lane is provided on the east approach

Kanata Ave/Highway 417 Westbound Off-Ramp

- Signalized intersection
- North approach: two through lane
- South approach: one through lanes
- East approach: one left turn lane and one right turn lane
- Standard crosswalks are provided on north and east approaches
- Bike lanes are provided on the north and south approaches

Kanata Ave/Highway 417 Eastbound On-Ramp

- Signalized intersection
- North approach: one through lane and one left turn lane
- South approach: one through lane and one right turn lane
- Standard crosswalks are provided on south and east approaches
- Bike lanes are provided on the north and south approaches



Kanata Ave/Castlefrank Rd/Aird Pl

- Signalized intersection
- East and west approaches: one shared left/through/right turn lane
- North and south approaches: one left turn lane and one shared through/right turn lane
- Textured crosswalks are provided on the east and west approaches
- Standard sidewalks are provided on the north and south approaches
- Bike lanes are provided on the north and south approaches

Campeau Dr/Maritime Way/Knudson Dr

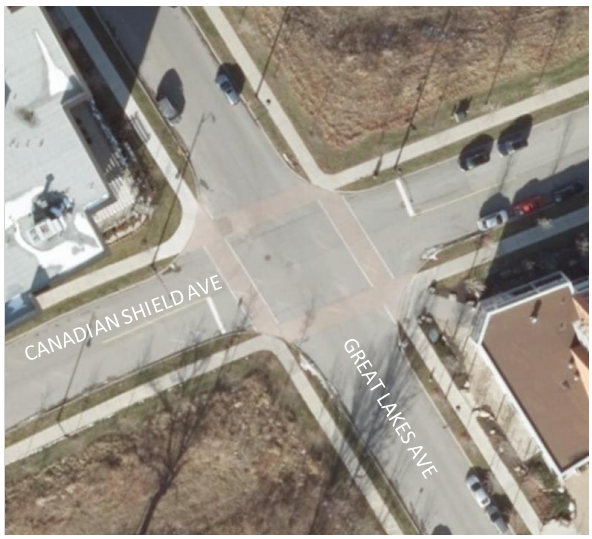
- Signalized intersection
- All approaches: one left turn lane and one shared through/right turn lane
- Standard crosswalks are provided on all approaches
- Separated cycling facilities are provided on the north, east and west approaches

Campeau Drive/Great Lakes Avenue/Conacher Gate

- Side street stop-controlled intersection, with free flow on Campeau Drive
- One travel lane in each direction

Great Lakes Avenue/Canadian Shield Avenue

- All way stop-controlled intersection (recently implemented)
- One travel lane in each direction
- Unit paver crosswalks on all approaches



2.1.3 Driveways

In accordance with the City's 2017 TIA guidelines, a review of adjacent driveways along the boundary roads (within 200m of the subject site) are provided as follows:

Canadian Shield Avenue, north side:

- One all-movement driveway to the retirement home at 3501 Campeau Drive

Great Lakes Avenue, west side:

- One all-movement driveway to the hotel at 900 Great Lakes Avenue

Canadian Shield Avenue, south side:

- Two all-movement driveways to the apartment building at 1025 Canadian Shield Avenue

Campeau Drive, south side:

- One all-movement driveway to the retirement home at 3501 Campeau Drive

2.1.4 Pedestrian and Cycling Facilities

The existing pedestrian and cycling infrastructure provided in the greater area surrounding the subject site is illustrated in **Figure 3**.

Figure 3: Existing Pedestrian and Cycling Infrastructure

Sidewalks are currently provided on both sides of Maritime Way, Castlefrank Road, Campeau Drive, Great Lakes Avenue, and Canadian Shield Avenue. Sidewalks are provided on both sides of Kanata Avenue south/east of Maritime Way, and the north side west of Maritime Way. Sidewalks are also provided on the north side of Aird Place and the west side of Knudson Drive.

Bike lanes are currently provided along Kanata Avenue, Campeau Drive, Knudson Drive, and Castlefrank Road north of Katimavik Road. A north-south pedestrian/cyclist crossing of Highway 417 is provided connecting Gray Crescent to Whitney Drive. Campeau Drive is identified as a spine cycling route, and Kanata Avenue, Castlefrank Road, Maritime Way, Knudson Drive and Lord Byng Way are identified as local cycling routes in the City's Ultimate Cycling Network.

2.1.5 Transit

The nearest bus stops to the subject site (OC Transpo stops #1137 and #1138) are located at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection. They serve OC Transpo Routes 62, 161, 164, and 268. OC Transpo stop #1815 is located on the west side of Knudson Drive, north of Campeau Drive and serves OC Transpo Route 265.

OC Transpo Route 62 travels from Terry Fox transit station to Tunney's Pasture transit station. It operates seven days a week, with all day service. On weekdays (with limited evening service), the route is extended to also travel to Stittsville, serving the Canadian Tire Center, Tanger Outlets, and the Goulbourn Recreation Complex.

OC Transpo Route 161 travels from Terry Fox transit station to the Bridlewood community. It operates on weekdays with all day service. This bus route generally does not serve the study area. However, the route is extended to Earl of March High School for one bus only, stopping at stops #1138 in the morning and #1137 in the afternoon.

OC Transpo Route 164 travels from Terry Fox transit station to Hope Side Road. It operates on weekdays with peak period service only.

OC Transpo Route 268 travels from the Kanata Lakes community to Tunney's Pasture transit station. It operates on weekdays with peak period service only.

OC Transpo Route 265 travels from Tunney's Pasture transit station to the Beaverbrook community. It operates on weekdays with peak period service only.

Bus stops have been constructed along the length of Maritime Way but are not currently in use. Transit service will become available along Maritime Way as development increases within the Kanata Town Centre. Bus stops to the future transit route are located along Maritime Way south and east of the subject site.

The subject site is also located within approximately a 650m radius, or an 950m walking distance, of the Terry Fox Transit Station, which provides access to numerous transit routes.

The location of the aforementioned transit facilities in relation to the subject site is shown in **Figure 4**. Detailed route information and an excerpt from the OC Transpo System Map are included in **Appendix C**.

Figure 4: OC Transpo Bus Stop Locations

2.1.6 Existing Area Traffic Management Measures

Speed cushions have been implemented along Knudson Drive. On-road messaging (SLOW pavement markings) have been implemented along Maritime Way and Great Lakes Avenue, and all-way stop control was recently implemented at the Maritime Way/Great Lakes Avenue, Canadian Shield Avenue/Great Lakes Avenue and Canadian Shield/Maritime Way intersections. A raised median is provided along Maritime Way approaching Kanata Avenue. No other area traffic management measures have been implemented within the study area.

Gateway speed limit signs were posted in 2019, reducing the speed limit on Cordillera Street, Maritime Way, Great Lakes Avenue, and Canadian Shield Avenue from 50km/h to 40km/h.

2.1.7 Existing Traffic Volumes

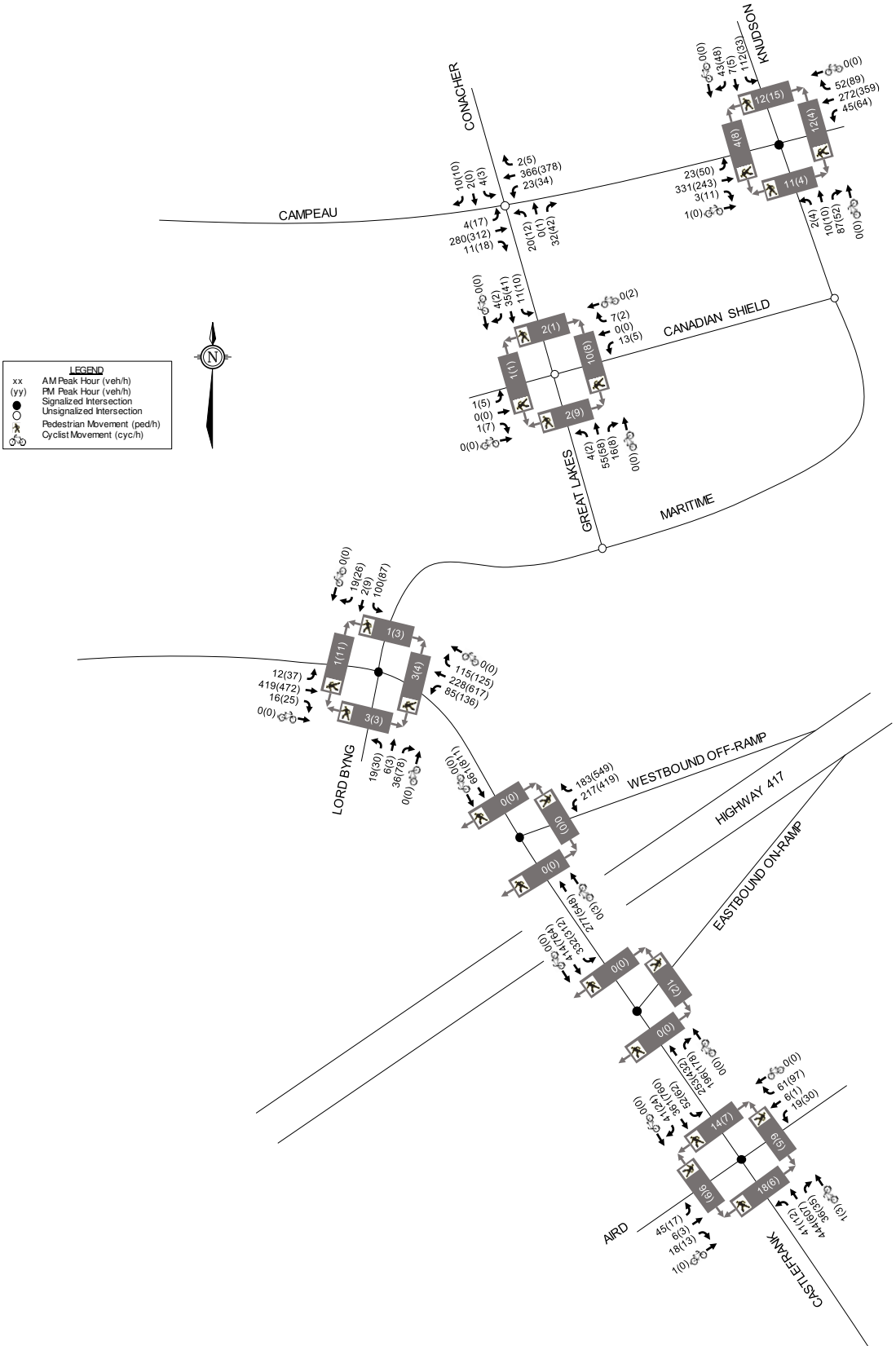
Weekday traffic counts were obtained from the City of Ottawa at available intersections to determine the existing pedestrian, cyclist and vehicular traffic volumes. Additionally, a traffic count was obtained from the 6301 Campeau Drive TIA (by Trans-Plan) at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection. The traffic counts were completed on the following dates:

- Kanata Avenue/Maritime Way/Lord Byng Way — March 20, 2018
- Kanata Avenue/Highway 417 WB Off-ramp — December 6, 2017
- Kanata Avenue/Highway 417 EB On-ramp — November 27, 2018
- Kanata Avenue/Castlefrank Road/Aird Place — April 11, 2018
- Campeau Drive/Maritime Way/Knudson Drive — March 10, 2020
- Campeau Drive/Great Lakes Avenue/Conacher Gate — September 22, 2020

As indicated above, the traffic count at the Campeau Drive/Great Lakes Avenue/Conacher Gate was completed during the COVID-19 pandemic. A comparison of pre-pandemic and pandemic counts was completed using counts collected at the Campeau Drive/Maritime Way/Knudson Drive intersection in early March 2020 and September 2020. It was found that the count collected in September 2020 was lower than the March 2020 count. An adjustment factor of 1.2 in the AM peak and 1.3 in the PM peak has been applied to the count at Campeau Drive/Great Lakes Avenue/Conacher Gate in order to account for higher pre-pandemic traffic.

Existing traffic volumes along the study area roadways are shown in **Figure 5**. Peak hour summary sheets of the above traffic counts are included in **Appendix D**.

Figure 5: Existing Traffic Volumes



2.1.8 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 intersection. Copies of the collision summary report are included in **Appendix E**.

The collision data has been evaluated to determine if there are any identifiable collision patterns. The following summarizes the number of collisions at each intersection from January 1, 2015 to December 31, 2019.

Table 1: Reported Collisions

Intersection	Impact Types						Total Number of Collisions
	Angle	Sideswipe	Rear End	Turning Movement	Approach	SMV[1]/ Other	
Kanata Avenue/Highway 417 WB Off-ramp	23	1	17	1	0	3	**45**
Kanata Avenue/Maritime Way/Lord Byng Way	5	3	27	1	1	5	**42**
Kanata Avenue/Highway 417 EB On-ramp	1	0	8	2	0	2	**13**
Kanata Avenue/ Castlefrank Road/ Aird Place	2	0	9	0	0	0	**11**
Campeau Drive/Maritime Way/Knudson Drive	1	1	2	1	0	1	**6**
Maritime Way between Canadian Shield Avenue and Great Lakes Avenue	0	0	0	0	1	4	**5**
Campeau Drive/Great Lakes Avenue/Conacher Gate	1	0	1	0	0	0	**2**
Kanata Avenue between 417 WB Off-Ramp and Maritime Way	0	0	2	0	0	0	**2**
Campeau Drive between Conacher Gate and Knudson Drive	0	0	0	0	0	1	**1**
Great Lakes Avenue/Maritime Way	1	0	0	0	0	0	**1**
Kanata Avenue between 417 EB On-ramp and Aird Place	0	0	1	0	0	0	**1**
Kanata Avenue between 417 EB On-Ramp and 417 WB Off-Ramp	0	0	1	0	0	0	**1**
Maritime Way between Great Lakes Avenue and Kanata Avenue	1	0	0	0	0	0	**1**
Great Lakes Avenue/ Canadian Shield Avenue	1	0	0	0	0	0	**1**

1. SMV = Single Motor Vehicle

<u>Kanata Avenue/Highway 417 Westbound Off-ramp</u>

A total of 45 collisions were reported at this intersection over the last five years. Of the 45 collisions, 23 were angle impacts, 17 were rear-end impacts, three were single motor vehicle/other impacts, one was a sideswipe impact, and one was a turning movement impact. Thirty-seven (37) of the total collisions caused property damage only, while the remaining eight

caused personal injuries but no fatalities. Eight of the collisions occurred under poor environmental conditions. One of the collisions involved a pedestrian and none involved cyclists.

Sixteen (16) of the twenty-three (23) angle impacts involved northbound and westbound vehicles, while the remaining seven (7) involved southbound and westbound vehicles. Eighteen (18) of the angle impacts caused property damage only, while the remaining five (5) caused personal injuries but no fatalities. Three of the angle impacts occurred under poor environmental conditions. Fourteen (14) of the angle impacts were attributable to a vehicle disobeying the traffic signal control.

Ten (10) of the seventeen (17) rear-end impacts involved westbound vehicles, four involved northbound vehicles, and three involved southbound vehicles. Sixteen (16) of the rear-end impacts caused property damage only, while one caused personal injuries but no fatalities. Three of the rear-end impacts occurred under poor environmental conditions.

Kanata Avenue/Maritime Way/Lord Byng Way

A total of 42 collisions were reported at this intersection over the last five years. Of the 42 collisions, 27 were rear-end impacts, five were single motor vehicle/other impacts, five were angle impacts, three were sideswipe impacts, one was a turning movement impact, and one was an approach impact. Thirty-one (31) of the total collisions caused property damage only, while the remaining eleven (11) caused personal injuries but no fatalities. Thirteen (13) of the collisions occurred under poor environmental conditions. One of the collisions involved a pedestrian and none involved cyclists.

Eleven (11) of the twenty-seven (27) rear-end impacts involved northbound vehicles, eight involved westbound vehicles, four involved southbound vehicles, and four involved eastbound vehicles. Twenty-wo (22) of the rear-end impacts caused property damage only, while the remaining five caused personal injuries but no fatalities. Nine of the rear-end impacts occurred under poor environmental conditions.

Kanata Avenue/Highway 417 Eastbound On-ramp

A total of thirteen (13) collisions were reported at this intersection over the last five years. Of the thirteen collisions, eight were rear-end impacts, two were turning movement impacts, two were single motor vehicle impacts, and one was an angle impact. All of the collisions caused property damage only and six of the collisions occurred under poor environmental conditions. None of the collisions involved a pedestrian or cyclists.

Kanata Avenue/Castlefrank Road/Aird Place

A total of eleven (11) collisions were reported at this intersection over the last five years. Of the 11 collisions, 9 were rear-end impacts and two were angle impacts. Ten of the total collisions caused property damage only, while the remaining one collision caused personal injuries but no fatalities. None of the collisions involved a pedestrian or cyclists.

Six of the nine rear-end impacts involved southbound vehicles, and three involved northbound vehicles. All of the rear-end impacts caused property damage only and two of the rear-end impacts occurred under poor environmental conditions.

Campeau Drive/Maritime Way/Knudson Drive

A total of six collisions occurred at this intersection over the last five years. Of the six collisions, two were rear-end impacts, one was an angle impact, one was a sideswipe impact, one was a

turning movement impact, and one was a single motor vehicle impact. Five of the collisions caused property damage only, while one caused personal injuries but no fatalities. One of the collisions occurred under poor environmental conditions. None of the collisions involved a pedestrian and one involved a cyclist.

Maritime Way between Canadian Shield Avenue and Great Lakes Avenue
A total of five collisions were reported along Maritime Way between Canadian Shield Avenue and Great Lakes Avenue over the last five years. Of these, four were single vehicle collisions and one was an approach impact. All of the collisions caused property damage only and two of the collisions occurred under poor environmental conditions.

Campeau Drive/Great Lakes Avenue/Conacher Gate
A total of two collisions were reported at this intersection over the last five years. Of these, one was a rear end impact and one was an angle impact. Both collisions caused property damage only and occurred under clear environmental conditions. None of the collisions involved pedestrians or cyclists.

Kanata Avenue between Highway 417 westbound off-ramp and Maritime Way
A total of two mid-block collisions were reported along Kanata Avenue between Maritime Way and the Highway 417 westbound off-ramp. Both of the collisions were rear-end impacts and occurred under good surface or environmental conditions.

Campeau Drive between Conacher Gate and Knudson Drive
One mid-block collision was reported along Campeau Drive mid-block between Conacher Gate and Knudson Drive. This collision was a single vehicle collision that occurred under good surface or environmental conditions and caused property damage only.

Great Lakes Avenue/Maritime Way
One collision was reported at the Great Lakes Avenue/Maritime Way intersection over the last five years. This collision was a single vehicle collision that occurred under good surface or environmental conditions and caused property damage only.

Kanata Avenue between Highway 417 eastbound on-ramp and Aird Place
One mid-block collision was reported along Kanata Avenue between the Highway 417 eastbound on-ramp and Aird Place. This collision was a rear-end impact that occurred under good surface or environmental conditions and caused property damage only.

Kanata Avenue between Highway 417 westbound off-ramp and eastbound on-ramp
One mid-block collision was reported along Kanata Avenue between the Highway 417 westbound off-ramp and eastbound on-ramp. This collision was a rear-end impact that occurred under good surface or environmental conditions and caused property damage only.

Maritime Way between Kanata Avenue and Great Lakes Avenue
One mid-block collision was reported along Maritime Way between Kanata Avenue and Campeau Drive. This collision was an angle impact that occurred under good surface or environmental conditions and caused property damage only.

Great Lakes Avenue/Canadian Shield Avenue
One collision was reported at this intersection over the last five years. This collision was an angle impact that caused property damage only.

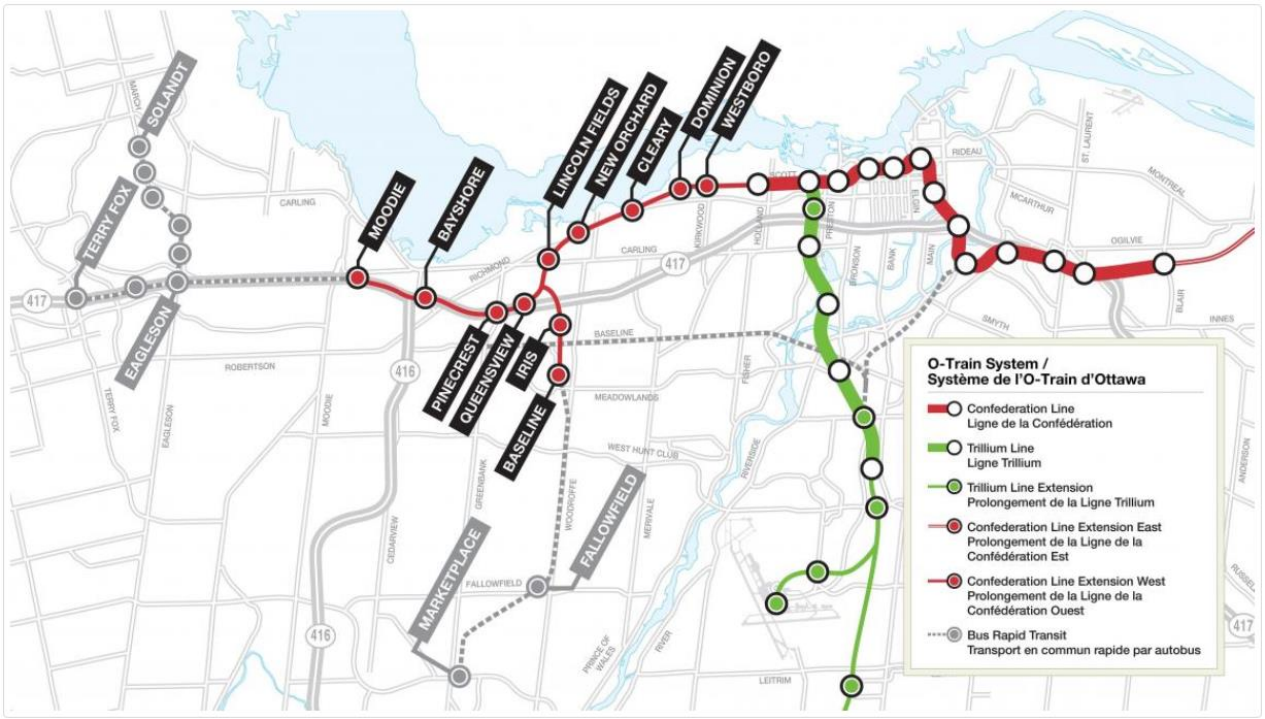
2.2 Planned Conditions

The City of Ottawa's Transportation Master Plan (TMP) 2031 Affordable Road Network identifies the widening of Kanata Avenue from two to four lanes between Highway 417 and Campeau Drive. This widening will fulfill the urban design initiatives ongoing in the vicinity of the Kanata Town Centre. Based on the TMP, the widening of Kanata Avenue is anticipated between 2020 and 2025. However, based on discussions with City staff this widening will not be constructed until approximately 2031. The TMP's 2031 Network Concept also includes the widening of Campeau Drive from two to four lanes between Didsbury Road and March Road.

The TMP's Affordable Rapid Transit and Transit Priority Network identifies exclusive and at-grade Bus Rapid Transit (BRT) between the Terry Fox and Eagleson Transit Stations. The Rapid Transit Network Concept will include exclusive BRT between Fernbank Road and Eagleson Transit Stations.

Construction for Phase 2 of the Light Rail Transit (LRT) began in 2019. Phase 2 of LRT will extend the Confederation Line east and west and will extend the Trillium Line further south. The Confederation Line Extension West will travel from the Tunney's Pasture Transit Station to the Moodie and Baseline Transit Stations and is anticipated to be completed by 2025. The proposed western Confederation Line extension is shown in **Figure 6**.

Figure 6: LRT Phase 2 - Confederation Line Extension West



The TMP's Ultimate Transit Network Concept will extend light rail transit from the Moodie Transit Station to the Hazeldean Transit Station. This project will convert the Terry Fox Transit Station to LRT.

The City of Ottawa's 2013 Ottawa Pedestrian Plan identifies a new sidewalk along the east side of Knudson Drive north of Campeau Drive as a Phase 3 project with implementation between 2026 and 2031.

Other area development includes:

- The Timberwalk retirement home containing 154 units was recently constructed at 1250 Maritime Way, immediately west of the subject site. A Revised Transportation Brief was prepared by Novatech, dated May 2017, in support of this development.

- A six-storey apartment building containing 144 units and an eight-storey apartment building containing 154 units are proposed at 1088 and 1136 Maritime Way. A Transportation Brief was prepared by Novatech, dated March 2017 in support of this development. Construction for the apartment building at 1136 Maritime Way is now complete and construction for the 1088 Maritime Way building is underway.

- A subdivision containing 1,544 residential dwelling units is proposed at 7000 Campeau Drive, which is currently occupied by the Kanata Golf & Country Club. A Transportation Impact Assessment was prepared by BA Group, dated June 2020 in support of this development. This development is anticipated to be constructed by 2024 but is subject to a legal challenge. The Ontario Supreme Court has upheld an 1981 agreement between the former city of Kanata and Campeau Corp that preserves 40 percent of land in the Kanata Lakes as natural space. This protected land would include the Kanata Golf & Country Club. It is understood that an appeal hearing is scheduled.

- A mixed-use development containing 798 residential units and 431m^2 of commercial is proposed at 6301 Campeau Drive. A Transportation Impact Assessment was prepared by Trans-Plan Transportation Engineering, dated November 2020 in support of this development. Phase 1 of this development was expected by 2021 with the timing for Phase 2 to be determined, however, construction for this development has not yet begun.

- A retail/office development is proposed at 255 Kanata Avenue, within the Kanata Centrum lands. A Planning Rationale was prepared by Fotenn, dated June 2015, in support of this development. No transportation studies were submitted to the City in support of this development. The development appears to be have been put on hold indefinitely.

- A Mandarin Restaurant was recently constructed at 150 Katimavik Road. A Transportation Brief was prepared by Parsons, dated October 2016 in support of this development.

- A residential development is proposed at 1200 Maritime Way. A Transportation Impact Assessment was prepared by Novatech, dated February 2021, in support of this development. The development is anticipated to be built out by 2028.

2.3 Study Area and Time Periods

The study area intersections include the proposed access and following intersections:

- Kanata Avenue/Maritime Way/Lord Byng Way
- Kanata Avenue/Highway 417 WB Off-ramp

- Kanata Avenue/Highway 417 EB On-ramp
- Kanata Avenue/Castlefrank Road/Aird Place
- Campeau Drive/Maritime Way/Knudson Drive
- Campeau Drive/Great Lakes Avenue/Conacher Gate
- Great Lakes Avenue/Canadian Shield Avenue

The selected time periods for the analysis are the weekday AM and PM peak hours, as they represent the 'worst case' combination of site generated traffic and adjacent street traffic.

Analysis will be completed for the 2022 build-out year and the 5-year (2027) horizon per the City's TIA guidelines.

2.4 Exemptions Review

This module reviews possible exemptions from the final TIA, as outlined in the TIA Guidelines. The applicable exemptions for this site are shown in **Table 3**.

Table 2: TIA Exemptions

Module	Element	Exemption Criteria	Exemption Applies
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	*All elements*	• Not required for non-residential site plans expected to have fewer than 60 employees and/or students on location at any given time	Not 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	Not Exempt
4.8 Network Concept	*All elements*	• 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

As the proposed development is anticipated to meet minimum parking requirements of the Zoning By-Law, Module 4.2.2 is exempt from the analysis.

The proposed uses conform to the existing zoning. As such, Module 4.8 is exempt from the analysis.

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 4.5: Transportation Demand Management
- Module 4.6: Neighbourhood Traffic Management
- Module 4.7: Transit
- Module 4.9: Intersection Design

3.0 FORECASTING

3.1 Development-Generated Traffic

3.1.1 Trip Generation

The proposed development consists of a six-storey apartment building with approximately 244 residential units and 275m^2 of ground floor commercial.

The methodology and results of estimating the trip generation for each land use are discussed in the subsequent sections.

The *TRANS Trip Generation Manual Summary Report*, prepared in October 2020 by WSP, includes data to estimate the mode shares for commercial trip generators (in Table 13 of the manual) and mid- or high-rise multifamily housing (in Table 8 of the manual) for the AM and PM peak periods, based on district. The *TRANS Trip Generation Manual* identifies the subject site as being located within the Kanata/Stittsville district. Mode shares for the Kanata/Stittsville district for commercial and residential developments are shown in **Table 3**.

Table 3: Mode Shares for Kanata/Stittsville District

Mode	Commercial		Residential	
	AM	PM	AM	PM
Auto Driver	81%	73%	43%	55%
Auto Passenger	12%	22%	26%	19%
Transit	5%	1%	28%	21%
Cyclist	0%	0%	0%	0%
Pedestrian	2%	4%	4%	5%

3.1.1.1 Proposed Commercial Trip Generation

Since the retail uses are not known at this time, the trips generated by the proposed commercial uses have been estimated using the Shopping Center land use rates included in the *ITE Trip Generation Manual, 10th Edition*. ITE trips have been converted to person trips using a 1.28 adjustment factor, consistent with the City's 2017 TIA guidelines. The estimated number of person trips generated by the proposed ground-floor commercial are shown in **Table 4**.

Table 4: Proposed Commercial – Trip Generation

Land Use	ITE Code	GFA	AM Peak Hour (pph)			PM Peak Hour (pph)		
			IN	OUT	TOT	IN	OUT	TOT
Shopping Centre	820	2,950 ft^2	3	1	*4*	8	10	*18*

Based on the previous table, the proposed commercial is estimated to generate four person trips during the AM peak hour and 18 person trips during the PM peak hour. A breakdown of these trips by modal share is shown in **Table 5**.

Table 5: Proposed Commercial – Trips by Mode Share

Travel Mode	Mode Share		AM Peak Hour			PM Peak Hour		
	AM	PM	IN	OUT	TOT	IN	OUT	TOT
Peak Hour Person Trips			**3**	**1**	***4***	**8**	**10**	***18***
Auto Driver	81%	73%	2	1	*3*	6	7	*13*
Auto Passenger	12%	22%	1	0	*1*	2	2	*4*
Transit	5%	1%	0	0	*0*	0	0	*0*
Cyclist	0%	0%	0	0	*0*	0	0	*0*
Pedestrian	2%	4%	0	0	*0*	0	1	*1*

From the previous table, the proposed commercial is estimated to generate three vehicle trips during the AM peak hour and 13 vehicle trips during the PM peak hour.

The commercial land use is 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, and pass-by trips are made as intermediate stops on the way to another destination. However, the analysis presented in this study assumes that all trips generated by the retail development are primary trips.

Due to the nature of the proposed land uses of the development, it is possible that some of the total volume of site generated trips will be internally captured within the site (i.e., tenants from the apartments that frequent the commercial component). However, in the interest of making a conservative estimate of the likely traffic impact associated with the development, the possibility of traffic being internally captured has been ignored. The analysis presented in this study assumes that all trips generated by the proposed development are 'external' trips.

3.1.1.2 Proposed Residential Trip Generation

The trips generated by the 244 proposed dwellings have been estimated using the *TRANS Trip Generation Manual*, which present peak hour trip generation rates for different types of housing for the AM and PM peak periods. For the Mid- or High-Rise Multifamily Housing land use, the process of converting the trip generation estimates from peak period to peak hour is shown in the following tables.

The estimated number of person trips generated by the proposed dwellings for the AM and PM peak periods are shown in **Table 6**. A breakdown of these trips by modal share is shown in **Table 7**.

Table 6: Proposed Residential – Peak Period Trip Generation

Land Use	TRANS Rate	Units	AM Peak Period (ppp[1])			PM Peak Period (ppp)		
			IN	OUT	TOT	IN	OUT	TOT
Mid-Rise Multifamily Housing	AM: 0.80 PM: 0.90	244	60	135	*195*	128	92	*220*

1. ppp: Person Trips per Peak Period

Table 7: Proposed Residential – Peak Period Trips by Mode Share

Travel Mode	Mode Share		AM Peak Period			PM Peak Period		
	AM	PM	IN	OUT	TOT	IN	OUT	TOT
Peak Period Person Trips			**60**	**135**	***195***	**128**	**92**	***220***
Auto Driver	43%	55%	26	58	*84*	71	51	*122*
Auto Passenger	26%	19%	16	35	*51*	24	17	*41*
Transit	28%	21%	16	38	*54*	27	19	*46*
Cyclist	0%	0%	0	0	*0*	0	0	*0*
Pedestrian	4%	5%	2	4	*6*	6	5	*11*

Table 4 of the *TRANS Trip Generation Manual* includes adjustment factors to convert the estimated number of trips generated for each mode from peak period to peak hour. A breakdown of the peak hour trips by mode is shown in **Table 8**.

Table 8: Proposed Residential – Peak Hour Trips by Mode Share

Travel Mode	Adj. Factor[1]		AM Peak Hour			PM Peak Hour		
	AM	PM	IN	OUT	TOT	IN	OUT	TOT
Auto Driver	0.48	0.44	12	28	*40*	31	23	*54*
Auto Passenger	0.48	0.44	8	17	*25*	11	7	*18*
Transit	0.55	0.47	9	21	*30*	13	9	*22*
Cyclist	0.58	0.48	0	0	*0*	0	0	*0*
Pedestrian	0.58	0.52	1	2	*3*	3	3	*6*
Peak Hour Person Trips			**30**	**68**	***98***	**58**	**42**	***100***

1. Adjustment Factors are included in Table 4 of the *TRANS Trip Generation Manual*

From the previous table, the proposed residential component is estimated to generate 98 person trips (including 40 vehicle trips) during the AM peak hour and 100 person trips (including 54 vehicle trips) during the PM peak hour.

3.1.1.3 Summary of Trip Generation Estimates

A summary of the peak hour person trips generated by the proposed commercial residential development are included in **Table 9**.

Table 9: Trip Generation Summary

Travel Mode	AM Peak Hour			PM Peak Hour		
	IN	OUT	TOT	IN	OUT	TOT
Commercial Trips	**3**	**1**	***4***	**8**	**10**	***18***
Auto Driver	2	1	*3*	6	7	*13*
Auto Passenger	1	0	*1*	2	2	*4*
Transit	0	0	*0*	0	0	*0*
Cyclist	0	0	*0*	0	0	*0*
Pedestrian	0	0	*0*	0	1	*1*
Residential Trips	**30**	**68**	***98***	**58**	**42**	***100***
Auto Driver	12	28	*40*	31	23	*54*
Auto Passenger	8	17	*25*	11	7	*18*
Transit	9	21	*30*	13	9	*22*
Cyclist	0	0	*0*	0	0	*0*
Pedestrian	1	2	*3*	3	3	*6*
Total Trips	**33**	**69**	**102**	**66**	**52**	**118**
Auto Driver	14	29	43	37	30	67
Auto Passenger	9	17	26	13	9	22
Transit	9	21	30	13	9	22
Cyclist	0	0	0	0	0	0
Pedestrian	1	2	3	3	4	7

From the previous table, the proposed development is estimated to generate an additional 102 person trips (including 43 vehicle trips) during the AM peak hour and 118 person trips (including 67 vehicle trips) during the PM peak hour.

It is likely that a percentage of the trips generated by the proposed development will be internally captured (for example, residents of the building making a trip to any of the businesses on the ground floor). No deduction has been made to account for internally captured trips, as the proposed commercial trip generation is relatively low. Therefore, all trips generated by the proposed commercial is assumed to have an origin or destination beyond the subject site. This simplifying assumption also allows for a more conservative analysis.

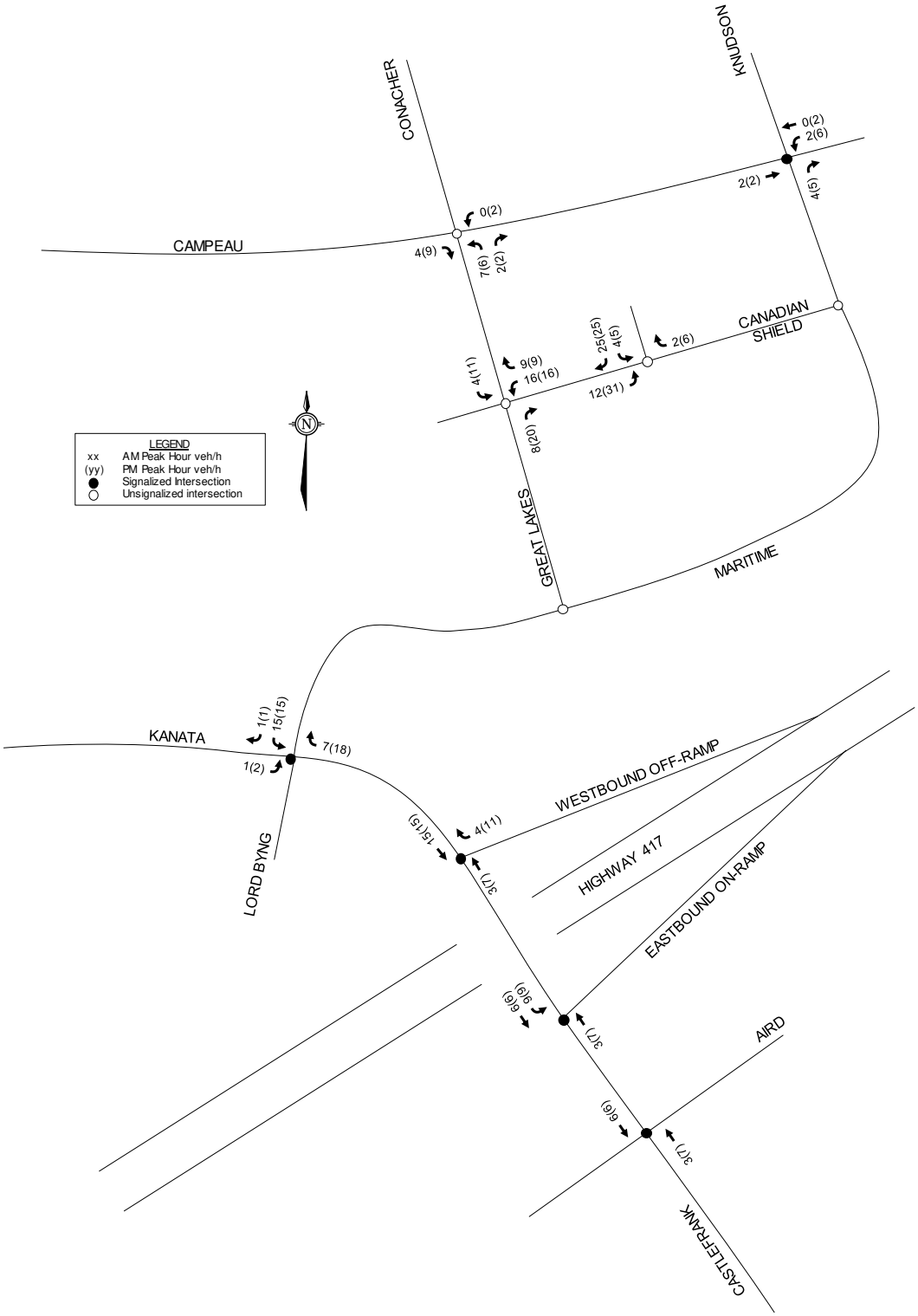
3.1.2 Trip Distribution

Site generated traffic was distributed based on the peak hour traffic patterns within the study area. The distribution can be described as follows:

- 25% to/from the west via Campeau Drive
- 5% to/from the west via Kanata Avenue
- 20% to/from the east via Campeau Drive
- 30% to/from the east via Highway 417
- 20% to/from the south via Castlefrank Road

Traffic generated by the proposed development during the weekday AM and PM peak hours is shown in **Figure 7**.

Figure 7: Site Generated Traffic



3.2 Background Traffic

3.2.1 General Background Growth Rate

A review of snapshots from the City's Long-Range Transportation Model have been reviewed to determine an appropriate background growth rate in the area. Based on the 2011 and 2031 long-range model snapshots, Kanata Avenue and Maritime Way are anticipated to grow at a rate of 2% per annum, traffic on the Highway 417 on-ramp is anticipated to grow at a rate of 1% per annum, Campeau Drive is not anticipated to grow, and traffic on the Highway 417 off-ramp is anticipated to decrease.

A further review of historic traffic counts at the Kanata Avenue/Maritime Way/Lord Byng Way (2014 and 2018 counts), Campeau Drive/Maritime Way/Knudson Drive (2015 and 2020 counts) has been conducted. Based on the annual average daily traffic (AADT), traffic at the Kanata Avenue/Maritime Way intersection has grown at a rate of 3% per annum, while traffic at the Campeau Drive/Maritime Way intersection has not grown significantly.

For the purposes of this analysis, a 2% per annum growth rate has been applied to traffic along Maritime Way and Kanata Avenue. Consistent with the 1200 Maritime Way, 7000 Campeau Drive and 6301 Campeau Drive TIA's, a 2% per annum growth rate has also been conservatively applied to Campeau Drive and Knudson Drive.

Historical AADT traffic counts were obtained from MTO for the Highway 417 Off-ramp (2014 and 2018 counts) and Highway 417 On-ramp (2014 and 2019 counts) along Kanata Avenue. Based on the ramp counts, the Highway 417 off-ramp grew at a rate of 6% per annum while the on-ramp grew at a rate of 3% per annum. Consistent with the 1200 Maritime Way TIA, and since background traffic generated by other area developments is accounted for separately, a 2% per annum growth rate has been applied to the Highway 417 on and off ramps along Kanata Avenue.

3.2.2 Other Area Development

A description of other study area developments is included in Section 2.2. Excerpts of site generated traffic figures from the respective traffic studies for the above developments are included in **Appendix F**.

Traffic from the following developments has been added to background traffic for the 2022 build-out year:

- The retirement home at 1250 Maritime Way
- The proposed residential development at 1088 and 1136 Maritime Way
- The proposed mixed-use development at 6301 Campeau Drive
- The restaurant at 150 Katimavik Road

Traffic from the following developments has been added to background traffic for the 2027 horizon year:

- The proposed residential development at 1200 Maritime Way
- The proposed subdivision at 7000 Campeau Drive. As described in Section 2.2, this development is subject to a legal challenge. Traffic generated by this proposed development has been conservatively added to background traffic for the 5-year horizon.

Background traffic volumes for the 2022 build-out and the 2027 horizon years are shown in **Figures 8** and **9**. Total traffic volumes for the 2022 build-out and the 2027 horizon years are shown in **Figures 10** and **11**.

Figure 8: 2022 Background Traffic

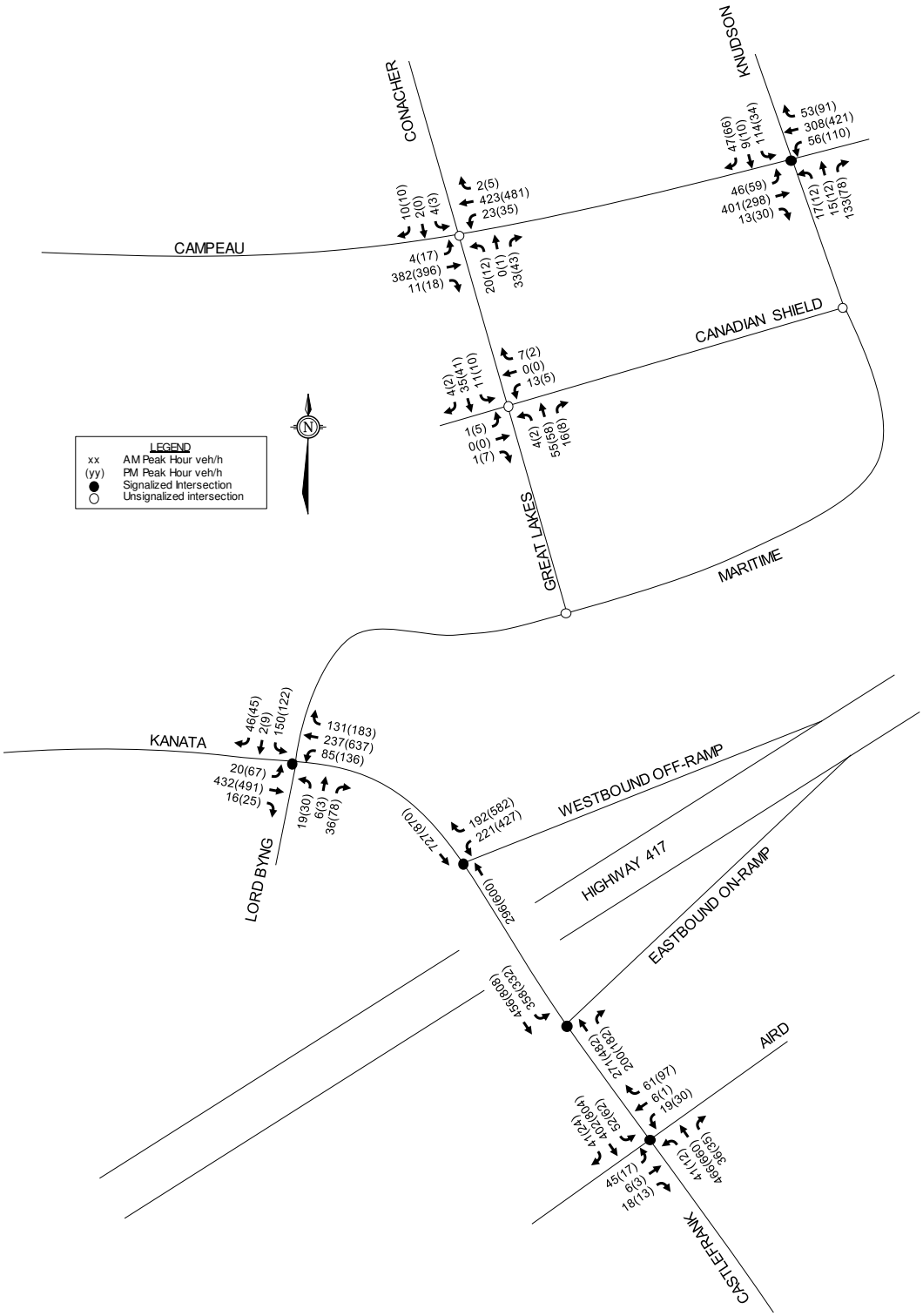


Figure 9: 2027 Background Traffic

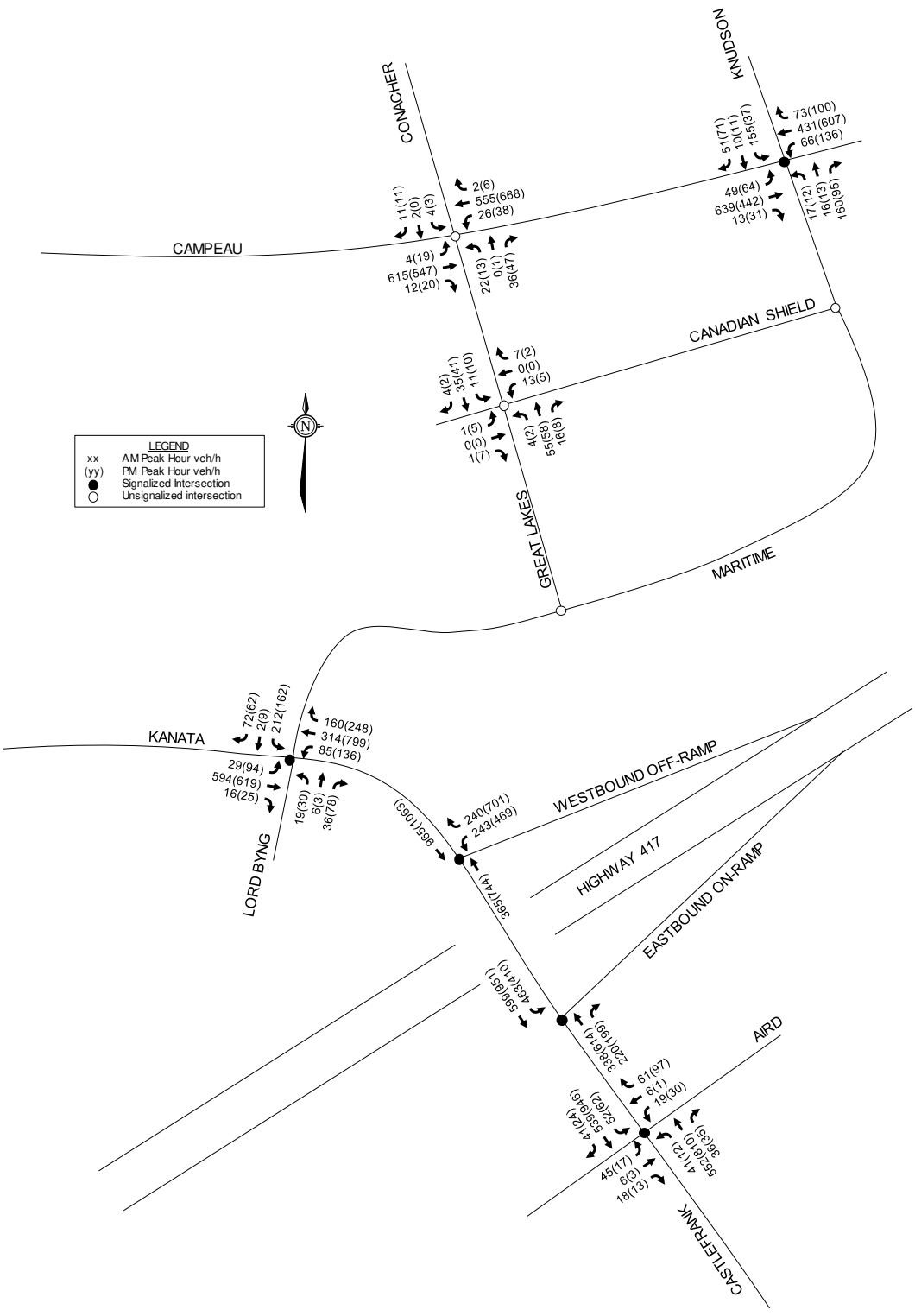


Figure 10: 2022 Total Traffic

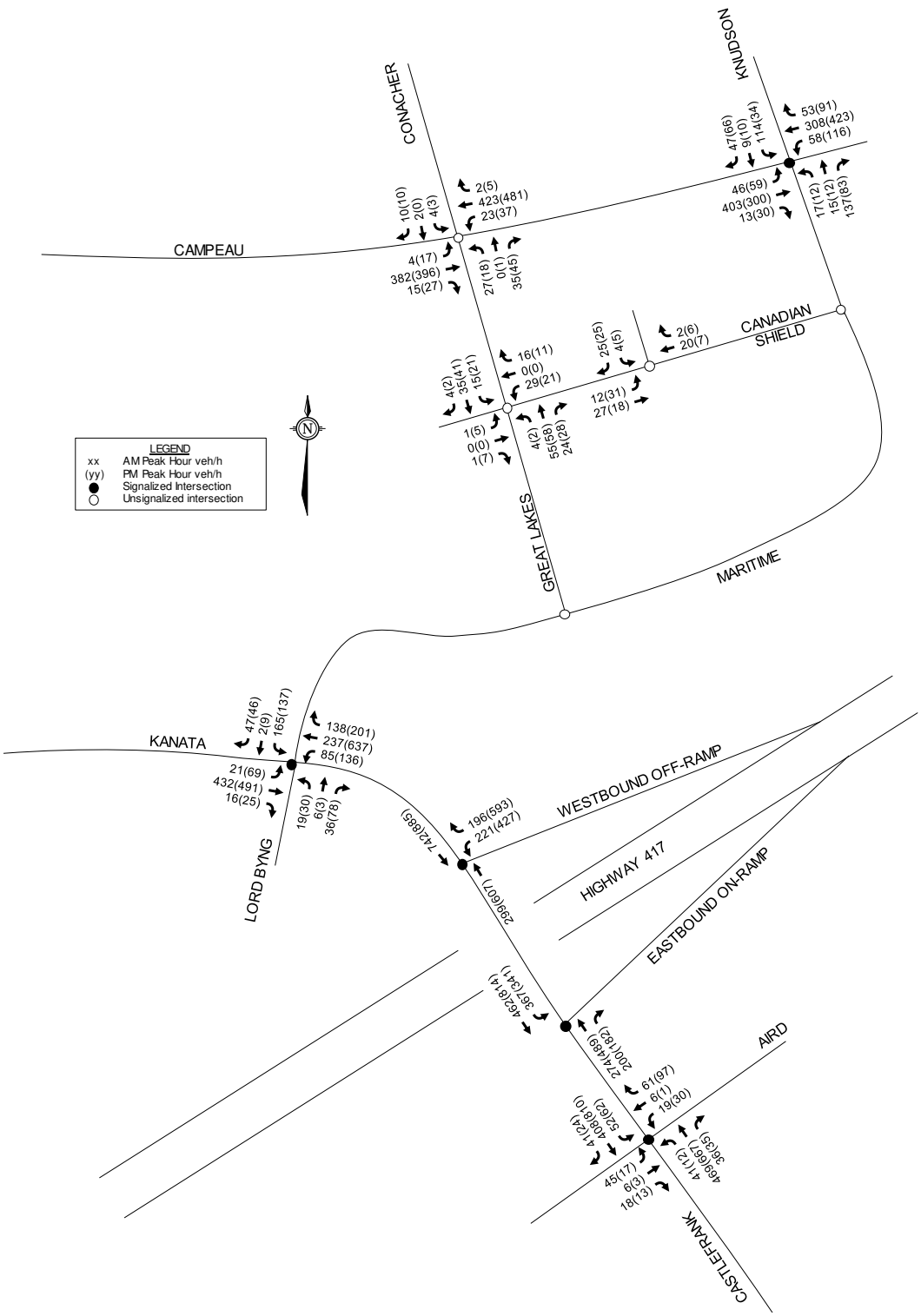
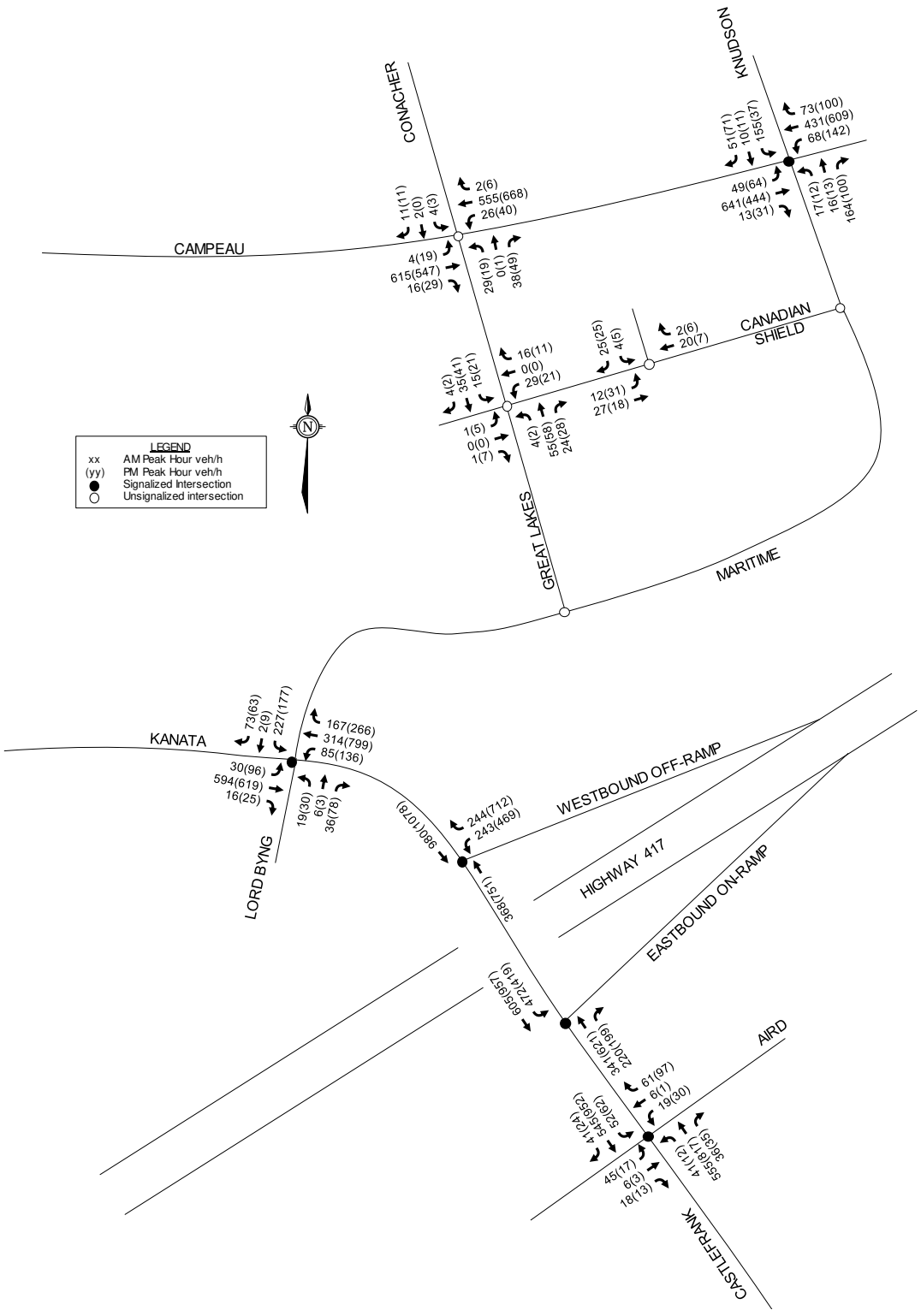


Figure 11: 2027 Total Traffic



3.3 Demand Rationalization

A review of the background intersection operations has been conducted to determine if and when the projected background traffic will exceed the capacity within the study area.

For City intersections, the target Auto LOS corresponds to a vehicle-to-capacity (v/c) ratio of 1.0 or better within 600m of a rapid transit station (Kanata Avenue/Maritime Way/Lord Byng Way, Kanata Avenue/Highway 417 Ramps and Kanata Avenue/Aird Place/Castlefrank Road) and a v/c ratio of 0.9 or better for study area intersections within a Mixed-Use Center (Campeau Drive/Knudson Drive/Maritime Way and Campeau Drive/Great Lakes Avenue/Conacher Gate).

The intersection parameters used in the analysis are consistent with the City of Ottawa's TIA guidelines (saturated flow rate: 1800 vphpl, Existing PHF: 0.9, Future PHF: 1.0).

3.3.1 Existing Traffic

Intersection capacity analysis has been completed for the existing traffic conditions. The lane configurations at the study area intersections are based on the existing conditions presented in Section 2.1. The results of the analysis are summarized in the following table for the weekday AM and PM peak hours. Detailed reports are included in **Appendix G**.

Table 10: Existing Intersection Operations

Intersection	AM Peak			PM Peak		
	Max. V/C Ratio or Delay	LOS	Mvmt	Max. V/C Ratio or Delay	LOS	Mvmt
Kanata Avenue/ Maritime Way/ Lord Byng Way[1]	0.57	A	WBL	0.63	B	NBT/R
Kanata Avenue/ Highway 417 WB Off Ramp	0.70	B	WBL	0.90	D	WBR
Kanata Avenue/ Highway 417 EB On Ramp	0.42	A	SBL	0.51	A	SBT
Kanata Avenue/ Aird Place/ Castlefrank Road	0.48	A	EB	0.65	B	SBT/R
Campeau Drive/ Knudson Drive/ Maritime Way	0.58	A	SBL	0.42	A	WBT/R
Campeau Drive/ Great Lakes Avenue/ Conacher Gate	14 sec.	B	NB	14 sec.	B	NB
Great Lakes Avenue/ Canadian Shield Avenue	7 sec.	A	NB/SB	7 sec.	A	SB

1. Kanata Avenue is considered the north-south roadway

All intersections currently meet the City's target Auto LOS during the AM and PM peak hours.

The maximum (i.e. 95th percentile) northbound queue at the Highway 417 Westbound Off-ramp is currently 145m during the PM peak hour and extends through the Highway 417 Eastbound On-ramp intersection. The maximum queue on the westbound approach to this intersection is currently 115m during the PM peak hour and does not extend onto the highway.

A review of turn lane requirements has been conducted to determine left turn lane requirements at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection. Based on the Ministry of Transportation Ontario (MTO) left turn lane warrant graphs, a 15m westbound left turn lane is warranted under existing traffic conditions. MTO left turn lane warrant graphs are included in **Appendix H**. As this is a result of existing traffic conditions, this is identified for the City's consideration as funding permits and is not attributable to the proposed development.

3.3.2 2022 Background Traffic

Intersection capacity analysis has been completed for the 2022 background traffic conditions. The lane configurations at the study area intersections are based on the existing conditions presented in Section 2.1. The results of the analysis are summarized in the following table for the weekday AM and PM peak hours. Detailed reports are included in **Appendix G**.

Table 11: Intersection Operations – 2022 Background Traffic

Intersection	AM Peak			PM Peak		
	V/C Ratio	LOS	Mvmt	V/C Ratio	LOS	Mvmt
Kanata Avenue/ Maritime Way/ Lord Byng Way[1]	0.68	B	WBL	0.68	B	NBT/R
Kanata Avenue/ Highway 417 WB Off Ramp	0.69	B	WBL/ SBT	0.89	D	WBR
Kanata Avenue/ Highway 417 EB On Ramp	0.40	A	SBL	0.49	A	SBT
Kanata Avenue/ Aird Place/ Castlefrank Road	0.43	A	EB	0.62	B	SBT/R
Campeau Drive/ Knudson Drive/ Maritime Way	0.57	A	SBL	0.43	A	WBT/R
Campeau Drive/ Great Lakes Avenue/ Conacher Gate	17 sec.	C	NB	16 sec.	C	NB
Great Lakes Avenue/ Canadian Shield Avenue	7 sec.	A	NB/SB	7 sec.	A	NB/SB

1. Kanata Avenue is considered the north-south roadway

All intersections anticipated to meet the City's target Auto LOS during the AM and PM peak hours.

Note that some critical movements appear to operate slightly better under projected conditions than under existing conditions; this is a result of the peak hour factor of 1.0 for future conditions as per the TIA guidelines.

Based on the Ministry of Transportation Ontario (MTO) left turn lane warrant graphs, a 15m westbound left turn lane and a 15m eastbound left turn lane are warranted at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection under 2022 background traffic conditions. MTO left turn lane warrant graphs are included in **Appendix H**. As this is a result of background traffic conditions, this is identified for the City's consideration as funding permits and is not attributable to the proposed development.

3.3.3 2027 Background Traffic

Intersection capacity analysis has been completed for the 2027 background traffic conditions. The results of the analysis are summarized in the following table for the weekday AM and PM peak hours. Detailed reports are included in **Appendix G**.

Table 12: Intersection Operations – 2027 Background Traffic

Intersection	AM Peak			PM Peak		
	V/C Ratio	LOS	Mvmt	V/C Ratio	LOS	Mvmt
Kanata Avenue/ Maritime Way/ Lord Byng Way[1]	0.82	D	WBL	0.90	D	NBT/R
Kanata Avenue/ Highway 417 WB Off Ramp	0.70	B	WBL	0.97	E	NB
				0.97	E	WBR
Kanata Avenue/ Highway 417 EB On Ramp	0.54	A	SBL	0.61	B	SBL
Kanata Avenue/ Aird Place/ Castlefrank Road	0.44	A	NBT/R	0.72	C	SBT/R
Campeau Drive/ Knudson Drive/ Maritime Way	0.70	B	SBL	0.60	A	WBT/R
Campeau Drive/ Great Lakes Avenue/ Conacher Gate	31 sec.	D	NB	29 sec.	D	NB
Great Lakes Avenue/ Canadian Shield Avenue	7 sec.	A	NB/SB	7 sec.	A	NB/SB

1. Kanata Avenue is considered the north-south roadway

Consistent with the 2022 background traffic condition, all intersections are anticipated to meet the City's target Auto LOS during the AM and PM peak hours.

Based on the Ministry of Transportation Ontario (MTO) left turn lane warrant graphs, a 25m westbound left turn lane and a 25m eastbound left turn lane are warranted at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection under 2027 background traffic conditions. MTO left turn lane warrant graphs are included in **Appendix H**. As this is a result of background traffic conditions, this is identified for the City's consideration as funding permits and is not attributable to the proposed development.

4.0 ANALYSIS

4.1 Development Design

4.1.1 Design for Sustainable Modes

Pedestrian facilities will be provided between the main building entrances and the existing sidewalks along Canadian Shield Avenue and Great Lakes Avenue. A connection to the Multi-Use Pathway along Campeau Drive is also proposed. A courtyard will be provided internal to the site, with pathways linking each building entrance.

The areas surrounding the building, as well as the internal courtyard will be landscaped, including trees, shrubs and pedestrian pathways with a fountain in the centre as a focal point of the courtyard.

Bicycle parking for the proposed development will be in accordance with the minimum requirement of the City's Zoning By-law (ZBL), as described 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 I**. All required TDM-supportive design and infrastructure measures in the TDM checklist are met. Measures proposed for the site that go above and beyond the basic requirements include:

- Locate building close to the street and do not locate parking areas between the street and building entrances.
- Locate building entrances in order to minimize walking distances to sidewalks and transit stops.
- Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort.
- Provide safe, direct and attractive walking routes from building entrances to nearby transit stops.

4.1.2 Circulation and Access

Waste will be stored internally to the building. A garbage room is located next to the parking garage ramp and will allow easy access to the curb.

The fire route will be curbside along Canadian Shield Avenue and Great Lakes Avenue.

4.2 Parking

The subject site is located in Area C on Schedule 1 and 1A of the City of Ottawa's Zoning By-Law (ZBL). Minimum vehicular and bicycle parking rates for the proposed development are identified in the ZBL and are summarized in the following table.

Table 13: Parking Requirements

Land Use	Minimum Parking Rate	Units/GFA	Required	Provided
Vehicle Parking				
Dwelling units in a Mixed-Use Building	Resident: 1 per dwelling unit	244	244	348
	Visitor: 0.2 per dwelling unit		49	
Retail Store	3.4 per 100m^2 of GFA	275m^2	9	
Bicycle Parking				
Apartment Building	0.5 per dwelling unit	244	122	124
Retail Store	1 per 250m^2 of GFA	275m^2	1	

The proposed number of vehicular parking spaces will adhere to the requirements of the City's ZBL.

For 348 parking spaces, 9 accessible spaces (4 Type A and 5 Type B) are required. The proposed accessible parking conforms to the AODA parking requirements.

The proposed number of bicycle parking spaces will adhere to the requirements of the City's ZBL. Secure bicycle parking will be located in the underground parking garage.

A surplus of parking is provided on site to provide flexibility for prospective commercial tenants and the ability to expand commercial uses in the future through the conversion of at-grade residential uses if and when demand warrants.

4.3 Boundary Streets

This section provides a review of the boundary streets using complete streets principles. The Multi-Modal Level of Service (MMLOS) guidelines produced by IBI Group in 2015 were used to evaluate the LOS of the boundary roadways for each mode of transportation. Schedule 'B' of the City of Ottawa's Official Plan indicates that Canadian Shield Avenue, Great Lakes Avenue, and Campeau Drive are located within a Mixed-Use Centre.

Targets for the Pedestrian Level of Service (PLOS), Bicycle Level of Service (BLOS), Transit Level of Service (TLOS) and Truck Level of Service (TkLOS) for the study area roadways are based on the targets for roadways within a Mixed-Use Centre, as identified in Exhibit 22 of the MMLOS guidelines.

A summary of the results of the segment MMLOS analysis for the boundary roadways is provided in the following table. Detailed segment MMLOS calculations can be found in **Appendix J**.

Table 14: Segment MMLOS Summary

Segment	PLOS	BLOS	TLOS	TkLOS
Canadian Shield Avenue	A	A	E	B
Target	**C**	**D**	**-**	**-**
Great Lakes Avenue	A	A	E	B
Target	**C**	**D**	**-**	**-**
Campeau Drive	D	C	D	B
Target	**C**	**C**	**-**	**E**

Campeau Drive does not meet the target PLOS. Based on the current operating speed and AADT, a maximum PLOS D can be achieved based on the criteria in Exhibit 4 of the MMLOS guidelines. As the existing pedestrian facilities along Campeau Drive achieve the maximum PLOS D, no modifications are proposed.

As indicated in the above table, all other MMLOS targets for the boundary roadways are met for roadways within a Mixed-Use Center.

4.4 Access Intersections Design

A new access is proposed to Canadian Shield Avenue. The proposed access will be approximately 9m in width at the property line and located 10m from the eastern property line. The underground parking ramp will have a width of 6m within the building.

Section 25 (c) of the City of Ottawa's Private Approach By-law (PABL) identifies a requirement for two-way accesses to have a width no greater than 9m, as measured at the street line. Section 107 (1)(a) of the ZBL identifies a minimum width of 6.0m and a maximum of 6.7m for a two-way driveway to a parking garage with more than 20 parking spaces. The width of the proposed access will adhere to the requirements of the PABL and ZBL.

Section 25 (p) of the PABL identifies a minimum spacing requirement of 3.0m between the nearest limit of a private approach and the property line, as measured at the street line. The location of the proposed access meets the requirements of the City's PABL.

For parking lots containing 50 or more parking spaces, Section 25 (u) of the PABL identifies a maximum grade of 2% for a distance of 9m within the property. However, Section 24 (3) of the PABL identifies that the General Manager may alter the direction of the grade and horizontal distances on which the direction of the grade applies, provided such alterations do not create any drainage issues or hazardous conditions. A grade of 2% is unachievable for the first 9m within the property. The garage entrance elevation of 99.20 was set based on the significant grade change between Campeau Drive and Canadian Shield Avenue as well as architectural requirements. A lesser slope between the curb and property line (2% and 3.5%) has been provided, which created a grade difference of 0.34m over the 5.6m (or 6%) between the garage and property line. The Transportation Association of Canada (TAC) Geometric Design Guidelines Section 8.9.11 identifies a maximum recommended downgrade of 7% for low volume driveways on local roadways. The proposed maximum 6% ramp grade for a distance of 9m within the property meets TAC recommendations. As the grade of 6% within the private property is not anticipated to have a significant impact on sight lines for vehicles exiting the site, a waiver to Section 25 (u) of the Private Approach By-law is requested.

Based on the projected traffic volumes at the access, the access is anticipated to operate acceptably under side street stop control. Intersection operations are reviewed further in Sections 4.8.2 and 4.8.3. Delays of less than ten seconds are anticipated at the site access.

4.5 Transportation Demand Management

4.5.1 Context for TDM

The proposed development will contain of 244 residential units and 275m^2 of ground floor commercial. The residential unit type breakdown is as follows:

- 25 one-bedroom units
- 113 one-bedroom plus office units
- 45 two-bedroom units
- 38 two-bedroom plus office units
- 7 three-bedroom units
- 16 three-bedroom plus office units

4.5.2 Need and Opportunity

The mode shares identified in the 2020 TRANS Trip Generation Manual for the typical residential commuter pattern and typical commercial generator pattern for the Kanata/Stittsville district have been used for this study.

The proposed development is located within a Design Priority Area (Kanata Town Centre).

4.5.3 TDM Program

The proposed development conforms to the City's TDM initiatives by providing easy access to the local pedestrian, bicycle and transit systems as outlined in Section 6.1. The TDM – Measures Checklist has been reviewed with the proponent and is included in **Appendix I**. At this point in time, the proponent does not agree to implement TDM measures within the development.

Transit service along Maritime Way would provide improved service to residents of the proposed development as well as other developments within the Kanata Town Centre. The provision of local transit would make transit more attractive to residents of the area and help achieve the target transit modal share. When transit is extended into the Kanata Town Center (along Maritime Way), the developer will consider implementing transit incentives for residents, such as displaying transit schedules and route maps at entrances.

4.6 Neighbourhood Traffic Management

Maritime Way, Canadian Shield Avenue, and Great Lakes Avenue are classified as local roadways and provides access to the subject site. The following table summarizes 2027 background traffic, proposed additional traffic, and total traffic along Maritime Way, Canadian Shield Avenue, and Great Lakes Avenue.

Table 15: Neighbourhood Traffic Impacts

Roadway	AM Peak			PM Peak		
	2027 Bkgd	Site	Total	2027 Bkgd	Site	Total
Maritime Way at Kanata Avenue						
Northbound	195	8	**203**	345	20	**365**
Southbound	286	16	**302**	233	17	**250**
Two-way	481	32	**513**	578	37	**615**
Maritime Way at Campeau Drive						
Northbound	193	4	**197**	120	5	**125**
Southbound	89	2	**91**	178	6	**184**
Two-way	282	6	**288**	298	11	**309**
Canadian Shield Avenue at Great Lakes Avenue						
Eastbound	27	12	**39**	18	31	**49**
Westbound	20	25	**45**	7	25	**32**
Two-way	47	37	**84**	25	56	**81**

Roadway	AM Peak			PM Peak		
	2027 Bkgd	Site	Total	2027 Bkgd	Site	Total
Great Lakes Avenue at Campeau Drive						
Northbound	58	9	**67**	61	9	**70**
Southbound	40	4	**44**	58	11	**69**
Two-Way	98	13	**111**	119	20	**139**

The City of Ottawa Area Traffic Management (ATM) guidelines identify a maximum threshold of 1,000 vehicles per day, or 120 vehicles during the peak hour for local roadways. The 2027 background and total traffic volumes along Maritime Way at Kanata Avenue and Campeau Drive exceed the ATM threshold. However, it is noted that the overall capacity of a local roadway is estimated at 400 vehicles per hour per lane based on the City's TRANS Long Range Transportation Model. Total peak hour, peak directional traffic volumes along Maritime Way at Kanata Avenue equate to a volume to capacity (v/c) ratio of 0.64 (LOS B) during the AM peak hour and 0.77 (LOS C) during the PM peak hour. Total peak hour, peak directional traffic along Maritime Way at Campeau Drive equate to a v/c ratio of 0.36 (LOS A) during the AM peak hour and 0.39 (LOS A) during the PM peak hour.

The 2027 total traffic volumes along Great Lakes Avenue at Campeau Drive exceed the ATM threshold in the PM peak hour. Total PM peak hour, peak directional traffic volumes along Great Lakes Avenue at Campeau Drive equate to a volume to capacity (v/c) ratio of 0.18 (LOS A) during the PM peak hour.

As there is sufficient capacity along Maritime Way and Great Lakes Avenue to accommodate traffic generated by the development, no changes to the existing roadway classification are required. Based on the foregoing, no mitigation measures are recommended to offset the impacts of the development generated traffic. A further review of intersection operations at the Kanata Avenue/Maritime Way/Lord Byng Way, Campeau Drive/Maritime Way/Knudson Drive, and Campeau Drive/Great Lakes Avenue/Conacher Gate intersections is provided in Section 4.9.

As indicated in Section 2.1.6, existing Area Traffic Management measures within the study area include:

- on-road messaging (SLOW pavement markings) along Maritime Way and Great Lakes Avenue;
- all-way stop control (recently implemented) at the Maritime Way/Great Lakes Avenue, Canadian Shield Avenue/Great Lakes Avenue and Canadian Shield/Maritime Way intersections; and
- gateway speed limit signs (posted in 2019), reducing the speed limit on Cordillera Street, Maritime Way, Great Lakes Avenue, and Canadian Shield Avenue from 50km/h to 40km/h.

4.7 Transit

Based on the trip generation presented in Section 3.1, the proposed development is anticipated to generate 30 transit trips (9 in, 21 out) during the weekday AM peak hour and 22 transit trips (13 in, 9 out) during the weekday PM peak hour.

It is anticipated that most transit trips will arrive/depart using OC Transpo stops #1137 and #1138, which serves routes 62, 164, and 268.

The proposed development is located within a 950m walking distance of the Terry Fox Transit Station (future LRT Station). The Terry Fox Transit Station currently serves numerous Frequent Routes, Rapid Routes, Peak Hour Routes, and Local Routes, which provide comprehensive transit coverage across the City of Ottawa. The future conversion to LRT is anticipated to provide more reliable transit service and increased transit capacity at the Terry Fox Transit Station.

Bus stops and pads have been constructed along Maritime Way, as indicated in Section 2.1.5, but are not currently in use. These bus stops will provide improved transit service to the residents of the proposed development as well as other developments within the Kanata Town Centre. As a number of developments within the Kanata Town Centre have been constructed, are under construction, or going through the approval process, consideration should be given by the City to providing local transit along Maritime Way.

4.8 Network Intersections

4.8.1 Existing Intersection MMLOS Analysis

This section provides a review of the study area intersections using the complete streets principles. The MMLOS guidelines produced by IBI Group in October 2015 were used to evaluate the LOS of all signalized study area intersections for each mode of transportation. Schedule 'B' of the City of Ottawa's Official Plan indicates that all study area intersections are located in the Mixed-Use Centre. Additionally all intersections along Kanata Avenue/Castlefrank Road are located within 600m of the Terry Fox Transit Station.

Aerial photos of the study area intersections are provided in Section 4.1.2.

A summary of the results of the intersection MMLOS analysis for the study area intersections is provided in the following table. Detailed intersection MMLOS calculations can be found in **Appendix J**.

Table 16: Intersection MMLOS Summary

Intersection	PLOS	BLOS	TLOS	TkLOS	Auto LOS
Kanata Avenue/ Maritime Way/ Lord Byng Way	F	D	C	E	B
Target	**A**	**B**	**-**	**D**	**E**
Kanata Avenue/ Highway 417 Westbound Off-Ramp	C	-	C	C	D
Target	**A**	**B**	**-**	**D**	**E**
Kanata Avenue/ Highway 417 Eastbound On-Ramp	E	-	B	C	A
Target	**A**	**B**	**-**	**D**	**E**
Kanata Avenue/ Castlefrank Road/ Aird Place	F	C	B	E	B
Target	**A**	**B**	**-**	**-**	**E**

Intersection	PLOS	BLOS	TLOS	TkLOS	Auto LOS
Campeau Drive/ Maritime Way/ Knudson Drive	F	B	E	F	A
Target	**C**	**B**	**-**	**-**	**D**

Kanata Avenue/Maritime Way/Lord Byng Way

The Kanata Avenue/Maritime Way/Lord Byng Way intersection currently meets the target Auto LOS E. As this intersection is not along a transit priority corridor, no target TLOS is identified.

This intersection does not currently meet the target PLOS A. As part of the Kanata Avenue road widening project, the crossing distance on the east and west legs of the intersection (Maritime Way/Lord Byng Way) are anticipated to be reduced by shifting the crosswalk back from the corner radii to accommodate east-west cross rides. The north and south approaches are anticipated to increase slightly to accommodate additional north-south travel lanes. Zebra striped crosswalks will be implemented on all legs.

This intersection does not currently meet the target BLOS B. As part of the Kanata Avenue road widening project, cycle tracks will be provided on Kanata Avenue and this intersection will be converted into a protected intersection design. This modification will improve the BLOS at this intersection.

This intersection does not currently meet the target TkLOS D. However, since Maritime Way and Lord Byng Way are not classified as a truck route, the provided TkLOS E is considered acceptable. As part of the Kanata Avenue road widening project, two receiving lanes will be provided for the eastbound and westbound right turn movement and will improve the TkLOS for these movements.

Kanata Avenue/Highway 417 Westbound Off-Ramp

The Kanata Avenue/Highway 417 Westbound Off-Ramp intersection currently meets the City's target TkLOS D and Auto LOS E. As this intersection is not along a transit priority corridor, no target TLOS is identified.

This intersection does not currently meet the target PLOS A. A reduction in the crossing distance on all legs of the intersection would provide the greatest improvement to the PLOS at this intersection. However, based on the existing intersection operations, a reduction in the number of travel lanes is not recommended.

Kanata Avenue/Highway 417 Eastbound On-Ramp

The Kanata Avenue/Highway 417 Eastbound On-Ramp intersection currently meets the City's target TkLOS D and Auto LOS E. As bicycles are not permitted on Highway 417, the BLOS was excluded from this analysis. As this intersection is not along a transit priority corridor, no target TLOS is identified.

This intersection does not currently meet the target PLOS A. A reduction in the crossing distance on all legs of the intersection would provide the greatest improvement to the PLOS at this intersection. Based on the existing northbound right turning volumes (170-195 vehicles during peak hours), removal of the northbound right turn lane is not recommended. As the width of the

east leg (Highway 417 eastbound on-ramp) is required to accommodate turning movements of heavy vehicles, a reduction in width is not recommended.

This intersection does not currently meet the target BLOS B. As cyclists are not permitted on Highway 417, the left turn characteristics on the north approach and left/right turn characteristics on the east approach were excluded from the analysis. Based on the right turn characteristics on the south approach, the intersection is operating with a BLOS D. To achieve the target BLOS B, either removal or a reduction in the length of the northbound right turn lane is required. As identified above, removal in the length of the northbound right turn lane is not recommended due to the high northbound right turning volumes (180-195 vehicles during peak hours). Based on the Synchro analysis in the following sections, the 95th percentile northbound right turn queue is anticipated to be approximately 15m. Based on the foregoing, consideration could be given by the City to reducing the length of the northbound right turn lane at this intersection.

Kanata Avenue/Castlefrank Road/Aird Place
The Kanata Avenue/Castlefrank Road/Aird Place intersection currently meets the target Auto LOS E. As this intersection is not along a transit priority corridor or a truck route, no target TLOS or TkLOS is identified.

This intersection does not currently meet the target PLOS A. A reduction in the crossing distance on all legs of the intersection would provide the greatest improvement to the PLOS at this intersection.

This intersection does not currently meet the target BLOS B. To achieve the target BLOS B, the implementation of two-stage northbound/southbound left turn bike boxes is required. This is identified for the City's consideration.

Campeau Drive/Maritime Way/Knudson Drive
The Campeau Drive/Maritime Way/Knudson Drive intersection currently meets the target BLOS B and Auto LOS E. As this intersection is not along a transit priority corridor or a truck route, no target TLOS or TkLOS is identified.

This intersection does not currently meet the target PLOS A. A reduction in the crossing distance on all legs of the intersection would provide the greatest improvement to the PLOS at this intersection.

This intersection currently meets the target BLOS B. However it is noted that cyclists are required to dismount and use the pedestrian crosswalks on the north, east, and west legs of the intersection.

4.8.2 2022 Total Intersection Operations

Intersection capacity analysis has been completed for the 2022 total traffic conditions. The intersection parameters used in the analysis are consistent with the TIA guidelines (saturation flow rate: 1800 vphpl, PHF: 1.0). The results of the synchro analysis are summarized in the following table for the weekday AM and PM peak hours. Detailed reports are included in **Appendix K**.

Table 17: Intersection Operations – 2022 Total Traffic

Intersection	AM Peak			PM Peak		
	V/C Ratio	LOS	Mvmt	V/C Ratio	LOS	Mvmt
Kanata Avenue/ Maritime Way/ Lord Byng Way[1]	0.72	C	WBL	0.71	C	NBT/R
Kanata Avenue/ Highway 417 WB Off Ramp	0.69	B	WBL/ NBT/SBT	0.89	D	WBR
Kanata Avenue/ Highway 417 EB On Ramp	0.41	A	SBL	0.49	A	SBT
Kanata Avenue/ Aird Place/ Castlefrank Road	0.43	A	EB	0.62	B	SBT/R
Campeau Drive/ Knudson Drive/ Maritime Way	0.58	A	SBL	0.44	A	WBT/R
Campeau Drive/ Great Lakes Avenue/ Conacher Gate	18 sec.	C	NB	18 sec.	C	NB
Great Lakes Avenue/ Canadian Shield Avenue	7 sec.	A	WB/ SB	8 sec.	A	SB
Canadian Shield Avenue/ Site Access	9 sec.	A	SB	9 sec.	A	SB

1. Kanata Avenue is considered the north-south roadway

Under 2022 total traffic conditions, all intersections are anticipated to meet the City's target Auto LOS during the AM and PM peak hours.

No additional modifications are required to accommodate site generated traffic. The proposed development is only anticipated to add two westbound left turning vehicles to the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection during the PM peak hour, equating to one vehicle every 30 minutes. As the requirement for a westbound left turn lane is a result of background traffic conditions, and not attributable to traffic generated by the site, this is identified for the City's consideration as funding permits and is not attributable to the proposed development.

4.8.3 2027 Total Intersection Operations

Intersection capacity analysis has been completed for the 2027 total traffic conditions. The intersection parameters used in the analysis are consistent with the TIA guidelines (saturation flow rate: 1800 vphpl, PHF: 1.0). The results of the synchro analysis are summarized in the following table for the weekday AM and PM peak hours. Detailed reports are included in **Appendix K**.

Table 18: Intersection Operations – 2027 Total Traffic

Intersection	AM Peak			PM Peak		
	V/C Ratio	LOS	Mvmt	V/C Ratio	LOS	Mvmt
Kanata Avenue/ Maritime Way/ Lord Byng Way[1]	0.85	D	WBL	0.92	E	NBT/R
Kanata Avenue/ Highway 417 WB Off Ramp	0.70	B	WBL	0.99	E	NBT
Kanata Avenue/ Highway 417 EB On Ramp	0.56	A	SBL	0.62	B	SBL/ NBT
Kanata Avenue/ Aird Place/ Castlefrank Road	0.44	A	NB	0.73	C	SBT/R
Campeau Drive/ Knudson Drive/ Maritime Way	0.71	C	SBL	0.60	A	WBT/R
Campeau Drive/ Great Lakes Avenue/ Conacher Gate	**37 sec.**	**E**	**NB**	**39 sec.**	**E**	**NB**
Great Lakes Avenue/ Canadian Shield Avenue	7 sec.	A	WB/ SB	8 sec.	A	SB
Canadian Shield Avenue/ Site Access	9 sec.	A	SB	9 sec.	A	SB

2. Kanata Avenue is considered the north-south roadway

Under 2027 total traffic conditions, the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection is anticipated to operate with a LOS E in the AM and PM peak hours. All other study area intersections are anticipated to meet the City's target Auto LOS during the AM and PM peak hours.

A review of the Ontario Traffic Manual criteria for traffic signalization was conducted for the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection. The signalization warrant was checked for projected total 2027 traffic volumes. For traffic signals to be warranted for an intersection using projected AM and PM peak traffic volumes, the traffic signalization warrant would need to be 120% met. Based on the OTM traffic signalization warrant, the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection is only 29% met. OTM signalization warrants are included in **Appendix H**. Given that the OTM traffic signalization warrant is only 29% met, and projected delay only marginally exceeds the threshold for acceptable operating conditions, side street stop-control is recommended at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection.

No additional modifications are required to accommodate site generated traffic. As the requirement for a westbound left turn lane at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection is a result of background traffic conditions, and not attributable to traffic generated by the site, this is identified for the City's consideration as funding permits.

5.0 CONCLUSIONS AND RECOMMENDATIONS

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

Demand Rationalization

- Under existing traffic conditions, all intersections meet the City's target Auto LOS during the AM and PM peak hours. A 15m westbound left turn lane is warranted at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection under existing traffic conditions.
- Under 2022 background traffic conditions, all intersections anticipated to meet the City's target Auto LOS during the AM and PM peak hours. A 15m westbound left turn lane and a 15m eastbound left turn lane are warranted at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection under 2022 background traffic conditions
- Under 2027 background traffic conditions, all intersections anticipated to meet the City's target Auto LOS during the AM and PM peak hours. A 25m westbound left turn lane and a 25m eastbound left turn lane are warranted at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection under 2027 background traffic conditions

Development Design

- Pedestrian facilities will be provided between the main building entrances and the existing sidewalks along Canadian Shield Avenue and Great Lakes Avenue. A connection to the Multi-Use Pathway along Campeau Drive is also proposed. A courtyard will be provided internal to the site, with pathways linking each building entrance.
- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.

Circulation and Parking

- Waste will be stored internally to the building. A garbage room is located next to the parking garage ramp and will allow easy access to the curb.
- The fire route will be curbside along Canadian Shield Avenue and Great Lakes Avenue.
- The proposed number of vehicular and bicycle parking spaces will adhere to the requirements of the City's Zoning By-law.
- Secure bicycle parking will be located in the underground parking garage.

Boundary Streets

- Campeau Drive does not meet the target PLOS. Based on the current operating speed and AADT, a maximum PLOS D can be achieved based on the criteria in Exhibit 4 of the MMLOS guidelines. As the existing pedestrian facilities along Campeau Drive achieve the maximum PLOS D, no modifications are proposed.
- All other MMLOS targets for the boundary roadways are met for roadways within a Mixed-Use Center.

Access Intersections Design

- A new access is proposed to Canadian Shield Avenue. The proposed access will be approximately 9m in width and located 10m from the eastern property line.
- The width and location of the proposed access will adhere to the requirements of the Private Approach By-Law and Zoning By-Law.

- A waiver to the Private Approach By-Law is required for the proposed driveway grading. A maximum grade of 6% will be provided for the first 9m within the property. A grade of 6% is not anticipated to have a significant impact on sight lines for vehicles exiting the site.
- The access is anticipated to operate acceptably under side street stop control. Delays of less than ten seconds are anticipated at the site access.

Transportation Demand Management

- The proposed development conforms to the City's TDM initiatives by providing easy access to the local pedestrian, bicycle and transit systems. At this point in time, the proponent does not agree to implement TDM measures within the development.
- Transit service along Maritime Way would provide improved service to residents of the proposed development as well as other developments within the Kanata Town Centre. The provision of local transit would make transit more attractive to residents of the area and help achieve the target transit modal share. When transit is extended into the Kanata Town Center (along Maritime Way), the developer will consider implementing transit incentives for residents, such as displaying transit schedules and route maps at entrances.

Neighbourhood Traffic Management

- The 2027 background and total traffic volumes along Maritime Way at Kanata Avenue and Campeau Drive exceed the ATM threshold of 120 vehicles during the peak hour for a local roadway.
- The 2027 total traffic volumes along Great Lakes Avenue at Campeau Drive exceed the ATM threshold in the PM peak hour.
- There is sufficient capacity along Maritime Way and Great Lakes Avenue to accommodate traffic generated by the development and no changes to the existing roadway classification are required.

Transit

- The proposed development is anticipated to generate 30 transit trips (9 in, 21 out) during the weekday AM peak hour and 22 transit trips (13 in, 9 out) during the weekday PM peak hour.
- It is anticipated that most transit trips will arrive/depart using OC Transpo stops #1137 and #1138, which serves routes 62, 164, and 268.
- Bus stops and pads have been constructed along Maritime Way but are not currently in use. These bus stops will provide improved transit service to the residents of the proposed development as well as other developments within the Kanata Town Centre. As a number of developments within the Kanata Town Centre have been constructed, are under construction, or going through the approval process, consideration should be given by the City to providing local transit along Maritime Way.

Intersection MMLOS

- *Kanata Avenue/Maritime Way/Lord Byng Way*
    - The Kanata Avenue/Maritime Way/Lord Byng Way intersection currently meets the target Auto LOS E. As this intersection is not along a transit priority corridor, no target TLOS is identified.
    - This intersection does not currently meet the target PLOS A. As part of the Kanata Avenue road widening project, the crossing distance on the east and west legs of the intersection (Maritime Way/Lord Byng Way) are anticipated to be reduced by shifting the crosswalk back from the corner radii to accommodate east-west cross

rides. The north and south approaches are anticipated to increase slightly to accommodate additional north-south travel lanes. Zebra striped crosswalks will be implemented on all legs.
    - This intersection does not currently meet the target BLOS B. As part of the Kanata Avenue road widening project, cycle tracks will be provided on Kanata Avenue and this intersection will be converted into a protected intersection design. This modification will improve the BLOS at this intersection.
    - This intersection does not currently meet the target TkLOS D. However, since Maritime Way and Lord Byng Way are not classified as a truck route, the provided TkLOS E is considered acceptable. As part of the Kanata Avenue road widening project, two receiving lanes will be provided for the eastbound and westbound right turn movement and will improve the TkLOS for these movements.
- *Kanata Avenue/Highway 417 Westbound Off-Ramp*
    - The Kanata Avenue/Highway 417 Westbound Off-Ramp intersection currently meets the City's target TkLOS D and Auto LOS E. As this intersection is not along a transit priority corridor, no target TLOS is identified.
    - This intersection does not currently meet the target PLOS A. A reduction in the crossing distance on all legs of the intersection would provide the greatest improvement to the PLOS at this intersection. However, based on the existing intersection operations, a reduction in the number of travel lanes is not recommended.
- *Kanata Avenue/Highway 417 Eastbound On-Ramp*
    - The Kanata Avenue/Highway 417 Eastbound On-Ramp intersection currently meets the City's target TkLOS D and Auto LOS E. As bicycles are not permitted on Highway 417, the BLOS was excluded from this analysis. As this intersection is not along a transit priority corridor, no target TLOS is identified.
    - This intersection does not currently meet the target PLOS A. A reduction in the crossing distance on all legs of the intersection would provide the greatest improvement to the PLOS at this intersection. Based on the existing northbound right turning volumes (170-195 vehicles during peak hours), removal of the northbound right turn lane is not recommended. As the width of the east leg (Highway 417 eastbound on-ramp) is required to accommodate turning movements of heavy vehicles, a reduction in width is not recommended.
    - This intersection does not currently meet the target BLOS B. As cyclists are not permitted on Highway 417, the left turn characteristics on the north approach and left/right turn characteristics on the east approach were excluded from the analysis. Based on the right turn characteristics on the south approach, the intersection is operating with a BLOS D. To achieve the target BLOS B, either removal or a reduction in the length of the northbound right turn lane is required. As identified above, removal in the length of the northbound right turn lane is not recommended due to the high northbound right turning volumes (180-195 vehicles during peak hours). Based on the Synchro analysis in the following sections, the 95th percentile northbound right turn queue is anticipated to be approximately 15m. Based on the foregoing, consideration could be given by the City to reducing the length of the northbound right turn lane at this intersection.
- *Kanata Avenue/Castlefrank Road/Aird Place*
    - The Kanata Avenue/Castlefrank Road/Aird Place intersection currently meets the target Auto LOS E. As this intersection is not along a transit priority corridor or a truck route, no target TLOS or TkLOS is identified.

  - This intersection does not currently meet the target PLOS A. A reduction in the crossing distance on all legs of the intersection would provide the greatest improvement to the PLOS at this intersection.
  - This intersection does not currently meet the target BLOS B. To achieve the target BLOS B, the implementation of two-stage northbound/southbound left turn bike boxes is required. This is identified for the City's consideration.
- *Campeau Drive/Maritime Way/Knudson Drive*
  - The Campeau Drive/Maritime Way/Knudson Drive intersection currently meets the target BLOS B and Auto LOS E. As this intersection is not along a transit priority corridor or a truck route, no target TLOS or TkLOS is identified.
  - This intersection does not currently meet the target PLOS A. A reduction in the crossing distance on all legs of the intersection would provide the greatest improvement to the PLOS at this intersection.
  - This intersection currently meets the target BLOS B. However it is noted that cyclists are required to dismount and use the pedestrian crosswalks on the north, east, and west legs of the intersection.

Total Intersection Operations

- Under 2022 total traffic conditions, all intersections are anticipated to meet the City's target Auto LOS during the AM and PM peak hours.
  - No additional modifications are required to accommodate site generated traffic.
  - The proposed development is only anticipated to add two westbound left turning vehicles to the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection during the PM peak hour, equating to one vehicle every 30 minutes. As the requirement for a westbound left turn lane is a result of background traffic conditions, and not attributable to traffic generated by the site, this is identified for the City's consideration as funding permits and is not attributable to the proposed development.
- Under 2027 total traffic conditions, the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection is anticipated to operate with a LOS E in the AM and PM peak hours. All other study area intersections are anticipated to meet the City's target Auto LOS during the AM and PM peak hours.
  - Based on the OTM traffic signalization warrant, traffic signals at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection are 29% warranted. Given that the OTM traffic signalization warrant is only 29% met, and projected delay only marginally exceeds the threshold for acceptable operating conditions, side street stop-control is recommended at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection.
  - No additional modifications are required to accommodate site generated traffic. As the requirement for a westbound left turn lane at the Campeau Drive/Great Lakes Avenue/Conacher Gate intersection is a result of background traffic conditions, and not attributable to traffic generated by the site, this is identified for the City's consideration as funding permits and is not attributable to the proposed development.

NOVATECH

Prepared by:

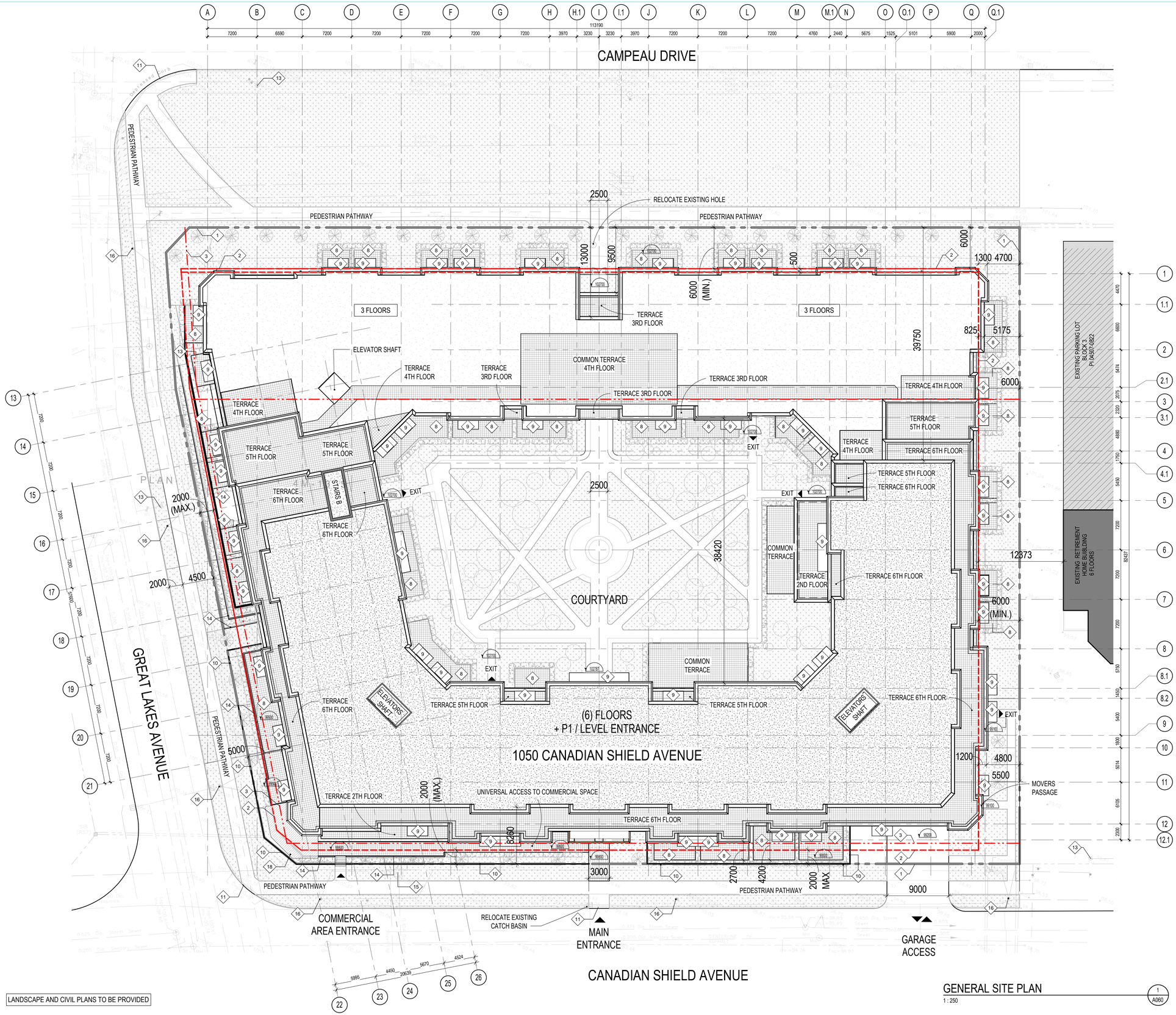
Reviewed by:

Rochelle Fortier, B.Eng.
E.I.T. | Transportation/Traffic

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

APPENDIX A

Proposed Site Plan



GENERAL SITE PLAN
1 : 250

1 / A060

GENERAL NOTES

# NOTE	DESCRIPTION
1	PROPERTY LINE
2	SETBACKS
3	HEIGHT LIMIT MAX. 15M
4	GROUND FLOOR - OUTLINE
5	2ND FLOOR - OUTLINE
6	POOL - OUTLINE
7	COMMERCIAL TERRACE
8	PRIVATE TERRACE
9	PRIVATE BALCONY
10	FENCE
11	DEPRESSED CURB
13	FIRE DEPARTMENT CONNECTION
14	RETAINING WALL
15	HYDRO KIOSK
16	LAMP STANDARD
17	ELEVATOR PIT
18	CANOPY
19	CANOPY FOOTPRINT

SURFACE LEGEND

- PAVING (ON-SLAB) LARGE PATIO TILES
- PAVING 2 (ON-GRADE) 300 x 600 FLAME GRANITE, NEWTON BROWN
- ASPHALT
- CONCRETE ON-GRADE
- LANDSCAPING
- EXISTING BUILDING

SITE STATISTICS

LOT AREA	10 917 m2
FOOTPRINT	6 261 m2
GROSS BUILDING AREA ABOVE GRADE	30 968 m2
GROSS BUILDING AREA BELOW GRADE (BUILDING & PARKADE)	15 871 m2
GROSS FLOOR AREA (ABOVE + BELOW GRADE)	46 839 m2

NUMBER OF UNITS

P1 FLOOR UNITS AT STREET LEVEL	6 UNITS
FIRST FLOOR UNITS AT STREET LEVEL	49 UNITS
2nd FLOOR UNITS ON A TYPICAL LEVEL	55 UNITS
3rd FLOOR UNITS ON A TYPICAL LEVEL	54 UNITS
4th FLOOR UNITS ON A TYPICAL LEVEL	31 UNITS
5th FLOOR UNITS ON A TYPICAL LEVEL	30 UNITS
6th FLOOR UNITS ON A TYPICAL LEVEL	19 UNITS
TOTAL	244 UNITS

NUMBER OF PARKING SPACES

1.0 Residents (parking space / dwelling unit)		**244**
0.2 Visitors (parking space / dwelling unit)		**49**
Commercial parking		**10**
TOTAL PARKING REQUIRED		**303**
TOTAL PARKING PROVIDED INCLUDED BARRIER FREE PARKING		**351**
MINIMUM BARRIER FREE PARKING REQUIRED 10	PROVIDED 10	

ZONE PROVISIONS BLOCK 2 - 1050 CANADIAN SHIELD

ZONING BY-LAW 2008 250
CURRENT ZONING : MC15 [2027]

	REQUIRED	PROPOSED
PERMITTED USES	RESIDENTIAL	RESIDENTIAL
FRONT YARD SETBACK GREAT LAKES AVENUE (WEST LOT LINE)	MAX. 0.5m OR 2m WHERE A PATIO IS PROVIDED	5.0m MIN / 5.8m MAX
SIDE YARD CAMPEAU DRIVE SETBACK (NORTH LOT LINE)	6.0 m MIN. 6.5 m MAX.	6.0 m MIN. 6.5 m MAX.
SIDE YARD SETBACK CANADIAN SHIELD AVENUE (SOUTH LOT LINE)	MAX. 0.5m OR 2m WHERE A PATIO IS PROVIDE	3.2m MIN / 4.76m MAX
INTERIOR REAR YARD SETBACK (EAST LOT LINE)	6.0 m	4.7 m
BUILDING HEIGHT	23.0 m MAX.	6 STOREYS + P1 / LEVEL ENTRANCE
WINDOWS ON WALL FACING STREET	MIN 50% OF LENGTH	CAMPEAU DRIVE 52% CANADA SHIELD AVE. 50% GREAT LAKES AVE. 52%
LANDSCAPE AREA	30% MIN. (3 275 m²)	32.4 % (3 541 m2)
MINIMUM BICYCLE PARKING	0.5 PER DWELLING UNIT 122 SPACES	124
TOTAL PRIVATE AMENITY SPACE	6 m² PER DWELLING UNIT 1 464 m²	2 622
TOTAL COMMUNAL AMENITY AREA	50% OF PRIVATE AMENITY SPACES 735 m2	603 m2 (INDOOR) 581 m2 (OUTDOOR) 1184 m2 (TOTAL)

NOTES GÉNÉRALES General Notes

1. Ces documents d'architecture sont la propriété exclusive de NEUF architect(e)s et ne pourront être utilisés, reproduits ou copiés sans autorisation écrite préalable. / These architectural documents are the exclusive property of NEUF architect(e)s and cannot be used, copied or reproduced without written pre-authorisation
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3. Veuillez aviser l'architecte de toute dimension erreur et/ou divergences entre ces documents et ceux des autres professionnels. / The architect must be notified of all errors, omissions and discrepancies between these documents and those of the others professionnals.
4. Les dimensions sur ces documents doivent être lues et non mesurées. / The dimensions on these documents must be read and not measured.

ARCHITECTES Architect
NEUF architect(e)s
630, boul. René-Lévesque O. 32e étages, Montréal QC H3B 1S6
T 514 847 1117 NEUFarchitectes.com

ARCHITECTURE DE PAYSAGE Landscape Architect

ARPENTEUR Surveyor
Fairhall Moffatt Woodland
100-600, Terry Fox Drive, Kanata, Ontario K2L 4B6
T 613 591 2580 F 613 591 1495

CIVIL Civil
NOVATECH
240 Michael Cowpland Drive, Suite 200, Ottawa, ON K2M 1P6
T 613 254 9643 novatech-eng.com

INGÉNIEUR ÉLECTRIQUE & MÉCANIQUE Electrical & Mechanical Engineer
NATIONAL MULTI-RESIDENTIAL INNOVATIVE DESIGN
555 Legget Drive, Tower A, Suite 212, Ottawa, ON K2K 2X3
T 613 224 2761 Fax 613 951 0586

INGÉNIEUR EN STRUCTURE Structural Engineer

URBANISTE Urban planner
NOVATECH
240 Michael Cowpland Drive, Suite 200, Ottawa, ON K2M 1P6
T 613 254 9643 novatech-eng.com

SCEAU / Seal

NEUF
ARCHITECT(E)S
NEUF ARCHITECTES SENCRL

CLIENT Client
LÉPINE

206-555 Legget Dr., Tower A, Ottawa, ON K2K 2X3
T 613 591 9090 F 613 591 9095

OUVRAGE Project
1050 CANADIAN SHIELD

EMPLACEMENT Location	NO PROJET No.
1050 CANADIAN SHIELD	12461

NO	RELEASE / VERSION	DATE (aa-mm-jj)
0.0	FOR COORDINATION	2020 04 16
0.1	FOR COORDINATION	2020 12 04
0.2	FOR COORDINATION	2021 01 07
0.3	FOR COORDINATION	2021 03 16
0.6	FOR COORDINATION	2021 04 30

Preliminary
DO NOT USE FOR CONSTRUCTION

DESSINÉ PAR Drawn by	VÉRIFIÉ PAR Checked by
W.W./A.G.	K.P. / BSJ.
DATE (aa.mm.jj)	ÉCHELLE Scale
06/04/20	As indicated

TITRE DU DESSIN Drawing Title
SITE PLAN

RÉVISION Revision **0.6** NO. DESSIN Dwg Number **A060**

APPENDIX B

TIA Screening Form

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	**1050 Canadian Shield Avenue**
Description of Location	**Northeast corner of Great Lakes Avenue/Canadian Shield Avenue**
Land Use Classification	**Residential with ground floor commercial**
Development Size (units)	**244 residential units**
Development Size (m^2)	**330m^2 ground floor commercial**
Number of Accesses and Locations	**One full movement access to Canadian Shield Avenue, approx. 100m east of Great Lakes Avenue**
Phase of Development	**1**
Buildout Year	**2022**

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 m^2
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?		X
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*	X	

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

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

4. Safety Triggers

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

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

5. Summary

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

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

APPENDIX C

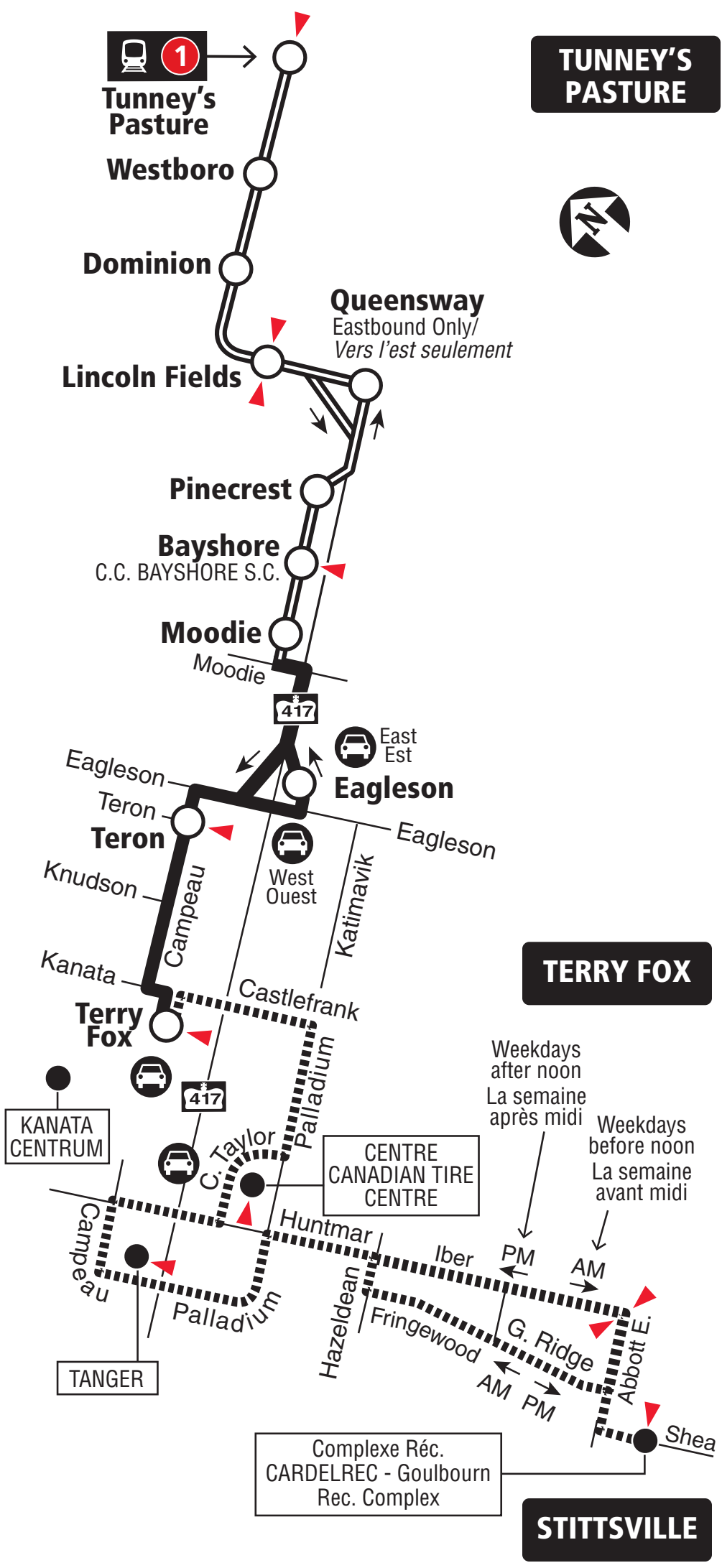
OC Transpo System Information

62 Rapide

TERRY FOX STITTSVILLE
TUNNEY'S PASTURE

7 days a week / 7 jours par semaine

All day service
Service toute la journée



Transitway & Station

Monday to Friday only (limited evening service)
Lundi au vendredi seulement (service de soirée limité)

Park & Ride / Parc-o-bus

Timepoint / Heures de passage

2019.07

1

Starting July 14, 2019
À partir du 14 juillet 2019

Lost and Found / Objets perdus..... **613-563-4011**
Security / Sécurité **613-741-2478**

OC Transpo

INFO 613-741-4390
octranspo.com

161

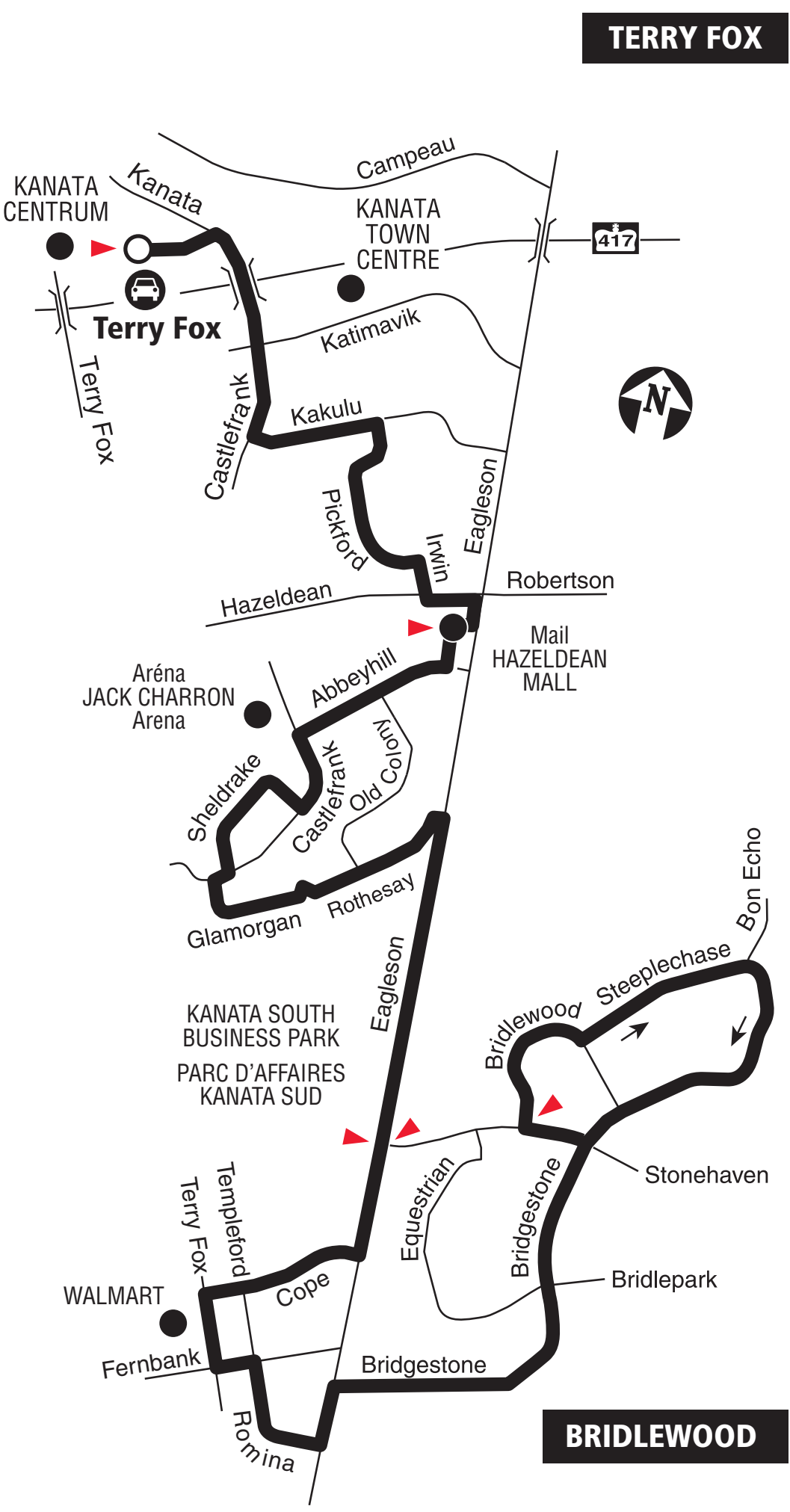
TERRY FOX

BRIDLEWOOD

Local

Monday to Friday/ Lundi au vendredi

All day service. No weekend service
Service toute la journée.
Aucun service les fins de semaine



Station

Park & Ride / Parc-o-bus

Timepoint / Heures de passage

2019.06

Schedule / Horaire.....613-560-1000
Text / Texto 560560

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

Customer Service
Service à la clientèle **613-741-4390**

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

Security / Sécurité **613-741-2478**

Effective June 29, 2015
En vigueur 29 juin 2015

OC Transpo

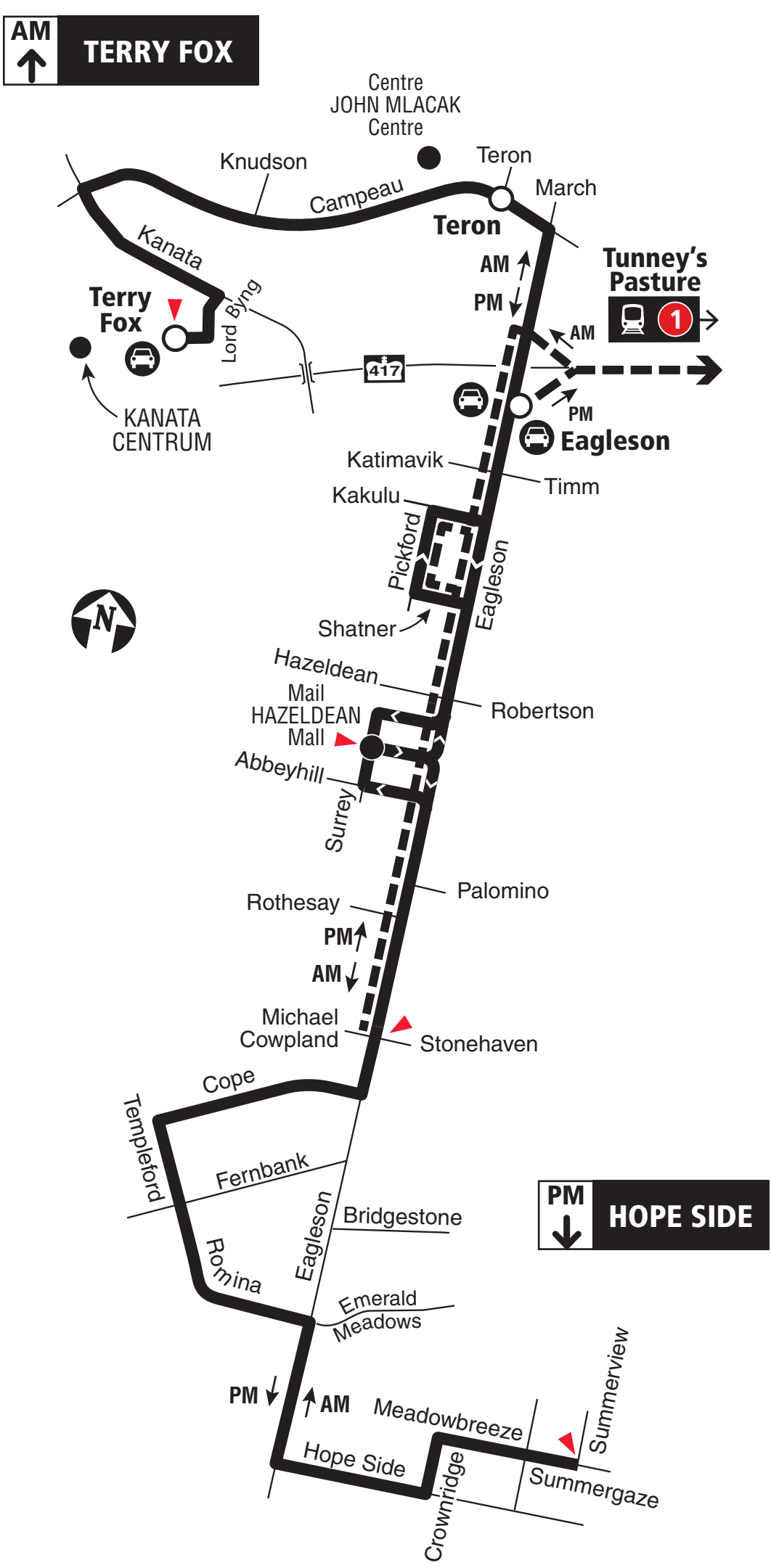
INFO 613-741-4390
octranspo.com

164 TERRY FOX / HOPE SIDE

Local

Monday to Friday/ Lundi au vendredi

Peak periods only
Périodes de pointe seulement



Transitway Station / Station du Transitway

Peak Periods Only / Périodes de pointe seulement
Some trips to / from Tunney's Pasture
Quelques trajets de / vers Tunney's Pasture

Park & Ride / Parc-o-bus

Timepoint / Heures de passage

2019.06

Schedule / Horaire.....613-560-1000
Text / Texto 560560

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

Customer Service
Service à la clientèle **613-741-4390**

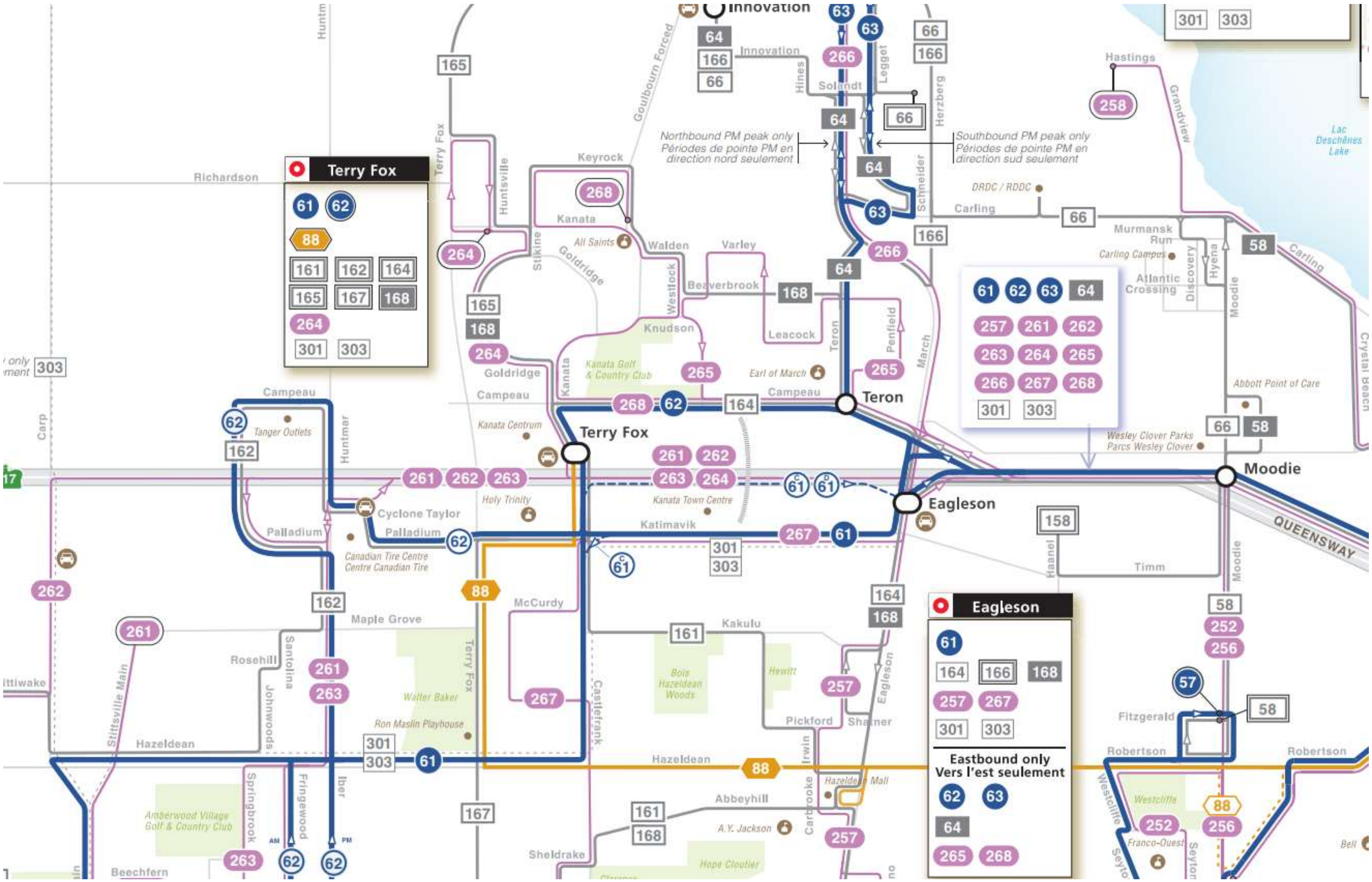
Lost and Found / Objets perdus..... **613-563-4011**

Security / Sécurité **613-741-2478**

Effective December 24, 2017
En vigueur 24 décembre 2017

OC Transpo

INFO 613-741-4390
octranspo.com


Innovation
Terry Fox
Teron
Moodie
Eagleson
Terry Fox
61 62
88
161 162 164
165 167 168
264
301 303
Eagleson
61
164 166 168
257 267
301 303
Eastbound only
Vers l'est seulement
62 63
64
265 268
61 62 63 64
257 261 262
263 264 265
266 267 268
301 303
Northbound PM peak only
Périodes de pointe PM en direction nord seulement
Southbound PM peak only
Périodes de pointe PM en direction sud seulement
QUEENSWAY
Lac Deschênes Lake
Richardson
Campeau
Palladium
Cyclone Taylor
Maple Grove
Rosehill
Hazeldean
Beechfern
Keyrock
Kanata
Walden
Varley
Beaverbrook
Knudson
Leacock
Goldridge
Katimavik
McCurdy
Kakulu
Pickford
Shirley's Brook
Abbeyhill
Sheldrake
Innovation
Solandt
Carling
Murmansk Run
Atlantic Crossing
Hastings
Timm
Fitzgerald
Robertson
Tanger Outlets
Kanata Centrum
Holy Trinity
Canadian Tire Centre
Centre Canadian Tire
Kanata Town Centre
Kanata Golf & Country Club
All Saints
Earl of March
DRDC / RDDC
Carling Campus
Abbott Point of Care
Wesley Clover Parks
Parcs Wesley Clover
Walter Baker
Ron Maslin Playhouse
Bois Hazeldean Woods
Hewitt
A.Y. Jackson
Hope Cloutier
Hazeldean Mall
Amberwood Village Golf & Country Club
Westcliffe
Franco-Ouest
Bell
Terry Fox
Huntsville
Stikine
Westlock
Goulbourn Forced
Hines
Legget
Herzberg
Schneider
March
Penfield
Teron
Grandview
Discovery
Hyena
Moodie
Crystal Beach
Huntmar
Carp
Stittsville Main
Santolina
Johnwoods
Springbrook
Fringewood
Iber
Castlefrank
Irwin
Carbrooke
Eagleson
Hanel
Westcliffe
Seyton
Ittiwake

APPENDIX D

Traffic Count Data, Long Range Model Screenshots, Signal Timings

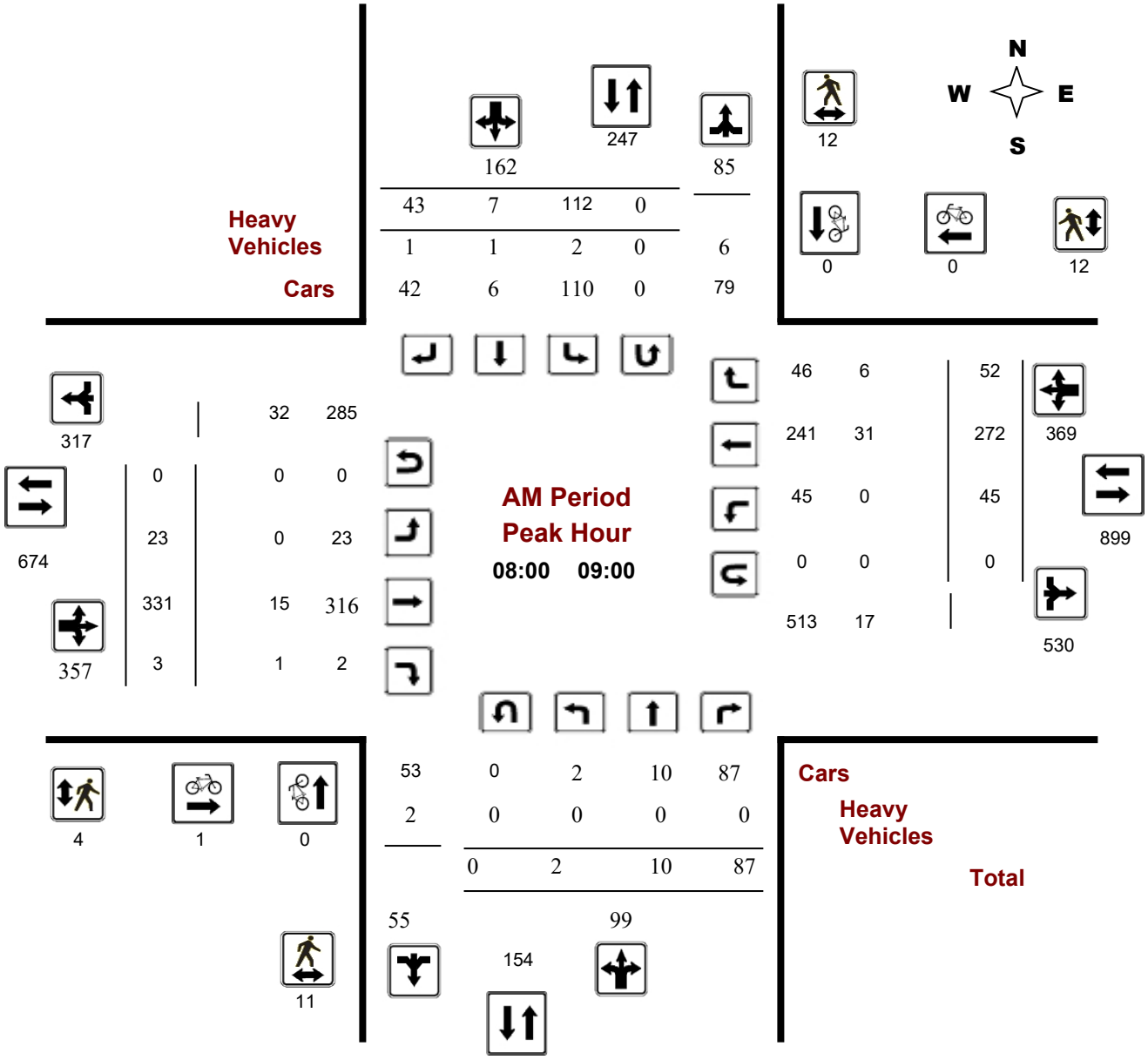
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CAMPEAU DR @ KNUDSON DR

Survey Date: Tuesday, March 10, 2020 **WO No:** 39594

Start Time: 07:00 **Device:** Miovision



Comments 5479344 - MAR 10 2020 - 8HRS - LORETTA

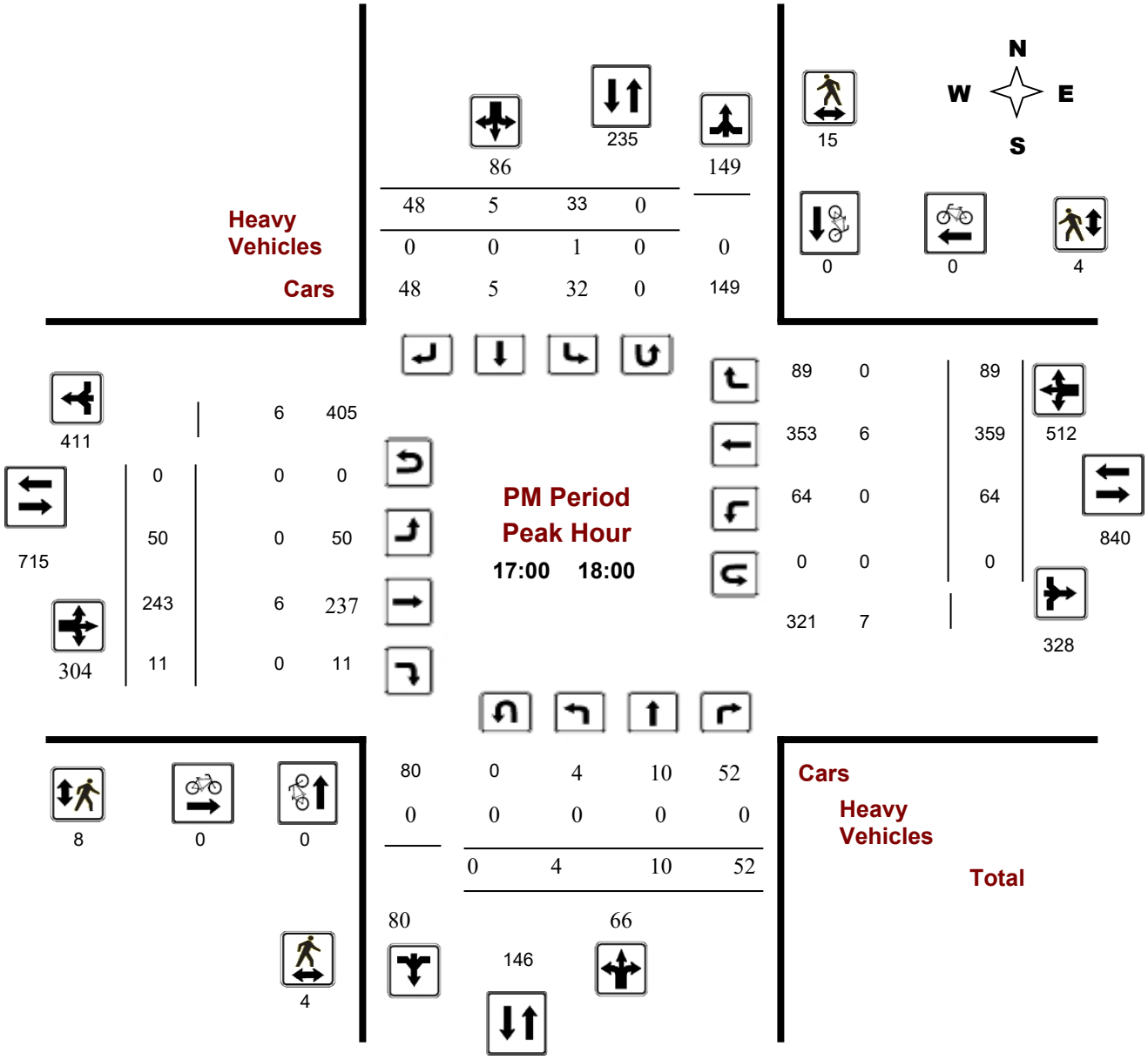
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CAMPEAU DR @ KNUDSON DR

Survey Date: Tuesday, March 10, 2020 **WO No:** 39594

Start Time: 07:00 **Device:** Miovision



Comments 5479344 - MAR 10 2020 - 8HRS - LORETTA

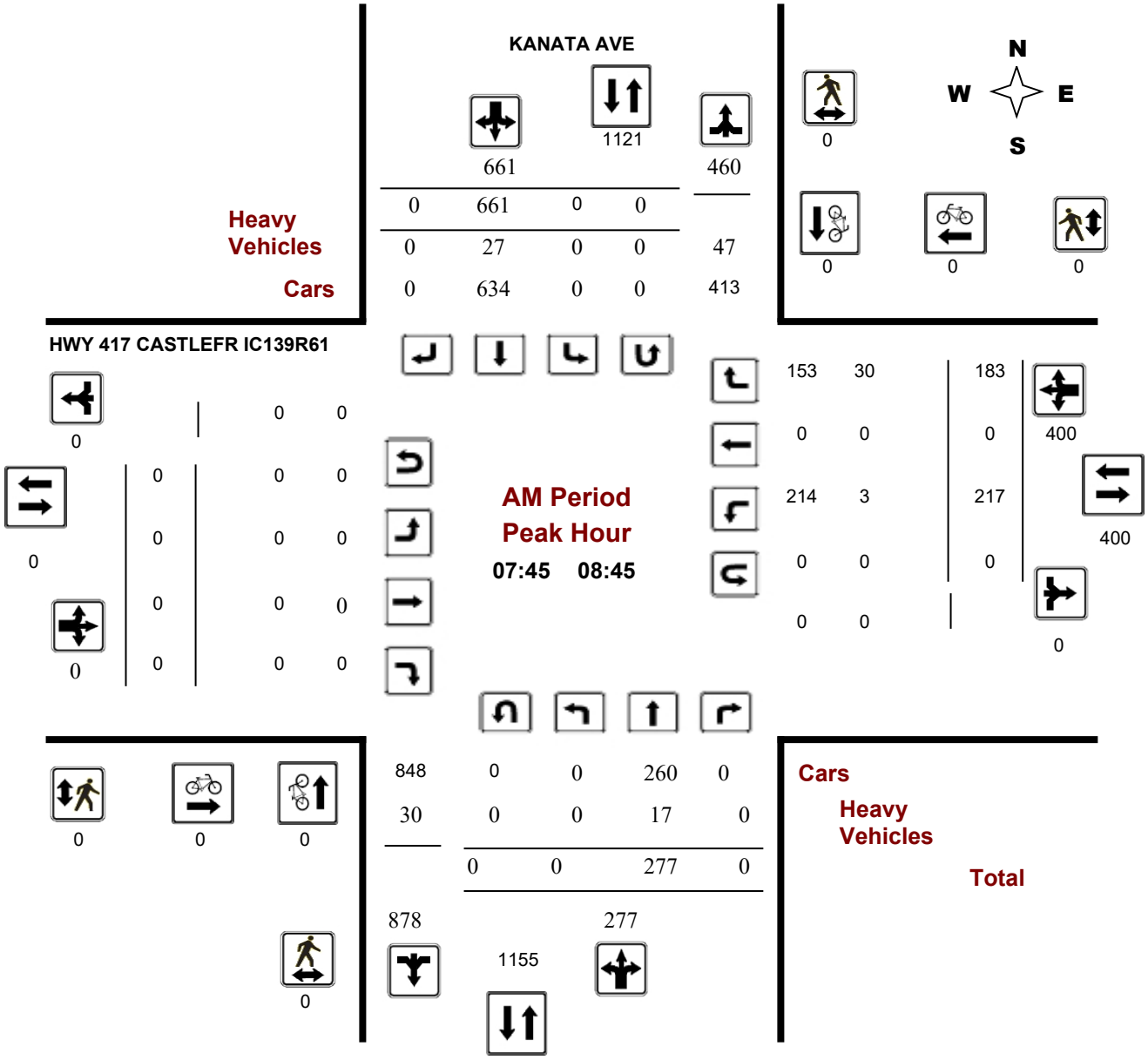
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HWY 417 CASTLEFR IC139R61 @ KANATA AVE

Survey Date: Wednesday, December 06, 2017 **WO No:** 37364

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

HWY 417 CASTLEFR IC139R61 @ KANATA AVE

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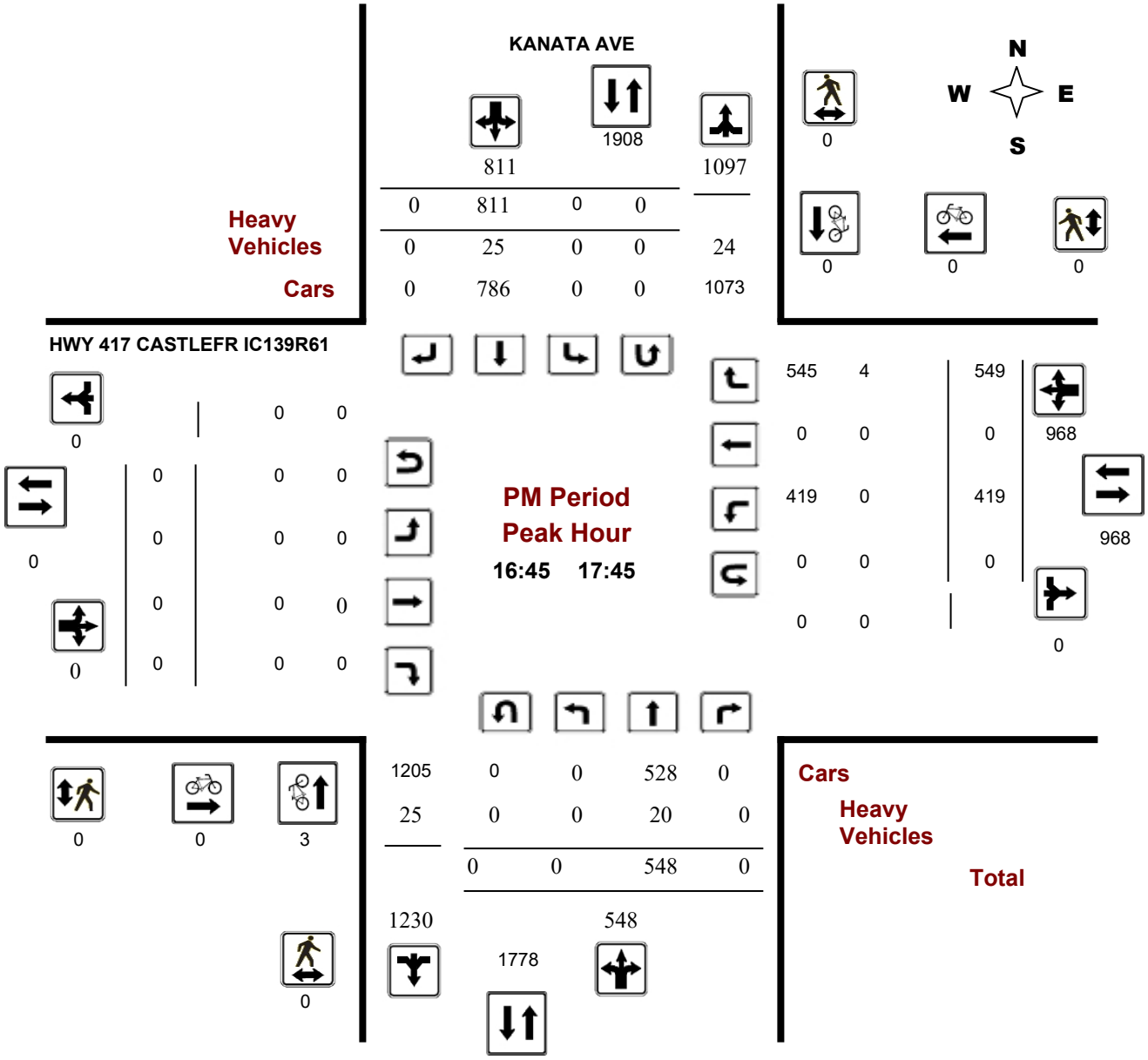
Start Time: 07:00 **Device:** Miovision



Comments

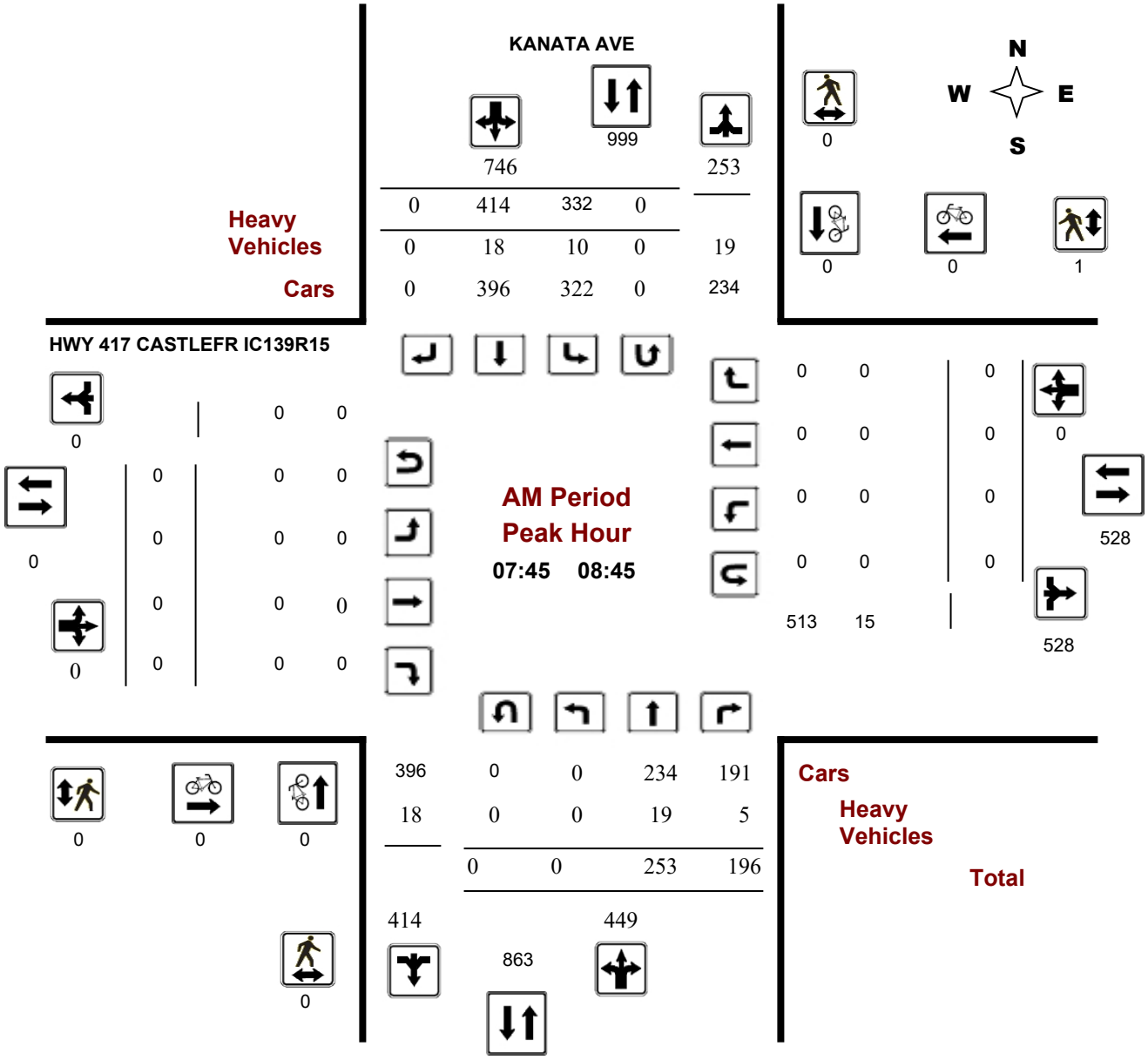
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

KANATA AVE @ HWY 417 CASTLEFR IC139R15

Survey Date: Tuesday, November 27, 2018 **WO No:** 38168

Start Time: 07:00 **Device:** Miovision



Comments

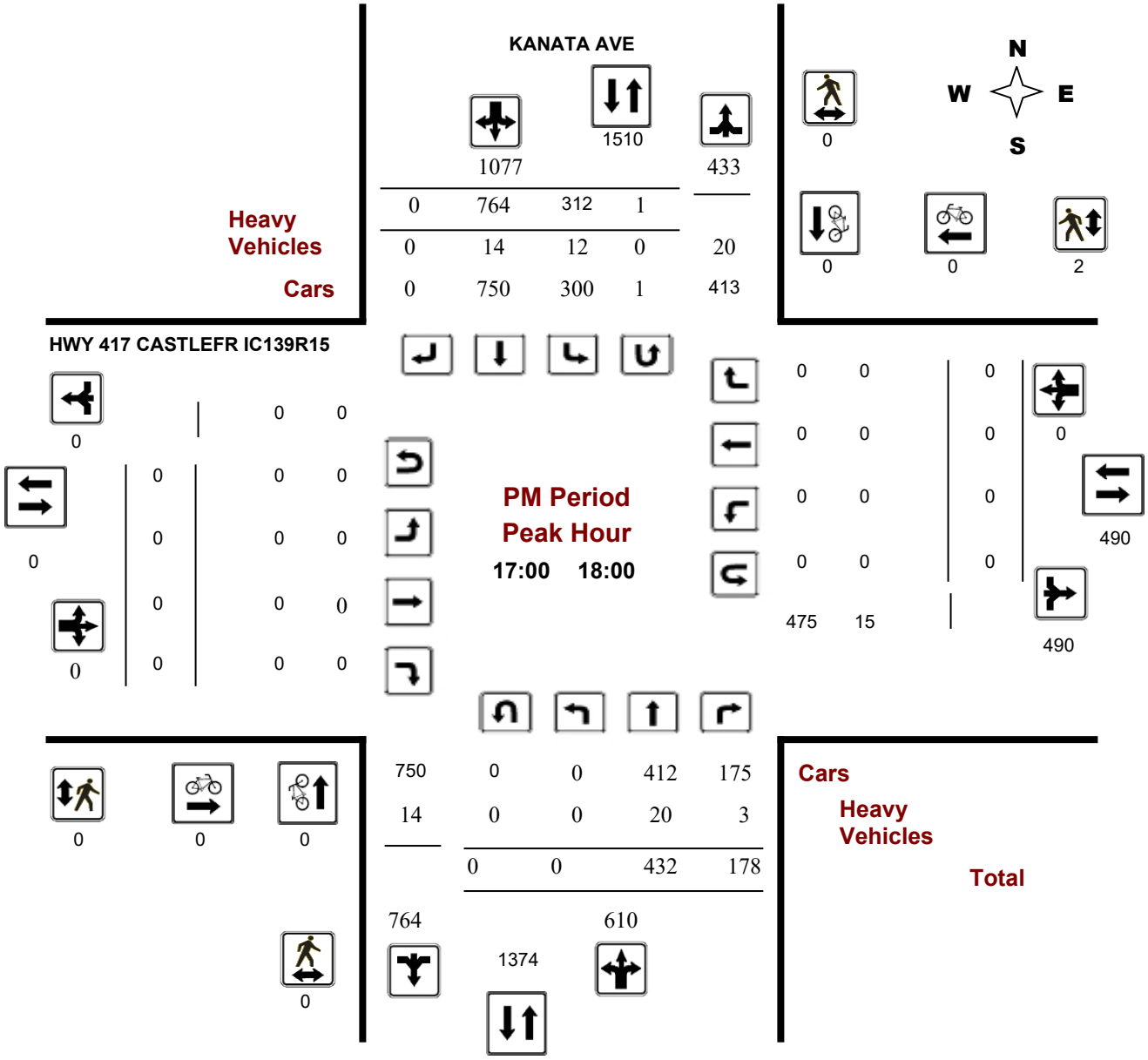
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

KANATA AVE @ HWY 417 CASTLEFR IC139R15

Survey Date: Tuesday, November 27, 2018 **WO No:** 38168

Start Time: 07:00 **Device:** Miovision



Comments

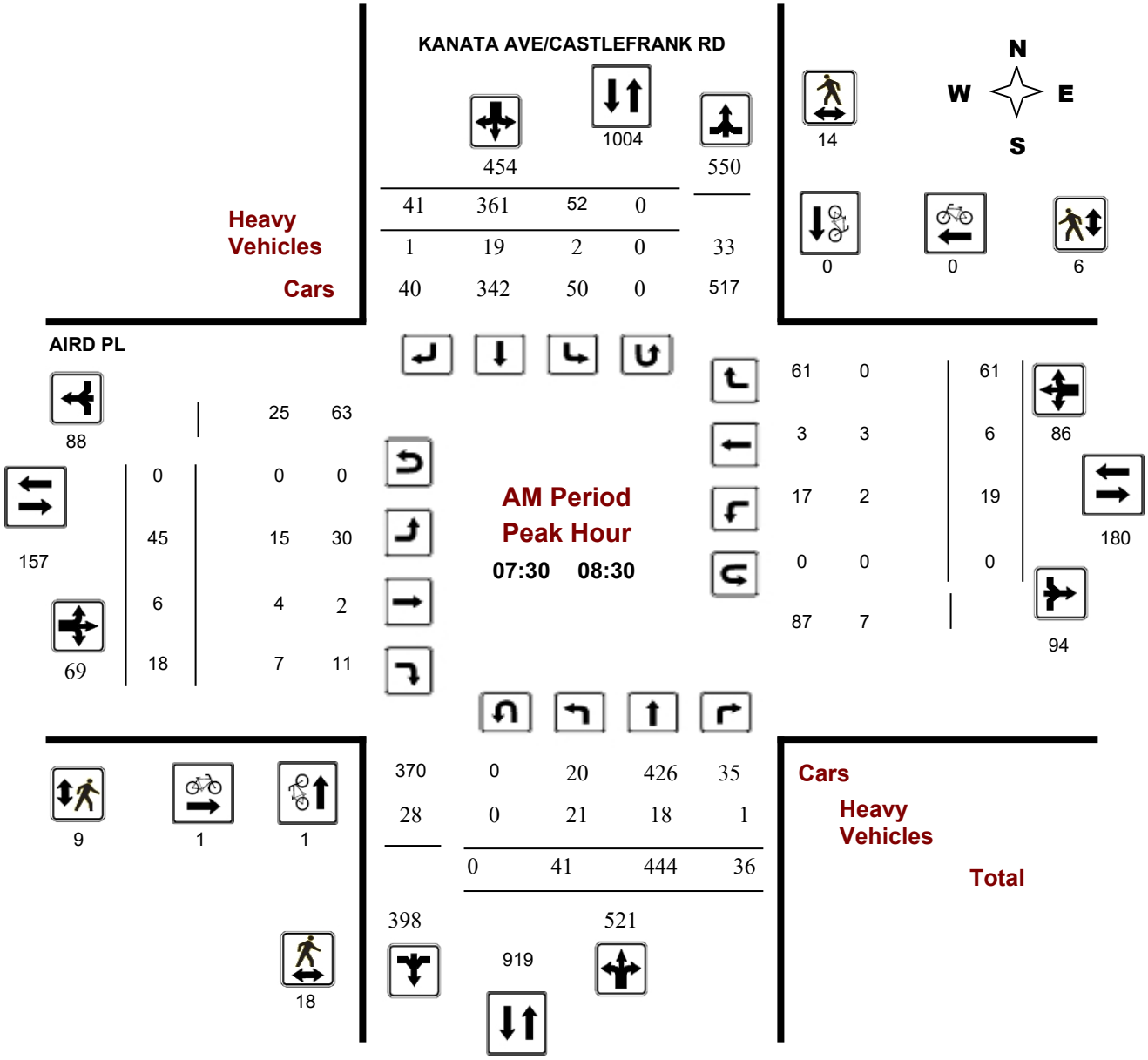
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

KANATA AVE/CASTLEFRANK RD @ AIRD PL

Survey Date: Wednesday, April 11, 2018 **WO No:** 37727

Start Time: 07:00 **Device:** Miovision



Comments

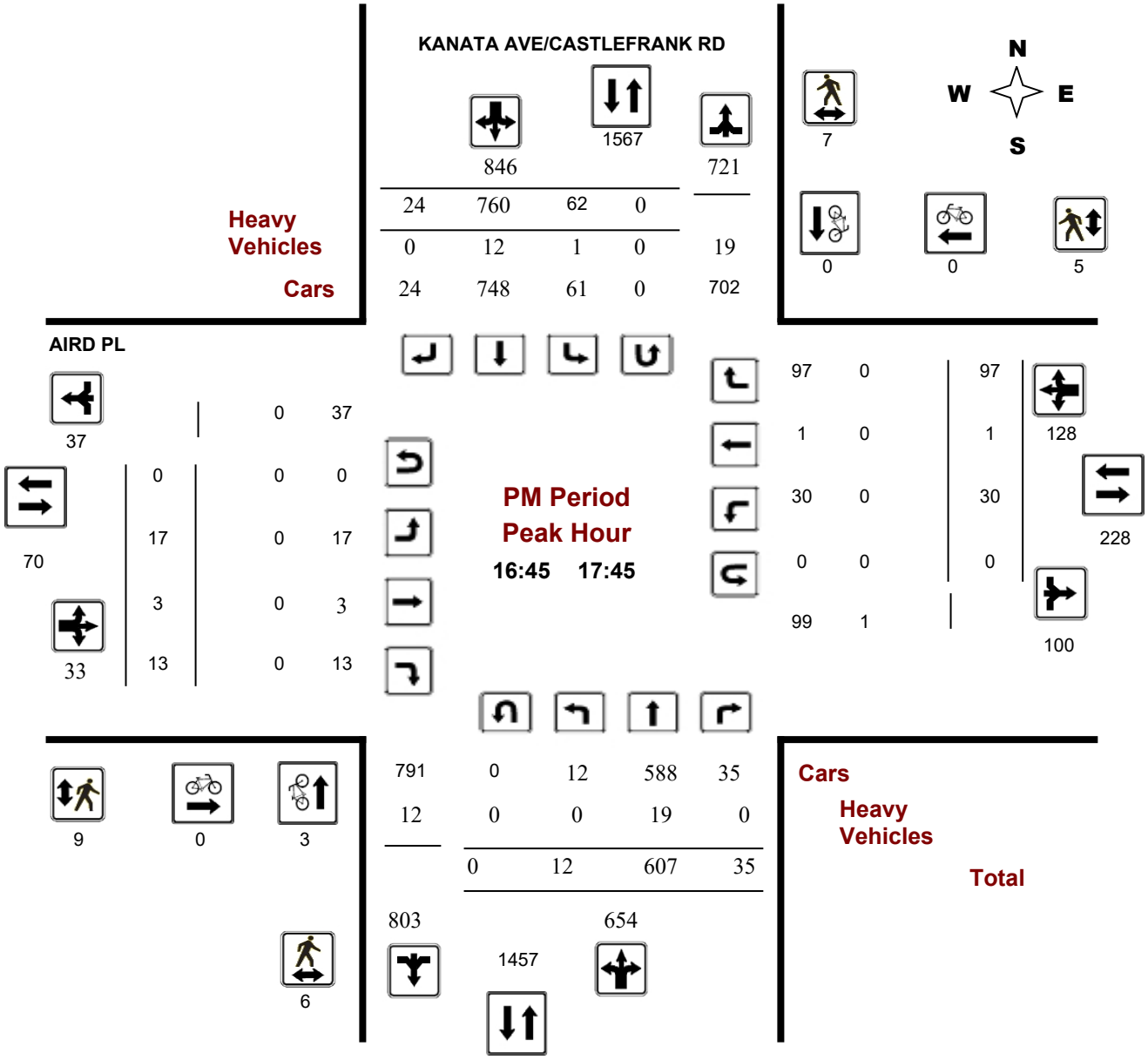
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

KANATA AVE/CASTLEFRANK RD @ AIRD PL

Survey Date: Wednesday, April 11, 2018 **WO No:** 37727

Start Time: 07:00 **Device:** Miovision



Comments

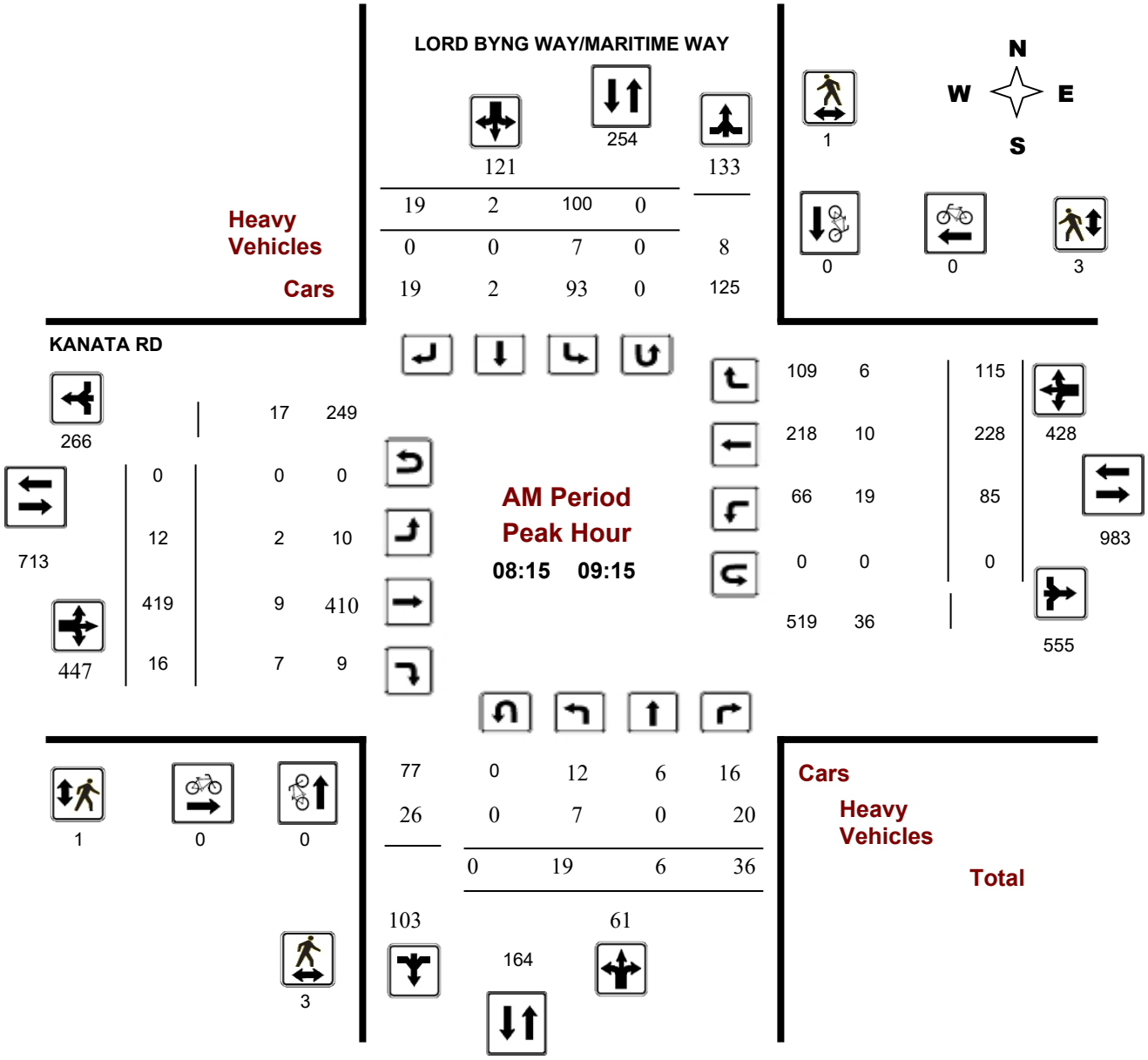
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

KANATA RD @ LORD BYNG WAY/MARITIME WAY

Survey Date: Tuesday, March 20, 2018 **WO No:** 37606

Start Time: 07:00 **Device:** Miovision



Comments

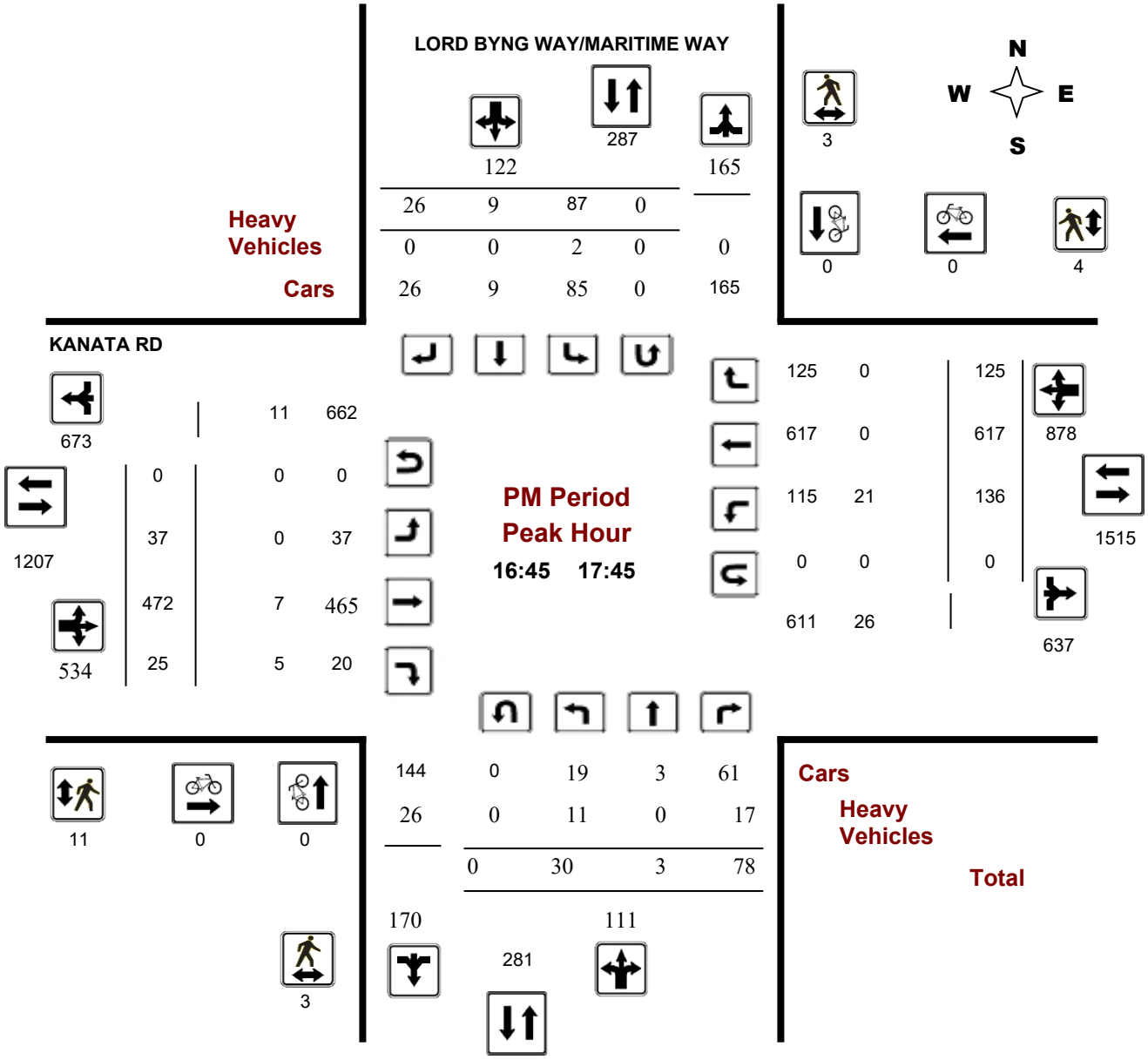
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

KANATA RD @ LORD BYNG WAY/MARITIME WAY

Survey Date: Tuesday, March 20, 2018 **WO No:** 37606

Start Time: 07:00 **Device:** Miovision



Comments

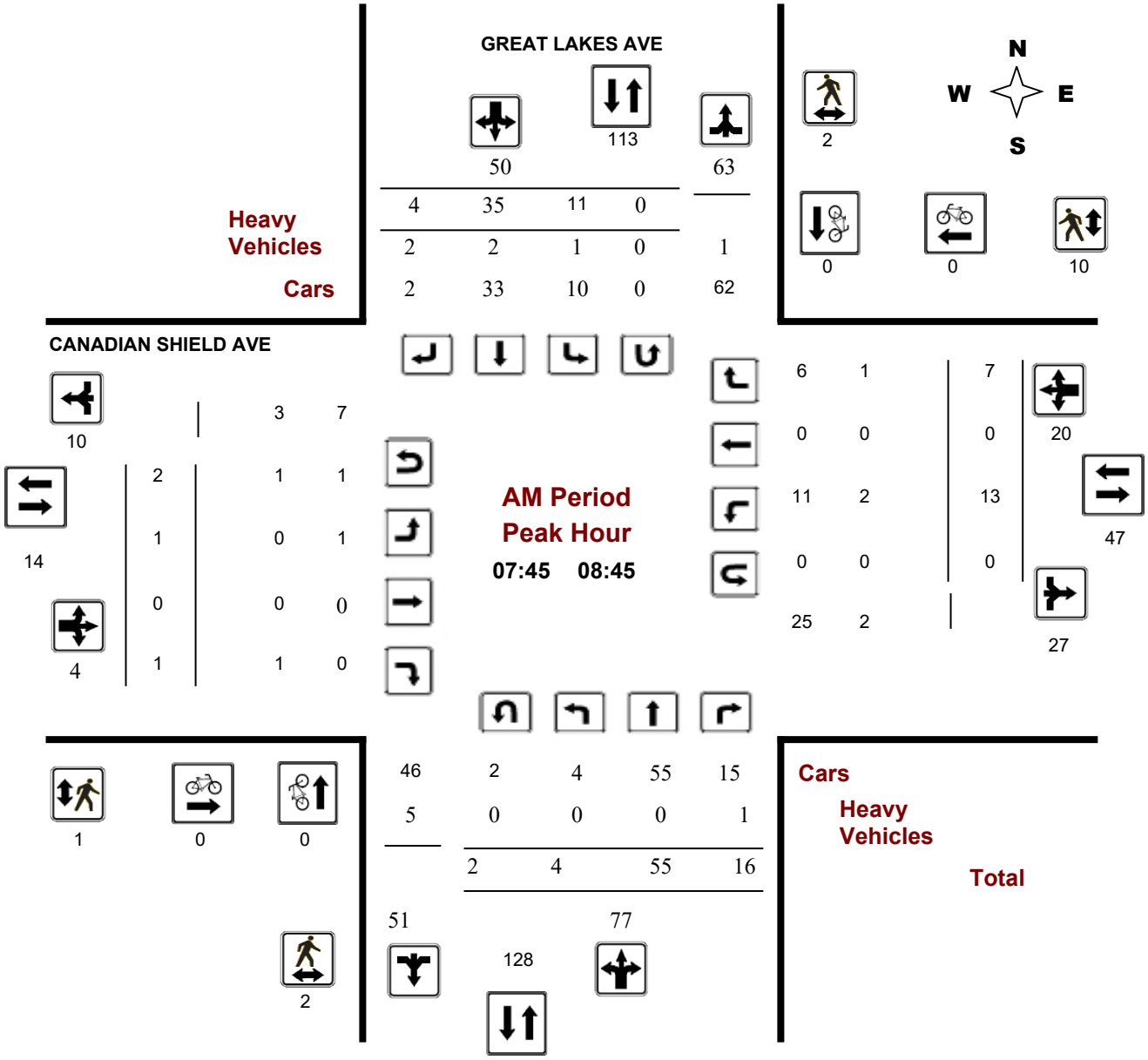
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CANADIAN SHIELD AVE @ GREAT LAKES AVE

Survey Date: Tuesday, May 15, 2018
Start Time: 07:00

WO No: 37817
Device: Miovision



Comments

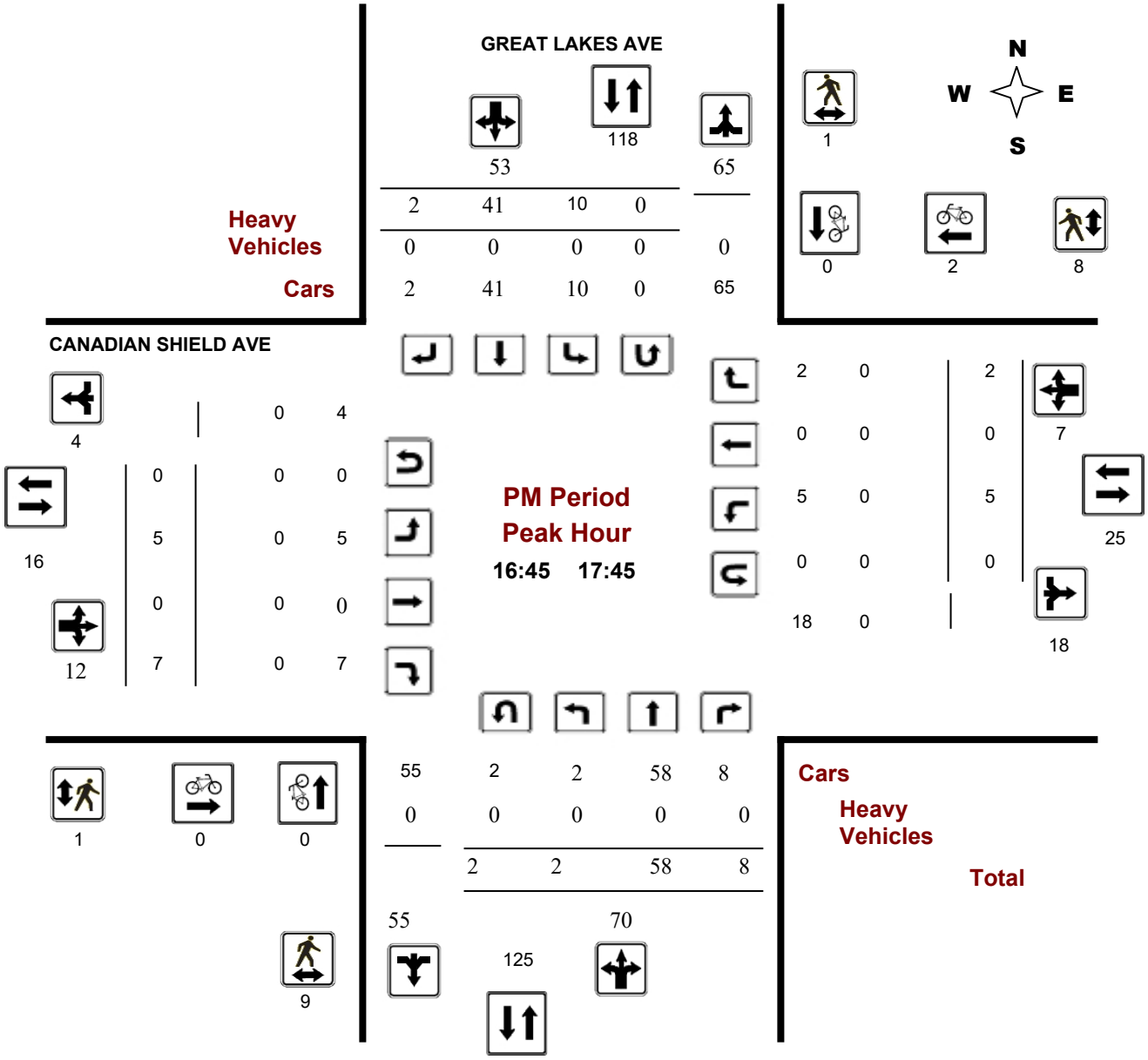
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CANADIAN SHIELD AVE @ GREAT LAKES AVE

Survey Date: Tuesday, May 15, 2018
Start Time: 07:00

WO No: 37817
Device: Miovision



Comments

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

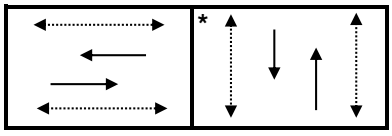
Intersection:	***Main:***	Campeau	***Side:***	Knudson / Maritime
Controller:	**MS 3200**		**TSD:**	**6548**
Author:	Matthew Anderson		**Date:**	16-Oct-2020

Existing Timing Plans†

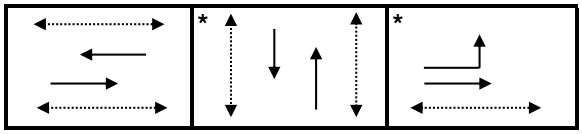
	Plan				**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	***Walk***	***DW***	***A+R***
Cycle	80	60	90	60			
Offset	0	0	0	x			
EB Thru	45	35	66	max=45.7	7	15	3.7+2.0
WB Thru	45	35	51	max=45.7	7	15	3.7+2.0
NB Thru	35	25	24	max=26	7	10	3.0+3.0
SB Thru	35	25	24	max=26	7	10	3.0+3.0
EB Left	-	-	15	-	-	-	3.7+2.0

Phasing Sequence‡

Plan: 1, 2, & 4



Plan: 3



Schedule

Weekday

Time	Plan
0:10	4
6:30	2
7:00	1
9:30	2
15:30	3
18:00	2
20:00	4

Weekend

Time	Plan
0:10	4
10:00	2
19:00	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 $58.78 ($52.02 + HST)

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

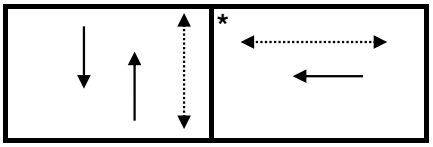
Intersection:	***Main:*** Kanata	***Side:***	417 WB Ramp
Controller:	**MS 3200**	**TSD:**	**6556**
Author:	Matthew Anderson	**Date:**	16-Oct-2020

Existing Timing Plans†

	Plan					**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	**Weekend** 5	***Walk***	***DW***	***A+R***
Cycle	90	75	90	60	85			
Offset	35	15	32	X	19			
NB Thru	53	38	45	35	45	7	15	3.3+2.8
SB Thru	53	38	45	35	45	-	-	3.3+2.8
WB Thru	37	37	45	25	40	7	11	3.3+1.7

Phasing Sequence‡

Plan: All



Schedule

Weekday

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

Saturday

Time	Plan
0:10	4
9:00	5
22:30	4

Sunday

Time	Plan
0:15	4
8:00	5
22:00	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 $58.78 ($52.02 + HST)

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

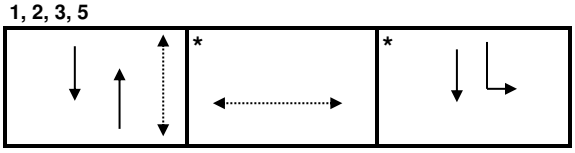
Intersection:	***Main:*** Kanata	***Side:***	417 EB Ramp
Controller:	**ATC 3**	**TSD:**	**6557**
Author:	Matthew Anderson	**Date:**	16-Oct-2020

Existing Timing Plans†

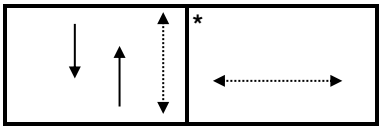
	Plan					**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	**Weekend** 5	***Walk***	***DW***	***A+R***
Cycle	90	75	90	60	85			
Offset	42	27	27	X	19			
NB Thru	50	35	50	32	45	7	11	3.3+2.4
SB Thru	62	47	62	32	57	-	-	3.3+2.4
EW Ped	28	28	28	28	28	7	15	3.0+2.0
SB Left	12	12	12	-	12	-	-	3.3+2.4

Phasing Sequence‡

Plan: 1, 2, 3, 5



Plan: 4



Schedule

Weekday

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

Saturday

Time	Plan
0:10	4
9:00	5
22:30	4

Sunday

Time	Plan
0:15	4
8:00	5
22:00	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 $58.78 ($52.02 + HST)

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

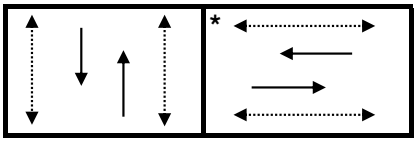
Intersection:	***Main:***	Kanata / Castlefrank	***Side:***	Aird
Controller:	**MS 3200**		**TSD:**	**6582**
Author:	Matthew Anderson		**Date:**	16-Oct-2020

Existing Timing Plans†

	Plan					**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	**Weekend** 5	***Walk***	***DW***	***A+R***
Cycle	90	75	90	60	85			
Offset	17	11	10	X	84			
NB Thru	60	45	60	30	55	7	12	3.3+2.4
SB Thru	60	45	60	30	55	7	12	3.3+2.4
EB Thru	30	30	30	30	30	7	15	3.0+3.2
WB Thru	30	30	30	30	30	7	15	3.0+3.2

Phasing Sequence‡

Plan: All



Schedule

Weekday

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

Saturday

Time	Plan
0:10	4
9:00	5
22:30	4

Sunday

Time	Plan
0:10	4
8:00	5
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 $58.78 ($52.02 + HST)

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

Intersection:	**Main:**	Kanata	**Side:**	Lord Byng / Maritime Way	
Controller:	**MS-3200**			**TSD:**	6593
Author:	Matthew Anderson			**Date:**	16-Oct-2020

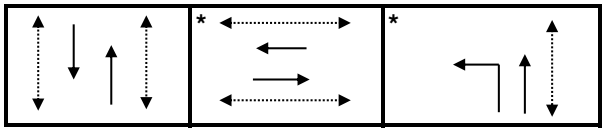
Existing Timing Plans†

	Plan					**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	**Weekend** 5	***Walk***	***DW***	***A+R***
Cycle	90	75	90	65	85			
Offset	40	14	31	X	9			
NB Thru	62	47	62	37	56	7	20	3.3+3.0
SB Thru	48	34	47	37	41	7	20	3.3+3.0
EB Thru	28	28	28	28	29	7	15	3.0+3.3
WB Thru	28	28	28	28	29	7	15	3.0+3.3
NB Left	14	13	15	-	15	-	-	3.3+3.0

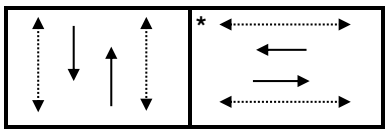
Note: Kanata is considered the NS movement

Phasing Sequence‡

Plan: 1,2,3



Plan: 4



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	5
22:30	4

Sunday

Time	Plan
0:10	4
8:00	5
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 $58.78 ($52.02 + HST)

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Campeau Drive and Kanata Ave

2011 Model - Basecase

N/A

User Initials: TIMW
Plot Prepared: August 10, 2020
EMME Scenario: 21711

TRANS

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

Distance (m)

100 200 300 400 500

N

348

106

278

621

589

1039

1914

321

876

795

677

236

350

385

The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

As general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Campeau Drive and Kanata Ave

2031 Model - Basecase

N/A

User Initials: TIMW
Plot Prepared: August 10, 2020
EMME Scenario: 21711

TRANS

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

N

Distance (m)

100 200 300 400 500

340
154
675
774
829
1551
1418
308
1347
1056
914
231
329
690

APPENDIX E

Collision Records

Transportation Services - Traffic Services

Collision Details Report - Public Version

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

Location: CAMPEAU DR @ CONACHER GT

Traffic Control: Stop sign **Total Collisions:** 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Feb-26, Thu,18:25	Clear	Angle	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2018-Jul-03, Tue,08:00	Clear	Rear end	P.D. only	Dry	East	Going ahead	School bus	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	

Location: CAMPEAU DR @ KNUDSON DR

Traffic Control: Traffic signal **Total Collisions:** 6

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Mar-04, Wed,16:39	Snow	Rear end	P.D. only	Loose snow	East	Slowing or stopping	Automobile, station wagon	Skidding/sliding	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2015-Dec-02, Wed,15:14	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2016-Jun-08, Wed,21:47	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle	0
					East	Turning left	Pick-up truck	Other motor vehicle	
2017-Apr-27, Thu,08:36	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Bicycle	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Cyclist	
2017-Jul-21, Fri,14:23	Clear	Turning movement	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Delivery van	Other motor vehicle	
2018-Aug-23, Thu,12:17	Clear	SMV other	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Debris on road	0

Location: CAMPEAU DR btwn CONACHER GT & KNUDSON DR

Traffic Control: No control **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jun-05, Fri,03:08	Clear	SMV other	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Curb	0

Transportation Services - Traffic Services

Collision Details Report - Public Version

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

Location: GREAT LAKES AVE @ MARITIME WAY

Traffic Control: Stop sign **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-Sep-07, Thu,16:25	Clear	Angle	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: HWY 417 CASTLEFR IC139R61 @ KANATA AVE

Traffic Control: Traffic signal **Total Collisions:** 45

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jan-21, Wed,08:26	Clear	Angle	P.D. only	Dry	West	Turning left	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Aug-17, Mon,07:29	Clear	Angle	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Municipal transit bus	Other motor vehicle	
2015-Sep-12, Sat,14:21	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Nov-14, Sat,18:16	Clear	Angle	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Turning left	Pick-up truck	Other motor vehicle	
2016-Jan-21, Thu,08:17	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2016-Feb-12, Fri,08:30	Snow	Rear end	P.D. only	Loose snow	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Mar-09, Wed,16:40	Clear	Rear end	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Jun-19, Sun,17:16	Clear	Angle	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
2016-Jul-12, Tue,12:45	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

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

Location: HWY 417 CASTLEFR IC139R61 @ KANATA AVE

Traffic Control: Traffic signal **Total Collisions:** 45

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Aug-11, Thu,14:30	Clear	Angle	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2016-Dec-13, Tue,19:27	Clear	Rear end	P.D. only	Loose snow	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2016-Dec-14, Wed,15:45	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Jan-29, Sun,16:12	Clear	Rear end	Non-fatal injury	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Mar-17, Fri,21:15	Clear	Sideswipe	P.D. only	Dry	West	Turning left	Pick-up truck	Other motor vehicle	0
					West	Turning left	Pick-up truck	Other motor vehicle	
2017-Apr-16, Sun,15:50	Rain	SMV other	P.D. only	Wet	West	Turning left	Automobile, station wagon	Building or wall	0
2017-May-17, Wed,16:00	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Sep-08, Fri,10:42	Clear	Angle	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2017-Sep-24, Sun,13:38	Clear	Turning movement	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2017-Nov-02, Thu,18:12	Rain	SMV other	Non-fatal injury	Wet	West	Turning left	Pick-up truck	Pole (utility, power)	0
2017-Dec-14, Thu,15:27	Clear	Angle	P.D. only	Dry	South	Going ahead	Unknown	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Jan-06, Sat,15:30	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jan-31, Wed,07:54	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

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

Location: HWY 417 CASTLEFR IC139R61 @ KANATA AVE

Traffic Control: Traffic signal **Total Collisions:** 45

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Mar-17, Sat,12:09	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Apr-04, Wed,17:44	Clear	Rear end	P.D. only	Wet	West	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Other motor vehicle	
2018-Apr-25, Wed,09:00	Rain	Angle	P.D. only	Wet	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Slowing or stopping	Municipal transit bus	Other motor vehicle	
2018-May-05, Sat,11:44	Clear	Angle	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2018-May-26, Sat,00:11	Clear	Angle	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Jun-08, Fri,11:17	Clear	SMV other	Non-fatal injury	Dry	West	Turning right	Automobile, station wagon	Pedestrian	1
2018-Jul-23, Mon,17:29	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jul-28, Sat,17:30	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Nov-24, Sat,13:32	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Passenger van	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Dec-19, Wed,18:00	Clear	Rear end	P.D. only	Dry	West	Turning right	Pick-up truck	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Other motor vehicle	
2019-Jan-03, Thu,21:23	Clear	Angle	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Jan-07, Mon,07:45	Clear	Angle	P.D. only	Dry	North	Going ahead	Passenger van	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

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

Location: HWY 417 CASTLEFR IC139R61 @ KANATA AVE

Traffic Control: Traffic signal **Total Collisions:** 45

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Feb-21, Thu,09:20	Clear	Angle	P.D. only	Slush	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-May-18, Sat,11:30	Clear	Rear end	P.D. only	Dry	West	Turning right	Pick-up truck	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Other motor vehicle	
2019-Jun-16, Sun,10:17	Clear	Angle	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Jul-16, Tue,17:45	Clear	Angle	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Sep-20, Fri,16:13	Clear	Angle	Non-fatal injury	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Oct-12, Sat,18:52	Rain	Angle	P.D. only	Wet	West	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Oct-19, Sat,11:15	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Oct-31, Thu,14:39	Rain	Angle	P.D. only	Wet	North	Going ahead	Passenger van	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Dec-10, Tue,10:05	Clear	Angle	P.D. only	Dry	North	Going ahead	Passenger van	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Dec-21, Sat,19:45	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Other motor vehicle	
2019-Dec-23, Mon,17:20	Clear	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

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

Location: KANATA AVE @ HWY 417 CASTLEFR IC139R15

Traffic Control: Traffic signal **Total Collisions:** 13

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Aug-23, Sun,15:50	Clear	Turning movement	P.D. only	Dry	North	Making "U" turn	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Aug-29, Sat,17:09	Rain	Turning movement	P.D. only	Wet	South	Turning left	Pick-up truck	Skidding/sliding	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Oct-17, Sat,00:53	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Nov-25, Fri,10:40	Clear	Angle	P.D. only	Slush	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Pick-up truck	Other motor vehicle	
2017-Oct-04, Wed,17:21	Rain	Rear end	P.D. only	Wet	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jan-06, Sat,20:23	Clear	Rear end	P.D. only	Dry	South	Going ahead	Passenger van	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-May-23, Wed,15:15	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Oct-16, Tue,18:21	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Oct-28, Sun,03:12	Rain	SMV other	P.D. only	Wet	Unknown	Going ahead	Automobile, station wagon	Ran off road	0
2019-Feb-12, Tue,12:30	Clear	Rear end	P.D. only	Dry	North	Turning right	Passenger van	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2019-Oct-16, Wed,16:27	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Oct-17, Thu,17:02	Rain	SMV other	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Concrete guide rail	0

Transportation Services - Traffic Services

Collision Details Report - Public Version

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

Location: KANATA AVE @ HWY 417 CASTLEFR IC139R15

Traffic Control: Traffic signal **Total Collisions:** 13

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Dec-10, Tue,14:36	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: KANATA AVE @ LORD BYNG WAY/MARITIME WAY

Traffic Control: Traffic signal **Total Collisions:** 42

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Mar-21, Sat,21:53	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2015-Apr-06, Mon,13:58	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Apr-08, Wed,14:51	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Jun-21, Sun,12:32	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Aug-04, Tue,20:02	Clear	Rear end	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2015-Nov-13, Fri,17:29	Rain	Rear end	P.D. only	Wet	West	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Turning right	Pick-up truck	Other motor vehicle	
2016-Feb-19, Fri,11:45	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Feb-25, Thu,20:00	Freezing Rain	Sideswipe	P.D. only	Ice	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

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

Location: KANATA AVE @ LORD BYNG WAY/MARITIME WAY

Traffic Control: Traffic signal **Total Collisions:** 42

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Feb-25, Thu,21:40	Clear	Rear end	P.D. only	Ice	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Sep-13, Tue,13:52	Clear	SMV other	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Pole (sign, parking meter)	0
2016-Sep-22, Thu,09:19	Clear	SMV other	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Pedestrian	1
2016-Oct-02, Sun,13:52	Rain	Angle	P.D. only	Wet	North	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2016-Dec-14, Wed,18:33	Clear	Rear end	Non-fatal injury	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Passenger van	Other motor vehicle	
2017-Apr-13, Thu,15:32	Clear	Rear end	Non-fatal injury	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Jun-07, Wed,10:58	Clear	Approaching	P.D. only	Dry	North	Unknown	Unknown	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Aug-04, Fri,22:21	Rain	Rear end	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Aug-17, Thu,17:30	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Sep-01, Fri,20:00	Clear	Rear end	P.D. only	Dry	West	Going ahead	Unknown	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Other motor vehicle	
2017-Sep-04, Mon,17:52	Rain	Rear end	Non-fatal injury	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Sep-16, Sat,17:33	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					South	Stopped	Pick-up truck	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

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

Location: KANATA AVE @ LORD BYNG WAY/MARITIME WAY

Traffic Control: Traffic signal **Total Collisions:** 42

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-Oct-29, Sun,11:45	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Nov-15, Wed,11:53	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Passenger van	Other motor vehicle	
2017-Dec-07, Thu,10:13	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Municipal transit bus	Other motor vehicle	
2018-Jan-05, Fri,11:45	Strong wind	Rear end	P.D. only	Ice	North	Going ahead	Pick-up truck	Skidding/sliding	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jan-05, Fri,17:50	Drifting Snow	Rear end	P.D. only	Slush	South	Going ahead	Unknown	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jul-03, Tue,17:00	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Aug-11, Sat,15:32	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2018-Oct-20, Sat,14:53	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Nov-14, Wed,00:02	Clear	SMV other	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Skidding/sliding	0
2018-Nov-30, Fri,11:00	Clear	Other	P.D. only	Dry	South	Reversing	Pick-up truck	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Dec-15, Sat,14:44	Clear	Turning movement	P.D. only	Wet	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Passenger van	Other motor vehicle	
2019-Jan-22, Tue,14:28	Clear	Rear end	Non-fatal injury	Wet	North	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

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

Location: KANATA AVE @ LORD BYNG WAY/MARITIME WAY

Traffic Control: Traffic signal **Total Collisions:** 42

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Feb-16, Sat,12:51	Clear	Angle	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-May-18, Sat,10:30	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Jun-08, Sat,17:54	Clear	Angle	Non-fatal injury	Dry	East	Turning left	Pick-up truck	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Jun-28, Fri,15:20	Rain	Rear end	Non-fatal injury	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Jul-30, Tue,12:47	Rain	SMV other	P.D. only	Wet	East	Turning left	Truck - dump	Pole (utility, power)	0
2019-Sep-06, Fri,21:58	Rain	Angle	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Skidding/sliding	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Sep-28, Sat,15:50	Rain	Rear end	Non-fatal injury	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Nov-02, Sat,19:12	Rain	Rear end	P.D. only	Wet	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-Nov-10, Sun,15:45	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Passenger van	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Dec-07, Sat,17:00	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

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

Location: KANATA AVE btwn HWY417 IC139 RAMP15 & AIRD PL

Traffic Control: No control **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Sep-02, Fri,11:17	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	

Location: KANATA AVE btwn HWY417 IC139 RAMP61 & Continuation of KANATA AVE

Traffic Control: No control **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jan-27, Tue,18:06	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Passenger van	Other motor vehicle	

Location: KANATA AVE btwn MARITIME WAY & HWY417 IC139 RAMP61

Traffic Control: No control **Total Collisions:** 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Aug-25, Tue,08:08	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2016-May-13, Fri,18:09	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Motorcycle	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	

Location: KANATA AVE/CASTLEFRANK RD @ AIRD PL

Traffic Control: Traffic signal **Total Collisions:** 11

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Aug-03, Mon,11:47	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Pick-up truck	Other motor vehicle	
2015-Nov-23, Mon,10:06	Clear	Angle	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

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

Location: KANATA AVE/CASTLEFRANK RD @ AIRD PL

Traffic Control: Traffic signal **Total Collisions:** 11

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Jan-21, Thu,13:09	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2016-Apr-05, Tue,16:19	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2016-Sep-10, Sat,11:20	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Mar-27, Mon,15:50	Rain	Rear end	P.D. only	Ice	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Apr-21, Fri,11:38	Clear	Rear end	P.D. only	Dry	South	Going ahead	Delivery van	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Jul-18, Tue,10:50	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Aug-14, Mon,17:00	Clear	Rear end	P.D. only	Dry	South	Changing lanes	Passenger van	Other motor vehicle	0
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-Oct-24, Thu,14:30	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Dec-18, Wed,18:55	Clear	Angle	P.D. only	Dry	North	Going ahead	Unknown	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: MARITIME WAY btwn CANADIAN SHIELD AVE & GREAT LAKES AVE

Traffic Control: No control **Total Collisions:** 5

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jan-17, Sat,02:08	Clear	SMV other	P.D. only	Dry	South	Going ahead	Pick-up truck	Ran off road	0
2015-Feb-16, Mon,06:06	Clear	SMV other	P.D. only	Ice	East	Going ahead	Pick-up truck	Skidding/sliding	0

Transportation Services - Traffic Services

Collision Details Report - Public Version

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

Location: MARITIME WAY btwn CANADIAN SHIELD AVE & GREAT LAKES AVE

Traffic Control: No control **Total Collisions:** 5

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-Jan-04, Wed,15:24	Snow	SMV unattended vehicle	P.D. only	Packed snow	East	Overtaking	Snow plow	Unattended vehicle	0
2018-Nov-23, Fri,00:00	Clear	SMV unattended vehicle	P.D. only	Dry	Unknown	Unknown	Unknown	Unattended vehicle	0
2019-Feb-03, Sun,12:05	Snow	Approaching	P.D. only	Packed snow	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: MARITIME WAY btwn GREAT LAKES AVE & KANATA AVE

Traffic Control: No control **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Jul-13, Sat,10:30	Clear	Angle	P.D. only	Dry	South	Reversing	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	

APPENDIX F

Relevant Excerpts from Other Reports

3.0 FORECASTING

3.1 Development-Generated Traffic

3.1.1 Trip Generation

The proposed development consisting of two residential buildings, will provide a total of 689 dwelling units.

Trips generated by the proposed development during the weekday AM and PM peak hours have been estimated using the relevant recommended rates outlined in the 2009 TRANS *Trip Generation Manual*. The vehicle trip generation rates, taken from Table 6.3 of the TRANS report, correspond to High-Rise Apartments (10+ floors) in the Suburban Area (outside the greenbelt). The vehicle trip generation using the aforementioned rates have been converted to person trips using the assumed modal shares in the in Table 3.13 of the TRANS report. The directional split between inbound and outbound trips are based on the blended splits presented in Table 3.17 of the TRANS report.

Estimates of the person trips generated by the proposed development are summarized in **Table 3**.

Table 3: Person Trip Generation

Land Use	Units	AM Peak			PM Peak		
		In	Out	Total	In	Out	Total
High-Rise Apartments (10+ Floors)	632	100	316	416	321	197	518

The *2011 TRANS O-D Survey Report* indicates that the study area lies within the Kanata/Stittsville district. Additionally, the site is located within 600m of the Terry Fox Transit Station and is therefore considered a Transit-Oriented Development (TOD). In TOD zones, the transit share is assumed to increase significantly compared to any TRANS O-D district.

Using the *2011 TRANS O-D Survey Report*, the typical residential commuter pattern is represented by all observed trips from/within a district in the AM peak hour and all observed trips to/within a district in the PM peak hour. A comparison of the assumed modal shares for a TOD, and the modal shares for commuter trips in the Kanata/Stittsville District, is presented in **Table 4**.

Table 4: Modal Shares by District/Zone

Travel Mode	TOD Zone	Kanata/Stittsville
Auto Driver	15%	60%
Auto Passenger	5%	20%
Transit	65%	10%
Non-Auto	15%	10%

Given the sites proximity to Terry Fox Transit Station, the proposed development is anticipated to have a lower auto-modal share and a higher transit modal share compared to the Kanata/Stittsville District. However, as the subject site is located within a suburban context, the

City's TOD modal share targets may not be achievable. As such, the TOD modal share targets have been adjusted to reflect a higher auto-modal share associated with the Kanata/Stittsville District. The assumed modal shares for the proposed development at build-out are summarized as follows:

- 30% Auto Driver
- 20% Auto Passenger
- 40% Transit
- 10% Non-Auto

As transit improves in proximity of the proposed development, it is anticipated that the developments modal shares will change, and an increased transit ridership will be realized. Although the timing for the Kanata LRT extension is unknown at this time, the modal shares for the 2038 horizon year have been adjusted to reflect a TOD zone. This is considered representative of the anticipated modal shares if LRT is extended to Kanata and the Terry Fox Transit Station is upgraded to LRT by the 2038 horizon year.

A full breakdown of the projected site-generated person trips by modal share is shown in **Table 5**.

Table 5: Person Trips by Modal Share

Travel Mode	Modal Share	AM Peak			PM Peak		
		In	Out	Total	In	Out	Total
2028 Build-out Condition							
Total Person Trips		*100*	*316*	*416*	*321*	*197*	*518*
Auto Driver	30%	30	95	125	96	59	155
Auto Passenger	20%	20	63	83	64	40	104
Transit	40%	40	126	166	128	79	207
Non-Auto	10%	10	32	42	32	20	52
2038 Horizon Year Condition							
Total Person Trips		*100*	*316*	*416*	*321*	*197*	*518*
Auto Driver	15%	15	47	62	48	30	78
Auto Passenger	5%	5	16	21	16	10	26
Transit	65%	65	206	271	208	128	336
Non-Auto	15%	15	47	62	48	30	78

3.1.2 Trip Distribution

Site generated traffic was distributed based on the peak hour traffic patterns within the study area. The distribution can be described as follows:

- 25% to/from the west via Kanata Avenue
- 10% to/from the west via Katimavik Road
- 10% to/from the south via Castlefrank Road
- 10% to/from the east via Katimavik Road
- 25% to/from the east via Highway 417
- 20% to/from the east via Campeau Drive

Traffic generated by the proposed development during the weekday AM and PM peak hours under the 2028 build-out year and 2038 horizon year are shown in **Figure 7** and **8**.

Figure 7: Site Generated Traffic (2028 Build-out year)

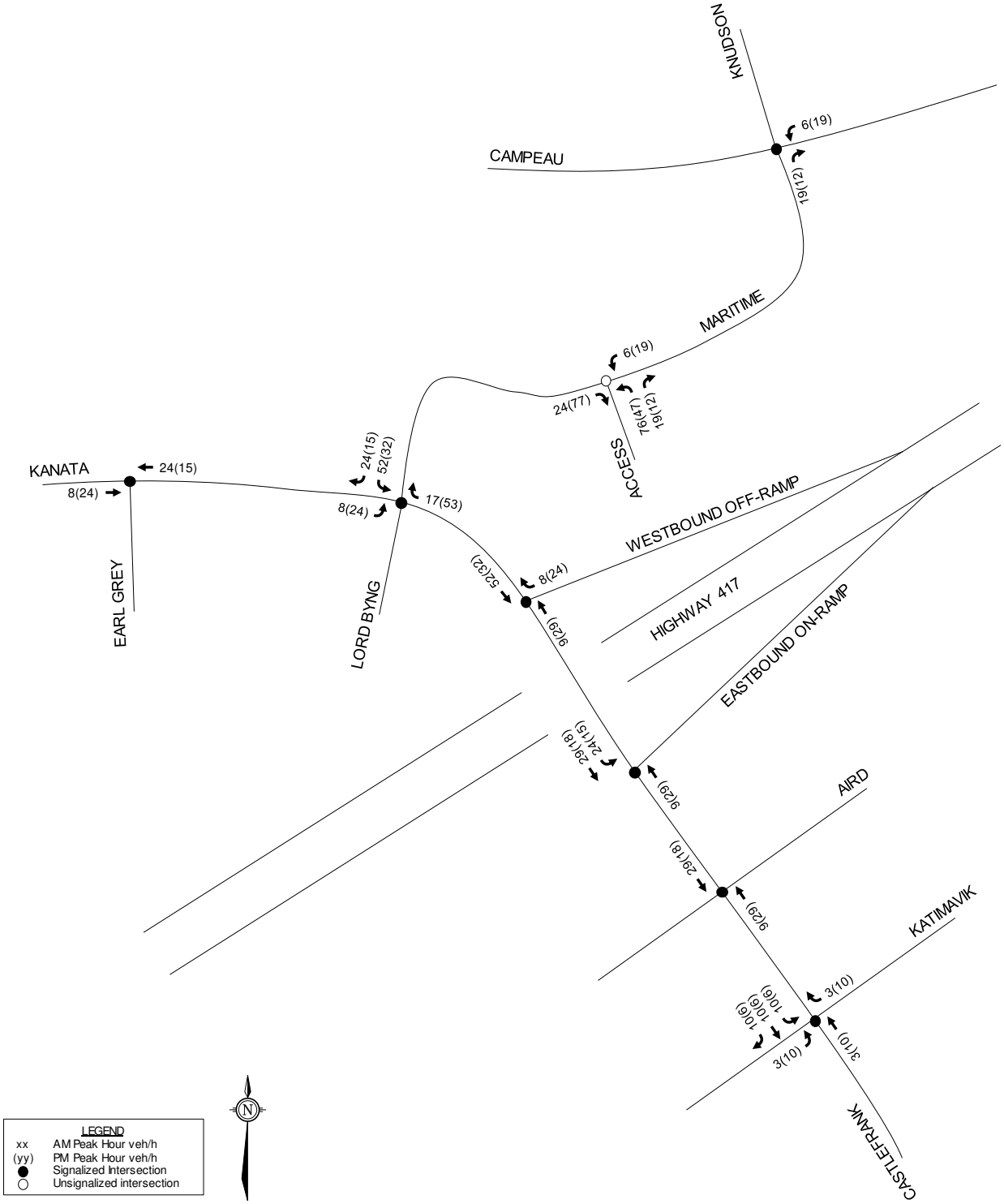


Figure 8: Site Generated Traffic (2038 Horizon Year)

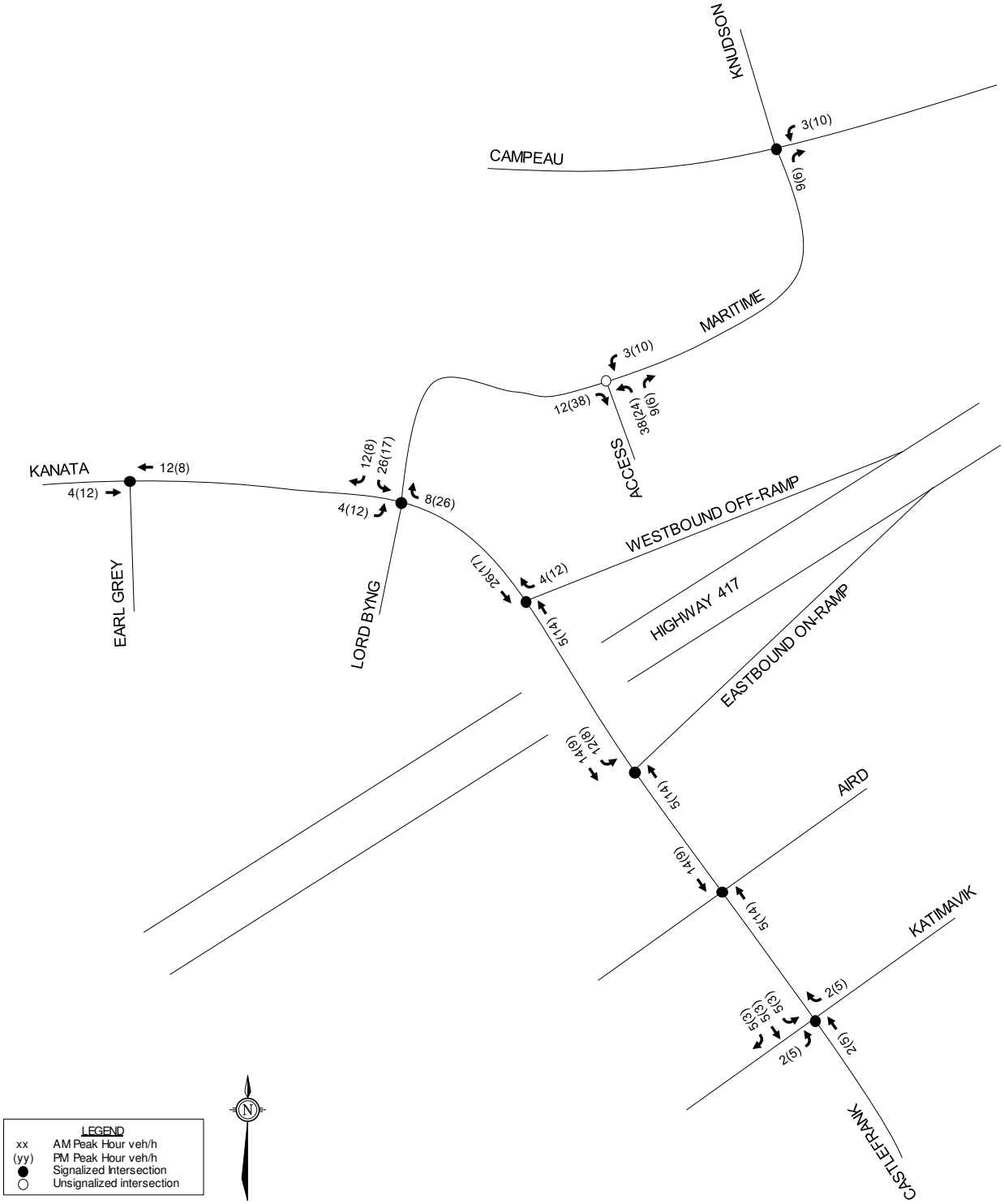


Figure 7: Site Generated Traffic Volumes

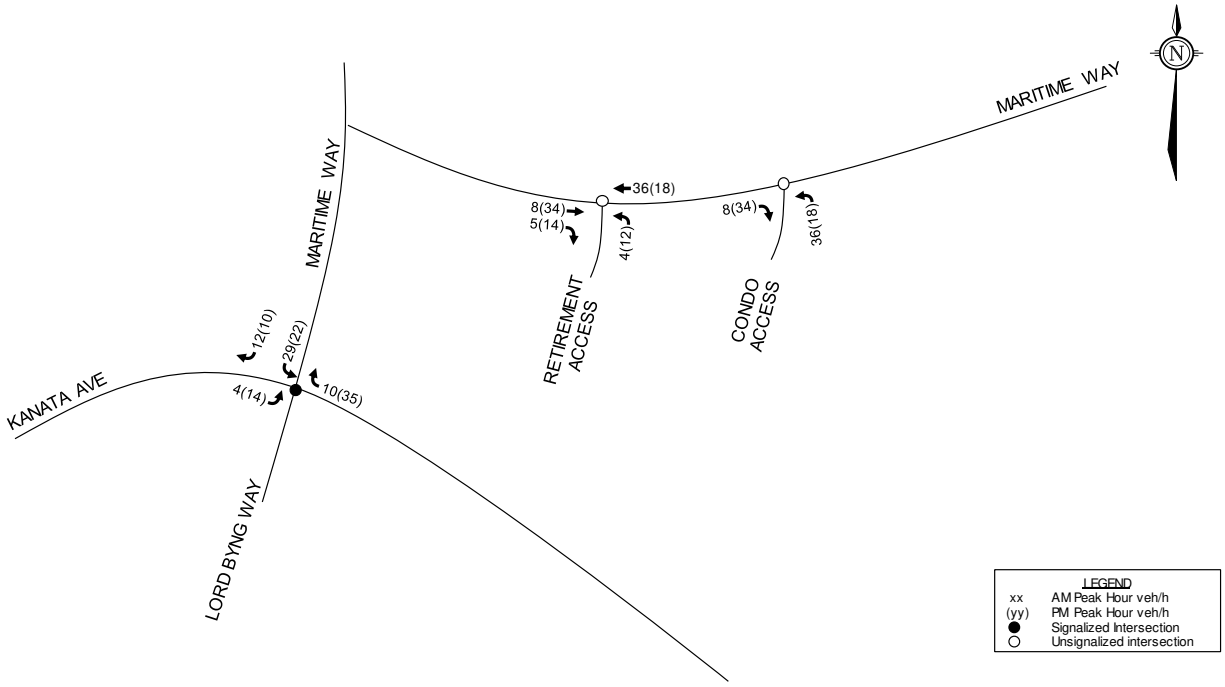


Figure 8: Total Traffic Volumes

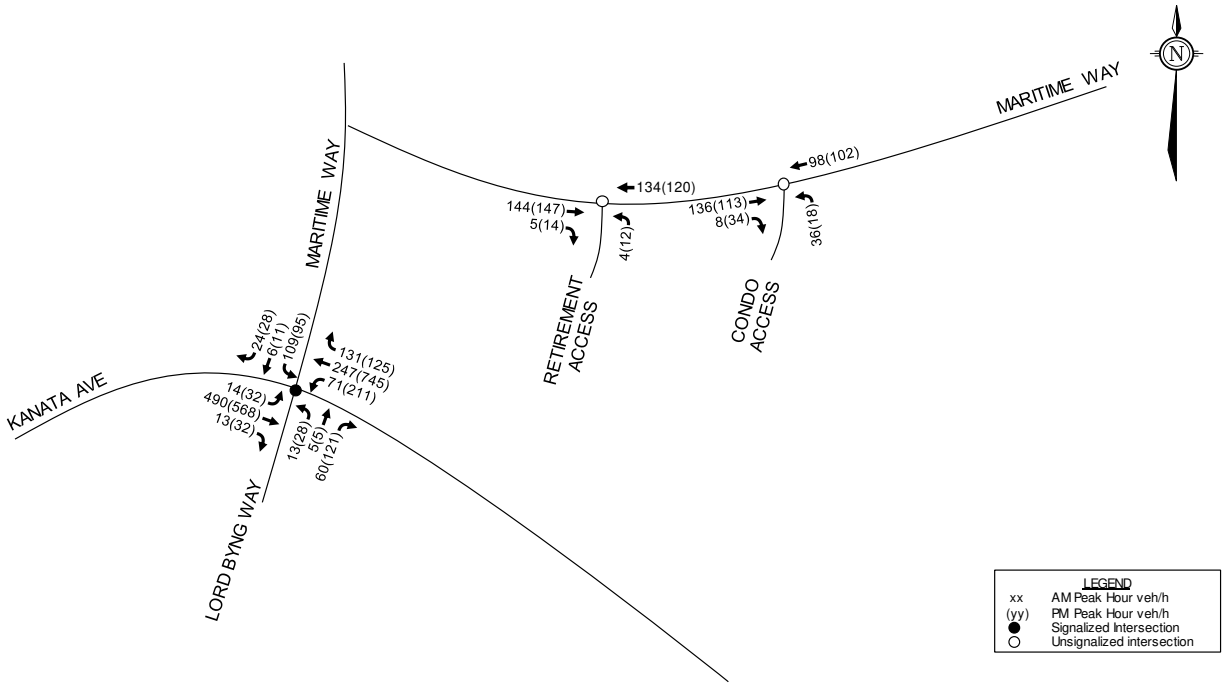


Figure 9: Projected Site-Generated Traffic

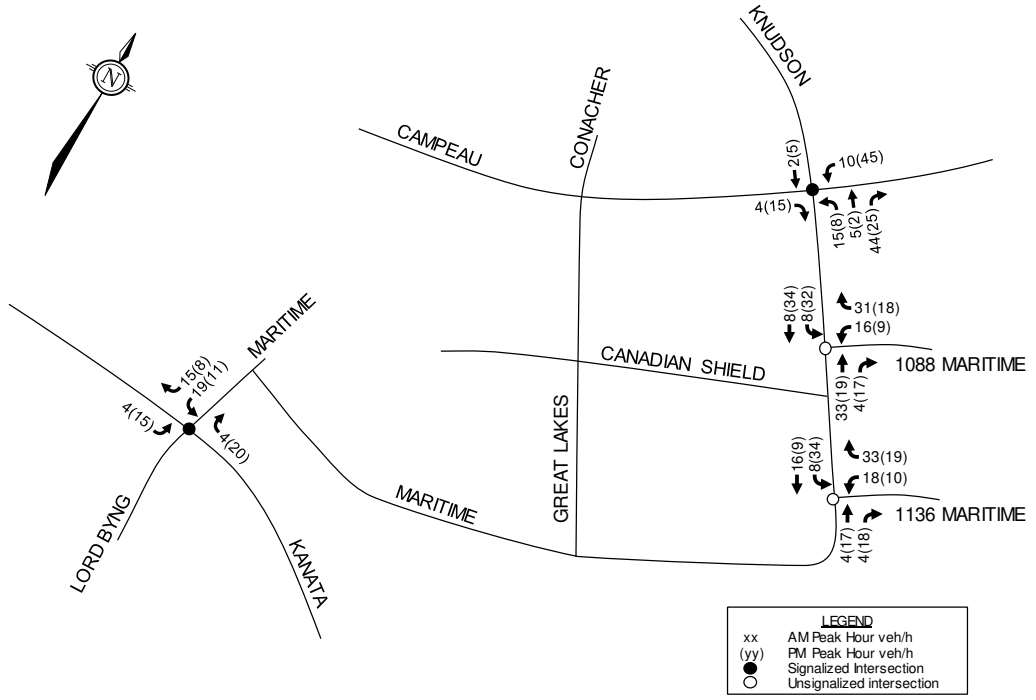
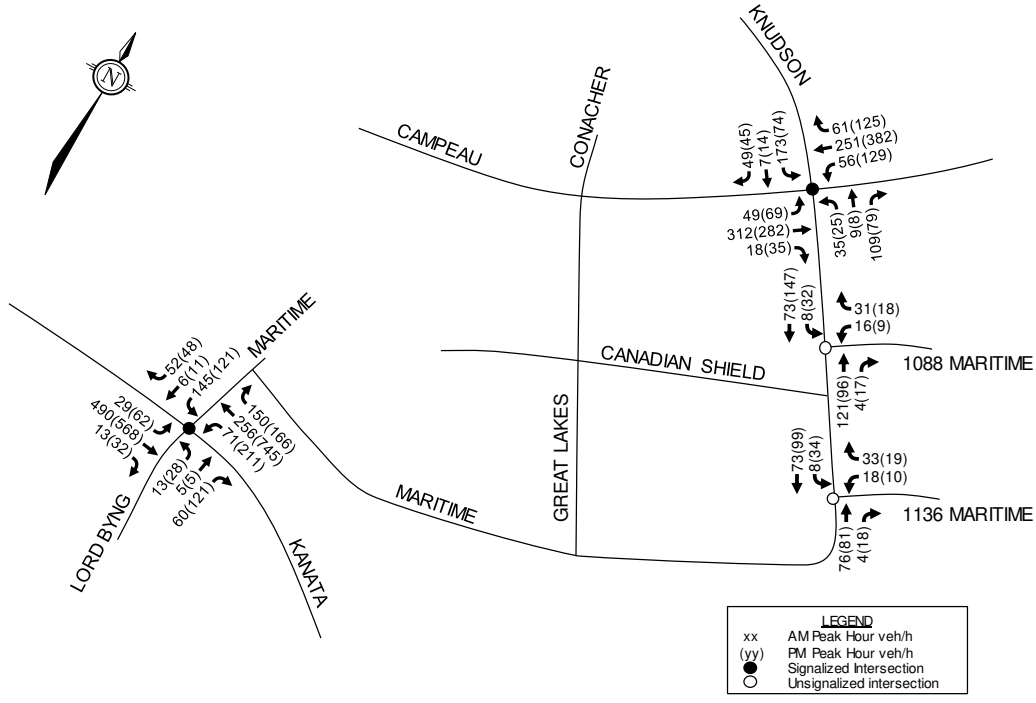
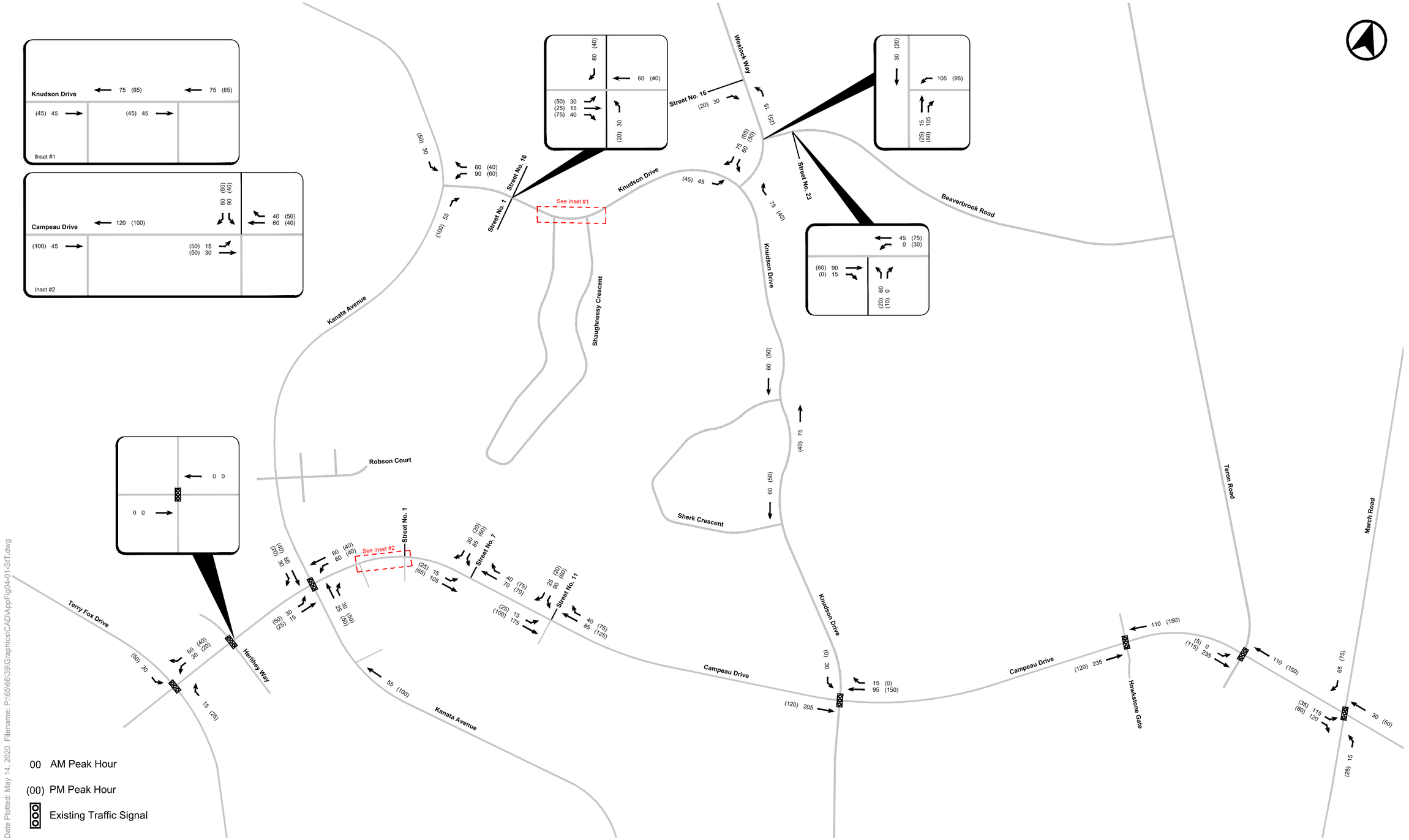


Figure 10: Total Traffic





Date Plotted: May 14, 2020 Filename: P:\6566\39\Graphics\CAD\AppFig\04-01-Str.dwg

APPENDIX C FIGURE 4 SITE TRAFFIC VOLUMES

Figure 6: Percent Assignment

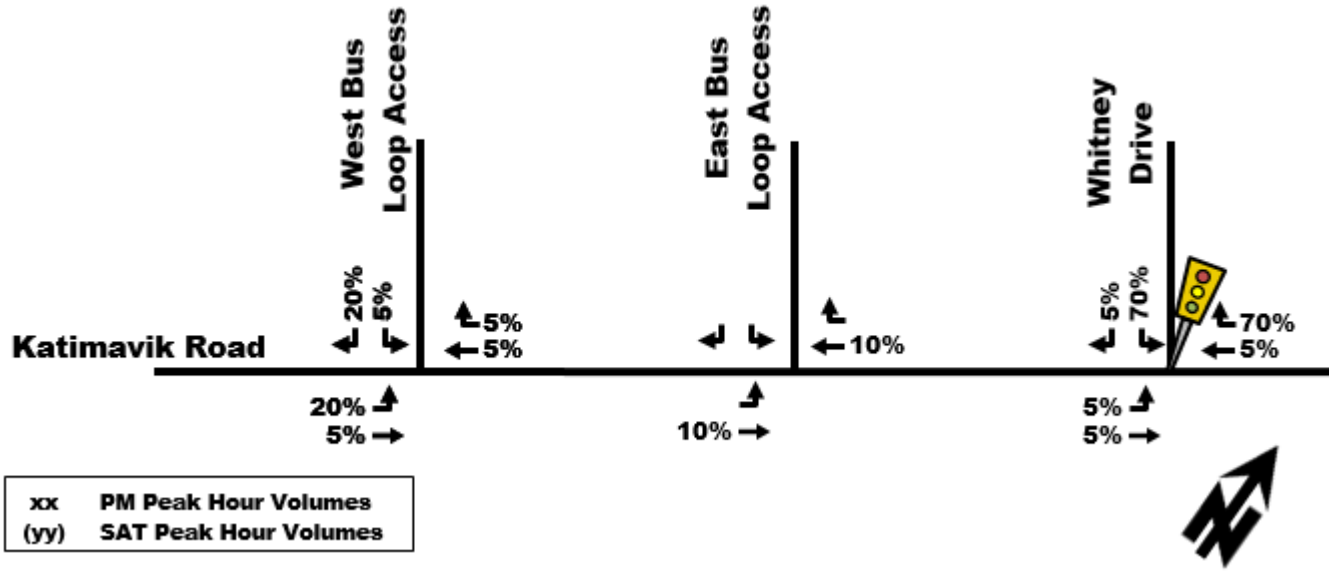
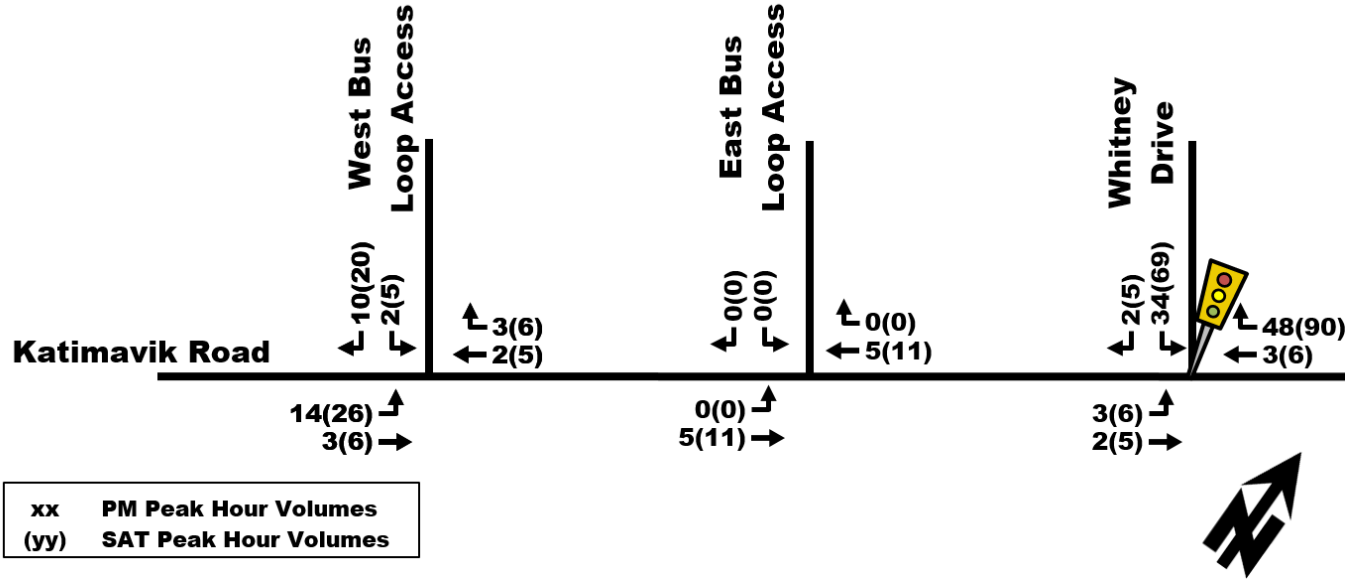


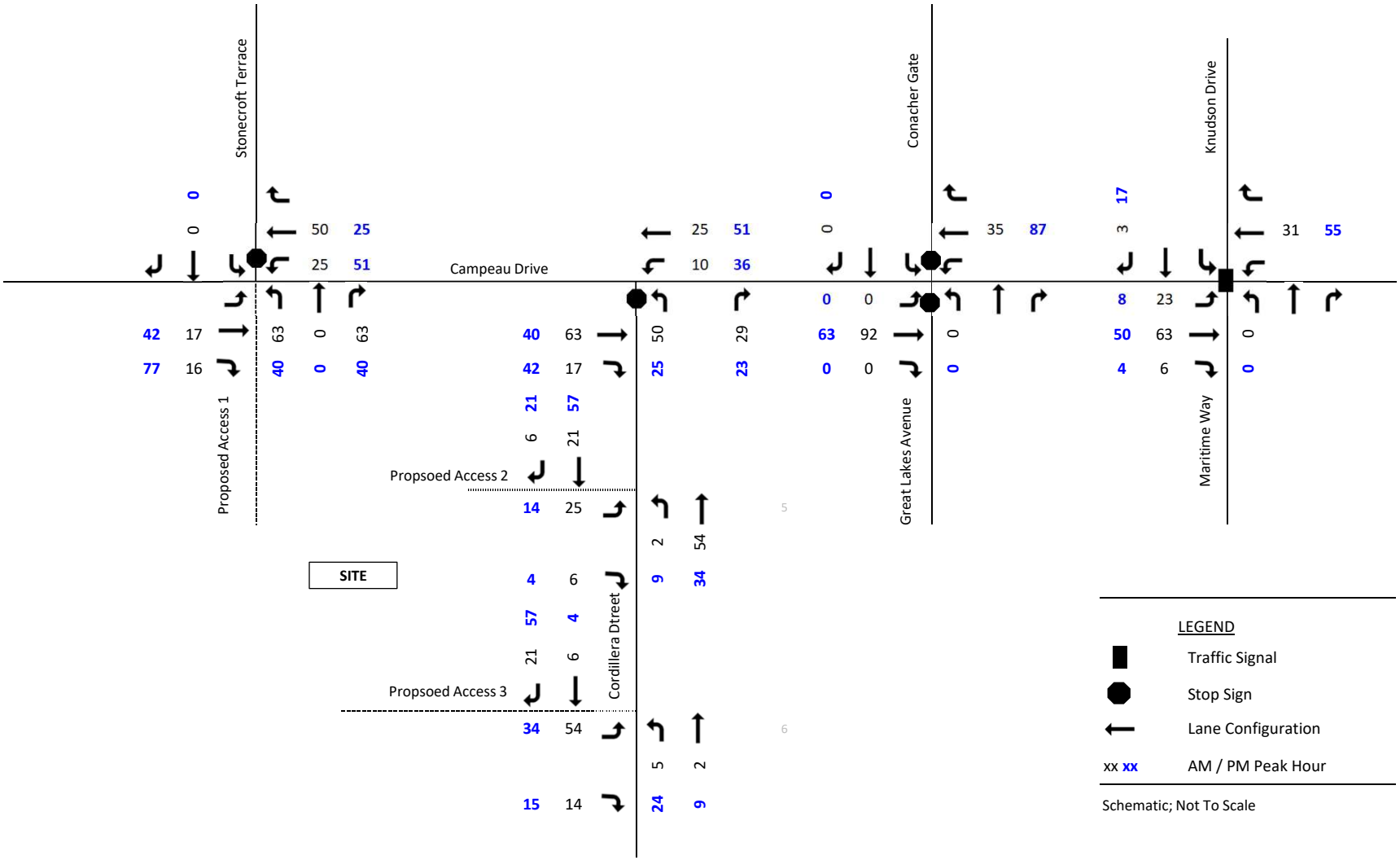
Figure 7: Site Generated Traffic Volumes



3.4. Future Background Projected Intersection Volumes

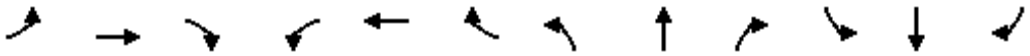
The future background traffic for the 2017 horizon year was projected by adding 1% background growth for 1 year to the through movements along Katimavik Road. The future background traffic for the 2022 horizon year was projected by adding 1% background growth for 6 years to the through movements along Katimavik Road. The future background traffic volumes for the 2017 and 2022 are illustrated in *Figure 8* and *Figure 9*, respectively.

Figure 7: Site Traffic Assignment, Weekday AM and PM Peak Hours



APPENDIX G

Synchro Analysis Reports – Existing/Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	6	36	100	2	19	85	228	115	12	419	16
Future Volume (vph)	19	6	36	100	2	19	85	228	115	12	419	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	20.0		0.0	40.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	25.0			40.0			75.0			55.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.98		0.99	0.98		1.00	0.99		1.00	1.00	
Frt		0.872			0.863			0.950			0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1262	1049	0	1616	1509	0	1417	1645	0	1478	1745	0
Flt Permitted	0.742			0.726			0.374			0.536		
Satd. Flow (perm)	984	1049	0	1228	1509	0	557	1645	0	833	1745	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40			21			53			3	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		119.6			99.0			110.4			236.0	
Travel Time (s)		8.6			7.1			7.9			17.0	
Confl. Peds. (#/hr)	1		3	3		1	3		1	1		3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	37%	2%	56%	7%	2%	2%	22%	4%	5%	17%	2%	44%
Adj. Flow (vph)	21	7	40	111	2	21	94	253	128	13	466	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	47	0	111	23	0	94	381	0	13	484	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Detector Phase	8	8		4	4		1	6		2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	28.3	28.3		28.3	28.3		11.3	33.3		33.3	33.3	
Total Split (s)	28.0	28.0		28.0	28.0		14.0	62.0		48.0	48.0	
Total Split (%)	31.1%	31.1%		31.1%	31.1%		15.6%	68.9%		53.3%	53.3%	
Maximum Green (s)	21.7	21.7		21.7	21.7		7.7	55.7		41.7	41.7	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.3	6.3		6.3	6.3	
Lead/Lag							Lead			Lag	Lag	
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	None	None		None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0			20.0		20.0	20.0	
Pedestrian Calls (#/hr)	10	10		10	10			10		10	10	
Act Effct Green (s)	14.4	14.4		14.4	14.4		66.3	67.5		56.6	56.6	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.74	0.75		0.63	0.63	
v/c Ratio	0.13	0.23		0.57	0.09		0.20	0.31		0.02	0.44	
Control Delay	31.9	14.6		45.3	13.8		6.0	4.9		11.9	14.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	31.9	14.6		45.3	13.8		6.0	4.9		11.9	14.4	
LOS	C	B		D	B		A	A		B	B	
Approach Delay		20.0			39.9			5.1			14.3	
Approach LOS		B			D			A			B	
90th %ile Green (s)	21.7	21.7		21.7	21.7		7.7	55.7		41.7	41.7	
90th %ile Term Code	Ped	Ped		Ped	Ped		Max	Coord		Coord	Coord	
70th %ile Green (s)	15.9	15.9		15.9	15.9		8.2	61.5		47.0	47.0	
70th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
50th %ile Green (s)	13.4	13.4		13.4	13.4		7.3	64.0		50.4	50.4	
50th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
30th %ile Green (s)	10.9	10.9		10.9	10.9		6.5	66.5		53.7	53.7	
30th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
10th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	83.7		83.7	83.7	
10th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Coord		Coord	Coord	
Stops (vph)	18	14		90	8		23	77		6	246	
Fuel Used(l)	1	1		14	2		3	10		1	20	
CO Emissions (g/hr)	20	24		257	40		51	192		10	374	
NOx Emissions (g/hr)	4	5		50	8		10	37		2	72	
VOC Emissions (g/hr)	5	5		59	9		12	44		2	86	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	3.2	1.1		18.2	0.3		3.5	12.2		1.0	47.2	
Queue Length 95th (m)	8.7	9.3		31.3	6.1		12.3	35.6		4.4	90.2	
Internal Link Dist (m)		95.6			75.0			86.4			212.0	
Turn Bay Length (m)	20.0			40.0			35.0			35.0		
Base Capacity (vph)	237	283		296	379		484	1247		523	1097	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.09	0.17		0.38	0.06		0.19	0.31		0.02	0.44	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 40 (44%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 13.9		Intersection LOS: B	
Intersection Capacity Utilization 59.3%		ICU Level of Service B	
Analysis Period (min) 15			

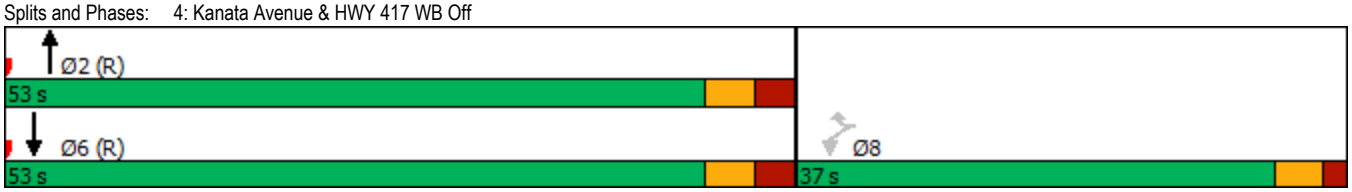
Splits and Phases: 3: Kanata Avenue & Lord Byng Way/Maritime Way

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	217	183	277	0	0	661
Future Volume (vph)	217	183	277	0	0	661
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1695	1334	1717	0	0	3325
Flt Permitted	0.950					
Satd. Flow (perm)	1695	1334	1717	0	0	3325
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		203				
Link Speed (k/h)	50		50			50
Link Distance (m)	332.8		126.6			114.0
Travel Time (s)	24.0		9.1			8.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	16%	6%	0%	0%	4%
Adj. Flow (vph)	241	203	308	0	0	734
Shared Lane Traffic (%)						
Lane Group Flow (vph)	241	203	308	0	0	734
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)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
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)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+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)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA			NA
Protected Phases			2			6
Permitted Phases	8	8				
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0			10.0
Minimum Split (s)	23.0	23.0	28.1			24.1
Total Split (s)	37.0	37.0	53.0			53.0
Total Split (%)	41.1%	41.1%	58.9%			58.9%
Maximum Green (s)	32.0	32.0	46.9			46.9
Yellow Time (s)	3.3	3.3	3.3			3.3
All-Red Time (s)	1.7	1.7	2.8			2.8
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	6.1			6.1
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)	7.0	7.0	7.0			
Flash Dont Walk (s)	11.0	11.0	15.0			
Pedestrian Calls (#/hr)	10	10	10			
Act Effct Green (s)	18.2	18.2	60.7			60.7
Actuated g/C Ratio	0.20	0.20	0.67			0.67
v/c Ratio	0.70	0.47	0.27			0.33
Control Delay	44.1	7.9	3.4			6.4
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	44.1	7.9	3.4			6.4
LOS	D	A	A			A
Approach Delay	27.6		3.4			6.4
Approach LOS	C		A			A
90th %ile Green (s)	24.9	24.9	54.0			54.0
90th %ile Term Code	Gap	Gap	Coord			Coord
70th %ile Green (s)	21.0	21.0	57.9			57.9
70th %ile Term Code	Gap	Gap	Coord			Coord
50th %ile Green (s)	18.2	18.2	60.7			60.7
50th %ile Term Code	Gap	Gap	Coord			Coord
30th %ile Green (s)	15.4	15.4	63.5			63.5
30th %ile Term Code	Gap	Gap	Coord			Coord
10th %ile Green (s)	11.5	11.5	67.4			67.4
10th %ile Term Code	Gap	Gap	Coord			Coord
Stops (vph)	194	23	37			239
Fuel Used(l)	19	7	5			23
CO Emissions (g/hr)	345	138	91			422
NOx Emissions (g/hr)	67	27	18			81
VOC Emissions (g/hr)	80	32	21			97
Dilemma Vehicles (#)	0	0	0			0
Queue Length 50th (m)	39.1	0.0	6.7			24.3
Queue Length 95th (m)	57.7	15.4	9.0			37.6
Internal Link Dist (m)	308.8		102.6			90.0
Turn Bay Length (m)						
Base Capacity (vph)	602	605	1158			2242
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	0.40	0.34	0.27			0.33

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 35 (39%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 12.1		Intersection LOS: B	
Intersection Capacity Utilization 43.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Kanata Avenue & HWY 417 WB Off



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
Lane Configurations							
Traffic Volume (vph)	0	0	253	196	332	414	
Future Volume (vph)	0	0	253	196	332	414	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	0.0	0.0		50.0	0.0		
Storage Lanes	0	0		1	1		
Taper Length (m)	7.6				7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor				0.98	1.00		
Frt				0.850			
Flt Protected					0.950		
Satd. Flow (prot)	0	0	1685	1502	1679	1750	
Flt Permitted					0.538		
Satd. Flow (perm)	0	0	1685	1468	949	1750	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)				218			
Link Speed (k/h)	48		50			50	
Link Distance (m)	278.4		119.2			126.6	
Travel Time (s)	20.9		8.6			9.1	
Confl. Peds. (#/hr)				1	1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehicles (%)	0%	0%	8%	3%	3%	4%	
Adj. Flow (vph)	0	0	281	218	369	460	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	281	218	369	460	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(m)	0.0		3.7			3.7	
Link Offset(m)	0.0		0.0			0.0	
Crosswalk Width(m)	4.9		4.9			4.9	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)	24	14		14	24		
Number of Detectors			2	1	1	2	
Detector Template			Thru	Right	Left	Thru	
Leading Detector (m)			30.5	6.1	6.1	30.5	
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)			1.8	6.1	6.1	1.8	
Detector 1 Type			Cl+Ex	Cl+Ex	Cl+Ex	Cl+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)			28.7			28.7	
Detector 2 Size(m)			1.8			1.8	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type			NA	Perm	pm+pt	NA	
Protected Phases			2		1	6	4
Permitted Phases				2	6		
Detector Phase			2	2	1	6	
Switch Phase							
Minimum Initial (s)			10.0	10.0	5.0	10.0	5.0
Minimum Split (s)			23.7	23.7	10.7	23.7	27.0
Total Split (s)			50.0	50.0	12.0	62.0	28.0
Total Split (%)			55.6%	55.6%	13.3%	68.9%	31%
Maximum Green (s)			44.3	44.3	6.3	56.3	23.0
Yellow Time (s)			3.3	3.3	3.3	3.3	3.0
All-Red Time (s)			2.4	2.4	2.4	2.4	2.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
Lost Time Adjust (s)			0.0	0.0	0.0	0.0	
Total Lost Time (s)			5.7	5.7	5.7	5.7	
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?			Yes	Yes	Yes		
Vehicle Extension (s)			3.0	3.0	3.0	3.0	3.0
Recall Mode			C-Max	C-Max	None	C-Max	None
Walk Time (s)			7.0	7.0			7.0
Flash Dont Walk (s)			11.0	11.0			15.0
Pedestrian Calls (#/hr)			10	10			10
Act Effct Green (s)			66.2	66.2	78.9	83.5	
Actuated g/C Ratio			0.74	0.74	0.88	0.93	
v/c Ratio			0.23	0.19	0.42	0.28	
Control Delay			6.0	1.8	4.0	2.5	
Queue Delay			0.0	0.0	0.1	0.0	
Total Delay			6.0	1.8	4.1	2.5	
LOS			A	A	A	A	
Approach Delay			4.2			3.2	
Approach LOS			A			A	
90th %ile Green (s)			44.3	44.3	7.3	57.3	22.0
90th %ile Term Code			Coord	Coord	Max	Coord	Ped
70th %ile Green (s)			71.2	71.2	7.4	84.3	0.0
70th %ile Term Code			Coord	Coord	Gap	Coord	Skip
50th %ile Green (s)			71.5	71.5	7.1	84.3	0.0
50th %ile Term Code			Coord	Coord	Gap	Coord	Skip
30th %ile Green (s)			71.9	71.9	6.7	84.3	0.0
30th %ile Term Code			Coord	Coord	Gap	Coord	Skip
10th %ile Green (s)			72.3	72.3	6.3	84.3	0.0
10th %ile Term Code			Coord	Coord	Gap	Coord	Skip
Stops (vph)			83	29	67	66	
Fuel Used(l)			6	3	7	7	
CO Emissions (g/hr)			110	59	121	135	
NOx Emissions (g/hr)			21	11	23	26	
VOC Emissions (g/hr)			25	14	28	31	
Dilemma Vehicles (#)			0	0	0	0	
Queue Length 50th (m)			4.9	0.0	0.8	0.0	
Queue Length 95th (m)			56.0	16.7	31.2	37.5	
Internal Link Dist (m)	254.4		95.2			102.6	
Turn Bay Length (m)				50.0			
Base Capacity (vph)			1240	1138	888	1623	
Starvation Cap Reductn			0	0	54	59	
Spillback Cap Reductn			0	0	0	0	
Storage Cap Reductn			0	0	0	0	
Reduced v/c Ratio			0.23	0.19	0.44	0.29	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 42 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.42			
Intersection Signal Delay: 3.6		Intersection LOS: A	
Intersection Capacity Utilization 43.9%		ICU Level of Service A	
Analysis Period (min) 15			

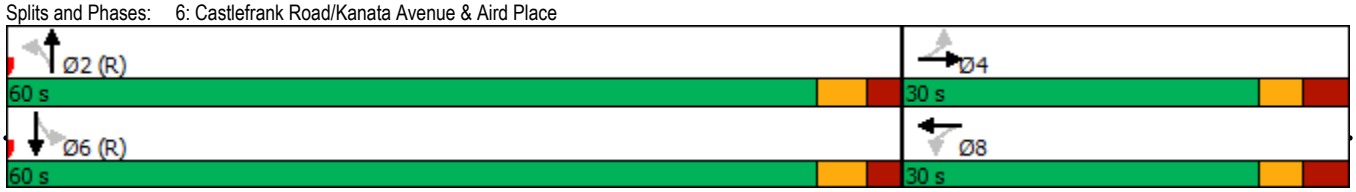
Splits and Phases: 5: Kanata Avenue & HWY 417 EB On

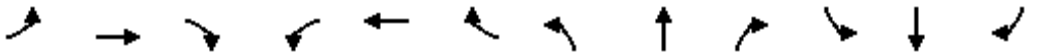
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	6	18	19	6	61	41	444	36	52	361	41
Future Volume (vph)	45	6	18	19	6	61	41	444	36	52	361	41
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.6			7.6			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97			0.96		0.99	1.00		0.99	1.00	
Frt		0.965			0.904			0.989			0.985	
Flt Protected		0.969			0.989		0.950			0.950		
Satd. Flow (prot)	0	1218	0	0	1463	0	1145	1728	0	1662	1705	0
Flt Permitted		0.787			0.918		0.489			0.437		
Satd. Flow (perm)	0	973	0	0	1348	0	584	1728	0	761	1705	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			68			8			12	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		125.4			132.9			95.7			119.2	
Travel Time (s)		11.3			12.0			6.9			8.6	
Confl. Peds. (#/hr)	14		18	18		14	9		6	6		9
Confl. Bikes (#/hr)			1						1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	33%	67%	39%	11%	50%	2%	51%	4%	3%	4%	5%	2%
Adj. Flow (vph)	50	7	20	21	7	68	46	493	40	58	401	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	77	0	0	96	0	46	533	0	58	447	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.2	28.2		28.2	28.2		24.7	24.7		24.7	24.7	
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Maximum Green (s)	23.8	23.8		23.8	23.8		54.3	54.3		54.3	54.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	3.2	3.2		3.2	3.2		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.2			6.2		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	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	10	10		10	10		10	10		10	10	
Act Effct Green (s)		13.3			13.3		69.2	69.2		69.2	69.2	
Actuated g/C Ratio		0.15			0.15		0.77	0.77		0.77	0.77	
v/c Ratio		0.48			0.37		0.10	0.40		0.10	0.34	
Control Delay		36.4			16.8		5.8	6.5		6.4	6.2	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.2	
Total Delay		36.4			16.8		5.8	6.5		6.4	6.4	
LOS		D			B		A	A		A	A	
Approach Delay		36.4			16.8			6.4			6.4	
Approach LOS		D			B			A			A	
90th %ile Green (s)	22.0	22.0		22.0	22.0		56.1	56.1		56.1	56.1	
90th %ile Term Code	Ped	Ped		Ped	Ped		Coord	Coord		Coord	Coord	
70th %ile Green (s)	13.6	13.6		13.6	13.6		64.5	64.5		64.5	64.5	
70th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord		Coord	Coord	
50th %ile Green (s)	10.9	10.9		10.9	10.9		67.2	67.2		67.2	67.2	
50th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord		Coord	Coord	
30th %ile Green (s)	10.0	10.0		10.0	10.0		68.1	68.1		68.1	68.1	
30th %ile Term Code	Min	Min		Min	Min		Coord	Coord		Coord	Coord	
10th %ile Green (s)	0.0	0.0		0.0	0.0		84.3	84.3		84.3	84.3	
10th %ile Term Code	Skip	Skip		Skip	Skip		Coord	Coord		Coord	Coord	
Stops (vph)		48			30		13	171		16	111	
Fuel Used(l)		4			3		1	11		1	9	
CO Emissions (g/hr)		66			51		16	197		22	167	
NOx Emissions (g/hr)		13			10		3	38		4	32	
VOC Emissions (g/hr)		15			12		4	45		5	38	
Dilemma Vehicles (#)		0			0		0	0		0	0	
Queue Length 50th (m)		9.5			4.4		1.8	26.8		2.8	23.7	
Queue Length 95th (m)		20.2			15.7		7.5	67.7		7.9	38.1	
Internal Link Dist (m)		101.4			108.9			71.7			95.2	
Turn Bay Length (m)							30.0			50.0		
Base Capacity (vph)		271			406		449	1330		585	1313	
Starvation Cap Reductn		0			0		0	0		0	306	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.28			0.24		0.10	0.40		0.10	0.44	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 17 (19%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 9.0		Intersection LOS: A	
Intersection Capacity Utilization 64.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: Castlefrank Road/Kanata Avenue & Aird Place





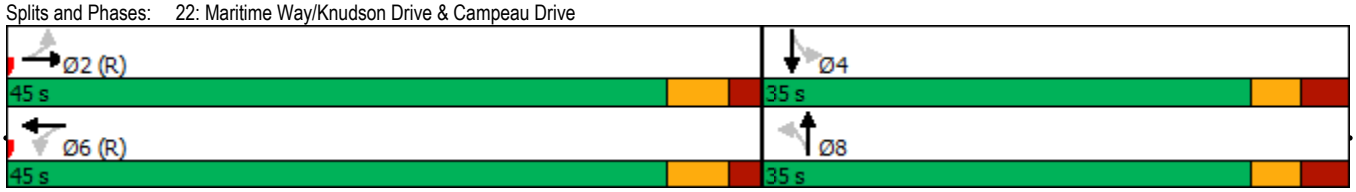
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	331	3	45	272	52	2	10	87	112	7	43
Future Volume (vph)	23	331	3	45	272	52	2	10	87	112	7	43
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	40.0			55.0			40.0			35.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	0.99		0.99	0.96		0.98	0.97	
Frt		0.999			0.976			0.865			0.871	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1727	0	1695	1587	0	1695	1477	0	1695	1490	0
Flt Permitted	0.543			0.536			0.720			0.687		
Satd. Flow (perm)	957	1727	0	946	1587	0	1274	1477	0	1196	1490	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			17			97			48	
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		250.4			203.8			223.0			144.1	
Travel Time (s)		18.0			14.7			16.1			13.0	
Confl. Peds. (#/hr)	12		11	11		12	4		12	12		4
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	5%	33%	2%	11%	12%	2%	2%	2%	2%	14%	2%
Adj. Flow (vph)	26	368	3	50	302	58	2	11	97	124	8	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	371	0	50	360	0	2	108	0	124	56	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.7	27.7		27.7	27.7		24.0	24.0		24.0	24.0	
Total Split (s)	45.0	45.0		45.0	45.0		35.0	35.0		35.0	35.0	
Total Split (%)	56.3%	56.3%		56.3%	56.3%		43.8%	43.8%		43.8%	43.8%	
Maximum Green (s)	39.3	39.3		39.3	39.3		29.0	29.0		29.0	29.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	

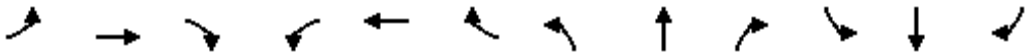
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7		5.7	5.7		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	10	10		10	10		10	10		10	10	
Act Effct Green (s)	58.4	58.4		58.4	58.4		14.2	14.2		14.2	14.2	
Actuated g/C Ratio	0.73	0.73		0.73	0.73		0.18	0.18		0.18	0.18	
v/c Ratio	0.04	0.29		0.07	0.31		0.01	0.32		0.58	0.18	
Control Delay	5.7	6.4		5.9	6.4		24.0	9.8		40.7	11.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	5.7	6.4		5.9	6.4		24.0	9.8		40.7	11.1	
LOS	A	A		A	A		C	A		D	B	
Approach Delay		6.4			6.3			10.0			31.5	
Approach LOS		A			A			B			C	
90th %ile Green (s)	48.2	48.2		48.2	48.2		20.1	20.1		20.1	20.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
70th %ile Green (s)	52.0	52.0		52.0	52.0		16.3	16.3		16.3	16.3	
70th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
50th %ile Green (s)	54.6	54.6		54.6	54.6		13.7	13.7		13.7	13.7	
50th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
30th %ile Green (s)	57.3	57.3		57.3	57.3		11.0	11.0		11.0	11.0	
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
10th %ile Green (s)	74.3	74.3		74.3	74.3		0.0	0.0		0.0	0.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		Skip	Skip		Skip	Skip	
Stops (vph)	8	123		16	118		3	23		99	15	
Fuel Used(l)	1	12		1	11		0	9		7	1	
CO Emissions (g/hr)	15	230		27	196		5	174		123	26	
NOx Emissions (g/hr)	3	44		5	38		1	34		24	5	
VOC Emissions (g/hr)	4	53		6	45		1	40		28	6	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	1.1	19.4		2.2	18.0		0.3	1.4		17.6	1.0	
Queue Length 95th (m)	4.4	41.2		7.2	39.6		1.9	12.7		31.1	9.3	
Internal Link Dist (m)		226.4			179.8			199.0			120.1	
Turn Bay Length (m)	30.0			30.0			40.0			35.0		
Base Capacity (vph)	699	1261		690	1163		461	597		433	570	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.04	0.29		0.07	0.31		0.00	0.18		0.29	0.10	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.58
Intersection Signal Delay: 10.9 Intersection LOS: B
Intersection Capacity Utilization 54.8% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 22: Maritime Way/Knudson Drive & Campeau Drive

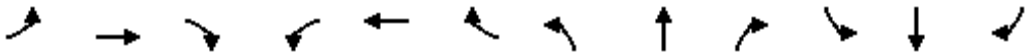




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	280	11	23	366	2	20	0	32	4	2	10
Future Volume (Veh/h)	4	280	11	23	366	2	20	0	32	4	2	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	4	311	12	26	407	2	22	0	36	4	2	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					251							
pX, platoon unblocked												
vC, conflicting volume	409			323			797	786	317	821	791	408
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	409			323			797	786	317	821	791	408
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			92	100	95	99	99	98
cM capacity (veh/h)	1150			1237			292	316	724	274	314	643

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	327	435	58	17
Volume Left	4	26	22	4
Volume Right	12	2	36	11
cSH	1150	1237	464	446
Volume to Capacity	0.00	0.02	0.13	0.04
Queue Length 95th (m)	0.1	0.5	3.2	0.9
Control Delay (s)	0.1	0.7	13.9	13.4
Lane LOS	A	A	B	B
Approach Delay (s)	0.1	0.7	13.9	13.4
Approach LOS			B	B

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	46.7%	ICU Level of Service	A	
Analysis Period (min)	15			

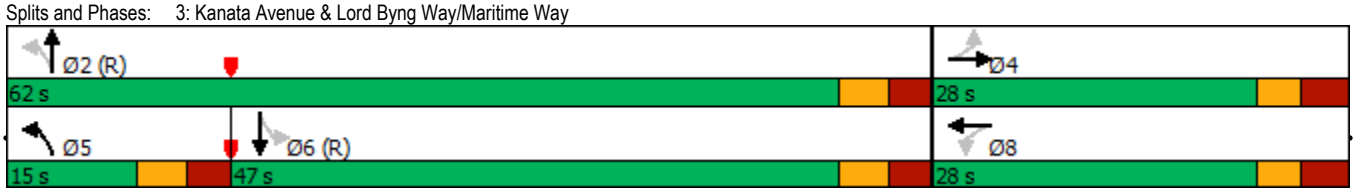


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	3	78	87	9	26	136	617	125	37	472	25
Future Volume (vph)	30	3	78	87	9	26	136	617	125	37	472	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	20.0		0.0	40.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	25.0			40.0			75.0			55.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	0.97		0.99	0.97		1.00	1.00		1.00	1.00	
Frt		0.855			0.888			0.975			0.992	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1262	1248	0	1695	1535	0	1503	1732	0	1695	1752	0
Flt Permitted	0.732			0.699			0.323			0.354		
Satd. Flow (perm)	952	1248	0	1238	1535	0	510	1732	0	631	1752	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		87			29			21			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		119.6			99.0			110.4			236.0	
Travel Time (s)		8.6			7.1			7.9			17.0	
Confl. Peds. (#/hr)	11		4	4		11	3		3	3		3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	37%	2%	22%	2%	2%	2%	15%	2%	2%	2%	2%	20%
Adj. Flow (vph)	33	3	87	97	10	29	151	686	139	41	524	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	90	0	97	39	0	151	825	0	41	552	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	28.3	28.3		28.3	28.3		11.3	33.3		33.3	33.3	
Total Split (s)	28.0	28.0		28.0	28.0		15.0	62.0		47.0	47.0	
Total Split (%)	31.1%	31.1%		31.1%	31.1%		16.7%	68.9%		52.2%	52.2%	
Maximum Green (s)	21.7	21.7		21.7	21.7		8.7	55.7		40.7	40.7	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.3	6.3		6.3	6.3	
Lead/Lag							Lead			Lag	Lag	
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	None	None		None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0			20.0		20.0	20.0	
Pedestrian Calls (#/hr)	10	10		10	10			10		10	10	
Act Effct Green (s)	13.7	13.7		13.7	13.7		66.9	68.2		52.8	52.8	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.74	0.76		0.59	0.59	
v/c Ratio	0.23	0.34		0.51	0.15		0.32	0.63		0.11	0.54	
Control Delay	35.2	11.1		39.5	12.1		5.8	8.2		13.1	16.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.1		0.0	0.0	
Total Delay	35.2	11.1		39.5	12.1		5.8	8.3		13.1	16.3	
LOS	D	B		D	B		A	A		B	B	
Approach Delay		17.6			31.7			7.9			16.1	
Approach LOS		B			C			A			B	
90th %ile Green (s)	21.7	21.7		21.7	21.7		8.7	55.7		40.7	40.7	
90th %ile Term Code	Ped	Ped		Ped	Ped		Max	Coord		Coord	Coord	
70th %ile Green (s)	14.7	14.7		14.7	14.7		9.4	62.7		47.0	47.0	
70th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
50th %ile Green (s)	12.3	12.3		12.3	12.3		8.2	65.1		50.6	50.6	
50th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
30th %ile Green (s)	10.0	10.0		10.0	10.0		7.2	67.4		53.9	53.9	
30th %ile Term Code	Min	Min		Min	Min		Gap	Coord		Coord	Coord	
10th %ile Green (s)	0.0	0.0		0.0	0.0		5.5	83.7		71.9	71.9	
10th %ile Term Code	Skip	Skip		Skip	Skip		Gap	Coord		Coord	Coord	
Stops (vph)	27	18		78	16		33	310		21	312	
Fuel Used(l)	2	2		12	4		4	27		2	24	
CO Emissions (g/hr)	33	38		216	67		79	511		31	454	
NOx Emissions (g/hr)	6	7		42	13		15	99		6	88	
VOC Emissions (g/hr)	8	9		50	15		18	118		7	105	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	5.2	0.5		16.1	1.9		3.3	28.6		3.1	56.4	
Queue Length 95th (m)	12.1	11.7		27.7	8.9		m13.4	126.1		10.5	110.0	
Internal Link Dist (m)		95.6			75.0			86.4			212.0	
Turn Bay Length (m)	20.0			40.0			35.0			35.0		
Base Capacity (vph)	229	366		298	392		476	1317		370	1029	
Starvation Cap Reductn	0	0		0	0		0	38		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.14	0.25		0.33	0.10		0.32	0.65		0.11	0.54	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 31 (34%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 13.0		Intersection LOS: B	
Intersection Capacity Utilization 80.2%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Kanata Avenue & Lord Byng Way/Maritime Way

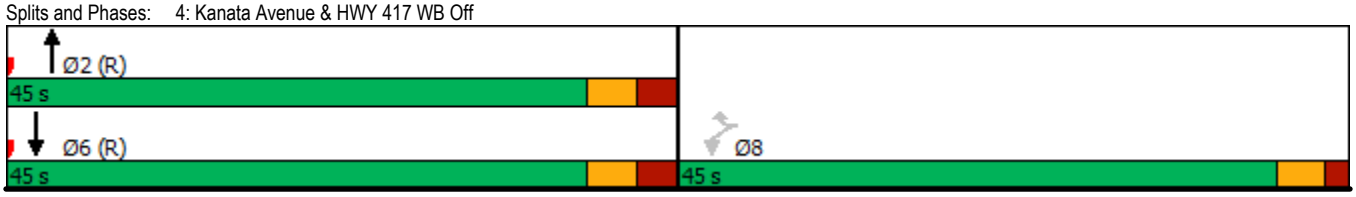


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	419	549	548	0	0	811
Future Volume (vph)	419	549	548	0	0	811
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1695	1517	1750	0	0	3357
Flt Permitted	0.950					
Satd. Flow (perm)	1695	1517	1750	0	0	3357
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		171				
Link Speed (k/h)	50		50			50
Link Distance (m)	332.8		126.6			114.0
Travel Time (s)	24.0		9.1			8.2
Confl. Bikes (#/hr)				3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	4%	0%	0%	3%
Adj. Flow (vph)	466	610	609	0	0	901
Shared Lane Traffic (%)						
Lane Group Flow (vph)	466	610	609	0	0	901
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)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
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)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+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)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA			NA
Protected Phases			2			6
Permitted Phases	8	8				
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0			10.0
Minimum Split (s)	23.0	23.0	28.1			24.1
Total Split (s)	45.0	45.0	45.0			45.0
Total Split (%)	50.0%	50.0%	50.0%			50.0%
Maximum Green (s)	40.0	40.0	38.9			38.9
Yellow Time (s)	3.3	3.3	3.3			3.3
All-Red Time (s)	1.7	1.7	2.8			2.8
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	6.1			6.1
Lead/Lag						

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)	7.0	7.0	7.0			
Flash Dont Walk (s)	11.0	11.0	15.0			
Pedestrian Calls (#/hr)	10	10	10			
Act Effct Green (s)	34.1	34.1	44.8			44.8
Actuated g/C Ratio	0.38	0.38	0.50			0.50
v/c Ratio	0.73	0.90	0.70			0.54
Control Delay	30.2	35.1	19.2			15.3
Queue Delay	0.0	0.0	0.4			0.0
Total Delay	30.2	35.1	19.6			15.3
LOS	C	D	B			B
Approach Delay	33.0		19.6			15.3
Approach LOS	C		B			B
90th %ile Green (s)	40.0	40.0	38.9			38.9
90th %ile Term Code	Max	Max	Coord			Coord
70th %ile Green (s)	40.0	40.0	38.9			38.9
70th %ile Term Code	Max	Max	Coord			Coord
50th %ile Green (s)	36.8	36.8	42.1			42.1
50th %ile Term Code	Gap	Gap	Coord			Coord
30th %ile Green (s)	31.3	31.3	47.6			47.6
30th %ile Term Code	Gap	Gap	Coord			Coord
10th %ile Green (s)	22.5	22.5	56.4			56.4
10th %ile Term Code	Gap	Gap	Coord			Coord
Stops (vph)	340	377	391			388
Fuel Used(l)	31	41	23			36
CO Emissions (g/hr)	569	756	436			661
NOx Emissions (g/hr)	110	146	84			128
VOC Emissions (g/hr)	131	174	101			152
Dilemma Vehicles (#)	0	0	0			0
Queue Length 50th (m)	64.1	69.6	84.6			36.0
Queue Length 95th (m)	91.3	#116.5	#146.5			60.3
Internal Link Dist (m)	308.8		102.6			90.0
Turn Bay Length (m)						
Base Capacity (vph)	753	769	870			1670
Starvation Cap Reductn	0	0	45			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.62	0.79	0.74			0.54

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 32 (36%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 23.7		Intersection LOS: C	
Intersection Capacity Utilization 97.5%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 4: Kanata Avenue & HWY 417 WB Off

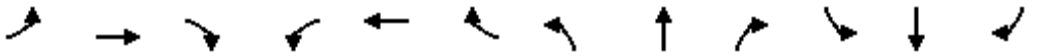


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lane Configurations							
Traffic Volume (vph)	0	0	432	178	312	764	
Future Volume (vph)	0	0	432	178	312	764	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	0.0	0.0		50.0	0.0		
Storage Lanes	0	0		1	1		
Taper Length (m)	7.6				7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor				0.98	1.00		
Frt				0.850			
Flt Protected					0.950		
Satd. Flow (prot)	0	0	1733	1517	1662	1784	
Flt Permitted					0.413		
Satd. Flow (perm)	0	0	1733	1479	722	1784	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)				198			
Link Speed (k/h)	48		50			50	
Link Distance (m)	278.4		119.2			126.6	
Travel Time (s)	20.9		8.6			9.1	
Confl. Peds. (#/hr)				2	2		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehicles (%)	0%	0%	5%	2%	4%	2%	
Adj. Flow (vph)	0	0	480	198	347	849	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	480	198	347	849	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(m)	0.0		3.7			3.7	
Link Offset(m)	0.0		0.0			0.0	
Crosswalk Width(m)	4.9		4.9			4.9	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)	24	14		14	24		
Number of Detectors			2	1	1	2	
Detector Template			Thru	Right	Left	Thru	
Leading Detector (m)			30.5	6.1	6.1	30.5	
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)			1.8	6.1	6.1	1.8	
Detector 1 Type			Cl+Ex	Cl+Ex	Cl+Ex	Cl+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)			28.7			28.7	
Detector 2 Size(m)			1.8			1.8	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type			NA	Perm	pm+pt	NA	
Protected Phases			2		1	6	8
Permitted Phases				2	6		
Detector Phase			2	2	1	6	
Switch Phase							
Minimum Initial (s)			10.0	10.0	5.0	10.0	5.0
Minimum Split (s)			23.7	23.7	10.7	23.7	27.0
Total Split (s)			50.0	50.0	12.0	62.0	28.0
Total Split (%)			55.6%	55.6%	13.3%	68.9%	31%
Maximum Green (s)			44.3	44.3	6.3	56.3	23.0
Yellow Time (s)			3.3	3.3	3.3	3.3	3.0
All-Red Time (s)			2.4	2.4	2.4	2.4	2.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lost Time Adjust (s)			0.0	0.0	0.0	0.0	
Total Lost Time (s)			5.7	5.7	5.7	5.7	
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?			Yes	Yes	Yes		
Vehicle Extension (s)			3.0	3.0	3.0	3.0	3.0
Recall Mode			C-Max	C-Max	None	C-Max	None
Walk Time (s)			7.0	7.0			7.0
Flash Dont Walk (s)			11.0	11.0			15.0
Pedestrian Calls (#/hr)			10	10			10
Act Effct Green (s)			65.4	65.4	78.9	83.5	
Actuated g/C Ratio			0.73	0.73	0.88	0.93	
v/c Ratio			0.38	0.18	0.49	0.51	
Control Delay			4.3	0.7	5.9	3.8	
Queue Delay			0.3	0.0	0.2	0.0	
Total Delay			4.6	0.7	6.1	3.8	
LOS			A	A	A	A	
Approach Delay			3.5			4.5	
Approach LOS			A			A	
90th %ile Green (s)			44.3	44.3	7.3	57.3	22.0
90th %ile Term Code			Coord	Coord	Max	Coord	Ped
70th %ile Green (s)			70.1	70.1	8.5	84.3	0.0
70th %ile Term Code			Coord	Coord	Gap	Coord	Skip
50th %ile Green (s)			70.5	70.5	8.1	84.3	0.0
50th %ile Term Code			Coord	Coord	Gap	Coord	Skip
30th %ile Green (s)			70.9	70.9	7.7	84.3	0.0
30th %ile Term Code			Coord	Coord	Gap	Coord	Skip
10th %ile Green (s)			71.4	71.4	7.2	84.3	0.0
10th %ile Term Code			Coord	Coord	Gap	Coord	Skip
Stops (vph)			113	8	66	139	
Fuel Used(l)			9	2	7	15	
CO Emissions (g/hr)			165	43	124	270	
NOx Emissions (g/hr)			32	8	24	52	
VOC Emissions (g/hr)			38	10	29	62	
Dilemma Vehicles (#)			0	0	0	0	
Queue Length 50th (m)			7.6	0.0	1.9	4.8	
Queue Length 95th (m)			66.1	3.5	35.5	83.4	
Internal Link Dist (m)	254.4		95.2			102.6	
Turn Bay Length (m)				50.0			
Base Capacity (vph)			1260	1129	713	1654	
Starvation Cap Reductn			281	0	65	6	
Spillback Cap Reductn			34	0	0	19	
Storage Cap Reductn			0	0	0	0	
Reduced v/c Ratio			0.49	0.18	0.54	0.52	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 27 (30%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.51			
Intersection Signal Delay: 4.1		Intersection LOS: A	
Intersection Capacity Utilization 97.5%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 5: Kanata Avenue & HWY 417 EB On



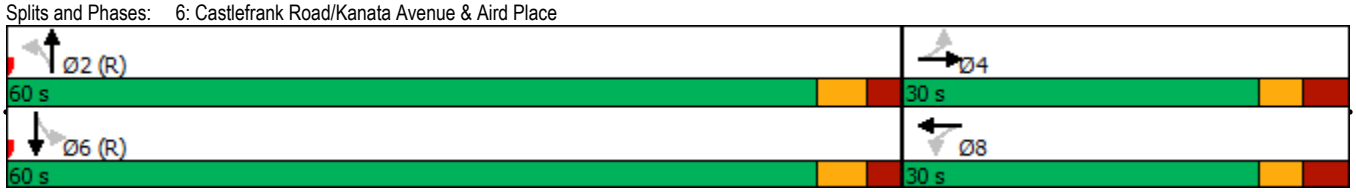
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	3	13	30	1	97	12	607	35	62	760	24
Future Volume (vph)	17	3	13	30	1	97	12	607	35	62	760	24
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.6			7.6			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.97			1.00		1.00	1.00	
Frt		0.947			0.897			0.992			0.995	
Flt Protected		0.974			0.989		0.950			0.950		
Satd. Flow (prot)	0	1625	0	0	1542	0	1695	1751	0	1695	1773	0
Flt Permitted		0.690			0.909		0.265			0.343		
Satd. Flow (perm)	0	1145	0	0	1413	0	473	1751	0	611	1773	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			108			6			3	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		125.4			132.9			95.7			119.2	
Travel Time (s)		11.3			12.0			6.9			8.6	
Confl. Peds. (#/hr)	7		6	6		7	9		5	5		9
Confl. Bikes (#/hr)									3			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	19	3	14	33	1	108	13	674	39	69	844	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	0	0	142	0	13	713	0	69	871	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	28.2	28.2		28.2	28.2		24.7	24.7		24.7	24.7	
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Maximum Green (s)	23.8	23.8		23.8	23.8		54.3	54.3		54.3	54.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	

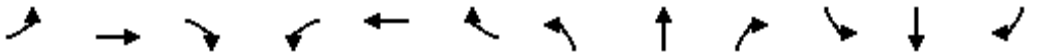
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	3.2	3.2		3.2	3.2		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.2			6.2		5.7	5.7		5.7	5.7	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	10	10		10	10		10	10		10	10	
Act Effct Green (s)		10.2			10.2		67.9	67.9		67.9	67.9	
Actuated g/C Ratio		0.11			0.11		0.75	0.75		0.75	0.75	
v/c Ratio		0.25			0.55		0.04	0.54		0.15	0.65	
Control Delay		27.1			19.4		5.1	7.7		6.0	8.2	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.1	
Total Delay		27.1			19.4		5.1	7.7		6.0	8.3	
LOS		C			B		A	A		A	A	
Approach Delay		27.1			19.4			7.7			8.2	
Approach LOS		C			B			A			A	
90th %ile Green (s)	22.0	22.0		22.0	22.0		56.1	56.1		56.1	56.1	
90th %ile Term Code	Ped	Ped		Ped	Ped		Coord	Coord		Coord	Coord	
70th %ile Green (s)	10.3	10.3		10.3	10.3		67.8	67.8		67.8	67.8	
70th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
50th %ile Green (s)	7.7	7.7		7.7	7.7		70.4	70.4		70.4	70.4	
50th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
30th %ile Green (s)	5.6	5.6		5.6	5.6		72.5	72.5		72.5	72.5	
30th %ile Term Code	Hold	Hold		Hold	Hold		Coord	Coord		Coord	Coord	
10th %ile Green (s)	5.5	5.5		5.5	5.5		72.6	72.6		72.6	72.6	
10th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
Stops (vph)		20			39		4	267		17	281	
Fuel Used(l)		1			4		0	16		1	20	
CO Emissions (g/hr)		26			80		5	291		26	375	
NOx Emissions (g/hr)		5			15		1	56		5	72	
VOC Emissions (g/hr)		6			18		1	67		6	86	
Dilemma Vehicles (#)		0			0		0	0		0	0	
Queue Length 50th (m)		3.6			5.6		0.4	34.3		2.5	40.6	
Queue Length 95th (m)		10.4			19.0		3.0	106.3		m7.6	61.3	
Internal Link Dist (m)		101.4			108.9			71.7			95.2	
Turn Bay Length (m)							30.0			50.0		
Base Capacity (vph)		313			453		356	1321		460	1337	
Starvation Cap Reductn		0			0		0	0		0	41	
Spillback Cap Reductn		0			1		0	18		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.12			0.31		0.04	0.55		0.15	0.67	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 10 (11%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 9.2 Intersection LOS: A
Intersection Capacity Utilization 73.6% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Castlefrank Road/Kanata Avenue & Aird Place



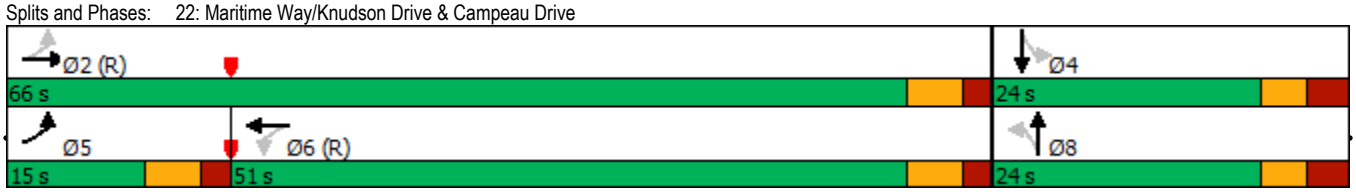


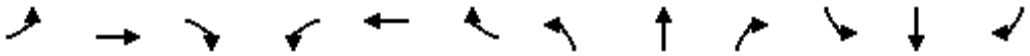
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	243	11	64	359	89	4	10	52	33	5	48
Future Volume (vph)	50	243	11	64	359	89	4	10	52	33	5	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	40.0			55.0			40.0			35.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	0.99		0.98	0.97		0.99	0.96	
Frt		0.994			0.970			0.874			0.865	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1771	0	1695	1714	0	1695	1520	0	1679	1487	0
Flt Permitted	0.389			0.587			0.719			0.712		
Satd. Flow (perm)	688	1771	0	1042	1714	0	1258	1520	0	1246	1487	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			20			58			53	
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		237.7			203.8			223.0			144.1	
Travel Time (s)		17.1			14.7			16.1			13.0	
Confl. Peds. (#/hr)	15		4	4		15	8		4	4		8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	56	270	12	71	399	99	4	11	58	37	6	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	282	0	71	498	0	4	69	0	37	59	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	10.7	27.7		27.7	27.7		24.0	24.0		24.0	24.0	
Total Split (s)	15.0	66.0		51.0	51.0		24.0	24.0		24.0	24.0	
Total Split (%)	16.7%	73.3%		56.7%	56.7%		26.7%	26.7%		26.7%	26.7%	
Maximum Green (s)	9.3	60.3		45.3	45.3		18.0	18.0		18.0	18.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7		5.7	5.7		6.0	6.0		6.0	6.0	
Lead/Lag	Lead			Lag	Lag							
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	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)		10		10	10		10	10		10	10	
Act Effct Green (s)	70.1	71.2		61.4	61.4		11.4	11.4		11.4	11.4	
Actuated g/C Ratio	0.78	0.79		0.68	0.68		0.13	0.13		0.13	0.13	
v/c Ratio	0.09	0.20		0.10	0.42		0.03	0.28		0.24	0.25	
Control Delay	3.9	3.9		8.8	10.4		37.5	23.5		38.1	14.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.9	3.9		8.8	10.4		37.5	23.5		38.1	14.3	
LOS	A	A		A	B		D	C		D	B	
Approach Delay		3.9			10.2			24.3			23.5	
Approach LOS		A			B			C			C	
90th %ile Green (s)	7.6	61.3		48.0	48.0		17.0	17.0		17.0	17.0	
90th %ile Term Code	Gap	Coord		Coord	Coord		Ped	Ped		Ped	Ped	
70th %ile Green (s)	6.5	68.3		56.1	56.1		10.0	10.0		10.0	10.0	
70th %ile Term Code	Gap	Coord		Coord	Coord		Min	Min		Min	Min	
50th %ile Green (s)	6.2	68.3		56.4	56.4		10.0	10.0		10.0	10.0	
50th %ile Term Code	Gap	Coord		Coord	Coord		Min	Min		Min	Min	
30th %ile Green (s)	5.9	68.3		56.7	56.7		10.0	10.0		10.0	10.0	
30th %ile Term Code	Gap	Coord		Coord	Coord		Min	Min		Min	Min	
10th %ile Green (s)	0.0	84.3		84.3	84.3		0.0	0.0		0.0	0.0	
10th %ile Term Code	Skip	Coord		Coord	Coord		Skip	Skip		Skip	Skip	
Stops (vph)	13	66		27	211		7	44		30	16	
Fuel Used(l)	2	8		2	17		1	7		2	2	
CO Emissions (g/hr)	29	148		42	316		11	135		35	30	
NOx Emissions (g/hr)	6	29		8	61		2	26		7	6	
VOC Emissions (g/hr)	7	34		10	73		3	31		8	7	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	1.9	10.9		4.4	39.0		0.8	4.2		6.0	0.9	
Queue Length 95th (m)	6.2	25.3		12.6	78.2		m1.8	m14.8		13.7	10.7	
Internal Link Dist (m)		213.7			179.8			199.0			120.1	
Turn Bay Length (m)	30.0			30.0			40.0			35.0		
Base Capacity (vph)	640	1403		711	1176		251	350		249	339	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.09	0.20		0.10	0.42		0.02	0.20		0.15	0.17	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.42			
Intersection Signal Delay: 10.4		Intersection LOS: B	
Intersection Capacity Utilization 54.5%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 22: Maritime Way/Knudson Drive & Campeau Drive

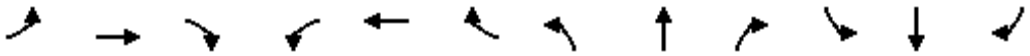




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	312	18	34	378	5	12	1	42	3	0	10
Future Volume (Veh/h)	17	312	18	34	378	5	12	1	42	3	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	347	20	38	420	6	13	1	47	3	0	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					238							
pX, platoon unblocked	0.91						0.91	0.91		0.91	0.91	0.91
vC, conflicting volume	426			367			905	897	357	942	904	423
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	321			367			847	838	357	887	846	318
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			95	100	93	99	100	98
cM capacity (veh/h)	1129			1192			243	262	687	216	259	658

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	386	464	61	14
Volume Left	19	38	13	3
Volume Right	20	6	47	11
cSH	1129	1192	485	457
Volume to Capacity	0.02	0.03	0.13	0.03
Queue Length 95th (m)	0.4	0.8	3.3	0.7
Control Delay (s)	0.6	1.0	13.5	13.1
Lane LOS	A	A	B	B
Approach Delay (s)	0.6	1.0	13.5	13.1
Approach LOS			B	B

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	45.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	6	36	150	2	46	85	237	131	20	432	16
Future Volume (vph)	19	6	36	150	2	46	85	237	131	20	432	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	20.0		0.0	40.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	25.0			40.0			75.0			55.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.98		0.99	0.98		1.00	0.99		1.00	1.00	
Frt		0.871			0.856			0.947			0.995	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1262	1045	0	1616	1495	0	1417	1639	0	1478	1748	0
Flt Permitted	0.726			0.730			0.381			0.542		
Satd. Flow (perm)	963	1045	0	1234	1495	0	567	1639	0	842	1748	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			46			58			3	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		119.6			99.0			110.4			236.0	
Travel Time (s)		8.6			7.1			7.9			17.0	
Confl. Peds. (#/hr)	1		3	3		1	3		1	1		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	37%	2%	56%	7%	2%	2%	22%	4%	5%	17%	2%	44%
Adj. Flow (vph)	19	6	36	150	2	46	85	237	131	20	432	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	19	42	0	150	48	0	85	368	0	20	448	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Detector Phase	8	8		4	4		1	6		2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	28.3	28.3		28.3	28.3		11.3	33.3		33.3	33.3	
Total Split (s)	28.0	28.0		28.0	28.0		14.0	62.0		48.0	48.0	
Total Split (%)	31.1%	31.1%		31.1%	31.1%		15.6%	68.9%		53.3%	53.3%	
Maximum Green (s)	21.7	21.7		21.7	21.7		7.7	55.7		41.7	41.7	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.3	6.3		6.3	6.3	
Lead/Lag							Lead			Lag	Lag	
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	None	None		None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0			20.0		20.0	20.0	
Pedestrian Calls (#/hr)	10	10		10	10			10		10	10	
Act Effct Green (s)	16.0	16.0		16.0	16.0		61.4	61.4		50.4	50.4	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.68	0.68		0.56	0.56	
v/c Ratio	0.11	0.20		0.68	0.16		0.19	0.32		0.04	0.46	
Control Delay	30.1	13.8		50.0	10.5		6.4	5.4		12.7	15.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	30.1	13.8		50.0	10.5		6.4	5.4		12.7	15.7	
LOS	C	B		D	B		A	A		B	B	
Approach Delay		18.9			40.4			5.6			15.6	
Approach LOS		B			D			A			B	
90th %ile Green (s)	21.7	21.7		21.7	21.7		7.7	55.7		41.7	41.7	
90th %ile Term Code	Ped	Ped		Ped	Ped		Max	Coord		Coord	Coord	
70th %ile Green (s)	19.0	19.0		19.0	19.0		8.3	58.4		43.8	43.8	
70th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
50th %ile Green (s)	16.1	16.1		16.1	16.1		7.3	61.3		47.7	47.7	
50th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
30th %ile Green (s)	13.2	13.2		13.2	13.2		6.5	64.2		51.4	51.4	
30th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
10th %ile Green (s)	10.0	10.0		10.0	10.0		0.0	67.4		67.4	67.4	
10th %ile Term Code	Hold	Hold		Min	Min		Skip	Coord		Coord	Coord	
Stops (vph)	17	14		136	13		24	88		12	270	
Fuel Used(l)	1	1		21	5		3	11		1	22	
CO Emissions (g/hr)	19	23		396	87		51	211		17	400	
NOx Emissions (g/hr)	4	4		76	17		10	41		3	77	
VOC Emissions (g/hr)	4	5		91	20		12	49		4	92	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	2.8	0.9		24.5	0.3		3.3	11.9		1.6	45.8	
Queue Length 95th (m)	8.1	8.7		41.0	8.5		11.1	33.0		5.8	81.4	
Internal Link Dist (m)		95.6			75.0			86.4			212.0	
Turn Bay Length (m)	20.0			40.0			35.0			35.0		
Base Capacity (vph)	232	279		297	395		460	1136		471	980	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.08	0.15		0.51	0.12		0.18	0.32		0.04	0.46	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 40 (44%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 16.1		Intersection LOS: B	
Intersection Capacity Utilization 62.1%		ICU Level of Service B	
Analysis Period (min) 15			

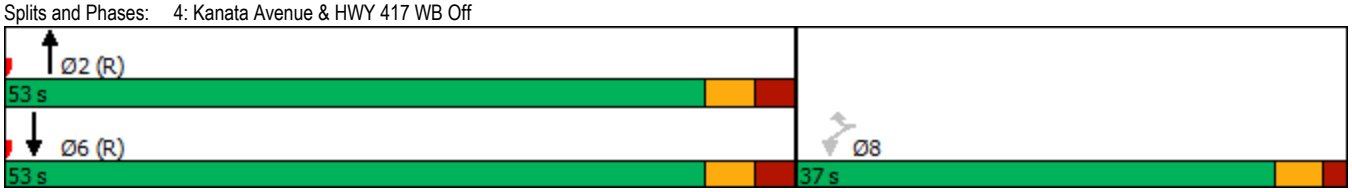
Splits and Phases: 3: Kanata Avenue & Lord Byng Way/Maritime Way

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	221	192	296	0	0	727
Future Volume (vph)	221	192	296	0	0	727
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1695	1334	1717	0	0	3325
Flt Permitted	0.950					
Satd. Flow (perm)	1695	1334	1717	0	0	3325
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		192				
Link Speed (k/h)	50		50			50
Link Distance (m)	332.8		126.6			114.0
Travel Time (s)	24.0		9.1			8.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	16%	6%	0%	0%	4%
Adj. Flow (vph)	221	192	296	0	0	727
Shared Lane Traffic (%)						
Lane Group Flow (vph)	221	192	296	0	0	727
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)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
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)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+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)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA			NA
Protected Phases			2			6
Permitted Phases	8	8				
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0			10.0
Minimum Split (s)	23.0	23.0	28.1			24.1
Total Split (s)	37.0	37.0	53.0			53.0
Total Split (%)	41.1%	41.1%	58.9%			58.9%
Maximum Green (s)	32.0	32.0	46.9			46.9
Yellow Time (s)	3.3	3.3	3.3			3.3
All-Red Time (s)	1.7	1.7	2.8			2.8
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	6.1			6.1
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)	7.0	7.0	7.0			
Flash Dont Walk (s)	11.0	11.0	15.0			
Pedestrian Calls (#/hr)	10	10	10			
Act Effct Green (s)	17.1	17.1	61.8			61.8
Actuated g/C Ratio	0.19	0.19	0.69			0.69
v/c Ratio	0.69	0.47	0.25			0.32
Control Delay	44.3	8.4	3.2			5.5
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	44.3	8.4	3.2			5.5
LOS	D	A	A			A
Approach Delay	27.6		3.2			5.5
Approach LOS	C		A			A
90th %ile Green (s)	23.6	23.6	55.3			55.3
90th %ile Term Code	Gap	Gap	Coord			Coord
70th %ile Green (s)	19.8	19.8	59.1			59.1
70th %ile Term Code	Gap	Gap	Coord			Coord
50th %ile Green (s)	17.1	17.1	61.8			61.8
50th %ile Term Code	Gap	Gap	Coord			Coord
30th %ile Green (s)	14.5	14.5	64.4			64.4
30th %ile Term Code	Gap	Gap	Coord			Coord
10th %ile Green (s)	10.7	10.7	68.2			68.2
10th %ile Term Code	Gap	Gap	Coord			Coord
Stops (vph)	198	26	36			255
Fuel Used(l)	19	8	5			24
CO Emissions (g/hr)	353	147	95			451
NOx Emissions (g/hr)	68	28	18			87
VOC Emissions (g/hr)	81	34	22			104
Dilemma Vehicles (#)	0	0	0			0
Queue Length 50th (m)	35.9	0.0	6.5			20.0
Queue Length 95th (m)	53.9	15.3	8.6			36.4
Internal Link Dist (m)	308.8		102.6			90.0
Turn Bay Length (m)						
Base Capacity (vph)	602	598	1178			2281
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	0.37	0.32	0.25			0.32

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 35 (39%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 11.4		Intersection LOS: B	
Intersection Capacity Utilization 45.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Kanata Avenue & HWY 417 WB Off



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
Lane Configurations							
Traffic Volume (vph)	0	0	271	200	358	456	
Future Volume (vph)	0	0	271	200	358	456	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	0.0	0.0		50.0	0.0		
Storage Lanes	0	0		1	1		
Taper Length (m)	7.6				7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor				0.98	1.00		
Frt				0.850			
Flt Protected					0.950		
Satd. Flow (prot)	0	0	1685	1502	1679	1750	
Flt Permitted					0.543		
Satd. Flow (perm)	0	0	1685	1468	958	1750	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)				200			
Link Speed (k/h)	48		50			50	
Link Distance (m)	278.4		119.2			126.6	
Travel Time (s)	20.9		8.6			9.1	
Confl. Peds. (#/hr)				1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	0%	0%	8%	3%	3%	4%	
Adj. Flow (vph)	0	0	271	200	358	456	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	271	200	358	456	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(m)	0.0		3.7			3.7	
Link Offset(m)	0.0		0.0			0.0	
Crosswalk Width(m)	4.9		4.9			4.9	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)	24	14		14	24		
Number of Detectors			2	1	1	2	
Detector Template			Thru	Right	Left	Thru	
Leading Detector (m)			30.5	6.1	6.1	30.5	
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)			1.8	6.1	6.1	1.8	
Detector 1 Type			Cl+Ex	Cl+Ex	Cl+Ex	Cl+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)			28.7			28.7	
Detector 2 Size(m)			1.8			1.8	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type			NA	Perm	pm+pt	NA	
Protected Phases			2		1	6	4
Permitted Phases				2	6		
Detector Phase			2	2	1	6	
Switch Phase							
Minimum Initial (s)			10.0	10.0	5.0	10.0	5.0
Minimum Split (s)			23.7	23.7	10.7	23.7	27.0
Total Split (s)			50.0	50.0	12.0	62.0	28.0
Total Split (%)			55.6%	55.6%	13.3%	68.9%	31%
Maximum Green (s)			44.3	44.3	6.3	56.3	23.0
Yellow Time (s)			3.3	3.3	3.3	3.3	3.0
All-Red Time (s)			2.4	2.4	2.4	2.4	2.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
Lost Time Adjust (s)			0.0	0.0	0.0	0.0	
Total Lost Time (s)			5.7	5.7	5.7	5.7	
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?			Yes	Yes	Yes		
Vehicle Extension (s)			3.0	3.0	3.0	3.0	3.0
Recall Mode			C-Max	C-Max	None	C-Max	None
Walk Time (s)			7.0	7.0			7.0
Flash Dont Walk (s)			11.0	11.0			15.0
Pedestrian Calls (#/hr)			10	10			10
Act Effct Green (s)			66.3	66.3	78.9	83.5	
Actuated g/C Ratio			0.74	0.74	0.88	0.93	
v/c Ratio			0.22	0.18	0.40	0.28	
Control Delay			6.0	1.9	4.0	2.6	
Queue Delay			0.0	0.0	0.1	0.0	
Total Delay			6.0	1.9	4.1	2.6	
LOS			A	A	A	A	
Approach Delay			4.3			3.2	
Approach LOS			A			A	
90th %ile Green (s)			44.3	44.3	7.3	57.3	22.0
90th %ile Term Code			Coord	Coord	Max	Coord	Ped
70th %ile Green (s)			71.2	71.2	7.4	84.3	0.0
70th %ile Term Code			Coord	Coord	Gap	Coord	Skip
50th %ile Green (s)			71.6	71.6	7.0	84.3	0.0
50th %ile Term Code			Coord	Coord	Gap	Coord	Skip
30th %ile Green (s)			71.9	71.9	6.7	84.3	0.0
30th %ile Term Code			Coord	Coord	Gap	Coord	Skip
10th %ile Green (s)			72.4	72.4	6.2	84.3	0.0
10th %ile Term Code			Coord	Coord	Gap	Coord	Skip
Stops (vph)			92	32	81	75	
Fuel Used(l)			6	3	7	8	
CO Emissions (g/hr)			119	61	134	150	
NOx Emissions (g/hr)			23	12	26	29	
VOC Emissions (g/hr)			27	14	31	35	
Dilemma Vehicles (#)			0	0	0	0	
Queue Length 50th (m)			4.3	0.0	1.3	0.0	
Queue Length 95th (m)			53.4	17.2	29.2	35.7	
Internal Link Dist (m)	254.4		95.2			102.6	
Turn Bay Length (m)				50.0			
Base Capacity (vph)			1241	1133	895	1623	
Starvation Cap Reductn			0	0	66	61	
Spillback Cap Reductn			0	0	0	0	
Storage Cap Reductn			0	0	0	0	
Reduced v/c Ratio			0.22	0.18	0.43	0.29	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 42 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.40
Intersection Signal Delay: 3.6 Intersection LOS: A
Intersection Capacity Utilization 45.5% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: Kanata Avenue & HWY 417 EB On

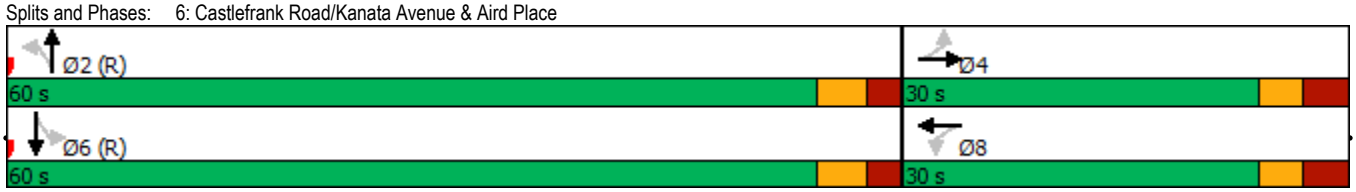
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	6	18	19	6	61	41	466	36	52	402	41
Future Volume (vph)	45	6	18	19	6	61	41	466	36	52	402	41
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.6			7.6			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97			0.96		0.99	1.00		0.99	1.00	
Frt		0.965			0.904			0.989			0.986	
Flt Protected		0.968			0.989		0.950			0.950		
Satd. Flow (prot)	0	1218	0	0	1464	0	1145	1728	0	1662	1707	0
Flt Permitted		0.809			0.909		0.493			0.457		
Satd. Flow (perm)	0	1001	0	0	1336	0	588	1728	0	795	1707	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			61			8			10	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		125.4			132.9			95.7			119.2	
Travel Time (s)		11.3			12.0			6.9			8.6	
Confl. Peds. (#/hr)	14		18	18		14	9		6	6		9
Confl. Bikes (#/hr)			1						1			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	33%	67%	39%	11%	50%	2%	51%	4%	3%	4%	5%	2%
Adj. Flow (vph)	45	6	18	19	6	61	41	466	36	52	402	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	69	0	0	86	0	41	502	0	52	443	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.2	28.2		28.2	28.2		24.7	24.7		24.7	24.7	
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Maximum Green (s)	23.8	23.8		23.8	23.8		54.3	54.3		54.3	54.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	

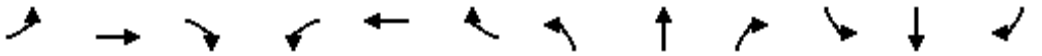
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	3.2	3.2		3.2	3.2		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.2			6.2		5.7	5.7		5.7	5.7	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	10	10		10	10		10	10		10	10	
Act Effct Green (s)		13.0			13.0		69.5	69.5		69.5	69.5	
Actuated g/C Ratio		0.14			0.14		0.77	0.77		0.77	0.77	
v/c Ratio		0.43			0.35		0.09	0.38		0.08	0.34	
Control Delay		34.5			17.0		5.5	6.1		6.4	6.4	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.2	
Total Delay		34.5			17.0		5.5	6.1		6.4	6.6	
LOS		C			B		A	A		A	A	
Approach Delay		34.5			17.0			6.1			6.6	
Approach LOS		C			B			A			A	
90th %ile Green (s)	22.0	22.0		22.0	22.0		56.1	56.1		56.1	56.1	
90th %ile Term Code	Ped	Ped		Ped	Ped		Coord	Coord		Coord	Coord	
70th %ile Green (s)	12.8	12.8		12.8	12.8		65.3	65.3		65.3	65.3	
70th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord		Coord	Coord	
50th %ile Green (s)	10.1	10.1		10.1	10.1		68.0	68.0		68.0	68.0	
50th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord		Coord	Coord	
30th %ile Green (s)	10.0	10.0		10.0	10.0		68.1	68.1		68.1	68.1	
30th %ile Term Code	Min	Min		Min	Min		Coord	Coord		Coord	Coord	
10th %ile Green (s)	0.0	0.0		0.0	0.0		84.3	84.3		84.3	84.3	
10th %ile Term Code	Skip	Skip		Skip	Skip		Coord	Coord		Coord	Coord	
Stops (vph)		47			30		14	170		18	129	
Fuel Used(l)		3			3		1	11		1	10	
CO Emissions (g/hr)		64			51		16	200		23	188	
NOx Emissions (g/hr)		12			10		3	39		4	36	
VOC Emissions (g/hr)		15			12		4	46		5	43	
Dilemma Vehicles (#)		0			0		0	0		0	0	
Queue Length 50th (m)		8.4			4.0		1.5	23.4		2.7	25.8	
Queue Length 95th (m)		18.3			14.6		6.8	62.3		7.3	38.3	
Internal Link Dist (m)		101.4			108.9			71.7			95.2	
Turn Bay Length (m)							30.0			50.0		
Base Capacity (vph)		277			398		454	1336		613	1320	
Starvation Cap Reductn		0			0		0	0		0	312	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.25			0.22		0.09	0.38		0.08	0.44	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 17 (19%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.43
Intersection Signal Delay: 8.7 — Intersection LOS: A
Intersection Capacity Utilization 65.3% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 6: Castlefrank Road/Kanata Avenue & Aird Place





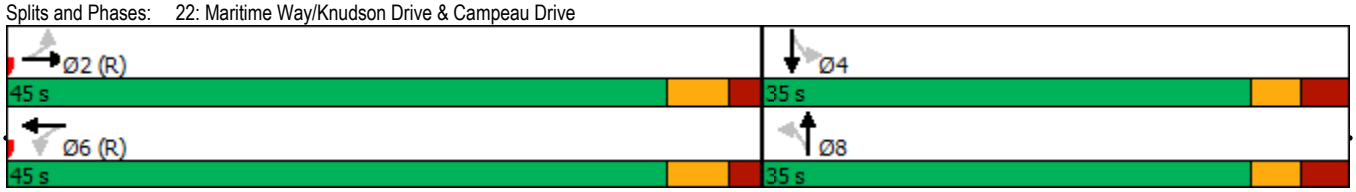
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	401	13	56	308	53	17	15	133	114	9	47
Future Volume (vph)	46	401	13	56	308	53	17	15	133	114	9	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	40.0			55.0			40.0			35.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	0.99		0.99	0.96		0.98	0.98	
Frt		0.995			0.978			0.865			0.874	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1708	0	1695	1592	0	1695	1477	0	1695	1493	0
Flt Permitted	0.538			0.501			0.720			0.663		
Satd. Flow (perm)	949	1708	0	885	1592	0	1274	1477	0	1156	1493	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			15			133			47	
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		250.4			203.8			223.0			144.1	
Travel Time (s)		18.0			14.7			16.1			13.0	
Confl. Peds. (#/hr)	12		11	11		12	4		12	12		4
Confl. Bikes (#/hr)			1									
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	5%	33%	2%	11%	12%	2%	2%	2%	2%	14%	2%
Adj. Flow (vph)	46	401	13	56	308	53	17	15	133	114	9	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	46	414	0	56	361	0	17	148	0	114	56	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.7	27.7		27.7	27.7		24.0	24.0		24.0	24.0	
Total Split (s)	45.0	45.0		45.0	45.0		35.0	35.0		35.0	35.0	
Total Split (%)	56.3%	56.3%		56.3%	56.3%		43.8%	43.8%		43.8%	43.8%	
Maximum Green (s)	39.3	39.3		39.3	39.3		29.0	29.0		29.0	29.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	

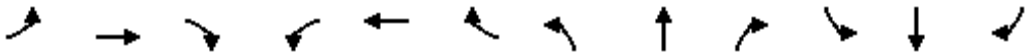
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7		5.7	5.7		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	10	10		10	10		10	10		10	10	
Act Effct Green (s)	54.4	54.4		54.4	54.4		13.9	13.9		13.9	13.9	
Actuated g/C Ratio	0.68	0.68		0.68	0.68		0.17	0.17		0.17	0.17	
v/c Ratio	0.07	0.36		0.09	0.33		0.08	0.40		0.57	0.19	
Control Delay	5.7	7.1		5.9	6.7		26.1	10.0		40.9	11.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	5.7	7.1		5.9	6.7		26.1	10.0		40.9	11.6	
LOS	A	A		A	A		C	B		D	B	
Approach Delay		6.9			6.6			11.7			31.2	
Approach LOS		A			A			B			C	
90th %ile Green (s)	48.7	48.7		48.7	48.7		19.6	19.6		19.6	19.6	
90th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
70th %ile Green (s)	52.4	52.4		52.4	52.4		15.9	15.9		15.9	15.9	
70th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
50th %ile Green (s)	55.1	55.1		55.1	55.1		13.2	13.2		13.2	13.2	
50th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
30th %ile Green (s)	57.7	57.7		57.7	57.7		10.6	10.6		10.6	10.6	
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
10th %ile Green (s)	58.3	58.3		58.3	58.3		10.0	10.0		10.0	10.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		Min	Min		Hold	Hold	
Stops (vph)	17	169		20	139		16	31		102	17	
Fuel Used(l)	2	16		2	12		2	14		7	2	
CO Emissions (g/hr)	31	296		33	223		39	265		126	30	
NOx Emissions (g/hr)	6	57		6	43		8	51		24	6	
VOC Emissions (g/hr)	7	68		8	51		9	61		29	7	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	1.9	21.7		2.4	17.7		2.2	2.0		16.3	1.2	
Queue Length 95th (m)	6.6	46.1		7.8	39.1		6.7	15.1		29.3	9.5	
Internal Link Dist (m)		226.4			179.8			199.0			120.1	
Turn Bay Length (m)	30.0			30.0			40.0			35.0		
Base Capacity (vph)	645	1163		602	1088		461	620		419	571	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.07	0.36		0.09	0.33		0.04	0.24		0.27	0.10	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 10.9 — Intersection LOS: B
Intersection Capacity Utilization 71.1% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 22: Maritime Way/Knudson Drive & Campeau Drive

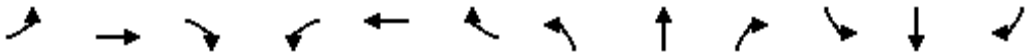




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	382	11	23	423	2	20	0	33	4	2	10
Future Volume (Veh/h)	4	382	11	23	423	2	20	0	33	4	2	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	4	424	12	26	470	2	22	0	37	4	2	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					251							
pX, platoon unblocked	1.00						1.00	1.00		1.00	1.00	1.00
vC, conflicting volume	472			436			973	962	430	998	967	471
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	472			436			973	962	430	998	967	471
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			90	100	94	98	99	98
cM capacity (veh/h)	1090			1124			221	249	625	205	247	593

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	440	498	59	17
Volume Left	4	26	22	4
Volume Right	12	2	37	11
cSH	1090	1124	372	368
Volume to Capacity	0.00	0.02	0.16	0.05
Queue Length 95th (m)	0.1	0.5	4.2	1.1
Control Delay (s)	0.1	0.7	16.5	15.2
Lane LOS	A	A	C	C
Approach Delay (s)	0.1	0.7	16.5	15.2
Approach LOS			C	C

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	51.0%	ICU Level of Service	A	
Analysis Period (min)	15			

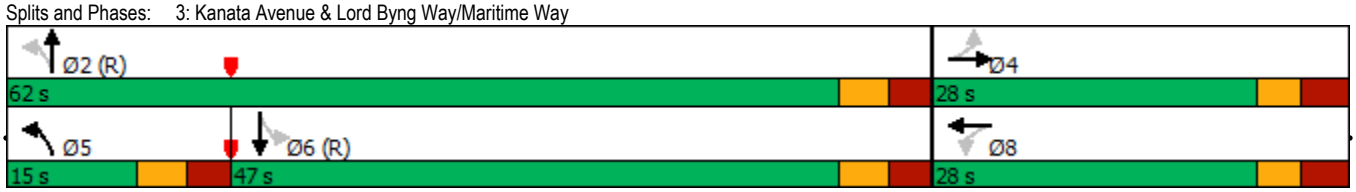


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	3	78	122	9	45	136	637	183	67	491	25
Future Volume (vph)	30	3	78	122	9	45	136	637	183	67	491	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	20.0		0.0	40.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	25.0			40.0			75.0			55.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	0.97		0.99	0.96		1.00	0.99		1.00	1.00	
Frt		0.856			0.875			0.967			0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1262	1250	0	1695	1507	0	1503	1716	0	1695	1755	0
Flt Permitted	0.722			0.704			0.329			0.339		
Satd. Flow (perm)	939	1250	0	1247	1507	0	520	1716	0	604	1755	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		78			45			30			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		119.6			99.0			110.4			236.0	
Travel Time (s)		8.6			7.1			7.9			17.0	
Confl. Peds. (#/hr)	11		4	4		11	3		3	3		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	37%	2%	22%	2%	2%	2%	15%	2%	2%	2%	2%	20%
Adj. Flow (vph)	30	3	78	122	9	45	136	637	183	67	491	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	81	0	122	54	0	136	820	0	67	516	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	28.3	28.3		28.3	28.3		11.3	33.3		33.3	33.3	
Total Split (s)	28.0	28.0		28.0	28.0		15.0	62.0		47.0	47.0	
Total Split (%)	31.1%	31.1%		31.1%	31.1%		16.7%	68.9%		52.2%	52.2%	
Maximum Green (s)	21.7	21.7		21.7	21.7		8.7	55.7		40.7	40.7	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.3	6.3		6.3	6.3	
Lead/Lag							Lead			Lag	Lag	
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	None	None		None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0			20.0		20.0	20.0	
Pedestrian Calls (#/hr)	10	10		10	10			10		10	10	
Act Effct Green (s)	14.8	14.8		14.8	14.8		62.6	62.6		48.5	48.5	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.70	0.70		0.54	0.54	
v/c Ratio	0.19	0.30		0.60	0.19		0.30	0.68		0.21	0.55	
Control Delay	33.3	10.8		40.7	9.2		6.1	9.7		15.1	17.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.1		0.0	0.0	
Total Delay	33.3	10.8		40.7	9.2		6.1	9.7		15.1	17.6	
LOS	C	B		D	A		A	A		B	B	
Approach Delay		16.9			31.0			9.2			17.3	
Approach LOS		B			C			A			B	
90th %ile Green (s)	21.7	21.7		21.7	21.7		8.7	55.7		40.7	40.7	
90th %ile Term Code	Ped	Ped		Ped	Ped		Max	Coord		Coord	Coord	
70th %ile Green (s)	16.7	16.7		16.7	16.7		9.3	60.7		45.1	45.1	
70th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
50th %ile Green (s)	14.1	14.1		14.1	14.1		8.1	63.3		48.9	48.9	
50th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
30th %ile Green (s)	11.4	11.4		11.4	11.4		7.1	66.0		52.6	52.6	
30th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
10th %ile Green (s)	10.0	10.0		10.0	10.0		6.1	67.4		55.0	55.0	
10th %ile Term Code	Hold	Hold		Min	Min		Gap	Coord		Coord	Coord	
Stops (vph)	27	17		111	24		37	395		37	338	
Fuel Used(l)	2	2		16	5		4	32		3	26	
CO Emissions (g/hr)	32	37		306	101		81	603		58	486	
NOx Emissions (g/hr)	6	7		59	20		16	116		11	94	
VOC Emissions (g/hr)	7	8		71	23		19	139		13	112	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	4.6	0.5		20.1	2.8		3.2	39.9		5.6	53.6	
Queue Length 95th (m)	11.2	11.3		33.8	10.2		m12.6	123.5		16.2	100.0	
Internal Link Dist (m)		95.6			75.0			86.4			212.0	
Turn Bay Length (m)	20.0			40.0			35.0			35.0		
Base Capacity (vph)	226	360		300	397		458	1203		325	946	
Starvation Cap Reductn	0	0		0	0		0	26		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.13	0.23		0.41	0.14		0.30	0.70		0.21	0.55	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 31 (34%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 14.4		Intersection LOS: B	
Intersection Capacity Utilization 86.5%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Kanata Avenue & Lord Byng Way/Maritime Way

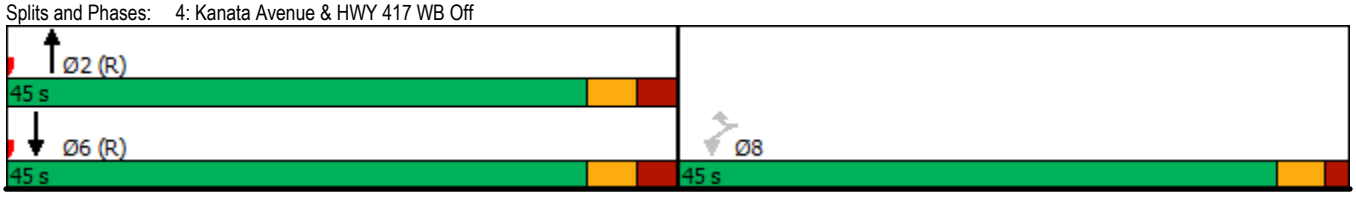


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	427	582	600	0	0	870
Future Volume (vph)	427	582	600	0	0	870
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1695	1517	1750	0	0	3357
Flt Permitted	0.950					
Satd. Flow (perm)	1695	1517	1750	0	0	3357
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		176				
Link Speed (k/h)	50		50			50
Link Distance (m)	332.8		126.6			114.0
Travel Time (s)	24.0		9.1			8.2
Confl. Bikes (#/hr)				3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	4%	0%	0%	3%
Adj. Flow (vph)	427	582	600	0	0	870
Shared Lane Traffic (%)						
Lane Group Flow (vph)	427	582	600	0	0	870
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)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
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)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+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)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA			NA
Protected Phases			2			6
Permitted Phases	8	8				
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0			10.0
Minimum Split (s)	23.0	23.0	28.1			24.1
Total Split (s)	45.0	45.0	45.0			45.0
Total Split (%)	50.0%	50.0%	50.0%			50.0%
Maximum Green (s)	40.0	40.0	38.9			38.9
Yellow Time (s)	3.3	3.3	3.3			3.3
All-Red Time (s)	1.7	1.7	2.8			2.8
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	6.1			6.1
Lead/Lag						

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)	7.0	7.0	7.0			
Flash Dont Walk (s)	11.0	11.0	15.0			
Pedestrian Calls (#/hr)	10	10	10			
Act Effct Green (s)	32.3	32.3	46.6			46.6
Actuated g/C Ratio	0.36	0.36	0.52			0.52
v/c Ratio	0.70	0.89	0.66			0.50
Control Delay	30.3	34.1	17.0			14.2
Queue Delay	0.0	0.0	0.3			0.0
Total Delay	30.3	34.1	17.3			14.2
LOS	C	C	B			B
Approach Delay	32.5		17.3			14.2
Approach LOS	C		B			B
90th %ile Green (s)	40.0	40.0	38.9			38.9
90th %ile Term Code	Max	Max	Coord			Coord
70th %ile Green (s)	38.9	38.9	40.0			40.0
70th %ile Term Code	Gap	Gap	Coord			Coord
50th %ile Green (s)	34.0	34.0	44.9			44.9
50th %ile Term Code	Gap	Gap	Coord			Coord
30th %ile Green (s)	28.8	28.8	50.1			50.1
30th %ile Term Code	Gap	Gap	Coord			Coord
10th %ile Green (s)	19.9	19.9	59.0			59.0
10th %ile Term Code	Gap	Gap	Coord			Coord
Stops (vph)	344	398	410			393
Fuel Used(l)	31	43	24			37
CO Emissions (g/hr)	580	792	451			686
NOx Emissions (g/hr)	112	153	87			132
VOC Emissions (g/hr)	134	183	104			158
Dilemma Vehicles (#)	0	0	0			0
Queue Length 50th (m)	60.3	66.0	77.6			35.6
Queue Length 95th (m)	81.5	101.2	#31.0			57.5
Internal Link Dist (m)	308.8		102.6			90.0
Turn Bay Length (m)						
Base Capacity (vph)	753	772	905			1737
Starvation Cap Reductn	0	0	54			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.57	0.75	0.71			0.50

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 32 (36%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 22.4		Intersection LOS: C	
Intersection Capacity Utilization 104.2%		ICU Level of Service G	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 4: Kanata Avenue & HWY 417 WB Off

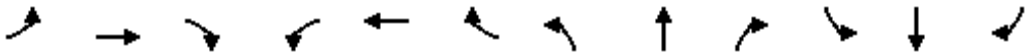


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lane Configurations							
Traffic Volume (vph)	0	0	482	182	332	808	
Future Volume (vph)	0	0	482	182	332	808	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	0.0	0.0		50.0	0.0		
Storage Lanes	0	0		1	1		
Taper Length (m)	7.6				7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor				0.98	1.00		
Frt				0.850			
Flt Protected					0.950		
Satd. Flow (prot)	0	0	1733	1517	1662	1784	
Flt Permitted					0.413		
Satd. Flow (perm)	0	0	1733	1479	722	1784	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)				182			
Link Speed (k/h)	48		50			50	
Link Distance (m)	278.4		119.2			126.6	
Travel Time (s)	20.9		8.6			9.1	
Confl. Peds. (#/hr)				2	2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	0%	0%	5%	2%	4%	2%	
Adj. Flow (vph)	0	0	482	182	332	808	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	482	182	332	808	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(m)	0.0		3.7			3.7	
Link Offset(m)	0.0		0.0			0.0	
Crosswalk Width(m)	4.9		4.9			4.9	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)	24	14		14	24		
Number of Detectors			2	1	1	2	
Detector Template			Thru	Right	Left	Thru	
Leading Detector (m)			30.5	6.1	6.1	30.5	
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)			1.8	6.1	6.1	1.8	
Detector 1 Type			Cl+Ex	Cl+Ex	Cl+Ex	Cl+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)			28.7			28.7	
Detector 2 Size(m)			1.8			1.8	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type			NA	Perm	pm+pt	NA	
Protected Phases			2		1	6	8
Permitted Phases				2	6		
Detector Phase			2	2	1	6	
Switch Phase							
Minimum Initial (s)			10.0	10.0	5.0	10.0	5.0
Minimum Split (s)			23.7	23.7	10.7	23.7	27.0
Total Split (s)			50.0	50.0	12.0	62.0	28.0
Total Split (%)			55.6%	55.6%	13.3%	68.9%	31%
Maximum Green (s)			44.3	44.3	6.3	56.3	23.0
Yellow Time (s)			3.3	3.3	3.3	3.3	3.0
All-Red Time (s)			2.4	2.4	2.4	2.4	2.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lost Time Adjust (s)			0.0	0.0	0.0	0.0	
Total Lost Time (s)			5.7	5.7	5.7	5.7	
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?			Yes	Yes	Yes		
Vehicle Extension (s)			3.0	3.0	3.0	3.0	3.0
Recall Mode			C-Max	C-Max	None	C-Max	None
Walk Time (s)			7.0	7.0			7.0
Flash Dont Walk (s)			11.0	11.0			15.0
Pedestrian Calls (#/hr)			10	10			10
Act Effct Green (s)			65.7	65.7	78.9	83.5	
Actuated g/C Ratio			0.73	0.73	0.88	0.93	
v/c Ratio			0.38	0.16	0.47	0.49	
Control Delay			4.3	0.6	5.6	3.5	
Queue Delay			0.2	0.0	0.2	0.0	
Total Delay			4.5	0.6	5.8	3.5	
LOS			A	A	A	A	
Approach Delay			3.5			4.2	
Approach LOS			A			A	
90th %ile Green (s)			44.3	44.3	7.3	57.3	22.0
90th %ile Term Code			Coord	Coord	Max	Coord	Ped
70th %ile Green (s)			70.5	70.5	8.1	84.3	0.0
70th %ile Term Code			Coord	Coord	Gap	Coord	Skip
50th %ile Green (s)			70.9	70.9	7.7	84.3	0.0
50th %ile Term Code			Coord	Coord	Gap	Coord	Skip
30th %ile Green (s)			71.2	71.2	7.4	84.3	0.0
30th %ile Term Code			Coord	Coord	Gap	Coord	Skip
10th %ile Green (s)			71.7	71.7	6.9	84.3	0.0
10th %ile Term Code			Coord	Coord	Gap	Coord	Skip
Stops (vph)			124	9	68	133	
Fuel Used(l)			10	2	7	15	
CO Emissions (g/hr)			183	44	129	277	
NOx Emissions (g/hr)			35	8	25	53	
VOC Emissions (g/hr)			42	10	30	64	
Dilemma Vehicles (#)			0	0	0	0	
Queue Length 50th (m)			7.0	0.0	1.3	3.1	
Queue Length 95th (m)			68.2	3.5	34.1	77.5	
Internal Link Dist (m)	254.4		95.2			102.6	
Turn Bay Length (m)				50.0			
Base Capacity (vph)			1265	1129	710	1654	
Starvation Cap Reductn			265	0	58	6	
Spillback Cap Reductn			31	0	0	12	
Storage Cap Reductn			0	0	0	0	
Reduced v/c Ratio			0.48	0.16	0.51	0.49	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 27 (30%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 3.9		Intersection LOS: A	
Intersection Capacity Utilization 104.2%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 5: Kanata Avenue & HWY 417 EB On



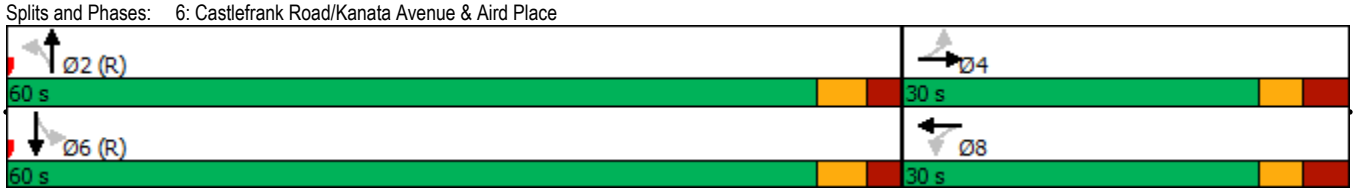
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	3	13	30	1	97	12	660	35	62	804	24
Future Volume (vph)	17	3	13	30	1	97	12	660	35	62	804	24
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.6			7.6			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.97			1.00		1.00	1.00	
Frt		0.947			0.898			0.992			0.996	
Flt Protected		0.975			0.988		0.950			0.950		
Satd. Flow (prot)	0	1627	0	0	1542	0	1695	1751	0	1695	1775	0
Flt Permitted		0.735			0.909		0.286			0.353		
Satd. Flow (perm)	0	1219	0	0	1415	0	510	1751	0	628	1775	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			97			5			3	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		125.4			132.9			95.7			119.2	
Travel Time (s)		11.3			12.0			6.9			8.6	
Confl. Peds. (#/hr)	7		6	6		7	9		5	5		9
Confl. Bikes (#/hr)									3			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	17	3	13	30	1	97	12	660	35	62	804	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	33	0	0	128	0	12	695	0	62	828	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	28.2	28.2		28.2	28.2		24.7	24.7		24.7	24.7	
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Maximum Green (s)	23.8	23.8		23.8	23.8		54.3	54.3		54.3	54.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	

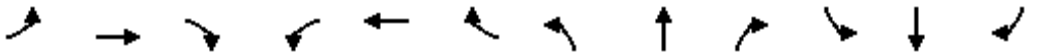
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	3.2	3.2		3.2	3.2		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.2			6.2		5.7	5.7		5.7	5.7	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	10	10		10	10		10	10		10	10	
Act Effct Green (s)		10.1			10.1		68.0	68.0		68.0	68.0	
Actuated g/C Ratio		0.11			0.11		0.76	0.76		0.76	0.76	
v/c Ratio		0.22			0.52		0.03	0.52		0.13	0.62	
Control Delay		26.2			19.2		5.0	7.4		5.8	7.4	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.1	
Total Delay		26.2			19.2		5.0	7.5		5.8	7.6	
LOS		C			B		A	A		A	A	
Approach Delay		26.2			19.2			7.4			7.4	
Approach LOS		C			B			A			A	
90th %ile Green (s)	22.0	22.0		22.0	22.0		56.1	56.1		56.1	56.1	
90th %ile Term Code	Ped	Ped		Ped	Ped		Coord	Coord		Coord	Coord	
70th %ile Green (s)	9.9	9.9		9.9	9.9		68.2	68.2		68.2	68.2	
70th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
50th %ile Green (s)	7.5	7.5		7.5	7.5		70.6	70.6		70.6	70.6	
50th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
30th %ile Green (s)	5.5	5.5		5.5	5.5		72.6	72.6		72.6	72.6	
30th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
10th %ile Green (s)	5.5	5.5		5.5	5.5		72.6	72.6		72.6	72.6	
10th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
Stops (vph)		21			40		4	282		16	258	
Fuel Used(l)		1			4		0	17		1	20	
CO Emissions (g/hr)		26			79		5	309		25	370	
NOx Emissions (g/hr)		5			15		1	60		5	71	
VOC Emissions (g/hr)		6			18		1	71		6	85	
Dilemma Vehicles (#)		0			0		0	0		0	0	
Queue Length 50th (m)		3.3			5.1		0.4	32.3		2.2	38.9	
Queue Length 95th (m)		9.9			17.8		2.8	101.7		m7.1	58.0	
Internal Link Dist (m)		101.4			108.9			71.7			95.2	
Turn Bay Length (m)							30.0			50.0		
Base Capacity (vph)		331			445		385	1324		474	1342	
Starvation Cap Reductn		0			0		0	0		0	70	
Spillback Cap Reductn		0			1		0	22		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.10			0.29		0.03	0.53		0.13	0.65	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 10 (11%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 8.6 Intersection LOS: A
Intersection Capacity Utilization 75.3% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Castlefrank Road/Kanata Avenue & Aird Place





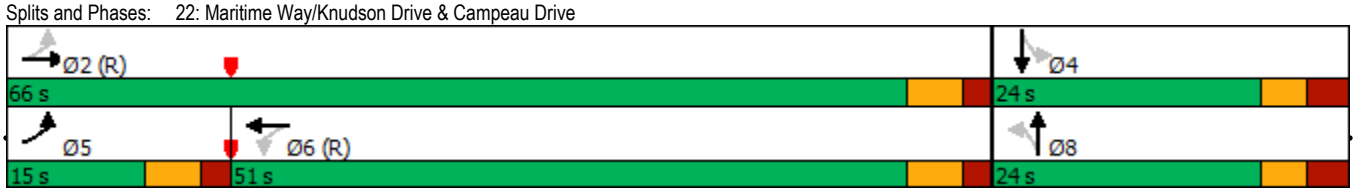
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	298	30	110	421	91	12	12	78	34	10	66
Future Volume (vph)	59	298	30	110	421	91	12	12	78	34	10	66
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	40.0			55.0			40.0			35.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	0.99		0.98	0.97		0.99	0.96	
Frt		0.986			0.973			0.870			0.870	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1755	0	1695	1721	0	1695	1511	0	1679	1497	0
Flt Permitted	0.380			0.562			0.708			0.699		
Satd. Flow (perm)	672	1755	0	998	1721	0	1239	1511	0	1224	1497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			17			78			66	
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		237.7			203.8			223.0			144.1	
Travel Time (s)		17.1			14.7			16.1			13.0	
Confl. Peds. (#/hr)	15		4	4		15	8		4	4		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	59	298	30	110	421	91	12	12	78	34	10	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	328	0	110	512	0	12	90	0	34	76	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	10.7	27.7		27.7	27.7		24.0	24.0		24.0	24.0	
Total Split (s)	15.0	66.0		51.0	51.0		24.0	24.0		24.0	24.0	
Total Split (%)	16.7%	73.3%		56.7%	56.7%		26.7%	26.7%		26.7%	26.7%	
Maximum Green (s)	9.3	60.3		45.3	45.3		18.0	18.0		18.0	18.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	

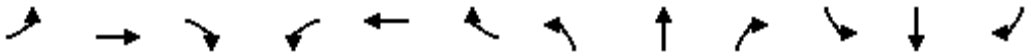
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7		5.7	5.7		6.0	6.0		6.0	6.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)		10		10	10		10	10		10	10	
Act Effct Green (s)	70.1	71.2		61.4	61.4		11.4	11.4		11.4	11.4	
Actuated g/C Ratio	0.78	0.79		0.68	0.68		0.13	0.13		0.13	0.13	
v/c Ratio	0.10	0.24		0.16	0.43		0.08	0.35		0.22	0.31	
Control Delay	3.9	4.0		9.1	10.7		38.3	22.9		37.7	14.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.9	4.0		9.1	10.7		38.3	22.9		37.7	14.6	
LOS	A	A		A	B		D	C		D	B	
Approach Delay		4.0			10.4			24.7			21.7	
Approach LOS		A			B			C			C	
90th %ile Green (s)	7.7	61.3		47.9	47.9		17.0	17.0		17.0	17.0	
90th %ile Term Code	Gap	Coord		Coord	Coord		Ped	Ped		Ped	Ped	
70th %ile Green (s)	6.6	68.3		56.0	56.0		10.0	10.0		10.0	10.0	
70th %ile Term Code	Gap	Coord		Coord	Coord		Min	Min		Min	Min	
50th %ile Green (s)	6.2	68.3		56.4	56.4		10.0	10.0		10.0	10.0	
50th %ile Term Code	Gap	Coord		Coord	Coord		Min	Min		Min	Min	
30th %ile Green (s)	5.9	68.3		56.7	56.7		10.0	10.0		10.0	10.0	
30th %ile Term Code	Gap	Coord		Coord	Coord		Min	Min		Min	Min	
10th %ile Green (s)	0.0	84.3		84.3	84.3		0.0	0.0		0.0	0.0	
10th %ile Term Code	Skip	Coord		Coord	Coord		Skip	Skip		Skip	Skip	
Stops (vph)	15	85		46	245		15	59		31	23	
Fuel Used(l)	2	10		4	20		2	10		2	2	
CO Emissions (g/hr)	34	192		73	365		31	194		36	44	
NOx Emissions (g/hr)	7	37		14	70		6	37		7	8	
VOC Emissions (g/hr)	8	44		17	84		7	45		8	10	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	2.0	12.9		7.2	40.8		2.2	5.5		5.5	1.6	
Queue Length 95th (m)	6.5	29.3		18.8	81.6		m4.7	m17.4		13.1	12.6	
Internal Link Dist (m)		213.7			179.8			199.0			120.1	
Turn Bay Length (m)	30.0			30.0			40.0			35.0		
Base Capacity (vph)	629	1391		680	1179		247	364		244	352	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.09	0.24		0.16	0.43		0.05	0.25		0.14	0.22	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.43
Intersection Signal Delay: 10.6 Intersection LOS: B
Intersection Capacity Utilization 58.1% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 22: Maritime Way/Knudson Drive & Campeau Drive

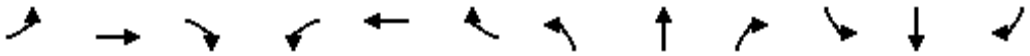




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	396	18	35	481	5	12	1	43	3	0	10
Future Volume (Veh/h)	17	396	18	35	481	5	12	1	43	3	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	440	20	39	534	6	13	1	48	3	0	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					238							
pX, platoon unblocked	0.90						0.90	0.90		0.90	0.90	0.90
vC, conflicting volume	540			460			1114	1106	450	1152	1113	537
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	430			460			1070	1061	450	1112	1069	426
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			96			92	99	92	98	100	98
cM capacity (veh/h)	1013			1101			168	190	609	147	188	563

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	479	579	62	14
Volume Left	19	39	13	3
Volume Right	20	6	48	11
cSH	1013	1101	384	351
Volume to Capacity	0.02	0.04	0.16	0.04
Queue Length 95th (m)	0.4	0.8	4.3	0.9
Control Delay (s)	0.6	1.0	16.2	15.7
Lane LOS	A	A	C	C
Approach Delay (s)	0.6	1.0	16.2	15.7
Approach LOS			C	C

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	52.8%	ICU Level of Service	A	
Analysis Period (min)	15			

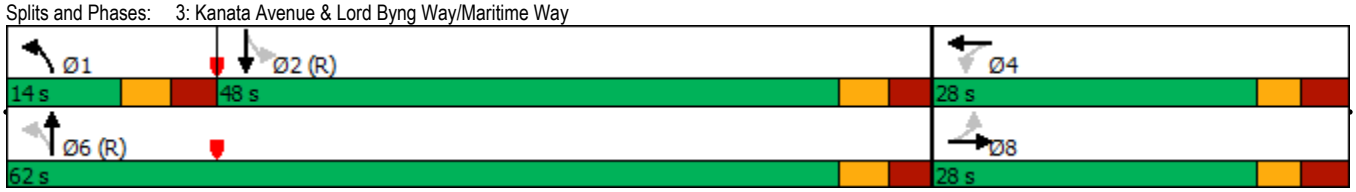


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	6	36	212	2	72	85	314	160	29	594	16
Future Volume (vph)	19	6	36	212	2	72	85	314	160	29	594	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	20.0		0.0	40.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	25.0			40.0			75.0			55.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.98		0.99	0.98		1.00	0.99		1.00	1.00	
Frt		0.871			0.854			0.949			0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1262	1045	0	1616	1491	0	1417	1643	0	1478	1757	0
Flt Permitted	0.709			0.730			0.248			0.492		
Satd. Flow (perm)	940	1045	0	1234	1491	0	370	1643	0	765	1757	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			72			53			2	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		119.6			99.0			110.4			236.0	
Travel Time (s)		8.6			7.1			7.9			17.0	
Confl. Peds. (#/hr)	1		3	3		1	3		1	1		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	37%	2%	56%	7%	2%	2%	22%	4%	5%	17%	2%	44%
Adj. Flow (vph)	19	6	36	212	2	72	85	314	160	29	594	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	19	42	0	212	74	0	85	474	0	29	610	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Detector Phase	8	8		4	4		1	6		2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	28.3	28.3		28.3	28.3		11.3	33.3		33.3	33.3	
Total Split (s)	28.0	28.0		28.0	28.0		14.0	62.0		48.0	48.0	
Total Split (%)	31.1%	31.1%		31.1%	31.1%		15.6%	68.9%		53.3%	53.3%	
Maximum Green (s)	21.7	21.7		21.7	21.7		7.7	55.7		41.7	41.7	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.3	6.3		6.3	6.3	
Lead/Lag							Lead			Lag	Lag	
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	None	None		None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0			20.0		20.0	20.0	
Pedestrian Calls (#/hr)	10	10		10	10			10		10	10	
Act Effct Green (s)	19.0	19.0		19.0	19.0		58.4	58.4		47.5	47.5	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.65	0.65		0.53	0.53	
v/c Ratio	0.10	0.17		0.82	0.20		0.26	0.44		0.07	0.66	
Control Delay	28.3	12.9		58.2	8.9		8.8	7.7		14.0	21.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	28.3	12.9		58.2	8.9		8.8	7.7		14.0	21.8	
LOS	C	B		E	A		A	A		B	C	
Approach Delay		17.7			45.5			7.9			21.5	
Approach LOS		B			D			A			C	
90th %ile Green (s)	21.7	21.7		21.7	21.7		7.7	55.7		41.7	41.7	
90th %ile Term Code	Ped	Ped		Ped	Ped		Max	Coord		Coord	Coord	
70th %ile Green (s)	21.7	21.7		21.7	21.7		7.7	55.7		41.7	41.7	
70th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Coord	Coord	
50th %ile Green (s)	21.0	21.0		21.0	21.0		7.6	56.4		42.5	42.5	
50th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
30th %ile Green (s)	17.7	17.7		17.7	17.7		6.7	59.7		46.7	46.7	
30th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
10th %ile Green (s)	12.7	12.7		12.7	12.7		0.0	64.7		64.7	64.7	
10th %ile Term Code	Hold	Hold		Gap	Gap		Skip	Coord		Coord	Coord	
Stops (vph)	17	14		192	16		27	136		17	452	
Fuel Used(l)	1	1		31	7		3	16		1	34	
CO Emissions (g/hr)	19	22		585	131		56	297		25	633	
NOx Emissions (g/hr)	4	4		113	25		11	57		5	122	
VOC Emissions (g/hr)	4	5		135	30		13	69		6	146	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	2.6	0.8		34.1	0.3		3.7	18.6		2.7	81.5	
Queue Length 95th (m)	8.1	8.7		#64.8	10.4		12.9	51.8		7.7	125.0	
Internal Link Dist (m)		95.6			75.0			86.4			212.0	
Turn Bay Length (m)	20.0			40.0			35.0			35.0		
Base Capacity (vph)	226	279		297	414		329	1085		403	927	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.08	0.15		0.71	0.18		0.26	0.44		0.07	0.66	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 40 (44%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 20.9		Intersection LOS: C	
Intersection Capacity Utilization 73.8%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Kanata Avenue & Lord Byng Way/Maritime Way

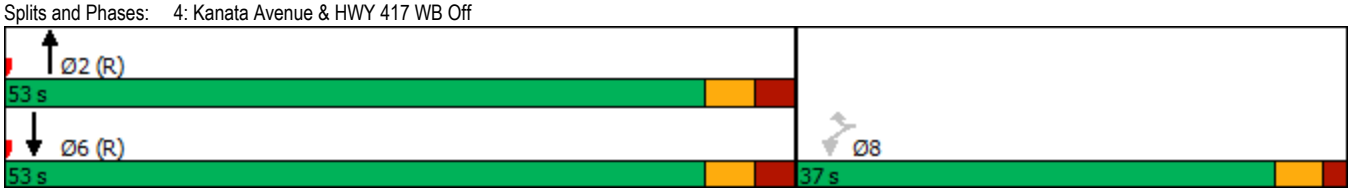


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	243	240	365	0	0	965
Future Volume (vph)	243	240	365	0	0	965
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1695	1334	1717	0	0	3325
Flt Permitted	0.950					
Satd. Flow (perm)	1695	1334	1717	0	0	3325
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		240				
Link Speed (k/h)	50		50			50
Link Distance (m)	332.8		126.6			114.0
Travel Time (s)	24.0		9.1			8.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	16%	6%	0%	0%	4%
Adj. Flow (vph)	243	240	365	0	0	965
Shared Lane Traffic (%)						
Lane Group Flow (vph)	243	240	365	0	0	965
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)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
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)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+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)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA			NA
Protected Phases			2			6
Permitted Phases	8	8				
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0			10.0
Minimum Split (s)	23.0	23.0	28.1			24.1
Total Split (s)	37.0	37.0	53.0			53.0
Total Split (%)	41.1%	41.1%	58.9%			58.9%
Maximum Green (s)	32.0	32.0	46.9			46.9
Yellow Time (s)	3.3	3.3	3.3			3.3
All-Red Time (s)	1.7	1.7	2.8			2.8
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	6.1			6.1
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)	7.0	7.0	7.0			
Flash Dont Walk (s)	11.0	11.0	15.0			
Pedestrian Calls (#/hr)	10	10	10			
Act Effct Green (s)	18.4	18.4	60.5			60.5
Actuated g/C Ratio	0.20	0.20	0.67			0.67
v/c Ratio	0.70	0.52	0.32			0.43
Control Delay	43.5	8.0	3.5			8.0
Queue Delay	0.0	0.0	0.2			0.0
Total Delay	43.5	8.0	3.6			8.0
LOS	D	A	A			A
Approach Delay	25.9		3.6			8.0
Approach LOS	C		A			A
90th %ile Green (s)	25.7	25.7	53.2			53.2
90th %ile Term Code	Gap	Gap	Coord			Coord
70th %ile Green (s)	21.1	21.1	57.8			57.8
70th %ile Term Code	Gap	Gap	Coord			Coord
50th %ile Green (s)	18.3	18.3	60.6			60.6
50th %ile Term Code	Gap	Gap	Coord			Coord
30th %ile Green (s)	15.5	15.5	63.4			63.4
30th %ile Term Code	Gap	Gap	Coord			Coord
10th %ile Green (s)	11.6	11.6	67.3			67.3
10th %ile Term Code	Gap	Gap	Coord			Coord
Stops (vph)	215	30	42			398
Fuel Used(l)	21	10	6			35
CO Emissions (g/hr)	384	181	117			659
NOx Emissions (g/hr)	74	35	23			127
VOC Emissions (g/hr)	89	42	27			152
Dilemma Vehicles (#)	0	0	0			0
Queue Length 50th (m)	39.3	0.0	7.8			28.6
Queue Length 95th (m)	57.3	16.4	10.2			64.0
Internal Link Dist (m)	308.8		102.6			90.0
Turn Bay Length (m)						
Base Capacity (vph)	602	628	1153			2233
Starvation Cap Reductn	0	0	230			0
Spillback Cap Reductn	0	0	0			11
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.40	0.38	0.40			0.43

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 35 (39%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 11.9		Intersection LOS: B	
Intersection Capacity Utilization 55.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: Kanata Avenue & HWY 417 WB Off

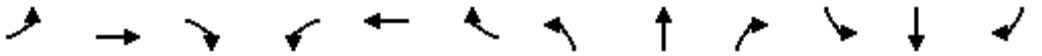


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
Lane Configurations							
Traffic Volume (vph)	0	0	338	220	463	599	
Future Volume (vph)	0	0	338	220	463	599	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	0.0	0.0		50.0	0.0		
Storage Lanes	0	0		1	1		
Taper Length (m)	7.6				7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor				0.98	1.00		
Frt				0.850			
Flt Protected					0.950		
Satd. Flow (prot)	0	0	1685	1502	1679	1750	
Flt Permitted					0.500		
Satd. Flow (perm)	0	0	1685	1468	883	1750	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)				220			
Link Speed (k/h)	48		50			50	
Link Distance (m)	278.4		119.2			126.6	
Travel Time (s)	20.9		8.6			9.1	
Confl. Peds. (#/hr)				1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	0%	0%	8%	3%	3%	4%	
Adj. Flow (vph)	0	0	338	220	463	599	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	338	220	463	599	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(m)	0.0		3.7			3.7	
Link Offset(m)	0.0		0.0			0.0	
Crosswalk Width(m)	4.9		4.9			4.9	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)	24	14		14	24		
Number of Detectors			2	1	1	2	
Detector Template			Thru	Right	Left	Thru	
Leading Detector (m)			30.5	6.1	6.1	30.5	
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)			1.8	6.1	6.1	1.8	
Detector 1 Type			Cl+Ex	Cl+Ex	Cl+Ex	Cl+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)			28.7			28.7	
Detector 2 Size(m)			1.8			1.8	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type			NA	Perm	pm+pt	NA	
Protected Phases			2		1	6	4
Permitted Phases				2	6		
Detector Phase			2	2	1	6	
Switch Phase							
Minimum Initial (s)			10.0	10.0	5.0	10.0	5.0
Minimum Split (s)			23.7	23.7	10.7	23.7	27.0
Total Split (s)			50.0	50.0	12.0	62.0	28.0
Total Split (%)			55.6%	55.6%	13.3%	68.9%	31%
Maximum Green (s)			44.3	44.3	6.3	56.3	23.0
Yellow Time (s)			3.3	3.3	3.3	3.3	3.0
All-Red Time (s)			2.4	2.4	2.4	2.4	2.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
Lost Time Adjust (s)			0.0	0.0	0.0	0.0	
Total Lost Time (s)			5.7	5.7	5.7	5.7	
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?			Yes	Yes	Yes		
Vehicle Extension (s)			3.0	3.0	3.0	3.0	3.0
Recall Mode			C-Max	C-Max	None	C-Max	None
Walk Time (s)			7.0	7.0			7.0
Flash Dont Walk (s)			11.0	11.0			15.0
Pedestrian Calls (#/hr)			10	10			10
Act Effct Green (s)			64.5	64.5	78.9	83.5	
Actuated g/C Ratio			0.72	0.72	0.88	0.93	
v/c Ratio			0.28	0.20	0.54	0.37	
Control Delay			6.4	1.7	5.8	2.3	
Queue Delay			0.3	0.0	0.0	0.0	
Total Delay			6.7	1.7	5.8	2.3	
LOS			A	A	A	A	
Approach Delay			4.7			3.8	
Approach LOS			A			A	
90th %ile Green (s)			44.3	44.3	7.3	57.3	22.0
90th %ile Term Code			Coord	Coord	Max	Coord	Ped
70th %ile Green (s)			68.8	68.8	9.8	84.3	0.0
70th %ile Term Code			Coord	Coord	Gap	Coord	Skip
50th %ile Green (s)			69.2	69.2	9.4	84.3	0.0
50th %ile Term Code			Coord	Coord	Gap	Coord	Skip
30th %ile Green (s)			69.7	69.7	8.9	84.3	0.0
30th %ile Term Code			Coord	Coord	Gap	Coord	Skip
10th %ile Green (s)			70.4	70.4	8.2	84.3	0.0
10th %ile Term Code			Coord	Coord	Gap	Coord	Skip
Stops (vph)			135	32	99	97	
Fuel Used(l)			9	4	10	10	
CO Emissions (g/hr)			158	65	183	195	
NOx Emissions (g/hr)			31	13	35	38	
VOC Emissions (g/hr)			37	15	42	45	
Dilemma Vehicles (#)			0	0	0	0	
Queue Length 50th (m)			7.1	0.0	4.7	0.0	
Queue Length 95th (m)			67.1	15.2	30.6	38.5	
Internal Link Dist (m)	254.4		95.2			102.6	
Turn Bay Length (m)				50.0			
Base Capacity (vph)			1207	1114	851	1623	
Starvation Cap Reductn			400	0	3	4	
Spillback Cap Reductn			0	0	0	0	
Storage Cap Reductn			0	0	0	0	
Reduced v/c Ratio			0.42	0.20	0.55	0.37	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 42 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 4.1		Intersection LOS: A	
Intersection Capacity Utilization 55.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Kanata Avenue & HWY 417 EB On



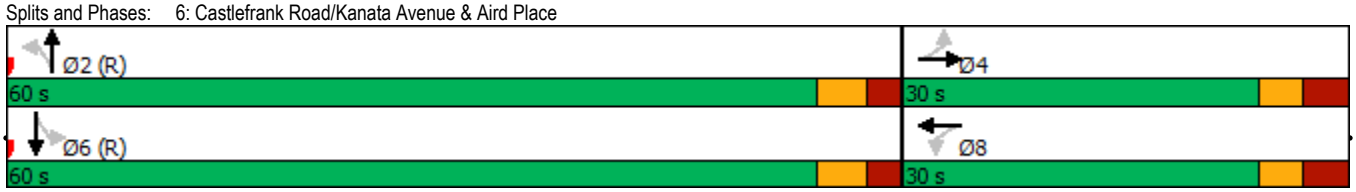
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	6	18	19	6	61	41	552	36	52	539	41
Future Volume (vph)	45	6	18	19	6	61	41	552	36	52	539	41
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.6			7.6			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97			0.96		0.99	1.00		1.00	1.00	
Frt		0.965			0.904			0.991			0.989	
Flt Protected		0.968			0.989		0.950			0.950		
Satd. Flow (prot)	0	1218	0	0	1464	0	1145	1732	0	1662	1713	0
Flt Permitted		0.809			0.909		0.411			0.407		
Satd. Flow (perm)	0	1001	0	0	1336	0	492	1732	0	709	1713	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			61			7			8	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		125.4			132.9			95.7			119.2	
Travel Time (s)		11.3			12.0			6.9			8.6	
Confl. Peds. (#/hr)	14		18	18		14	9		6	6		9
Confl. Bikes (#/hr)			1						1			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	33%	67%	39%	11%	50%	2%	51%	4%	3%	4%	5%	2%
Adj. Flow (vph)	45	6	18	19	6	61	41	552	36	52	539	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	69	0	0	86	0	41	588	0	52	580	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.2	28.2		28.2	28.2		24.7	24.7		24.7	24.7	
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Maximum Green (s)	23.8	23.8		23.8	23.8		54.3	54.3		54.3	54.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	

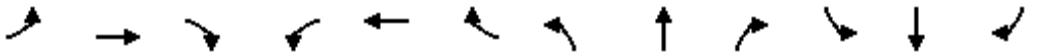
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	3.2	3.2		3.2	3.2		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.2			6.2		5.7	5.7		5.7	5.7	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	10	10		10	10		10	10		10	10	
Act Effct Green (s)		13.0			13.0		69.5	69.5		69.5	69.5	
Actuated g/C Ratio		0.14			0.14		0.77	0.77		0.77	0.77	
v/c Ratio		0.43			0.35		0.11	0.44		0.10	0.44	
Control Delay		34.5			17.0		5.9	6.8		5.6	6.8	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.2	
Total Delay		34.5			17.0		5.9	6.8		5.6	7.0	
LOS		C			B		A	A		A	A	
Approach Delay		34.5			17.0			6.7			6.9	
Approach LOS		C			B			A			A	
90th %ile Green (s)	22.0	22.0		22.0	22.0		56.1	56.1		56.1	56.1	
90th %ile Term Code	Ped	Ped		Ped	Ped		Coord	Coord		Coord	Coord	
70th %ile Green (s)	12.8	12.8		12.8	12.8		65.3	65.3		65.3	65.3	
70th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord		Coord	Coord	
50th %ile Green (s)	10.1	10.1		10.1	10.1		68.0	68.0		68.0	68.0	
50th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord		Coord	Coord	
30th %ile Green (s)	10.0	10.0		10.0	10.0		68.1	68.1		68.1	68.1	
30th %ile Term Code	Min	Min		Min	Min		Coord	Coord		Coord	Coord	
10th %ile Green (s)	0.0	0.0		0.0	0.0		84.3	84.3		84.3	84.3	
10th %ile Term Code	Skip	Skip		Skip	Skip		Coord	Coord		Coord	Coord	
Stops (vph)		47			30		14	217		16	190	
Fuel Used(l)		3			3		1	13		1	14	
CO Emissions (g/hr)		64			51		16	247		22	258	
NOx Emissions (g/hr)		12			10		3	48		4	50	
VOC Emissions (g/hr)		15			12		4	57		5	59	
Dilemma Vehicles (#)		0			0		0	0		0	0	
Queue Length 50th (m)		8.4			4.0		1.5	29.7		2.7	48.0	
Queue Length 95th (m)		18.3			14.6		7.1	78.3		6.2	40.4	
Internal Link Dist (m)		101.4			108.9			71.7			95.2	
Turn Bay Length (m)							30.0			50.0		
Base Capacity (vph)		277			398		379	1339		547	1324	
Starvation Cap Reductn		0			0		0	0		0	192	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.25			0.22		0.11	0.44		0.10	0.51	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 17 (19%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.44
Intersection Signal Delay: 8.8 Intersection LOS: A
Intersection Capacity Utilization 69.6% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 6: Castlefrank Road/Kanata Avenue & Aird Place





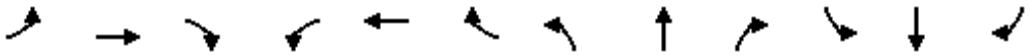
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	639	13	66	431	73	17	16	160	155	10	51
Future Volume (vph)	49	639	13	66	431	73	17	16	160	155	10	51
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	40.0			55.0			40.0			35.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		1.00	0.99		0.99	0.96		0.98	0.98	
Frt		0.997			0.978			0.864			0.875	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1718	0	1695	1592	0	1695	1475	0	1695	1494	0
Flt Permitted	0.429			0.333			0.717			0.612		
Satd. Flow (perm)	759	1718	0	591	1592	0	1268	1475	0	1068	1494	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			15			160			51	
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		250.4			203.8			223.0			144.1	
Travel Time (s)		18.0			14.7			16.1			13.0	
Confl. Peds. (#/hr)	12		11	11		12	4		12	12		4
Confl. Bikes (#/hr)			1									
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	5%	33%	2%	11%	12%	2%	2%	2%	2%	14%	2%
Adj. Flow (vph)	49	639	13	66	431	73	17	16	160	155	10	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	652	0	66	504	0	17	176	0	155	61	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.7	27.7		27.7	27.7		24.0	24.0		24.0	24.0	
Total Split (s)	45.0	45.0		45.0	45.0		35.0	35.0		35.0	35.0	
Total Split (%)	56.3%	56.3%		56.3%	56.3%		43.8%	43.8%		43.8%	43.8%	
Maximum Green (s)	39.3	39.3		39.3	39.3		29.0	29.0		29.0	29.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7		5.7	5.7		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	10	10		10	10		10	10		10	10	
Act Effct Green (s)	51.7	51.7		51.7	51.7		16.6	16.6		16.6	16.6	
Actuated g/C Ratio	0.65	0.65		0.65	0.65		0.21	0.21		0.21	0.21	
v/c Ratio	0.10	0.59		0.17	0.49		0.06	0.41		0.70	0.17	
Control Delay	7.7	12.1		8.8	10.2		22.9	8.2		45.3	9.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.7	12.1		8.8	10.2		22.9	8.2		45.3	9.9	
LOS	A	B		A	B		C	A		D	A	
Approach Delay		11.8			10.1			9.5			35.3	
Approach LOS		B			B			A			D	
90th %ile Green (s)	44.4	44.4		44.4	44.4		23.9	23.9		23.9	23.9	
90th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
70th %ile Green (s)	48.8	48.8		48.8	48.8		19.5	19.5		19.5	19.5	
70th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
50th %ile Green (s)	51.9	51.9		51.9	51.9		16.4	16.4		16.4	16.4	
50th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
30th %ile Green (s)	55.1	55.1		55.1	55.1		13.2	13.2		13.2	13.2	
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
10th %ile Green (s)	58.3	58.3		58.3	58.3		10.0	10.0		10.0	10.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		Min	Min		Min	Min	
Stops (vph)	20	376		29	255		15	32		137	19	
Fuel Used(l)	2	30		2	19		2	17		10	2	
CO Emissions (g/hr)	35	558		44	362		38	309		181	31	
NOx Emissions (g/hr)	7	108		9	70		7	60		35	6	
VOC Emissions (g/hr)	8	129		10	83		9	71		42	7	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	2.4	49.0		3.5	33.1		2.1	2.0		22.1	1.2	
Queue Length 95th (m)	8.3	102.8		11.5	71.7		6.2	15.1		37.0	9.1	
Internal Link Dist (m)		226.4			179.8			199.0			120.1	
Turn Bay Length (m)	30.0			30.0			40.0			35.0		
Base Capacity (vph)	490	1110		382	1034		459	636		387	574	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.10	0.59		0.17	0.49		0.04	0.28		0.40	0.11	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 14.0 — Intersection LOS: B
Intersection Capacity Utilization 86.3% — ICU Level of Service E
Analysis Period (min) 15

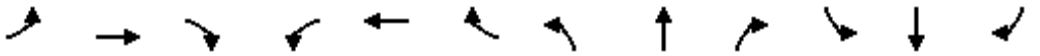
Splits and Phases: 22: Maritime Way/Knudson Drive & Campeau Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	615	12	26	555	2	22	0	36	4	2	11
Future Volume (Veh/h)	4	615	12	26	555	2	22	0	36	4	2	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	4	683	13	29	617	2	24	0	40	4	2	12
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					251							
pX, platoon unblocked	0.91						0.91	0.91		0.91	0.91	0.91
vC, conflicting volume	619			696			1386	1374	690	1414	1380	618
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	527			696			1375	1361	690	1404	1367	526
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			77	100	91	96	98	98
cM capacity (veh/h)	942			900			104	129	445	94	128	500

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	700	648	64	18
Volume Left	4	29	24	4
Volume Right	13	2	40	12
cSH	942	900	200	219
Volume to Capacity	0.00	0.03	0.32	0.08
Queue Length 95th (m)	0.1	0.8	10.0	2.0
Control Delay (s)	0.1	0.9	31.3	22.9
Lane LOS	A	A	D	C
Approach Delay (s)	0.1	0.9	31.3	22.9
Approach LOS			D	C

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	62.5%	ICU Level of Service	B	
Analysis Period (min)	15			

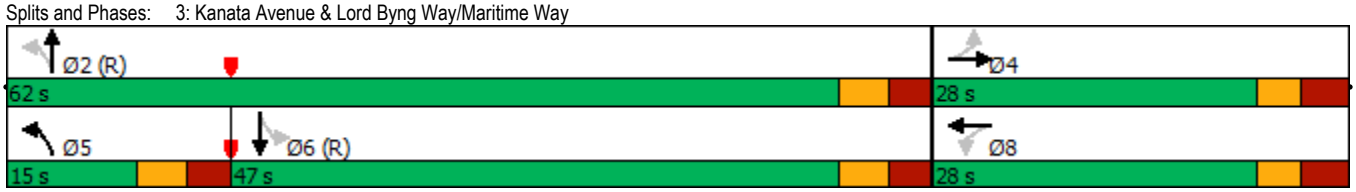


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	3	78	162	9	62	136	799	248	94	619	25
Future Volume (vph)	30	3	78	162	9	62	136	799	248	94	619	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	20.0		0.0	40.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	25.0			40.0			75.0			55.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	0.97		0.99	0.96			0.99		1.00	1.00	
Frt		0.856			0.869			0.964			0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1262	1250	0	1695	1494	0	1503	1710	0	1695	1760	0
Flt Permitted	0.711			0.704			0.228			0.165		
Satd. Flow (perm)	925	1250	0	1247	1494	0	361	1710	0	294	1760	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		78			62			33			3	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		119.6			99.0			110.4			236.0	
Travel Time (s)		8.6			7.1			7.9			17.0	
Confl. Peds. (#/hr)	11		4	4		11	3		3	3		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	37%	2%	22%	2%	2%	2%	15%	2%	2%	2%	2%	20%
Adj. Flow (vph)	30	3	78	162	9	62	136	799	248	94	619	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	81	0	162	71	0	136	1047	0	94	644	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	28.3	28.3		28.3	28.3		11.3	33.3		33.3	33.3	
Total Split (s)	28.0	28.0		28.0	28.0		15.0	62.0		47.0	47.0	
Total Split (%)	31.1%	31.1%		31.1%	31.1%		16.7%	68.9%		52.2%	52.2%	
Maximum Green (s)	21.7	21.7		21.7	21.7		8.7	55.7		40.7	40.7	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.3	6.3		6.3	6.3	
Lead/Lag							Lead			Lag	Lag	
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	None	None		None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0			20.0		20.0	20.0	
Pedestrian Calls (#/hr)	10	10		10	10			10		10	10	
Act Effct Green (s)	16.5	16.5		16.5	16.5		60.9	60.9		46.6	46.6	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.68	0.68		0.52	0.52	
v/c Ratio	0.18	0.28		0.71	0.22		0.39	0.90		0.62	0.71	
Control Delay	31.4	10.1		45.5	7.8		7.2	17.2		40.7	23.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.6		0.0	0.0	
Total Delay	31.4	10.1		45.5	7.8		7.2	17.7		40.7	23.5	
LOS	C	B		D	A		A	B		D	C	
Approach Delay		15.8			34.0			16.5			25.7	
Approach LOS		B			C			B			C	
90th %ile Green (s)	21.7	21.7		21.7	21.7		8.7	55.7		40.7	40.7	
90th %ile Term Code	Ped	Ped		Ped	Ped		Max	Coord		Coord	Coord	
70th %ile Green (s)	19.8	19.8		19.8	19.8		9.7	57.6		41.6	41.6	
70th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
50th %ile Green (s)	16.9	16.9		16.9	16.9		8.4	60.5		45.8	45.8	
50th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
30th %ile Green (s)	13.9	13.9		13.9	13.9		7.3	63.5		49.9	49.9	
30th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
10th %ile Green (s)	10.0	10.0		10.0	10.0		6.1	67.4		55.0	55.0	
10th %ile Term Code	Hold	Hold		Min	Min		Gap	Coord		Coord	Coord	
Stops (vph)	27	17		149	26		43	626		68	478	
Fuel Used(l)	2	2		22	7		5	50		7	37	
CO Emissions (g/hr)	31	36		418	129		86	933		122	684	
NOx Emissions (g/hr)	6	7		81	25		17	180		24	132	
VOC Emissions (g/hr)	7	8		97	30		20	215		28	158	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	4.4	0.4		26.5	3.3		6.9	125.5		11.1	81.5	
Queue Length 95th (m)	11.2	11.3		44.7	11.1		m8.8	m#153.7		#39.8	#151.8	
Internal Link Dist (m)		95.6			75.0			86.4			212.0	
Turn Bay Length (m)	20.0			40.0			35.0			35.0		
Base Capacity (vph)	223	360		300	407		357	1168		152	912	
Starvation Cap Reductn	0	0		0	0		0	17		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.13	0.23		0.54	0.17		0.38	0.91		0.62	0.71	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 31 (34%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 21.3		Intersection LOS: C	
Intersection Capacity Utilization 101.3%		ICU Level of Service G	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Kanata Avenue & Lord Byng Way/Maritime Way

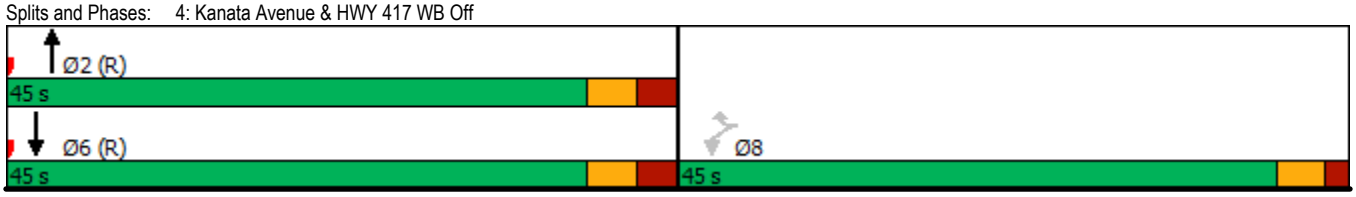


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	469	701	744	0	0	1063
Future Volume (vph)	469	701	744	0	0	1063
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1695	1517	1750	0	0	3357
Flt Permitted	0.950					
Satd. Flow (perm)	1695	1517	1750	0	0	3357
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		112				
Link Speed (k/h)	50		50			50
Link Distance (m)	332.8		126.6			114.0
Travel Time (s)	24.0		9.1			8.2
Confl. Bikes (#/hr)				3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	4%	0%	0%	3%
Adj. Flow (vph)	469	701	744	0	0	1063
Shared Lane Traffic (%)						
Lane Group Flow (vph)	469	701	744	0	0	1063
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)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
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)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+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)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA			NA
Protected Phases			2			6
Permitted Phases	8	8				
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0			10.0
Minimum Split (s)	23.0	23.0	28.1			24.1
Total Split (s)	45.0	45.0	45.0			45.0
Total Split (%)	50.0%	50.0%	50.0%			50.0%
Maximum Green (s)	40.0	40.0	38.9			38.9
Yellow Time (s)	3.3	3.3	3.3			3.3
All-Red Time (s)	1.7	1.7	2.8			2.8
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	6.1			6.1
Lead/Lag						

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)	7.0	7.0	7.0			
Flash Dont Walk (s)	11.0	11.0	15.0			
Pedestrian Calls (#/hr)	10	10	10			
Act Effct Green (s)	39.3	39.3	39.6			39.6
Actuated g/C Ratio	0.44	0.44	0.44			0.44
v/c Ratio	0.63	0.97	0.97			0.72
Control Delay	24.3	48.7	41.8			20.9
Queue Delay	0.3	0.9	34.9			0.0
Total Delay	24.6	49.6	76.7			20.9
LOS	C	D	E			C
Approach Delay	39.6		76.7			20.9
Approach LOS	D		E			C
90th %ile Green (s)	40.0	40.0	38.9			38.9
90th %ile Term Code	Max	Max	Coord			Coord
70th %ile Green (s)	40.0	40.0	38.9			38.9
70th %ile Term Code	Max	Max	Coord			Coord
50th %ile Green (s)	40.0	40.0	38.9			38.9
50th %ile Term Code	Max	Max	Coord			Coord
30th %ile Green (s)	40.0	40.0	38.9			38.9
30th %ile Term Code	Max	Max	Coord			Coord
10th %ile Green (s)	36.3	36.3	42.6			42.6
10th %ile Term Code	Gap	Gap	Coord			Coord
Stops (vph)	355	522	528			639
Fuel Used(l)	32	60	45			54
CO Emissions (g/hr)	587	1119	831			1006
NOx Emissions (g/hr)	113	216	160			194
VOC Emissions (g/hr)	135	258	192			232
Dilemma Vehicles (#)	0	0	0			0
Queue Length 50th (m)	60.3	99.1	124.3			46.2
Queue Length 95th (m)	92.0	#174.6	#193.3			75.4
Internal Link Dist (m)	308.8		102.6			90.0
Turn Bay Length (m)						
Base Capacity (vph)	753	736	770			1478
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	42	5	84			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.66	0.96	1.08			0.72

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 32 (36%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 42.2		Intersection LOS: D	
Intersection Capacity Utilization 124.9%		ICU Level of Service H	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 4: Kanata Avenue & HWY 417 WB Off

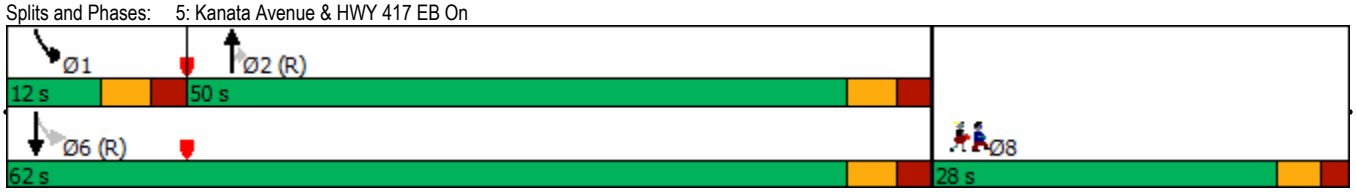


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lane Configurations							
Traffic Volume (vph)	0	0	614	199	410	951	
Future Volume (vph)	0	0	614	199	410	951	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	0.0	0.0		50.0	0.0		
Storage Lanes	0	0		1	1		
Taper Length (m)	7.6				7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor				0.98			
Frt				0.850			
Flt Protected					0.950		
Satd. Flow (prot)	0	0	1733	1517	1662	1784	
Flt Permitted					0.265		
Satd. Flow (perm)	0	0	1733	1479	464	1784	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)				193			
Link Speed (k/h)	48		50			50	
Link Distance (m)	278.4		119.2			126.6	
Travel Time (s)	20.9		8.6			9.1	
Confl. Peds. (#/hr)				2	2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	0%	0%	5%	2%	4%	2%	
Adj. Flow (vph)	0	0	614	199	410	951	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	614	199	410	951	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(m)	0.0		3.7			3.7	
Link Offset(m)	0.0		0.0			0.0	
Crosswalk Width(m)	4.9		4.9			4.9	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)	24	14		14	24		
Number of Detectors			2	1	1	2	
Detector Template			Thru	Right	Left	Thru	
Leading Detector (m)			30.5	6.1	6.1	30.5	
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)			1.8	6.1	6.1	1.8	
Detector 1 Type			Cl+Ex	Cl+Ex	Cl+Ex	Cl+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)			28.7			28.7	
Detector 2 Size(m)			1.8			1.8	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type			NA	Perm	pm+pt	NA	
Protected Phases			2		1	6	8
Permitted Phases				2	6		
Detector Phase			2	2	1	6	
Switch Phase							
Minimum Initial (s)			10.0	10.0	5.0	10.0	5.0
Minimum Split (s)			23.7	23.7	10.7	23.7	27.0
Total Split (s)			50.0	50.0	12.0	62.0	28.0
Total Split (%)			55.6%	55.6%	13.3%	68.9%	31%
Maximum Green (s)			44.3	44.3	6.3	56.3	23.0
Yellow Time (s)			3.3	3.3	3.3	3.3	3.0
All-Red Time (s)			2.4	2.4	2.4	2.4	2.0

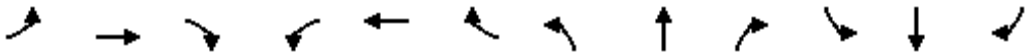
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lost Time Adjust (s)			0.0	0.0	0.0	0.0	
Total Lost Time (s)			5.7	5.7	5.7	5.7	
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?			Yes	Yes	Yes		
Vehicle Extension (s)			3.0	3.0	3.0	3.0	3.0
Recall Mode			C-Max	C-Max	None	C-Max	None
Walk Time (s)			7.0	7.0			7.0
Flash Dont Walk (s)			11.0	11.0			15.0
Pedestrian Calls (#/hr)			10	10			10
Act Effct Green (s)			53.1	53.1	78.9	83.5	
Actuated g/C Ratio			0.59	0.59	0.88	0.93	
v/c Ratio			0.60	0.21	0.61	0.57	
Control Delay			9.7	1.0	16.4	5.5	
Queue Delay			2.1	0.0	0.0	0.1	
Total Delay			11.8	1.0	16.4	5.6	
LOS			B	A	B	A	
Approach Delay			9.1			8.8	
Approach LOS			A			A	
90th %ile Green (s)			44.3	44.3	7.3	57.3	22.0
90th %ile Term Code			Coord	Coord	Max	Coord	Ped
70th %ile Green (s)			60.7	60.7	17.9	84.3	0.0
70th %ile Term Code			Coord	Coord	Gap	Coord	Skip
50th %ile Green (s)			59.9	59.9	18.7	84.3	0.0
50th %ile Term Code			Coord	Coord	Gap	Coord	Skip
30th %ile Green (s)			56.4	56.4	22.2	84.3	0.0
30th %ile Term Code			Coord	Coord	Gap	Coord	Skip
10th %ile Green (s)			44.3	44.3	34.3	84.3	0.0
10th %ile Term Code			Coord	Coord	Max	Coord	Skip
Stops (vph)			350	15	141	176	
Fuel Used(l)			19	3	13	19	
CO Emissions (g/hr)			360	51	247	361	
NOx Emissions (g/hr)			70	10	48	70	
VOC Emissions (g/hr)			83	12	57	83	
Dilemma Vehicles (#)			0	0	0	0	
Queue Length 50th (m)			50.6	1.4	23.3	8.0	
Queue Length 95th (m)			80.5	2.9	#72.8	#105.7	
Internal Link Dist (m)	254.4		95.2			102.6	
Turn Bay Length (m)				50.0			
Base Capacity (vph)			1023	951	674	1654	
Starvation Cap Reductn			184	0	0	6	
Spillback Cap Reductn			261	0	0	83	
Storage Cap Reductn			0	0	0	0	
Reduced v/c Ratio			0.81	0.21	0.61	0.61	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 27 (30%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 124.9%	ICU Level of Service H
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 5: Kanata Avenue & HWY 417 EB On



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	3	13	30	1	97	12	810	35	62	946	24
Future Volume (vph)	17	3	13	30	1	97	12	810	35	62	946	24
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.6			7.6			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.97			1.00			1.00	
Frt		0.947			0.898			0.994			0.996	
Flt Protected		0.975			0.988		0.950			0.950		
Satd. Flow (prot)	0	1627	0	0	1542	0	1695	1755	0	1695	1775	0
Flt Permitted		0.735			0.909		0.219			0.278		
Satd. Flow (perm)	0	1219	0	0	1415	0	391	1755	0	496	1775	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			97			4			3	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		125.4			132.9			95.7			119.2	
Travel Time (s)		11.3			12.0			6.9			8.6	
Confl. Peds. (#/hr)	7		6	6		7	9		5	5		9
Confl. Bikes (#/hr)									3			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	17	3	13	30	1	97	12	810	35	62	946	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	33	0	0	128	0	12	845	0	62	970	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	28.2	28.2		28.2	28.2		24.7	24.7		24.7	24.7	
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Maximum Green (s)	23.8	23.8		23.8	23.8		54.3	54.3		54.3	54.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	



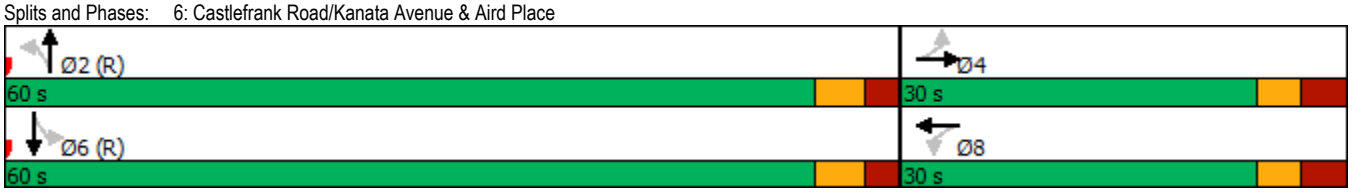
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	3.2	3.2		3.2	3.2		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.2			6.2		5.7	5.7		5.7	5.7	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	10	10		10	10		10	10		10	10	
Act Effct Green (s)		10.1			10.1		68.0	68.0		68.0	68.0	
Actuated g/C Ratio		0.11			0.11		0.76	0.76		0.76	0.76	
v/c Ratio		0.22			0.52		0.04	0.64		0.17	0.72	
Control Delay		26.2			19.2		5.2	9.5		6.9	12.0	
Queue Delay		0.0			0.0		0.0	0.1		0.0	0.0	
Total Delay		26.2			19.2		5.2	9.6		6.9	12.0	
LOS		C			B		A	A		A	B	
Approach Delay		26.2			19.2			9.5			11.7	
Approach LOS		C			B			A			B	
90th %ile Green (s)	22.0	22.0		22.0	22.0		56.1	56.1		56.1	56.1	
90th %ile Term Code	Ped	Ped		Ped	Ped		Coord	Coord		Coord	Coord	
70th %ile Green (s)	9.9	9.9		9.9	9.9		68.2	68.2		68.2	68.2	
70th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
50th %ile Green (s)	7.5	7.5		7.5	7.5		70.6	70.6		70.6	70.6	
50th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
30th %ile Green (s)	5.5	5.5		5.5	5.5		72.6	72.6		72.6	72.6	
30th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
10th %ile Green (s)	5.5	5.5		5.5	5.5		72.6	72.6		72.6	72.6	
10th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
Stops (vph)		21			40		4	410		20	423	
Fuel Used(l)		1			4		0	23		1	29	
CO Emissions (g/hr)		26			79		5	429		27	547	
NOx Emissions (g/hr)		5			15		1	83		5	106	
VOC Emissions (g/hr)		6			18		1	99		6	126	
Dilemma Vehicles (#)		0			0		0	0		0	0	
Queue Length 50th (m)		3.3			5.1		0.4	46.0		3.6	81.7	
Queue Length 95th (m)		9.9			17.8		2.9	147.1		m5.8	#217.2	
Internal Link Dist (m)		101.4			108.9			71.7			95.2	
Turn Bay Length (m)							30.0			50.0		
Base Capacity (vph)		331			445		295	1327		375	1342	
Starvation Cap Reductn		0			0		0	0		0	8	
Spillback Cap Reductn		0			2		0	38		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.10			0.29		0.04	0.66		0.17	0.73	

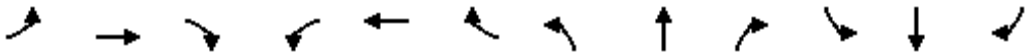
Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 10 (11%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 11.5		Intersection LOS: B	
Intersection Capacity Utilization 75.3%		ICU Level of Service D	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Castlefrank Road/Kanata Avenue & Aird Place



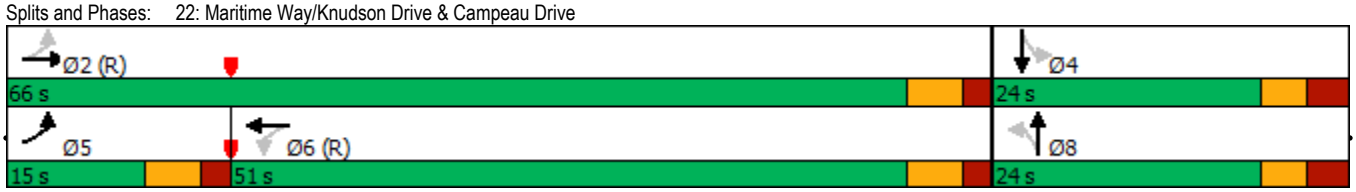


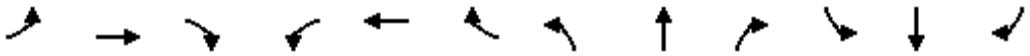
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	442	31	136	607	100	12	13	95	37	11	71
Future Volume (vph)	64	442	31	136	607	100	12	13	95	37	11	71
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	40.0			55.0			40.0			35.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	0.99		0.98	0.97		0.99	0.96	
Frt		0.990			0.979			0.868			0.870	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1763	0	1695	1734	0	1695	1507	0	1679	1498	0
Flt Permitted	0.267			0.492			0.704			0.687		
Satd. Flow (perm)	476	1763	0	874	1734	0	1232	1507	0	1203	1498	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			13			95			71	
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		237.7			203.8			223.0			144.1	
Travel Time (s)		17.1			14.7			16.1			13.0	
Confl. Peds. (#/hr)	15		4	4		15	8		4	4		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	64	442	31	136	607	100	12	13	95	37	11	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	473	0	136	707	0	12	108	0	37	82	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	10.7	27.7		27.7	27.7		24.0	24.0		24.0	24.0	
Total Split (s)	15.0	66.0		51.0	51.0		24.0	24.0		24.0	24.0	
Total Split (%)	16.7%	73.3%		56.7%	56.7%		26.7%	26.7%		26.7%	26.7%	
Maximum Green (s)	9.3	60.3		45.3	45.3		18.0	18.0		18.0	18.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7		5.7	5.7		6.0	6.0		6.0	6.0	
Lead/Lag	Lead			Lag	Lag							
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	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)		10		10	10		10	10		10	10	
Act Effct Green (s)	70.1	71.2		61.3	61.3		11.4	11.4		11.4	11.4	
Actuated g/C Ratio	0.78	0.79		0.68	0.68		0.13	0.13		0.13	0.13	
v/c Ratio	0.14	0.34		0.23	0.60		0.08	0.40		0.24	0.33	
Control Delay	4.3	4.7		10.0	13.9		34.2	19.1		38.5	14.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	4.3	4.7		10.0	13.9		34.2	19.1		38.5	14.5	
LOS	A	A		B	B		C	B		D	B	
Approach Delay		4.7			13.3			20.6			21.9	
Approach LOS		A			B			C			C	
90th %ile Green (s)	7.8	61.3		47.8	47.8		17.0	17.0		17.0	17.0	
90th %ile Term Code	Gap	Coord		Coord	Coord		Ped	Ped		Ped	Ped	
70th %ile Green (s)	6.7	68.3		55.9	55.9		10.0	10.0		10.0	10.0	
70th %ile Term Code	Gap	Coord		Coord	Coord		Min	Min		Min	Min	
50th %ile Green (s)	6.3	68.3		56.3	56.3		10.0	10.0		10.0	10.0	
50th %ile Term Code	Gap	Coord		Coord	Coord		Min	Min		Min	Min	
30th %ile Green (s)	5.9	68.3		56.7	56.7		10.0	10.0		10.0	10.0	
30th %ile Term Code	Gap	Coord		Coord	Coord		Min	Min		Min	Min	
10th %ile Green (s)	0.0	84.3		84.3	84.3		0.0	0.0		0.0	0.0	
10th %ile Term Code	Skip	Coord		Coord	Coord		Skip	Skip		Skip	Skip	
Stops (vph)	17	137		60	414		15	60		34	23	
Fuel Used(l)	2	15		5	31		2	12		2	2	
CO Emissions (g/hr)	38	288		93	568		31	222		40	46	
NOx Emissions (g/hr)	7	56		18	110		6	43		8	9	
VOC Emissions (g/hr)	9	66		22	131		7	51		9	11	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	2.2	20.9		9.4	68.3		2.2	6.9		6.0	1.8	
Queue Length 95th (m)	6.9	46.0		24.0	136.2		m2.8	m14.0		13.8	13.1	
Internal Link Dist (m)		213.7			179.8			199.0			120.1	
Turn Bay Length (m)	30.0			30.0			40.0			35.0		
Base Capacity (vph)	496	1397		595	1186		246	377		240	356	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.13	0.34		0.23	0.60		0.05	0.29		0.15	0.23	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 11.6		Intersection LOS: B	
Intersection Capacity Utilization 69.1%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 22: Maritime Way/Knudson Drive & Campeau Drive





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	547	20	38	668	6	13	1	47	3	0	11
Future Volume (Veh/h)	19	547	20	38	668	6	13	1	47	3	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	21	608	22	42	742	7	14	1	52	3	0	12
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					238							
pX, platoon unblocked	0.77						0.77	0.77		0.77	0.77	0.77
vC, conflicting volume	749			630			1502	1494	619	1543	1502	746
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	530			630			1503	1492	619	1556	1502	526
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			96			80	99	89	95	100	97
cM capacity (veh/h)	803			952			71	89	489	60	88	427

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	651	791	67	15
Volume Left	21	42	14	3
Volume Right	22	7	52	12
cSH	803	952	213	191
Volume to Capacity	0.03	0.04	0.31	0.08
Queue Length 95th (m)	0.6	1.1	9.8	1.9
Control Delay (s)	0.7	1.1	29.4	25.4
Lane LOS	A	A	D	D
Approach Delay (s)	0.7	1.1	29.4	25.4
Approach LOS			D	D

Intersection Summary					
Average Delay	2.4				
Intersection Capacity Utilization	66.4%	ICU Level of Service	C		
Analysis Period (min)	15				

APPENDIX H

Left Turn Lane Warrant Graphs and Signal Warrants

NOVATECH
Engineers, Planners & Landscape Architects

TRAFFIC SIGNAL JUSTIFICATION USING PROJECTED VOLUMES

LOCATION: Campeau Drive **at** Conacher/Great Lakes

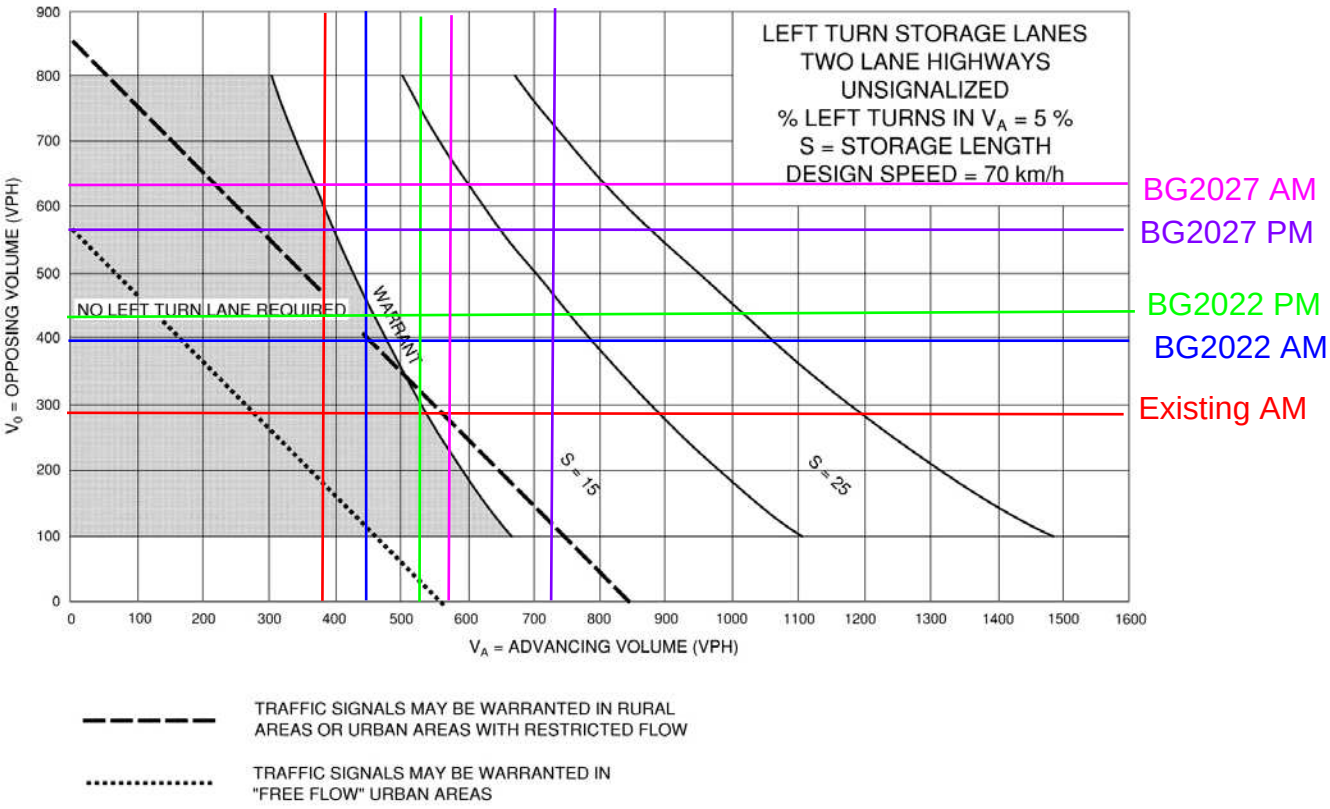
YEAR: 2027 total traffic

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT		COMPLIANCE		
		FREE FLOW	RESTRICTED FLOW	SECTIONAL		ENTIRE % (2)
		OPERATING SPEED ≥ 70KM/H	OPERATING SPEED < 70 KM/H	NUMERICAL	PERCENT	
1. MINIMUM VEHICULAR WARRANT	A. Vehicle volume, all approaches (average hour)	480 600 (2 or more lane approach	720 900 (2 or more lane approach	590	123%	35%
	B. Vehicle volume along minor street (average hour)	120 180 (tee intersection)	170 255 (tee intersection)	42	35%	
2. DELAY TO CROSS TRAFFIC	A. Vehicle volume along major street (average hour)	480 600 (2 or more lane approach)	720 900 (2 or more lane approach	632	132%	29%
	B (1). Combined vehicle and pedestrian volume crossing the major street (average hour)	50	75	14	29%	

NOTES

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

Exhibit 9A-10



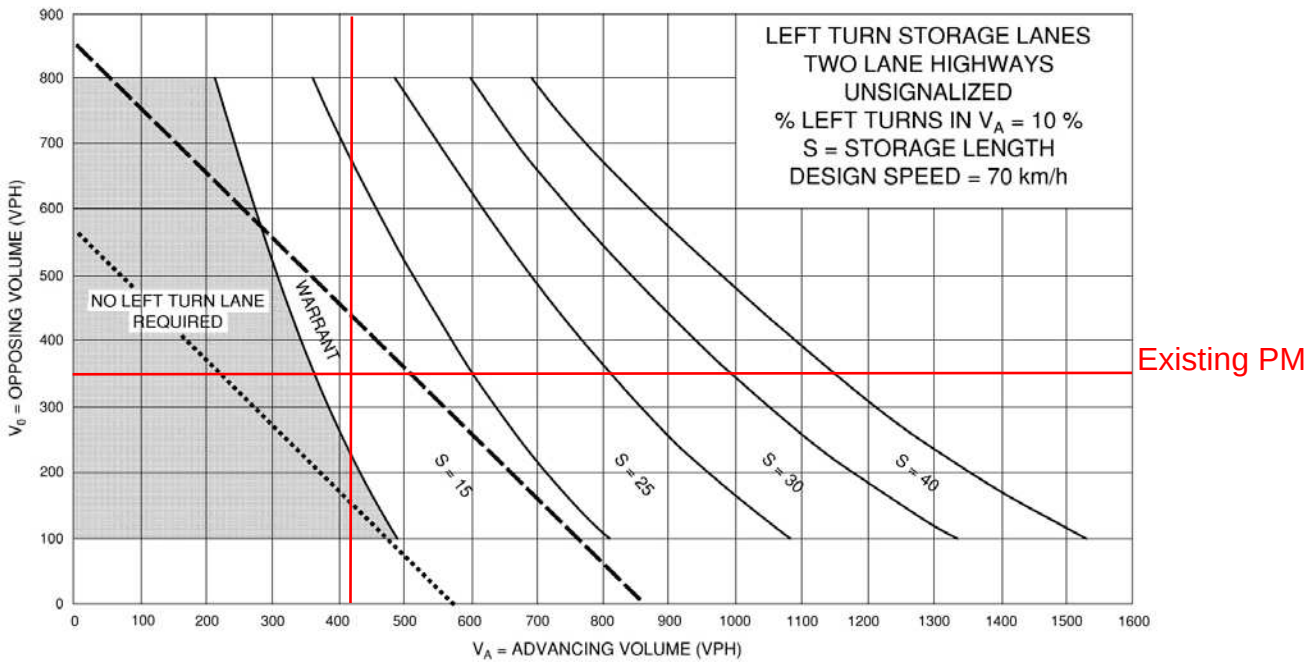
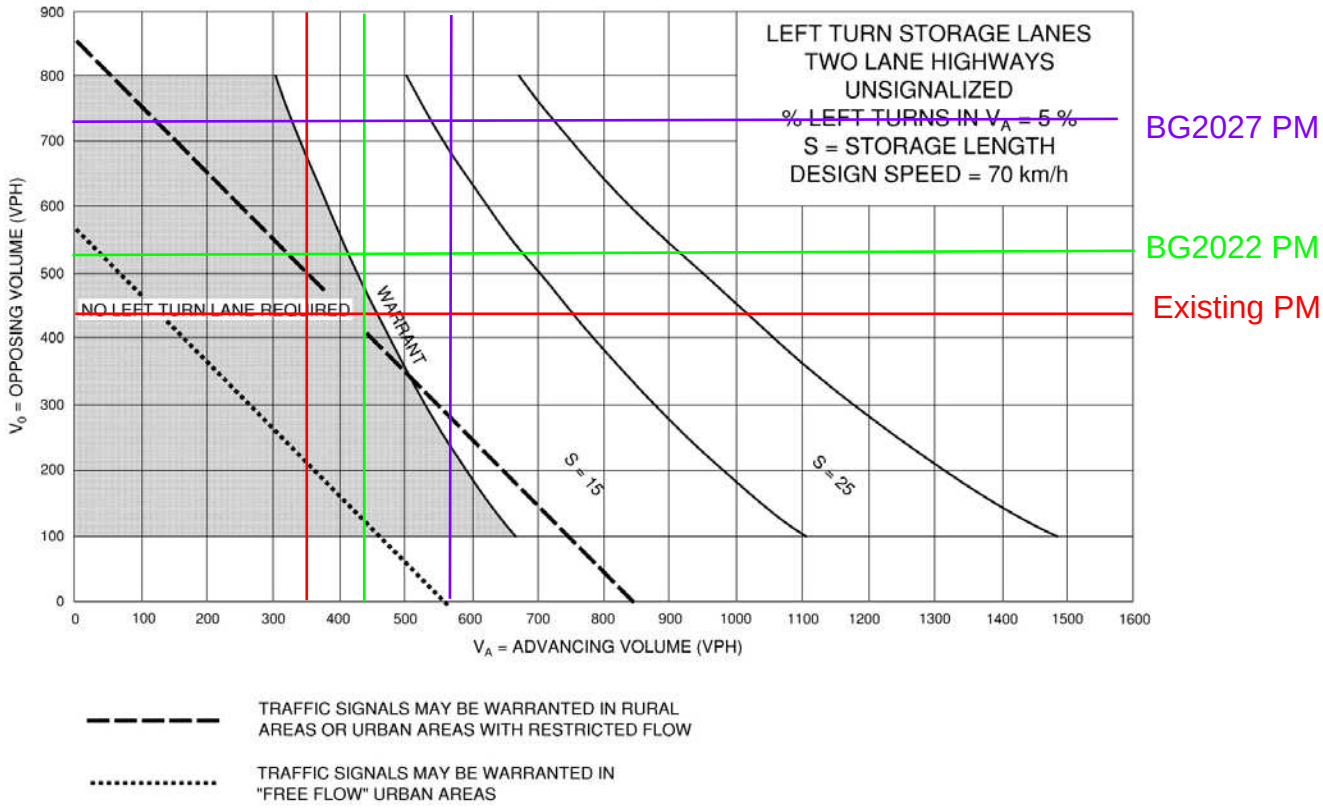


Exhibit 9A-10



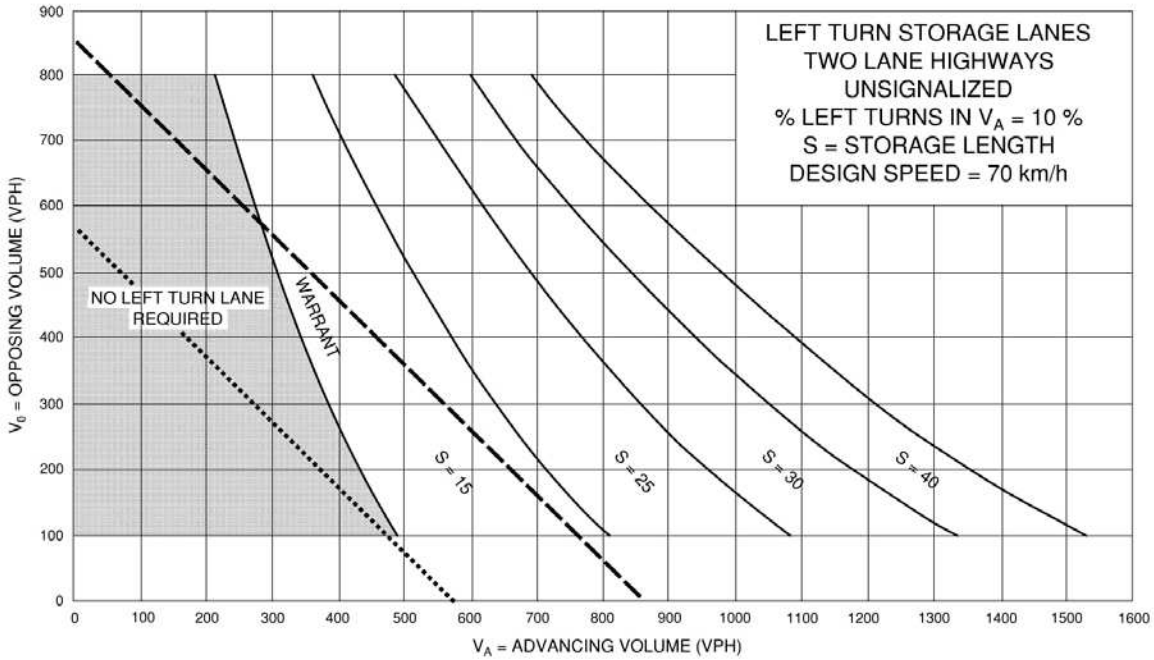
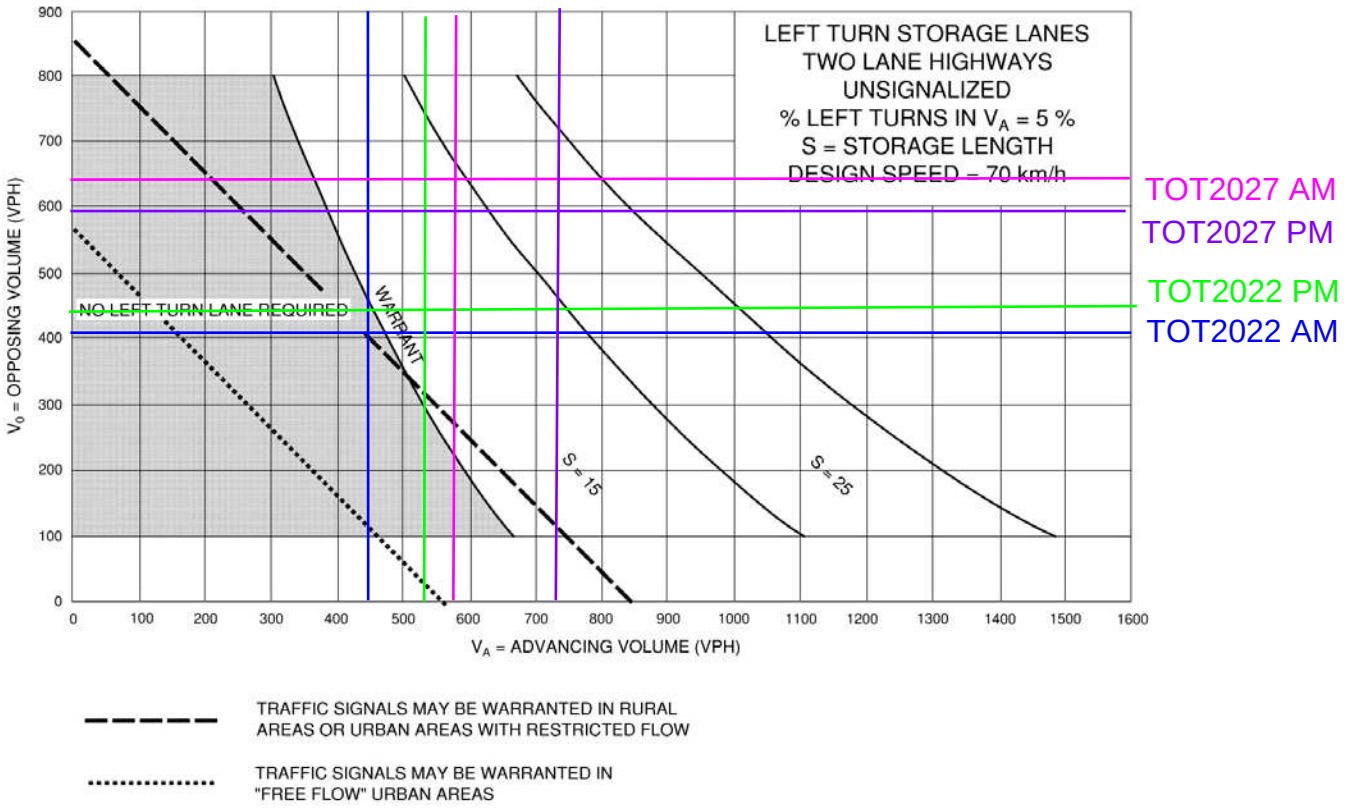


Exhibit 9A-10



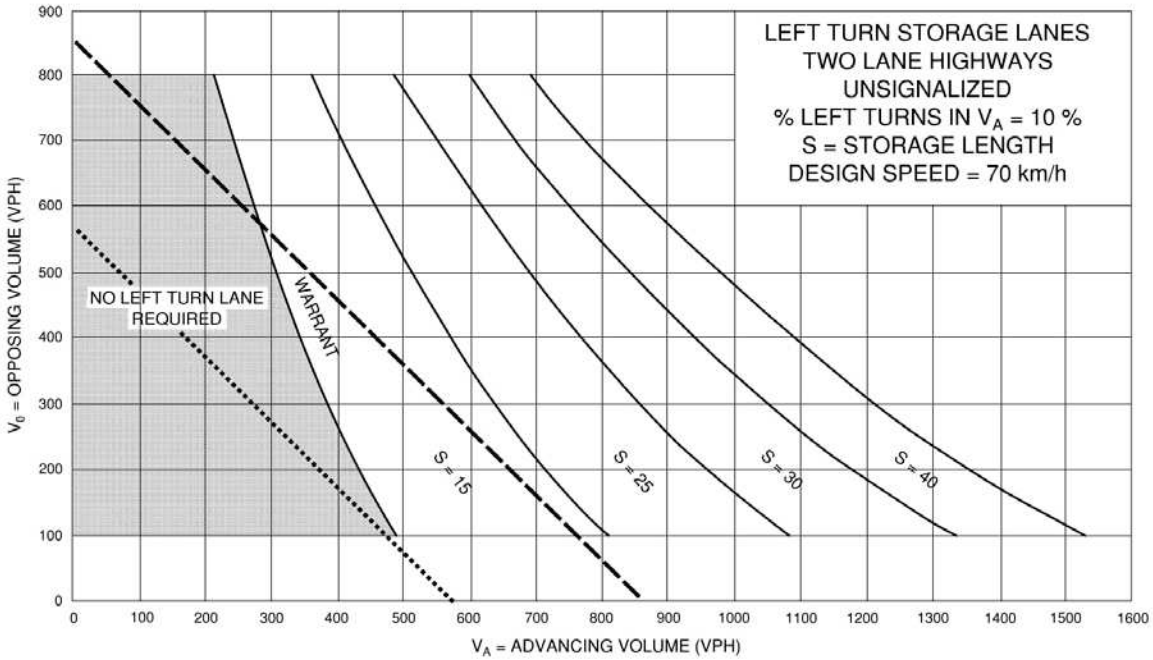
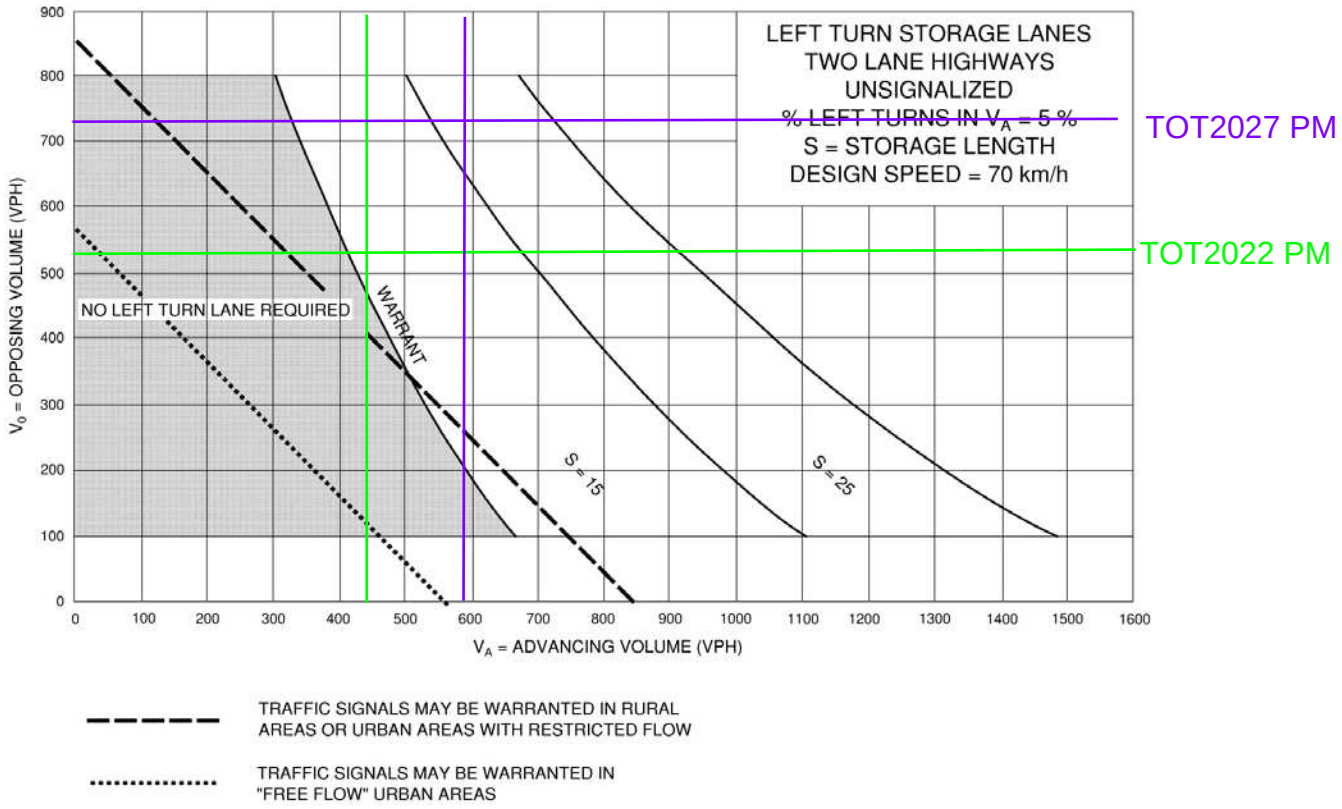
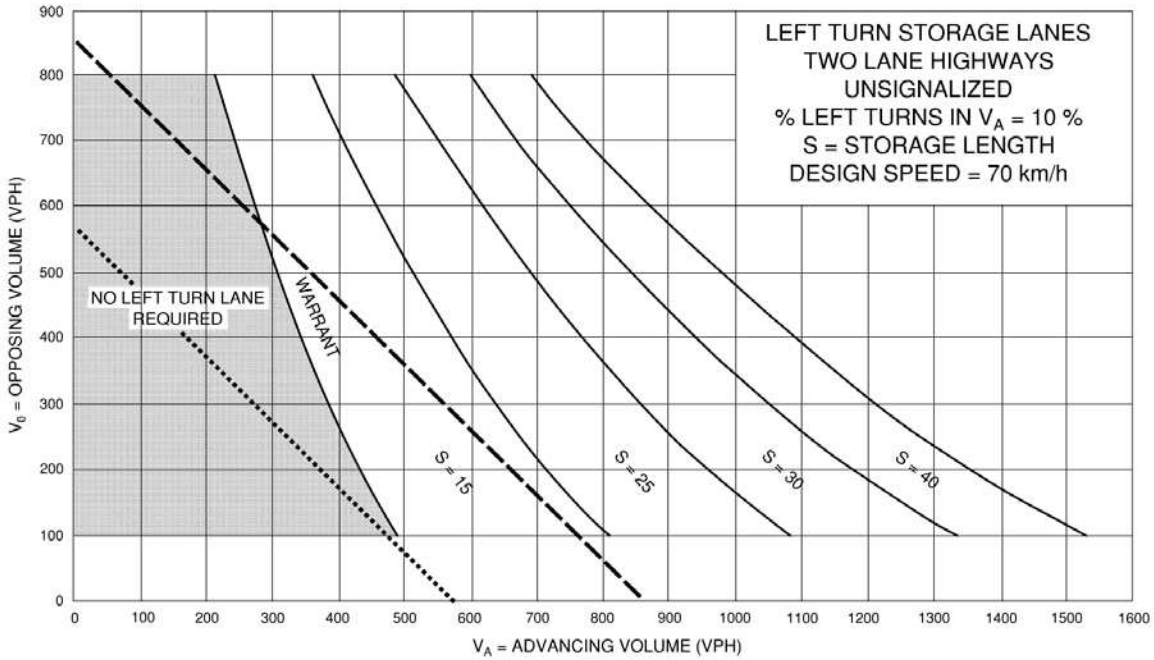


Exhibit 9A-10





APPENDIX I

TDM Checklists

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

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: *Residential developments*	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	✓
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	✓
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	✓
	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 *(see Official Plan policy 4.3.3)*	☐ N/A - no rapid transit within 600m
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 *(see Official Plan policy 4.3.12)*	✓

TDM-supportive design & infrastructure measures: *Residential developments*			Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	✓
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	✓
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	✓
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	✓
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☐
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	☐
	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	☐
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)	☐

		TDM-supportive design & infrastructure measures: *Residential developments*	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 Official Plan policy 4.3.6)*	✓
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 Zoning By-law Section 111)*	✓
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 Zoning By-law Section 111)*	✓
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	✓
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☐
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
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	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	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	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see Zoning By-law Section 94)*	☐
	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	☐
	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	✓
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	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
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 *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☐

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

Legend

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

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

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

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

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

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

APPENDIX J

MMLOS Analysis

Pedestrian Level of Service (PLOS)

Criteria	North Approach		South Approach		East Approach		West Approach	
Kanata Avenue/Maritime Way/Lord Byng Way								
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	39	No	39	No	55	No	55
Lanes Crossed (3.5m Lane Width)	7		7		6		6	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Permissive	-8	Perm + Prot	-8	Permissive	-8	Permissive	-8
Right Turn Conflict	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	> 10m to 15m	-6	> 10m to 15m	-6	> 15m to 25m	-8	> 15m to 25m	-8
Parallel Right Turn Channel	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Standard	-7	Standard	-4	Standard	-7	Standard	-7
PETSI SCORE		**4**		**7**		**18**		**18**
LOS		**F**		**F**		**F**		**F**
DELAY SCORE								
Cycle Length		90		90		90		90
Pedestrian Walk Time		6.7		6.7		35.7		20.7
DELAY SCORE		**38.5**		**38.5**		**16.4**		**26.7**
LOS		**D**		**D**		**B**		**C**
OVERALL		**F**		**F**		**F**		**F**

Criteria	North Approach		South Approach		East Approach	
Kanata Avenue/Highway 417 Westbound Off-Ramp						
PETSI SCORE						
CROSSING DISTANCE CONDITIONS						
Median > 2.4m in Width	No	88	N/A	N/A	No	72
Lanes Crossed (3.5m Lane Width)	4		N/A		5	
SIGNAL PHASING AND TIMING						
Left Turn Conflict	No Left Turn/Prohibited	0	N/A	N/A	No Left Turn/Prohibited	0
Right Turn Conflict	Permissive or Yield	-5	N/A	N/A	No Right Turn/Prohibited	0
Right Turn on Red	N/A	0	N/A	N/A	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	N/A	N/A	No	-2
CORNER RADIUS						
Parallel Radius	> 5m to 10m	-5	N/A	N/A	No Right Turn	0
Parallel Right Turn Channel	No Right Turn Channel	-4	N/A	N/A	No Right Turn	0
Perpendicular Radius	N/A	0	N/A	N/A	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	N/A	N/A	0
CROSSING TREATMENT						
Treatment	Standard	-7	N/A	N/A	Standard	-7
PETSI SCORE		**65**		**N/A**		**60**
LOS		**C**		**N/A**		**C**
DELAY SCORE						
Cycle Length		90		N/A		90
Pedestrian Walk Time		21		N/A		23.9
DELAY SCORE		**26.5**		**N/A**		**24.3**
LOS		**C**		**N/A**		**C**
OVERALL		**C**		**N/A**		**C**

Criteria	North Approach		South Approach		East Approach	
Kanata Avenue/Highway 417 Eastbound On-Ramp						
PETSI SCORE						
CROSSING DISTANCE CONDITIONS						
Median > 2.4m in Width	N/A	N/A	No	55	No	72
Lanes Crossed (3.5m Lane Width)	N/A		6		5	
SIGNAL PHASING AND TIMING						
Left Turn Conflict	N/A	N/A	No Left Turn/Prohibited	0	Perm + Prot	-8
Right Turn Conflict	N/A	N/A	No Right Turn/Prohibited	0	Permissive or Yield	-5
Right Turn on Red	N/A	N/A	RTOR Allowed	-3	N/A	0
Leading Pedestrian Interval	N/A	N/A	No	-2	No	-2
CORNER RADIUS						
Parallel Radius	N/A	N/A	No Right Turn	0	> 10m to 15m	-6
Parallel Right Turn Channel	N/A	N/A	No Right Turn	0	No Right Turn Channel	-4
Perpendicular Radius	N/A	N/A	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	N/A	N/A	0	N/A	0
CROSSING TREATMENT						
Treatment	N/A	N/A	Standard	-4	Standard	-7
PETSI SCORE		**N/A**		**46**		**40**
LOS		**N/A**		**D**		**E**
DELAY SCORE						
Cycle Length		N/A		90		90
Pedestrian Walk Time		N/A		8		33.3
DELAY SCORE		**N/A**		**37.4**		**17.9**
LOS		**N/A**		**D**		**B**
OVERALL		**N/A**		**D**		**E**

Criteria	North Approach		South Approach		East Approach		West Approach	
Kanata Avenue/Castlefrank Road/Aird Place								
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	55	No	72	No	72	No	72
Lanes Crossed (3.5m Lane Width)	6		5		5		5	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Permissive	-8	Permissive	-8	Permissive	-8	Permissive	-8
Right Turn Conflict	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	> 10m to 15m	-6	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8
Parallel Right Turn Channel	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Standard	-7	Standard	-4	Textured	-4	Textured	-4
PETSI SCORE		**20**		**38**		**38**		**38**
LOS		**F**		**E**		**E**		**E**
DELAY SCORE								
Cycle Length		90		90		90		90
Pedestrian Walk Time		8.8		8.8		42.3		42.3
DELAY SCORE		**36.6**		**36.6**		**12.6**		**12.6**
LOS		**D**		**D**		**B**		**B**
OVERALL		**F**		**E**		**E**		**E**

Criteria	North Approach		South Approach		East Approach		West Approach	
Campeau Drive/Maritime Way/Knudson Drive								
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	55	No	72	No	72	No	72
Lanes Crossed (3.5m Lane Width)	6		5		5		5	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Perm + Prot	-8	Permissive	-8	Permissive	-8	Permissive	-8
Right Turn Conflict	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	> 5m to 10m	-5	> 5m to 10m	-5	> 10m to 15m	-6	> 10m to 15m	-6
Parallel Right Turn Channel	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Standard	-7	Standard	-4	Standard	-7	Standard	-7
PETSI SCORE		**21**		**41**		**37**		**37**
LOS		**F**		**E**		**E**		**E**
DELAY SCORE								
Cycle Length		80		80		90		90
Pedestrian Walk Time		24.3		24.3		8		8
DELAY SCORE		**19.4**		**19.4**		**37.4**		**37.4**
LOS		**B**		**B**		**D**		**D**
OVERALL		**F**		**E**		**E**		**E**

Bicycle Level of Service (BLOS)

Approach	Bikeway Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
Kanata Avenue/Maritime Way/Lord Byng Way				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	No Impact to LTS	A
		Left Turn Accommodation	One Lane Crossed; 50km/h	D
South Approach	Mixed Traffic	Right Turn Lane Characteristics	No Impact to LTS	A
		Left Turn Accommodation	One Lane Crossed; 50km/h	D
East Approach	Bike Lane	Right Turn Lane Characteristics	No Impact to LTS	A
		Left Turn Accommodation	One Lane Crossed; 50km/h	C
West Approach	Mixed Traffic	Right Turn Lane Characteristics	No Impact to LTS	A
		Left Turn Accommodation	One Lane Crossed; 50km/h	D
Kanata Avenue/Highway 417 Westbound Off-Ramp[1]				
North Approach	Bike Lane	Right Turn Lane Characteristics	Not Applicable	-
		Left Turn Accommodation	Not Applicable	-
South Approach	Bike Lane	Right Turn Lane Characteristics	Not Applicable	-
		Left Turn Accommodation	Not Applicable	-
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Not Applicable	-
		Left Turn Accommodation	Not Applicable	-
Kanata Avenue/Highway 417 Eastbound On-Ramp				
North Approach	Bike Lane	Right Turn Lane Characteristics	Not Applicable	-
		Left Turn Accommodation	Not Applicable	-
South Approach	Pocket Bike Lane	Right Turn Lane Characteristics	Right turn lane >50m	D
		Left Turn Accommodation	Not Applicable	-
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Not Applicable	-
		Left Turn Accommodation	Not Applicable	-

Approach	Bikeway Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
Kanata Avenue/Castlefrank Road/Aird Place				
North Approach	Bike Lane	Right Turn Lane Characteristics	No Impact to LTS	A
		Left Turn Accommodation	One Lane Crossed; 50km/h	C
South Approach	Bike Lane	Right Turn Lane Characteristics	No Impact to LTS	A
		Left Turn Accommodation	One Lane Crossed; 50km/h	C
East Approach	Mixed Traffic	Right Turn Lane Characteristics	No Impact to LTS	A
		Left Turn Accommodation	No Lanes Crossed; 40km/h	B
West Approach	Mixed Traffic	Right Turn Lane Characteristics	No Impact to LTS	A
		Left Turn Accommodation	No Lanes Crossed; 40km/h	B
Campeau Drive/Maritime Way/Knudson Drive				
North Approach	Separated	Right Turn Lane Characteristics	No Impact to LTS	A
		Left Turn Accommodation	No Impact to LTS[1]	A
South Approach	Mixed Traffic	Right Turn Lane Characteristics	No Impact to LTS	A
		Left Turn Accommodation	One Lane Crossed; 40km/h	B
East Approach	Separated	Right Turn Lane Characteristics	No Impact to LTS	A
		Left Turn Accommodation	No Impact to LTS[1]	A
West Approach	Separated	Right Turn Lane Characteristics	No Impact to LTS	A
		Left Turn Accommodation	No Impact to LTS[1]	A

1. Cyclists are required to dismount and cross using the crosswalks

Transit Level of Service (TLOS)

Approach	Delay (sec.)		TLOS
	AM Peak	PM Peak	
Kanata Avenue/Maritime Way/Lord Byng Way			
East Approach	N/A	N/A	N/A
West Approach	20 seconds	18 seconds	C
North Approach	14 seconds	16 seconds	C
South Approach	5 seconds	9 seconds	B
Kanata Avenue/Highway 417 Westbound Off-Ramp			
East Approach	N/A	N/A	N/A
North Approach	6 seconds	15 seconds	C
South Approach	3 seconds	20 seconds	C
Kanata Avenue/Highway 417 Eastbound On-Ramp			
North Approach	3 seconds	5 seconds	B
South Approach	4 seconds	3 seconds	B
Kanata Avenue/Castlefrank Road/Aird Place			
East Approach	N/A	N/A	N/A
West Approach	N/A	N/A	N/A
North Approach	6 seconds	8 seconds	B
South Approach	6 seconds	6 seconds	B
Campeau Drive/Maritime Way/Knudson Drive			
East Approach	6 seconds	10 seconds	B
West Approach	6 seconds	4 seconds	B
North Approach	32 seconds	24 seconds	E
South Approach	N/A	N/A	N/A

Truck Level of Service (TkLOS)

Approach	Effective Corner Radius	Number of Receiving Lanes on Departure from Intersection	LOS
Kanata Avenue/Maritime Way/Lord Byng Way			
North	> 15m	One	C
South	> 15m	One	C
East	10m to 15m	One	E
West	10m to 15m	One	E
Kanata Avenue/Highway 417 Westbound Off-Ramp			
East	> 15m	One	C
Kanata Avenue/Highway 417 Eastbound On-Ramp			
North	N/A	N/A	-
South	> 15m	One	C
Kanata Avenue/Castlefrank Road/Aird Place			
North	> 15m	One	C
South	> 15m	One	C
East	> 15m	One	C
West	10m to 15m	One	E
Campeau Drive/Maritime Way/Knudson Drive			
North	10m to 15m	One	E
South	10m to 15m	One	E
East	< 10m	One	F
West	< 10m	One	F

Vehicle Level of Service (Auto LOS)

Intersection	AM Peak			PM Peak		
	Max V/C	LOS	Mvmt	Max V/C	LOS	Mvmt
Kanata Avenue/ Maritime Way/ Lord Byng Way	0.57	A	WBL	0.63	B	NBT/R
Kanata Avenue/ Highway 417 Westbound Off-Ramp	0.70	B	WBL	0.90	D	WBR
Kanata Avenue/ Highway 417 Eastbound On-Ramp	0.42	A	SBL	0.51	A	SBT
Kanata Avenue/ Castlefrank Road/ Aird Place	0.48	A	EB	0.65	B	SBT/R
Campeau Drive/ Maritime Way/ Knudson Drive	0.58	A	SBL	0.42	A	WBT/R

- The intersection parameters used in the analysis are consistent with the TIA guidelines (saturation flow rate: 1800 vphpl, PHF: 0.9)
- Detailed Synchro reports are included in **Appendix G**

Pedestrian Level of Service (PLOS)

Sidewalk Width	Boulevard Width	Avg. Daily Curb Lane Traffic Volume	Presence of On-Street Parking	Operating Speed	Segment PLOS
Campeau Drive (South Side)					
2m	> 2m	> 3,000 vpd	No	70km/h	D
Great Lakes Avenue (East Side)					
2m	2m	< 3,000 vpd	Yes	50km/h	A
Canadian Shield Avenue (North Side)					
2m	2m	< 3,000 vpd	Yes	50km/h	A

Bicycle Level of Service (BLOS)

Road Class	Bike Route	Type of Bikeway	Travel Lanes (Per Direction)	Operating Speed	Segment BLOS
Campeau Drive					
Arterial	Spine Route	Multi-Use Pathway	1	60km/h	A
		Bike Lane			C
Great Lakes Avenue					
Local	N/A	Mixed Traffic	1	40km/h	A
Canadian Shield Avenue					
Local	N/A	Mixed Traffic	1	40km/h	A

Transit Level of Service (TLOS)

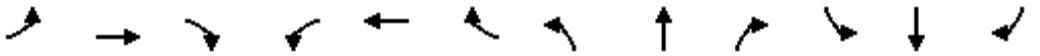
Facility Type	Level/Exposure to Congestion Delay, Friction and Incidents			Segment TLOS
	Congestion	Friction	Incident Potential	
Campeau Drive				
Mixed Traffic	Yes	Low	Medium	D
Great Lakes Avenue				
Mixed Traffic	Yes	Medium	Medium	E
Canadian Shield Avenue				
Mixed Traffic	Yes	Medium	Medium	E

Truck Level of Service (TkLOS)

Curb Lane Width	Number of Travel Lanes (Per Direction)	Segment TkLOS
Campeau Drive		
>3.7m	1	B
Great Lakes Avenue		
>3.7m	1	B
Canadian Shield Avenue		
>3.7m	1	B

APPENDIX K

Synchro Analysis Reports – Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	6	36	165	2	47	85	237	138	21	432	16
Future Volume (vph)	19	6	36	165	2	47	85	237	138	21	432	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	20.0		0.0	40.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	25.0			40.0			75.0			55.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.98		0.99	0.98		1.00	0.99		1.00	1.00	
Frt		0.871			0.856			0.945			0.995	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1262	1045	0	1616	1495	0	1417	1635	0	1478	1748	0
Flt Permitted	0.725			0.730			0.377			0.539		
Satd. Flow (perm)	961	1045	0	1234	1495	0	561	1635	0	838	1748	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			47			61			3	
Link Speed (k/h)		50			40			50			50	
Link Distance (m)		119.6			99.0			110.4			236.0	
Travel Time (s)		8.6			8.9			7.9			17.0	
Confl. Peds. (#/hr)	1		3	3		1	3		1	1		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	37%	2%	56%	7%	2%	2%	22%	4%	5%	17%	2%	44%
Adj. Flow (vph)	19	6	36	165	2	47	85	237	138	21	432	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	19	42	0	165	49	0	85	375	0	21	448	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Detector Phase	8	8		4	4		1	6		2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	28.3	28.3		28.3	28.3		11.3	33.3		33.3	33.3	
Total Split (s)	28.0	28.0		28.0	28.0		14.0	62.0		48.0	48.0	
Total Split (%)	31.1%	31.1%		31.1%	31.1%		15.6%	68.9%		53.3%	53.3%	
Maximum Green (s)	21.7	21.7		21.7	21.7		7.7	55.7		41.7	41.7	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.3	6.3		6.3	6.3	
Lead/Lag							Lead			Lag	Lag	
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	None	None		None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0			20.0		20.0	20.0	
Pedestrian Calls (#/hr)	10	10		10	10			10		10	10	
Act Effct Green (s)	16.7	16.7		16.7	16.7		60.7	60.7		49.7	49.7	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.67	0.67		0.55	0.55	
v/c Ratio	0.11	0.19		0.72	0.16		0.19	0.33		0.05	0.46	
Control Delay	29.5	13.5		51.9	10.3		6.6	5.6		13.0	16.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	29.5	13.5		51.9	10.3		6.6	5.6		13.0	16.3	
LOS	C	B		D	B		A	A		B	B	
Approach Delay		18.5			42.4			5.8			16.1	
Approach LOS		B			D			A			B	
90th %ile Green (s)	21.7	21.7		21.7	21.7		7.7	55.7		41.7	41.7	
90th %ile Term Code	Ped	Ped		Ped	Ped		Max	Coord		Coord	Coord	
70th %ile Green (s)	20.2	20.2		20.2	20.2		8.4	57.2		42.5	42.5	
70th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
50th %ile Green (s)	17.2	17.2		17.2	17.2		7.4	60.2		46.5	46.5	
50th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
30th %ile Green (s)	14.2	14.2		14.2	14.2		6.5	63.2		50.4	50.4	
30th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
10th %ile Green (s)	10.0	10.0		10.0	10.0		0.0	67.4		67.4	67.4	
10th %ile Term Code	Hold	Hold		Min	Min		Skip	Coord		Coord	Coord	
Stops (vph)	17	14		151	13		24	89		12	275	
Fuel Used(l)	1	1		24	5		3	12		1	22	
CO Emissions (g/hr)	19	23		441	90		52	216		18	406	
NOx Emissions (g/hr)	4	4		85	17		10	42		3	78	
VOC Emissions (g/hr)	4	5		102	21		12	50		4	94	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	2.7	0.9		26.9	0.3		3.5	12.3		1.7	47.3	
Queue Length 95th (m)	8.1	8.7		45.2	8.7		11.2	33.7		6.0	81.4	
Internal Link Dist (m)		95.6			75.0			86.4			212.0	
Turn Bay Length (m)	20.0			40.0			35.0			35.0		
Base Capacity (vph)	231	279		297	396		453	1123		462	966	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.08	0.15		0.56	0.12		0.19	0.33		0.05	0.46	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 40 (44%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 17.0		Intersection LOS: B	
Intersection Capacity Utilization 63.0%		ICU Level of Service B	
Analysis Period (min) 15			

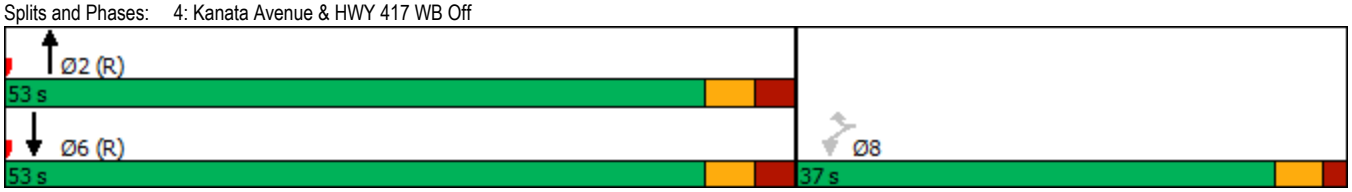
Splits and Phases: 3: Kanata Avenue & Lord Byng Way/Maritime Way

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	221	196	299	0	0	742
Future Volume (vph)	221	196	299	0	0	742
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1695	1334	1717	0	0	3325
Flt Permitted	0.950					
Satd. Flow (perm)	1695	1334	1717	0	0	3325
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		196				
Link Speed (k/h)	50		50			50
Link Distance (m)	332.8		126.6			114.0
Travel Time (s)	24.0		9.1			8.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	16%	6%	0%	0%	4%
Adj. Flow (vph)	221	196	299	0	0	742
Shared Lane Traffic (%)						
Lane Group Flow (vph)	221	196	299	0	0	742
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)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
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)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+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)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA			NA
Protected Phases			2			6
Permitted Phases	8	8				
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0			10.0
Minimum Split (s)	23.0	23.0	28.1			24.1
Total Split (s)	37.0	37.0	53.0			53.0
Total Split (%)	41.1%	41.1%	58.9%			58.9%
Maximum Green (s)	32.0	32.0	46.9			46.9
Yellow Time (s)	3.3	3.3	3.3			3.3
All-Red Time (s)	1.7	1.7	2.8			2.8
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	6.1			6.1
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)	7.0	7.0	7.0			
Flash Dont Walk (s)	11.0	11.0	15.0			
Pedestrian Calls (#/hr)	10	10	10			
Act Effct Green (s)	17.1	17.1	61.8			61.8
Actuated g/C Ratio	0.19	0.19	0.69			0.69
v/c Ratio	0.69	0.48	0.25			0.33
Control Delay	44.3	8.4	3.2			5.4
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	44.3	8.4	3.2			5.4
LOS	D	A	A			A
Approach Delay	27.4		3.2			5.4
Approach LOS	C		A			A
90th %ile Green (s)	23.6	23.6	55.3			55.3
90th %ile Term Code	Gap	Gap	Coord			Coord
70th %ile Green (s)	19.8	19.8	59.1			59.1
70th %ile Term Code	Gap	Gap	Coord			Coord
50th %ile Green (s)	17.1	17.1	61.8			61.8
50th %ile Term Code	Gap	Gap	Coord			Coord
30th %ile Green (s)	14.5	14.5	64.4			64.4
30th %ile Term Code	Gap	Gap	Coord			Coord
10th %ile Green (s)	10.7	10.7	68.2			68.2
10th %ile Term Code	Gap	Gap	Coord			Coord
Stops (vph)	198	26	36			263
Fuel Used(l)	19	8	5			25
CO Emissions (g/hr)	353	150	96			461
NOx Emissions (g/hr)	68	29	18			89
VOC Emissions (g/hr)	81	35	22			106
Dilemma Vehicles (#)	0	0	0			0
Queue Length 50th (m)	35.9	0.0	6.6			19.8
Queue Length 95th (m)	53.9	15.6	8.7			36.6
Internal Link Dist (m)	308.8		102.6			90.0
Turn Bay Length (m)						
Base Capacity (vph)	602	600	1178			2281
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	0.37	0.33	0.25			0.33

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 35 (39%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 11.3		Intersection LOS: B	
Intersection Capacity Utilization 46.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Kanata Avenue & HWY 417 WB Off



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
Lane Configurations							
Traffic Volume (vph)	0	0	274	200	367	462	
Future Volume (vph)	0	0	274	200	367	462	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	0.0	0.0		50.0	0.0		
Storage Lanes	0	0		1	1		
Taper Length (m)	7.6				7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor				0.98	1.00		
Frt				0.850			
Flt Protected					0.950		
Satd. Flow (prot)	0	0	1685	1502	1679	1750	
Flt Permitted					0.541		
Satd. Flow (perm)	0	0	1685	1468	955	1750	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)				200			
Link Speed (k/h)	48		50			50	
Link Distance (m)	278.4		119.2			126.6	
Travel Time (s)	20.9		8.6			9.1	
Confl. Peds. (#/hr)				1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	0%	0%	8%	3%	3%	4%	
Adj. Flow (vph)	0	0	274	200	367	462	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	274	200	367	462	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(m)	0.0		3.7			3.7	
Link Offset(m)	0.0		0.0			0.0	
Crosswalk Width(m)	4.9		4.9			4.9	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)	24	14		14	24		
Number of Detectors			2	1	1	2	
Detector Template			Thru	Right	Left	Thru	
Leading Detector (m)			30.5	6.1	6.1	30.5	
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)			1.8	6.1	6.1	1.8	
Detector 1 Type			Cl+Ex	Cl+Ex	Cl+Ex	Cl+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)			28.7			28.7	
Detector 2 Size(m)			1.8			1.8	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type			NA	Perm	pm+pt	NA	
Protected Phases			2		1	6	4
Permitted Phases				2	6		
Detector Phase			2	2	1	6	
Switch Phase							
Minimum Initial (s)			10.0	10.0	5.0	10.0	5.0
Minimum Split (s)			23.7	23.7	10.7	23.7	27.0
Total Split (s)			50.0	50.0	12.0	62.0	28.0
Total Split (%)			55.6%	55.6%	13.3%	68.9%	31%
Maximum Green (s)			44.3	44.3	6.3	56.3	23.0
Yellow Time (s)			3.3	3.3	3.3	3.3	3.0
All-Red Time (s)			2.4	2.4	2.4	2.4	2.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
Lost Time Adjust (s)			0.0	0.0	0.0	0.0	
Total Lost Time (s)			5.7	5.7	5.7	5.7	
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?			Yes	Yes	Yes		
Vehicle Extension (s)			3.0	3.0	3.0	3.0	3.0
Recall Mode			C-Max	C-Max	None	C-Max	None
Walk Time (s)			7.0	7.0			7.0
Flash Dont Walk (s)			11.0	11.0			15.0
Pedestrian Calls (#/hr)			10	10			10
Act Effct Green (s)			66.3	66.3	78.9	83.5	
Actuated g/C Ratio			0.74	0.74	0.88	0.93	
v/c Ratio			0.22	0.18	0.41	0.28	
Control Delay			6.0	1.9	4.1	2.5	
Queue Delay			0.0	0.0	0.1	0.0	
Total Delay			6.0	1.9	4.1	2.5	
LOS			A	A	A	A	
Approach Delay			4.3			3.3	
Approach LOS			A			A	
90th %ile Green (s)			44.3	44.3	7.3	57.3	22.0
90th %ile Term Code			Coord	Coord	Max	Coord	Ped
70th %ile Green (s)			71.2	71.2	7.4	84.3	0.0
70th %ile Term Code			Coord	Coord	Gap	Coord	Skip
50th %ile Green (s)			71.6	71.6	7.0	84.3	0.0
50th %ile Term Code			Coord	Coord	Gap	Coord	Skip
30th %ile Green (s)			71.9	71.9	6.7	84.3	0.0
30th %ile Term Code			Coord	Coord	Gap	Coord	Skip
10th %ile Green (s)			72.3	72.3	6.3	84.3	0.0
10th %ile Term Code			Coord	Coord	Gap	Coord	Skip
Stops (vph)			92	32	85	76	
Fuel Used(l)			6	3	7	8	
CO Emissions (g/hr)			120	61	139	152	
NOx Emissions (g/hr)			23	12	27	29	
VOC Emissions (g/hr)			28	14	32	35	
Dilemma Vehicles (#)			0	0	0	0	
Queue Length 50th (m)			4.4	0.0	1.7	0.0	
Queue Length 95th (m)			54.1	17.1	29.3	35.5	
Internal Link Dist (m)	254.4		95.2			102.6	
Turn Bay Length (m)				50.0			
Base Capacity (vph)			1240	1133	893	1623	
Starvation Cap Reductn			0	0	54	59	
Spillback Cap Reductn			0	0	0	0	
Storage Cap Reductn			0	0	0	0	
Reduced v/c Ratio			0.22	0.18	0.44	0.30	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 42 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.41			
Intersection Signal Delay: 3.6		Intersection LOS: A	
Intersection Capacity Utilization 46.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Kanata Avenue & HWY 417 EB On

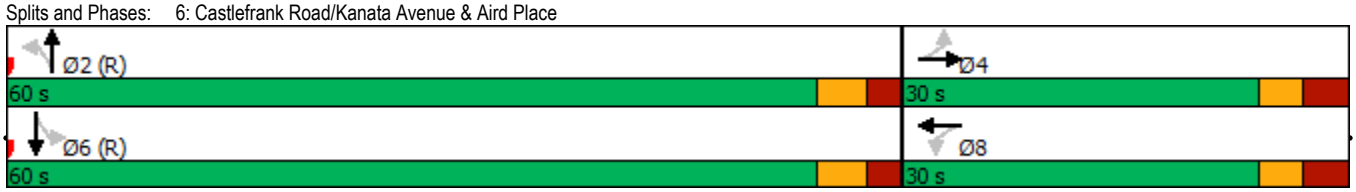
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	6	18	19	6	61	41	469	36	52	408	41
Future Volume (vph)	45	6	18	19	6	61	41	469	36	52	408	41
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.6			7.6			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97			0.96		0.99	1.00		0.99	1.00	
Frt		0.965			0.904			0.989			0.986	
Flt Protected		0.968			0.989		0.950			0.950		
Satd. Flow (prot)	0	1218	0	0	1464	0	1145	1728	0	1662	1707	0
Flt Permitted		0.809			0.909		0.489			0.455		
Satd. Flow (perm)	0	1001	0	0	1336	0	584	1728	0	792	1707	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			61			8			10	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		125.4			132.9			95.7			119.2	
Travel Time (s)		11.3			12.0			6.9			8.6	
Confl. Peds. (#/hr)	14		18	18		14	9		6	6		9
Confl. Bikes (#/hr)			1						1			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	33%	67%	39%	11%	50%	2%	51%	4%	3%	4%	5%	2%
Adj. Flow (vph)	45	6	18	19	6	61	41	469	36	52	408	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	69	0	0	86	0	41	505	0	52	449	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.2	28.2		28.2	28.2		24.7	24.7		24.7	24.7	
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Maximum Green (s)	23.8	23.8		23.8	23.8		54.3	54.3		54.3	54.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	

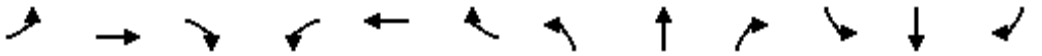
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	3.2	3.2		3.2	3.2		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.2			6.2		5.7	5.7		5.7	5.7	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	10	10		10	10		10	10		10	10	
Act Effct Green (s)		13.0			13.0		69.5	69.5		69.5	69.5	
Actuated g/C Ratio		0.14			0.14		0.77	0.77		0.77	0.77	
v/c Ratio		0.43			0.35		0.09	0.38		0.09	0.34	
Control Delay		34.5			17.0		5.6	6.1		6.2	6.4	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.2	
Total Delay		34.5			17.0		5.6	6.1		6.2	6.6	
LOS		C			B		A	A		A	A	
Approach Delay		34.5			17.0			6.1			6.6	
Approach LOS		C			B			A			A	
90th %ile Green (s)	22.0	22.0		22.0	22.0		56.1	56.1		56.1	56.1	
90th %ile Term Code	Ped	Ped		Ped	Ped		Coord	Coord		Coord	Coord	
70th %ile Green (s)	12.8	12.8		12.8	12.8		65.3	65.3		65.3	65.3	
70th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord		Coord	Coord	
50th %ile Green (s)	10.1	10.1		10.1	10.1		68.0	68.0		68.0	68.0	
50th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord		Coord	Coord	
30th %ile Green (s)	10.0	10.0		10.0	10.0		68.1	68.1		68.1	68.1	
30th %ile Term Code	Min	Min		Min	Min		Coord	Coord		Coord	Coord	
10th %ile Green (s)	0.0	0.0		0.0	0.0		84.3	84.3		84.3	84.3	
10th %ile Term Code	Skip	Skip		Skip	Skip		Coord	Coord		Coord	Coord	
Stops (vph)		47			30		14	174		17	134	
Fuel Used(l)		3			3		1	11		1	10	
CO Emissions (g/hr)		64			51		16	202		23	192	
NOx Emissions (g/hr)		12			10		3	39		4	37	
VOC Emissions (g/hr)		15			12		4	47		5	44	
Dilemma Vehicles (#)		0			0		0	0		0	0	
Queue Length 50th (m)		8.4			4.0		1.5	23.6		2.9	28.0	
Queue Length 95th (m)		18.3			14.6		6.9	62.8		7.2	38.0	
Internal Link Dist (m)		101.4			108.9			71.7			95.2	
Turn Bay Length (m)							30.0			50.0		
Base Capacity (vph)		277			398		451	1336		611	1320	
Starvation Cap Reductn		0			0		0	0		0	307	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.25			0.22		0.09	0.38		0.09	0.44	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 17 (19%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.43
Intersection Signal Delay: 8.7 — Intersection LOS: A
Intersection Capacity Utilization 65.5% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 6: Castlefrank Road/Kanata Avenue & Aird Place





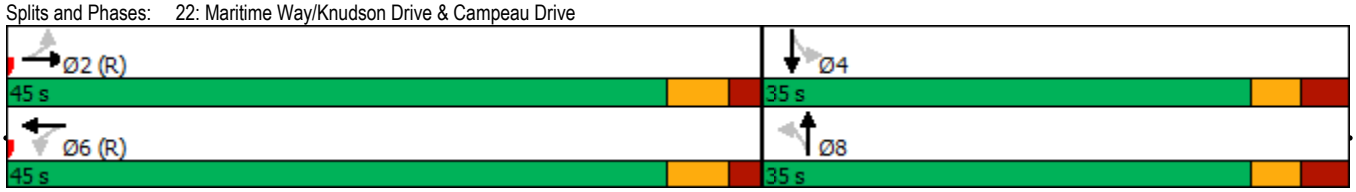
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	403	13	58	308	53	17	15	137	114	9	47
Future Volume (vph)	46	403	13	58	308	53	17	15	137	114	9	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	40.0			55.0			40.0			35.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	0.99		0.99	0.96		0.98	0.98	
Frt		0.995			0.978			0.865			0.874	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1708	0	1695	1592	0	1695	1477	0	1695	1493	0
Flt Permitted	0.538			0.500			0.720			0.656		
Satd. Flow (perm)	949	1708	0	884	1592	0	1274	1477	0	1144	1493	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			15			137			47	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		250.4			203.8			223.0			144.1	
Travel Time (s)		18.0			14.7			20.1			13.0	
Confl. Peds. (#/hr)	12		11	11		12	4		12	12		4
Confl. Bikes (#/hr)			1									
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	5%	33%	2%	11%	12%	2%	2%	2%	2%	14%	2%
Adj. Flow (vph)	46	403	13	58	308	53	17	15	137	114	9	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	46	416	0	58	361	0	17	152	0	114	56	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.7	27.7		27.7	27.7		24.0	24.0		24.0	24.0	
Total Split (s)	45.0	45.0		45.0	45.0		35.0	35.0		35.0	35.0	
Total Split (%)	56.3%	56.3%		56.3%	56.3%		43.8%	43.8%		43.8%	43.8%	
Maximum Green (s)	39.3	39.3		39.3	39.3		29.0	29.0		29.0	29.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	

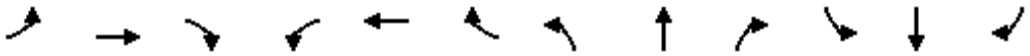
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7		5.7	5.7		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	10	10		10	10		10	10		10	10	
Act Effct Green (s)	54.4	54.4		54.4	54.4		13.9	13.9		13.9	13.9	
Actuated g/C Ratio	0.68	0.68		0.68	0.68		0.17	0.17		0.17	0.17	
v/c Ratio	0.07	0.36		0.10	0.33		0.08	0.41		0.58	0.19	
Control Delay	5.7	7.1		5.9	6.7		26.1	9.9		41.1	11.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	5.7	7.1		5.9	6.7		26.1	9.9		41.1	11.5	
LOS	A	A		A	A		C	A		D	B	
Approach Delay		7.0			6.6			11.6			31.4	
Approach LOS		A			A			B			C	
90th %ile Green (s)	48.6	48.6		48.6	48.6		19.7	19.7		19.7	19.7	
90th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
70th %ile Green (s)	52.4	52.4		52.4	52.4		15.9	15.9		15.9	15.9	
70th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
50th %ile Green (s)	55.0	55.0		55.0	55.0		13.3	13.3		13.3	13.3	
50th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
30th %ile Green (s)	57.7	57.7		57.7	57.7		10.6	10.6		10.6	10.6	
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
10th %ile Green (s)	58.3	58.3		58.3	58.3		10.0	10.0		10.0	10.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		Min	Min		Hold	Hold	
Stops (vph)	17	170		21	140		16	31		102	17	
Fuel Used(l)	2	16		2	12		2	15		7	2	
CO Emissions (g/hr)	31	297		35	223		39	278		127	30	
NOx Emissions (g/hr)	6	57		7	43		8	54		24	6	
VOC Emissions (g/hr)	7	69		8	51		9	64		29	7	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	2.0	21.9		2.5	17.8		2.2	2.0		16.2	1.2	
Queue Length 95th (m)	6.6	46.5		8.1	39.3		6.7	15.3		29.3	9.5	
Internal Link Dist (m)		226.4			179.8			199.0			120.1	
Turn Bay Length (m)	30.0			30.0			40.0			35.0		
Base Capacity (vph)	645	1162		601	1087		461	622		414	571	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.07	0.36		0.10	0.33		0.04	0.24		0.28	0.10	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.58
Intersection Signal Delay: 10.9 — Intersection LOS: B
Intersection Capacity Utilization 71.4% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 22: Maritime Way/Knudson Drive & Campeau Drive

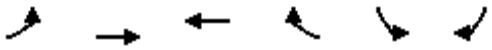




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	0	1	29	0	16	4	55	24	15	35	4
Future Volume (vph)	1	0	1	29	0	16	4	55	24	15	35	4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	0	1	29	0	16	4	55	24	15	35	4

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	2	45	83	54
Volume Left (vph)	1	29	4	15
Volume Right (vph)	1	16	24	4
Hadj (s)	-0.17	-0.05	-0.13	0.05
Departure Headway (s)	4.1	4.1	3.9	4.1
Degree Utilization, x	0.00	0.05	0.09	0.06
Capacity (veh/h)	848	839	893	856
Control Delay (s)	7.1	7.4	7.3	7.4
Approach Delay (s)	7.1	7.4	7.3	7.4
Approach LOS	A	A	A	A

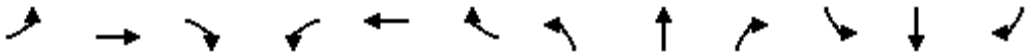
Intersection Summary				
Delay	7.3			
Level of Service	A			
Intersection Capacity Utilization	19.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	27	20	2	4	25
Future Volume (Veh/h)	12	27	20	2	4	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	12	27	20	2	4	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	22				72	21
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	22				72	21
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1593				925	1056

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	39	22	29
Volume Left	12	0	4
Volume Right	0	2	25
cSH	1593	1700	1036
Volume to Capacity	0.01	0.01	0.03
Queue Length 95th (m)	0.2	0.0	0.7
Control Delay (s)	2.3	0.0	8.6
Lane LOS	A		A
Approach Delay (s)	2.3	0.0	8.6
Approach LOS			A

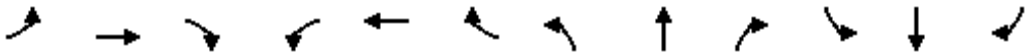
Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	18.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	382	15	23	423	2	27	0	35	4	2	10
Future Volume (Veh/h)	4	382	15	23	423	2	27	0	35	4	2	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	4	424	17	26	470	2	30	0	39	4	2	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					251							
pX, platoon unblocked	1.00						1.00	1.00		1.00	1.00	1.00
vC, conflicting volume	472			441			976	964	432	1002	972	471
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	472			441			975	964	432	1002	972	471
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			86	100	94	98	99	98
cM capacity (veh/h)	1090			1119			220	248	623	203	246	593

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	445	498	69	17
Volume Left	4	26	30	4
Volume Right	17	2	39	11
cSH	1090	1119	347	366
Volume to Capacity	0.00	0.02	0.20	0.05
Queue Length 95th (m)	0.1	0.5	5.5	1.1
Control Delay (s)	0.1	0.7	17.9	15.3
Lane LOS	A	A	C	C
Approach Delay (s)	0.1	0.7	17.9	15.3
Approach LOS			C	C

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	52.4%	ICU Level of Service	A	
Analysis Period (min)	15			

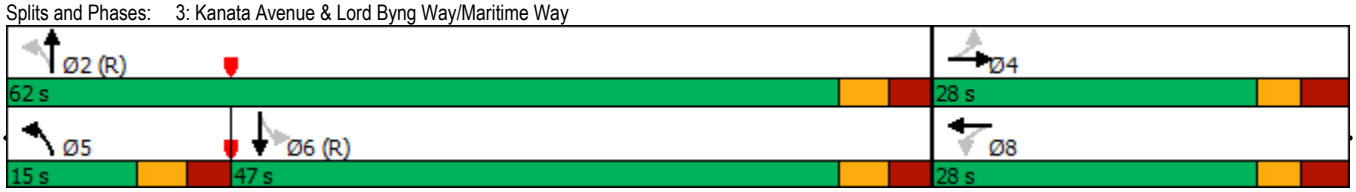


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	3	78	137	9	46	136	637	201	69	491	25
Future Volume (vph)	30	3	78	137	9	46	136	637	201	69	491	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	20.0		0.0	40.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	25.0			40.0			75.0			55.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	0.97		0.99	0.96		1.00	0.99		1.00	1.00	
Frt		0.856			0.875			0.964			0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1262	1250	0	1695	1506	0	1503	1710	0	1695	1755	0
Flt Permitted	0.721			0.704			0.325			0.322		
Satd. Flow (perm)	938	1250	0	1247	1506	0	514	1710	0	574	1755	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		78			46			33			4	
Link Speed (k/h)		50			40			50			50	
Link Distance (m)		119.6			99.0			110.4			236.0	
Travel Time (s)		8.6			8.9			7.9			17.0	
Confl. Peds. (#/hr)	11		4	4		11	3		3	3		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	37%	2%	22%	2%	2%	2%	15%	2%	2%	2%	2%	20%
Adj. Flow (vph)	30	3	78	137	9	46	136	637	201	69	491	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	81	0	137	55	0	136	838	0	69	516	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	28.3	28.3		28.3	28.3		11.3	33.3		33.3	33.3	
Total Split (s)	28.0	28.0		28.0	28.0		15.0	62.0		47.0	47.0	
Total Split (%)	31.1%	31.1%		31.1%	31.1%		16.7%	68.9%		52.2%	52.2%	
Maximum Green (s)	21.7	21.7		21.7	21.7		8.7	55.7		40.7	40.7	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.3	6.3		6.3	6.3	
Lead/Lag							Lead			Lag	Lag	
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	None	None		None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0			20.0		20.0	20.0	
Pedestrian Calls (#/hr)	10	10		10	10			10		10	10	
Act Effct Green (s)	15.4	15.4		15.4	15.4		62.0	62.0		47.8	47.8	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.69	0.69		0.53	0.53	
v/c Ratio	0.19	0.29		0.64	0.19		0.31	0.71		0.23	0.55	
Control Delay	32.5	10.5		42.5	8.8		6.4	10.5		16.0	18.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.1		0.0	0.0	
Total Delay	32.5	10.5		42.5	8.8		6.4	10.6		16.0	18.2	
LOS	C	B		D	A		A	B		B	B	
Approach Delay		16.5			32.9			10.0			17.9	
Approach LOS		B			C			A			B	
90th %ile Green (s)	21.7	21.7		21.7	21.7		8.7	55.7		40.7	40.7	
90th %ile Term Code	Ped	Ped		Ped	Ped		Max	Coord		Coord	Coord	
70th %ile Green (s)	17.8	17.8		17.8	17.8		9.5	59.6		43.8	43.8	
70th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
50th %ile Green (s)	15.1	15.1		15.1	15.1		8.2	62.3		47.8	47.8	
50th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
30th %ile Green (s)	12.4	12.4		12.4	12.4		7.2	65.0		51.5	51.5	
30th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
10th %ile Green (s)	10.0	10.0		10.0	10.0		6.1	67.4		55.0	55.0	
10th %ile Term Code	Hold	Hold		Min	Min		Gap	Coord		Coord	Coord	
Stops (vph)	27	17		125	24		38	431		39	343	
Fuel Used(l)	2	2		19	6		4	34		3	26	
CO Emissions (g/hr)	32	36		348	103		82	638		61	492	
NOx Emissions (g/hr)	6	7		67	20		16	123		12	95	
VOC Emissions (g/hr)	7	8		80	24		19	147		14	114	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	4.5	0.4		22.4	2.8		3.6	46.3		6.0	55.4	
Queue Length 95th (m)	11.2	11.3		38.0	10.3		m12.2	126.1		17.0	100.0	
Internal Link Dist (m)		95.6			75.0			86.4			212.0	
Turn Bay Length (m)	20.0			40.0			35.0			35.0		
Base Capacity (vph)	226	360		300	398		451	1188		304	933	
Starvation Cap Reductn	0	0		0	0		0	22		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.13	0.23		0.46	0.14		0.30	0.72		0.23	0.55	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 31 (34%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 15.2		Intersection LOS: B	
Intersection Capacity Utilization 88.3%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Kanata Avenue & Lord Byng Way/Maritime Way

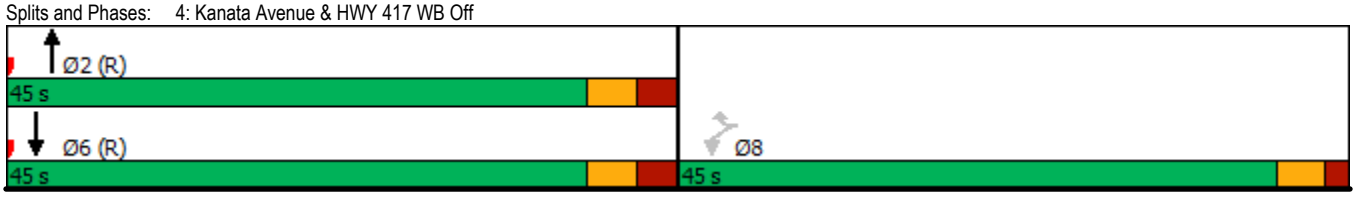


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	427	593	607	0	0	885
Future Volume (vph)	427	593	607	0	0	885
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1695	1517	1750	0	0	3357
Flt Permitted	0.950					
Satd. Flow (perm)	1695	1517	1750	0	0	3357
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		173				
Link Speed (k/h)	50		50			50
Link Distance (m)	332.8		126.6			114.0
Travel Time (s)	24.0		9.1			8.2
Confl. Bikes (#/hr)				3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	4%	0%	0%	3%
Adj. Flow (vph)	427	593	607	0	0	885
Shared Lane Traffic (%)						
Lane Group Flow (vph)	427	593	607	0	0	885
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)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
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)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+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)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA			NA
Protected Phases			2			6
Permitted Phases	8	8				
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0			10.0
Minimum Split (s)	23.0	23.0	28.1			24.1
Total Split (s)	45.0	45.0	45.0			45.0
Total Split (%)	50.0%	50.0%	50.0%			50.0%
Maximum Green (s)	40.0	40.0	38.9			38.9
Yellow Time (s)	3.3	3.3	3.3			3.3
All-Red Time (s)	1.7	1.7	2.8			2.8
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	6.1			6.1
Lead/Lag						

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)	7.0	7.0	7.0			
Flash Dont Walk (s)	11.0	11.0	15.0			
Pedestrian Calls (#/hr)	10	10	10			
Act Effct Green (s)	33.2	33.2	45.7			45.7
Actuated g/C Ratio	0.37	0.37	0.51			0.51
v/c Ratio	0.68	0.89	0.68			0.52
Control Delay	29.0	34.2	18.1			14.8
Queue Delay	0.0	0.0	0.3			0.0
Total Delay	29.0	34.2	18.4			14.8
LOS	C	C	B			B
Approach Delay	32.0		18.4			14.8
Approach LOS	C		B			B
90th %ile Green (s)	40.0	40.0	38.9			38.9
90th %ile Term Code	Max	Max	Coord			Coord
70th %ile Green (s)	39.7	39.7	39.2			39.2
70th %ile Term Code	Gap	Gap	Coord			Coord
50th %ile Green (s)	35.5	35.5	43.4			43.4
50th %ile Term Code	Gap	Gap	Coord			Coord
30th %ile Green (s)	29.8	29.8	49.1			49.1
30th %ile Term Code	Gap	Gap	Coord			Coord
10th %ile Green (s)	21.0	21.0	57.9			57.9
10th %ile Term Code	Gap	Gap	Coord			Coord
Stops (vph)	339	407	424			413
Fuel Used(l)	31	43	25			38
CO Emissions (g/hr)	570	808	470			711
NOx Emissions (g/hr)	110	156	91			137
VOC Emissions (g/hr)	131	186	108			164
Dilemma Vehicles (#)	0	0	0			0
Queue Length 50th (m)	58.5	67.0	81.5			37.7
Queue Length 95th (m)	81.5	105.2	#145.7			59.5
Internal Link Dist (m)	308.8		102.6			90.0
Turn Bay Length (m)						
Base Capacity (vph)	753	770	888			1704
Starvation Cap Reductn	0	0	47			0
Spillback Cap Reductn	0	0	2			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.57	0.77	0.72			0.52

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 32 (36%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 22.7		Intersection LOS: C	
Intersection Capacity Utilization 105.7%		ICU Level of Service G	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 4: Kanata Avenue & HWY 417 WB Off

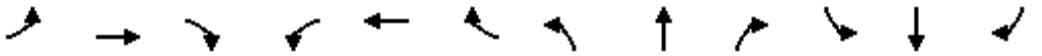


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lane Configurations							
Traffic Volume (vph)	0	0	489	182	341	814	
Future Volume (vph)	0	0	489	182	341	814	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	0.0	0.0		50.0	0.0		
Storage Lanes	0	0		1	1		
Taper Length (m)	7.6				7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor				0.98	1.00		
Frt				0.850			
Flt Protected					0.950		
Satd. Flow (prot)	0	0	1733	1517	1662	1784	
Flt Permitted					0.408		
Satd. Flow (perm)	0	0	1733	1479	713	1784	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)				182			
Link Speed (k/h)	48		50			50	
Link Distance (m)	278.4		119.2			126.6	
Travel Time (s)	20.9		8.6			9.1	
Confl. Peds. (#/hr)				2	2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	0%	0%	5%	2%	4%	2%	
Adj. Flow (vph)	0	0	489	182	341	814	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	489	182	341	814	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(m)	0.0		3.7			3.7	
Link Offset(m)	0.0		0.0			0.0	
Crosswalk Width(m)	4.9		4.9			4.9	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)	24	14		14	24		
Number of Detectors			2	1	1	2	
Detector Template			Thru	Right	Left	Thru	
Leading Detector (m)			30.5	6.1	6.1	30.5	
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)			1.8	6.1	6.1	1.8	
Detector 1 Type			Cl+Ex	Cl+Ex	Cl+Ex	Cl+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)			28.7			28.7	
Detector 2 Size(m)			1.8			1.8	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type			NA	Perm	pm+pt	NA	
Protected Phases			2		1	6	8
Permitted Phases				2	6		
Detector Phase			2	2	1	6	
Switch Phase							
Minimum Initial (s)			10.0	10.0	5.0	10.0	5.0
Minimum Split (s)			23.7	23.7	10.7	23.7	27.0
Total Split (s)			50.0	50.0	12.0	62.0	28.0
Total Split (%)			55.6%	55.6%	13.3%	68.9%	31%
Maximum Green (s)			44.3	44.3	6.3	56.3	23.0
Yellow Time (s)			3.3	3.3	3.3	3.3	3.0
All-Red Time (s)			2.4	2.4	2.4	2.4	2.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lost Time Adjust (s)			0.0	0.0	0.0	0.0	
Total Lost Time (s)			5.7	5.7	5.7	5.7	
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?			Yes	Yes	Yes		
Vehicle Extension (s)			3.0	3.0	3.0	3.0	3.0
Recall Mode			C-Max	C-Max	None	C-Max	None
Walk Time (s)			7.0	7.0			7.0
Flash Dont Walk (s)			11.0	11.0			15.0
Pedestrian Calls (#/hr)			10	10			10
Act Effct Green (s)			65.5	65.5	78.9	83.5	
Actuated g/C Ratio			0.73	0.73	0.88	0.93	
v/c Ratio			0.39	0.16	0.48	0.49	
Control Delay			4.3	0.6	6.2	3.5	
Queue Delay			0.2	0.0	0.2	0.0	
Total Delay			4.6	0.6	6.4	3.5	
LOS			A	A	A	A	
Approach Delay			3.5			4.4	
Approach LOS			A			A	
90th %ile Green (s)			44.3	44.3	7.3	57.3	22.0
90th %ile Term Code			Coord	Coord	Max	Coord	Ped
70th %ile Green (s)			70.2	70.2	8.4	84.3	0.0
70th %ile Term Code			Coord	Coord	Gap	Coord	Skip
50th %ile Green (s)			70.6	70.6	8.0	84.3	0.0
50th %ile Term Code			Coord	Coord	Gap	Coord	Skip
30th %ile Green (s)			70.9	70.9	7.7	84.3	0.0
30th %ile Term Code			Coord	Coord	Gap	Coord	Skip
10th %ile Green (s)			71.4	71.4	7.2	84.3	0.0
10th %ile Term Code			Coord	Coord	Gap	Coord	Skip
Stops (vph)			126	9	76	135	
Fuel Used(l)			10	2	7	15	
CO Emissions (g/hr)			186	44	138	279	
NOx Emissions (g/hr)			36	8	27	54	
VOC Emissions (g/hr)			43	10	32	64	
Dilemma Vehicles (#)			0	0	0	0	
Queue Length 50th (m)			7.1	0.0	1.7	3.5	
Queue Length 95th (m)			69.2	3.5	37.3	77.0	
Internal Link Dist (m)	254.4		95.2			102.6	
Turn Bay Length (m)				50.0			
Base Capacity (vph)			1260	1125	706	1654	
Starvation Cap Reductn			261	0	59	6	
Spillback Cap Reductn			32	0	0	15	
Storage Cap Reductn			0	0	0	0	
Reduced v/c Ratio			0.49	0.16	0.53	0.50	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 27 (30%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 4.1		Intersection LOS: A	
Intersection Capacity Utilization 105.7%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 5: Kanata Avenue & HWY 417 EB On



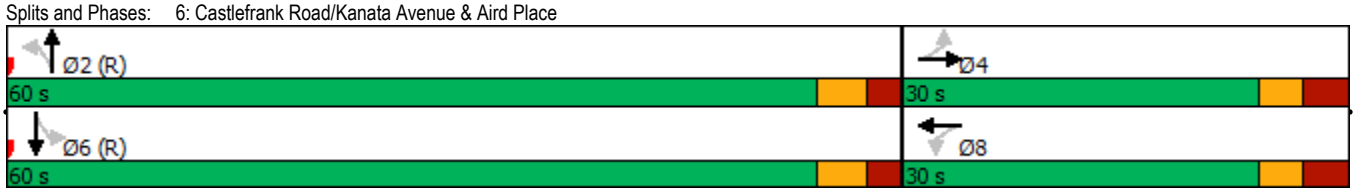
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	3	13	30	1	97	12	667	35	62	810	24
Future Volume (vph)	17	3	13	30	1	97	12	667	35	62	810	24
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.6			7.6			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.97			1.00		1.00	1.00	
Frt		0.947			0.898			0.993			0.996	
Flt Protected		0.975			0.988		0.950			0.950		
Satd. Flow (prot)	0	1627	0	0	1542	0	1695	1753	0	1695	1775	0
Flt Permitted		0.735			0.909		0.283			0.349		
Satd. Flow (perm)	0	1219	0	0	1415	0	505	1753	0	621	1775	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			97			5			3	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		125.4			132.9			95.7			119.2	
Travel Time (s)		11.3			12.0			6.9			8.6	
Confl. Peds. (#/hr)	7		6	6		7	9		5	5		9
Confl. Bikes (#/hr)									3			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	17	3	13	30	1	97	12	667	35	62	810	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	33	0	0	128	0	12	702	0	62	834	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	28.2	28.2		28.2	28.2		24.7	24.7		24.7	24.7	
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Maximum Green (s)	23.8	23.8		23.8	23.8		54.3	54.3		54.3	54.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	

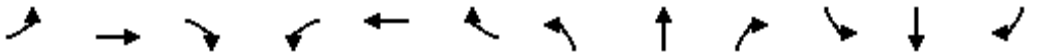
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	3.2	3.2		3.2	3.2		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.2			6.2		5.7	5.7		5.7	5.7	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	10	10		10	10		10	10		10	10	
Act Effct Green (s)		10.1			10.1		68.0	68.0		68.0	68.0	
Actuated g/C Ratio		0.11			0.11		0.76	0.76		0.76	0.76	
v/c Ratio		0.22			0.52		0.03	0.53		0.13	0.62	
Control Delay		26.2			19.2		5.0	7.5		6.0	7.8	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.1	
Total Delay		26.2			19.2		5.0	7.5		6.0	8.0	
LOS		C			B		A	A		A	A	
Approach Delay		26.2			19.2			7.5			7.8	
Approach LOS		C			B			A			A	
90th %ile Green (s)	22.0	22.0		22.0	22.0		56.1	56.1		56.1	56.1	
90th %ile Term Code	Ped	Ped		Ped	Ped		Coord	Coord		Coord	Coord	
70th %ile Green (s)	9.9	9.9		9.9	9.9		68.2	68.2		68.2	68.2	
70th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
50th %ile Green (s)	7.5	7.5		7.5	7.5		70.6	70.6		70.6	70.6	
50th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
30th %ile Green (s)	5.5	5.5		5.5	5.5		72.6	72.6		72.6	72.6	
30th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
10th %ile Green (s)	5.5	5.5		5.5	5.5		72.6	72.6		72.6	72.6	
10th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
Stops (vph)		21			40		4	287		18	292	
Fuel Used(l)		1			4		0	17		1	21	
CO Emissions (g/hr)		26			79		5	314		26	391	
NOx Emissions (g/hr)		5			15		1	61		5	75	
VOC Emissions (g/hr)		6			18		1	72		6	90	
Dilemma Vehicles (#)		0			0		0	0		0	0	
Queue Length 50th (m)		3.3			5.1		0.4	32.8		2.4	41.5	
Queue Length 95th (m)		9.9			17.8		2.8	103.4		m7.2	59.7	
Internal Link Dist (m)		101.4			108.9			71.7			95.2	
Turn Bay Length (m)							30.0			50.0		
Base Capacity (vph)		331			445		381	1326		469	1342	
Starvation Cap Reductn		0			0		0	0		0	65	
Spillback Cap Reductn		0			1		0	24		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.10			0.29		0.03	0.54		0.13	0.65	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 10 (11%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 8.9 Intersection LOS: A
Intersection Capacity Utilization 75.3% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Castlefrank Road/Kanata Avenue & Aird Place





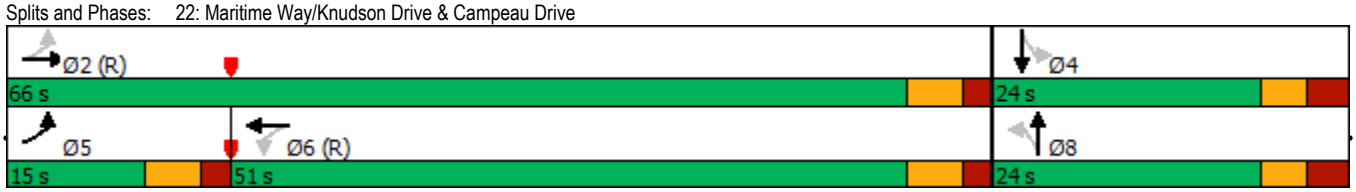
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	300	30	116	423	91	12	12	83	34	10	66
Future Volume (vph)	59	300	30	116	423	91	12	12	83	34	10	66
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	40.0			55.0			40.0			35.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	0.99		0.98	0.97		0.99	0.96	
Frt		0.986			0.973			0.869			0.870	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1755	0	1695	1721	0	1695	1509	0	1679	1497	0
Flt Permitted	0.378			0.561			0.708			0.695		
Satd. Flow (perm)	668	1755	0	996	1721	0	1239	1509	0	1217	1497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			17			83			66	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		237.7			203.8			223.0			144.1	
Travel Time (s)		17.1			14.7			20.1			13.0	
Confl. Peds. (#/hr)	15		4	4		15	8		4	4		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	59	300	30	116	423	91	12	12	83	34	10	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	330	0	116	514	0	12	95	0	34	76	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	10.7	27.7		27.7	27.7		24.0	24.0		24.0	24.0	
Total Split (s)	15.0	66.0		51.0	51.0		24.0	24.0		24.0	24.0	
Total Split (%)	16.7%	73.3%		56.7%	56.7%		26.7%	26.7%		26.7%	26.7%	
Maximum Green (s)	9.3	60.3		45.3	45.3		18.0	18.0		18.0	18.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	

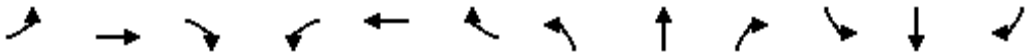
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7		5.7	5.7		6.0	6.0		6.0	6.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)		10		10	10		10	10		10	10	
Act Effct Green (s)	70.1	71.2		61.4	61.4		11.4	11.4		11.4	11.4	
Actuated g/C Ratio	0.78	0.79		0.68	0.68		0.13	0.13		0.13	0.13	
v/c Ratio	0.10	0.24		0.17	0.44		0.08	0.36		0.22	0.31	
Control Delay	3.9	4.0		9.2	10.7		33.6	20.4		37.8	14.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.9	4.0		9.2	10.7		33.6	20.4		37.8	14.6	
LOS	A	A		A	B		C	C		D	B	
Approach Delay		4.0			10.4			21.9			21.8	
Approach LOS		A			B			C			C	
90th %ile Green (s)	7.7	61.3		47.9	47.9		17.0	17.0		17.0	17.0	
90th %ile Term Code	Gap	Coord		Coord	Coord		Ped	Ped		Ped	Ped	
70th %ile Green (s)	6.6	68.3		56.0	56.0		10.0	10.0		10.0	10.0	
70th %ile Term Code	Gap	Coord		Coord	Coord		Min	Min		Min	Min	
50th %ile Green (s)	6.2	68.3		56.4	56.4		10.0	10.0		10.0	10.0	
50th %ile Term Code	Gap	Coord		Coord	Coord		Min	Min		Min	Min	
30th %ile Green (s)	5.9	68.3		56.7	56.7		10.0	10.0		10.0	10.0	
30th %ile Term Code	Gap	Coord		Coord	Coord		Min	Min		Min	Min	
10th %ile Green (s)	0.0	84.3		84.3	84.3		0.0	0.0		0.0	0.0	
10th %ile Term Code	Skip	Coord		Coord	Coord		Skip	Skip		Skip	Skip	
Stops (vph)	15	85		49	246		15	63		32	23	
Fuel Used(l)	2	10		4	20		2	11		2	2	
CO Emissions (g/hr)	34	193		77	367		30	203		37	44	
NOx Emissions (g/hr)	7	37		15	71		6	39		7	8	
VOC Emissions (g/hr)	8	45		18	85		7	47		8	10	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	2.0	12.9		7.7	41.1		2.1	5.9		5.5	1.6	
Queue Length 95th (m)	6.5	29.5		19.7	82.2		m4.3	m17.3		13.1	12.6	
Internal Link Dist (m)		213.7			179.8			199.0			120.1	
Turn Bay Length (m)	30.0			30.0			40.0			35.0		
Base Capacity (vph)	626	1391		679	1179		247	368		243	352	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.09	0.24		0.17	0.44		0.05	0.26		0.14	0.22	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.44
Intersection Signal Delay: 10.4 Intersection LOS: B
Intersection Capacity Utilization 58.2% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 22: Maritime Way/Knudson Drive & Campeau Drive

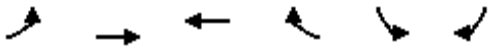




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	0	7	21	0	11	2	58	28	21	41	2
Future Volume (vph)	5	0	7	21	0	11	2	58	28	21	41	2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	0	7	21	0	11	2	58	28	21	41	2

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	12	32	88	64
Volume Left (vph)	5	21	2	21
Volume Right (vph)	7	11	28	2
Hadj (s)	-0.23	-0.04	-0.15	0.08
Departure Headway (s)	4.0	4.2	3.9	4.2
Degree Utilization, x	0.01	0.04	0.10	0.07
Capacity (veh/h)	855	826	898	849
Control Delay (s)	7.1	7.4	7.3	7.5
Approach Delay (s)	7.1	7.4	7.3	7.5
Approach LOS	A	A	A	A

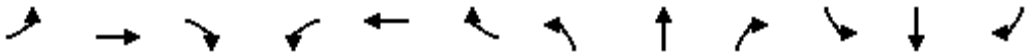
Intersection Summary				
Delay			7.4	
Level of Service			A	
Intersection Capacity Utilization			20.3%	ICU Level of Service
Analysis Period (min)			15	



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	31	18	7	6	5	25
Future Volume (Veh/h)	31	18	7	6	5	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	31	18	7	6	5	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	13				90	10
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	13				90	10
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	98
cM capacity (veh/h)	1606				893	1071

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	49	13	5	25
Volume Left	31	0	5	0
Volume Right	0	6	0	25
cSH	1606	1700	893	1071
Volume to Capacity	0.02	0.01	0.01	0.02
Queue Length 95th (m)	0.4	0.0	0.1	0.5
Control Delay (s)	4.7	0.0	9.1	8.4
Lane LOS	A		A	A
Approach Delay (s)	4.7	0.0	8.5	
Approach LOS			A	

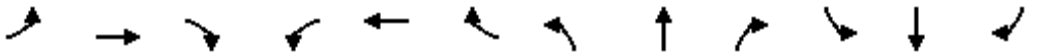
Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	19.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	396	27	37	481	5	18	1	45	3	0	10
Future Volume (Veh/h)	17	396	27	37	481	5	18	1	45	3	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	440	30	41	534	6	20	1	50	3	0	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					238							
pX, platoon unblocked	0.90						0.90	0.90		0.90	0.90	0.90
vC, conflicting volume	540			470			1123	1115	455	1162	1127	537
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	428			470			1079	1070	455	1123	1084	425
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			96			88	99	92	98	100	98
cM capacity (veh/h)	1013			1092			165	187	605	143	184	564

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	489	581	71	14
Volume Left	19	41	20	3
Volume Right	30	6	50	11
cSH	1013	1092	339	346
Volume to Capacity	0.02	0.04	0.21	0.04
Queue Length 95th (m)	0.4	0.9	5.9	1.0
Control Delay (s)	0.5	1.0	18.4	15.8
Lane LOS	A	A	C	C
Approach Delay (s)	0.5	1.0	18.4	15.8
Approach LOS			C	C

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	55.0%	ICU Level of Service	B	
Analysis Period (min)	15			

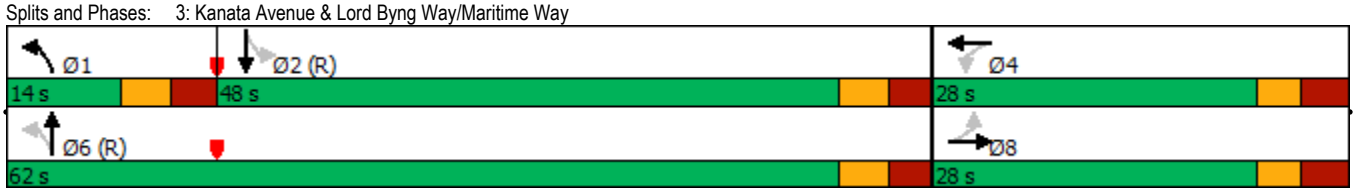


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	6	36	227	2	73	85	314	167	30	594	16
Future Volume (vph)	19	6	36	227	2	73	85	314	167	30	594	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	20.0		0.0	40.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	25.0			40.0			75.0			55.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.98		0.99	0.98		1.00	0.99		1.00	1.00	
Frt		0.871			0.854			0.948			0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1262	1045	0	1616	1491	0	1417	1641	0	1478	1757	0
Flt Permitted	0.708			0.730			0.244			0.489		
Satd. Flow (perm)	939	1045	0	1234	1491	0	364	1641	0	760	1757	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			73			56			2	
Link Speed (k/h)		50			40			50			50	
Link Distance (m)		119.6			99.0			110.4			236.0	
Travel Time (s)		8.6			8.9			7.9			17.0	
Confl. Peds. (#/hr)	1		3	3		1	3		1	1		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	37%	2%	56%	7%	2%	2%	22%	4%	5%	17%	2%	44%
Adj. Flow (vph)	19	6	36	227	2	73	85	314	167	30	594	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	19	42	0	227	75	0	85	481	0	30	610	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Detector Phase	8	8		4	4		1	6		2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	28.3	28.3		28.3	28.3		11.3	33.3		33.3	33.3	
Total Split (s)	28.0	28.0		28.0	28.0		14.0	62.0		48.0	48.0	
Total Split (%)	31.1%	31.1%		31.1%	31.1%		15.6%	68.9%		53.3%	53.3%	
Maximum Green (s)	21.7	21.7		21.7	21.7		7.7	55.7		41.7	41.7	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.3	6.3		6.3	6.3	
Lead/Lag							Lead			Lag	Lag	
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	None	None		None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0			20.0		20.0	20.0	
Pedestrian Calls (#/hr)	10	10		10	10			10		10	10	
Act Effct Green (s)	19.6	19.6		19.6	19.6		57.8	57.8		46.8	46.8	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.64	0.64		0.52	0.52	
v/c Ratio	0.09	0.16		0.85	0.20		0.27	0.45		0.08	0.67	
Control Delay	28.1	12.8		61.2	8.7		9.0	7.9		14.2	22.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	28.1	12.8		61.2	8.7		9.0	7.9		14.2	22.4	
LOS	C	B		E	A		A	A		B	C	
Approach Delay		17.6			48.2			8.1			22.0	
Approach LOS		B			D			A			C	
90th %ile Green (s)	21.7	21.7		21.7	21.7		7.7	55.7		41.7	41.7	
90th %ile Term Code	Ped	Ped		Ped	Ped		Max	Coord		Coord	Coord	
70th %ile Green (s)	21.7	21.7		21.7	21.7		7.7	55.7		41.7	41.7	
70th %ile Term Code	Hold	Hold		Max	Max		Max	Coord		Coord	Coord	
50th %ile Green (s)	21.7	21.7		21.7	21.7		7.6	55.7		41.8	41.8	
50th %ile Term Code	Hold	Hold		Max	Max		Gap	Coord		Coord	Coord	
30th %ile Green (s)	19.0	19.0		19.0	19.0		6.7	58.4		45.4	45.4	
30th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
10th %ile Green (s)	13.9	13.9		13.9	13.9		0.0	63.5		63.5	63.5	
10th %ile Term Code	Hold	Hold		Gap	Gap		Skip	Coord		Coord	Coord	
Stops (vph)	17	14		202	16		28	139		17	459	
Fuel Used(l)	1	1		34	7		3	16		1	34	
CO Emissions (g/hr)	19	22		635	134		56	303		26	641	
NOx Emissions (g/hr)	4	4		123	26		11	59		5	124	
VOC Emissions (g/hr)	4	5		146	31		13	70		6	148	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	2.6	0.8		36.6	0.3		3.8	19.0		2.8	82.9	
Queue Length 95th (m)	8.1	8.7		#71.7	10.5		13.0	52.7		7.8	125.0	
Internal Link Dist (m)		95.6			75.0			86.4			212.0	
Turn Bay Length (m)	20.0			40.0			35.0			35.0		
Base Capacity (vph)	226	279		297	414		323	1073		395	915	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.08	0.15		0.76	0.18		0.26	0.45		0.08	0.67	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 40 (44%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 21.8		Intersection LOS: C	
Intersection Capacity Utilization 74.7%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Kanata Avenue & Lord Byng Way/Maritime Way

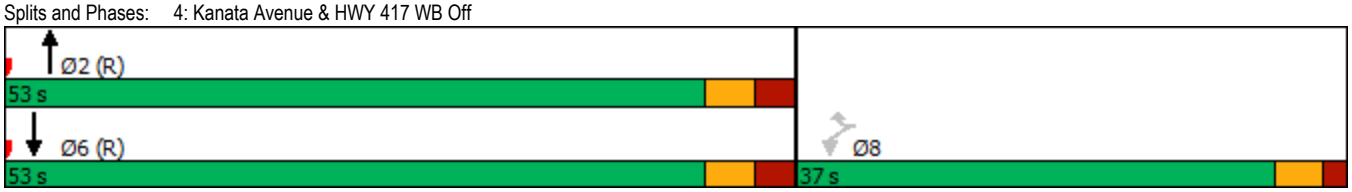


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	243	244	368	0	0	980
Future Volume (vph)	243	244	368	0	0	980
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1695	1334	1717	0	0	3325
Flt Permitted	0.950					
Satd. Flow (perm)	1695	1334	1717	0	0	3325
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		244				
Link Speed (k/h)	50		50			50
Link Distance (m)	332.8		126.6			114.0
Travel Time (s)	24.0		9.1			8.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	16%	6%	0%	0%	4%
Adj. Flow (vph)	243	244	368	0	0	980
Shared Lane Traffic (%)						
Lane Group Flow (vph)	243	244	368	0	0	980
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)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
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)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+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)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA			NA
Protected Phases			2			6
Permitted Phases	8	8				
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0			10.0
Minimum Split (s)	23.0	23.0	28.1			24.1
Total Split (s)	37.0	37.0	53.0			53.0
Total Split (%)	41.1%	41.1%	58.9%			58.9%
Maximum Green (s)	32.0	32.0	46.9			46.9
Yellow Time (s)	3.3	3.3	3.3			3.3
All-Red Time (s)	1.7	1.7	2.8			2.8
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	6.1			6.1
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)	7.0	7.0	7.0			
Flash Dont Walk (s)	11.0	11.0	15.0			
Pedestrian Calls (#/hr)	10	10	10			
Act Effct Green (s)	18.4	18.4	60.5			60.5
Actuated g/C Ratio	0.20	0.20	0.67			0.67
v/c Ratio	0.70	0.52	0.32			0.44
Control Delay	43.5	8.0	3.5			8.0
Queue Delay	0.0	0.0	0.2			0.0
Total Delay	43.5	8.0	3.6			8.0
LOS	D	A	A			A
Approach Delay	25.7		3.6			8.0
Approach LOS	C		A			A
90th %ile Green (s)	25.7	25.7	53.2			53.2
90th %ile Term Code	Gap	Gap	Coord			Coord
70th %ile Green (s)	21.1	21.1	57.8			57.8
70th %ile Term Code	Gap	Gap	Coord			Coord
50th %ile Green (s)	18.3	18.3	60.6			60.6
50th %ile Term Code	Gap	Gap	Coord			Coord
30th %ile Green (s)	15.5	15.5	63.4			63.4
30th %ile Term Code	Gap	Gap	Coord			Coord
10th %ile Green (s)	11.6	11.6	67.3			67.3
10th %ile Term Code	Gap	Gap	Coord			Coord
Stops (vph)	215	31	42			407
Fuel Used(l)	21	10	6			36
CO Emissions (g/hr)	384	184	118			671
NOx Emissions (g/hr)	74	36	23			129
VOC Emissions (g/hr)	89	43	27			155
Dilemma Vehicles (#)	0	0	0			0
Queue Length 50th (m)	39.3	0.0	7.8			28.8
Queue Length 95th (m)	57.3	16.5	10.2			65.6
Internal Link Dist (m)	308.8		102.6			90.0
Turn Bay Length (m)						
Base Capacity (vph)	602	631	1153			2233
Starvation Cap Reductn	0	0	225			0
Spillback Cap Reductn	0	0	0			11
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.40	0.39	0.40			0.44

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 35 (39%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 11.8		Intersection LOS: B	
Intersection Capacity Utilization 56.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: Kanata Avenue & HWY 417 WB Off

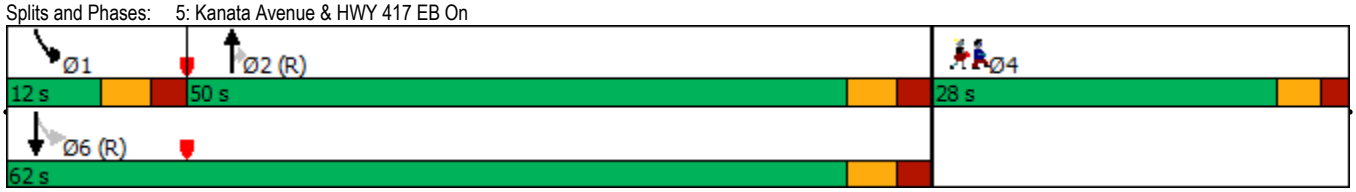


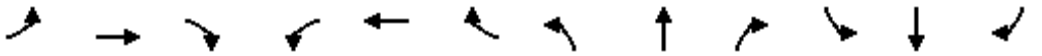
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
Lane Configurations							
Traffic Volume (vph)	0	0	341	220	472	605	
Future Volume (vph)	0	0	341	220	472	605	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	0.0	0.0		50.0	0.0		
Storage Lanes	0	0		1	1		
Taper Length (m)	7.6				7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor				0.98	1.00		
Frt				0.850			
Flt Protected					0.950		
Satd. Flow (prot)	0	0	1685	1502	1679	1750	
Flt Permitted					0.496		
Satd. Flow (perm)	0	0	1685	1468	875	1750	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)				220			
Link Speed (k/h)	48		50			50	
Link Distance (m)	278.4		119.2			126.6	
Travel Time (s)	20.9		8.6			9.1	
Confl. Peds. (#/hr)				1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	0%	0%	8%	3%	3%	4%	
Adj. Flow (vph)	0	0	341	220	472	605	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	341	220	472	605	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(m)	0.0		3.7			3.7	
Link Offset(m)	0.0		0.0			0.0	
Crosswalk Width(m)	4.9		4.9			4.9	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)	24	14		14	24		
Number of Detectors			2	1	1	2	
Detector Template			Thru	Right	Left	Thru	
Leading Detector (m)			30.5	6.1	6.1	30.5	
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)			1.8	6.1	6.1	1.8	
Detector 1 Type			Cl+Ex	Cl+Ex	Cl+Ex	Cl+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)			28.7			28.7	
Detector 2 Size(m)			1.8			1.8	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type			NA	Perm	pm+pt	NA	
Protected Phases			2		1	6	4
Permitted Phases				2	6		
Detector Phase			2	2	1	6	
Switch Phase							
Minimum Initial (s)			10.0	10.0	5.0	10.0	5.0
Minimum Split (s)			23.7	23.7	10.7	23.7	27.0
Total Split (s)			50.0	50.0	12.0	62.0	28.0
Total Split (%)			55.6%	55.6%	13.3%	68.9%	31%
Maximum Green (s)			44.3	44.3	6.3	56.3	23.0
Yellow Time (s)			3.3	3.3	3.3	3.3	3.0
All-Red Time (s)			2.4	2.4	2.4	2.4	2.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
Lost Time Adjust (s)			0.0	0.0	0.0	0.0	
Total Lost Time (s)			5.7	5.7	5.7	5.7	
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?			Yes	Yes	Yes		
Vehicle Extension (s)			3.0	3.0	3.0	3.0	3.0
Recall Mode			C-Max	C-Max	None	C-Max	None
Walk Time (s)			7.0	7.0			7.0
Flash Dont Walk (s)			11.0	11.0			15.0
Pedestrian Calls (#/hr)			10	10			10
Act Effct Green (s)			64.0	64.0	78.9	83.5	
Actuated g/C Ratio			0.71	0.71	0.88	0.93	
v/c Ratio			0.28	0.20	0.56	0.37	
Control Delay			6.6	1.8	6.2	2.3	
Queue Delay			0.3	0.0	0.0	0.0	
Total Delay			6.9	1.8	6.2	2.3	
LOS			A	A	A	A	
Approach Delay			4.9			4.0	
Approach LOS			A			A	
90th %ile Green (s)			44.3	44.3	7.3	57.3	22.0
90th %ile Term Code			Coord	Coord	Max	Coord	Ped
70th %ile Green (s)			68.4	68.4	10.2	84.3	0.0
70th %ile Term Code			Coord	Coord	Gap	Coord	Skip
50th %ile Green (s)			68.4	68.4	10.2	84.3	0.0
50th %ile Term Code			Coord	Coord	Gap	Coord	Skip
30th %ile Green (s)			69.0	69.0	9.6	84.3	0.0
30th %ile Term Code			Coord	Coord	Gap	Coord	Skip
10th %ile Green (s)			69.7	69.7	8.9	84.3	0.0
10th %ile Term Code			Coord	Coord	Gap	Coord	Skip
Stops (vph)			142	33	102	97	
Fuel Used(l)			9	4	10	11	
CO Emissions (g/hr)			163	66	190	196	
NOx Emissions (g/hr)			31	13	37	38	
VOC Emissions (g/hr)			38	15	44	45	
Dilemma Vehicles (#)			0	0	0	0	
Queue Length 50th (m)			10.0	0.0	5.4	0.0	
Queue Length 95th (m)			67.8	15.1	#31.9	38.3	
Internal Link Dist (m)	254.4		95.2			102.6	
Turn Bay Length (m)				50.0			
Base Capacity (vph)			1197	1106	849	1623	
Starvation Cap Reductn			392	0	3	2	
Spillback Cap Reductn			0	0	0	0	
Storage Cap Reductn			0	0	0	0	
Reduced v/c Ratio			0.42	0.20	0.56	0.37	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 42 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 4.3		Intersection LOS: A	
Intersection Capacity Utilization 56.0%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.			

Splits and Phases: 5: Kanata Avenue & HWY 417 EB On



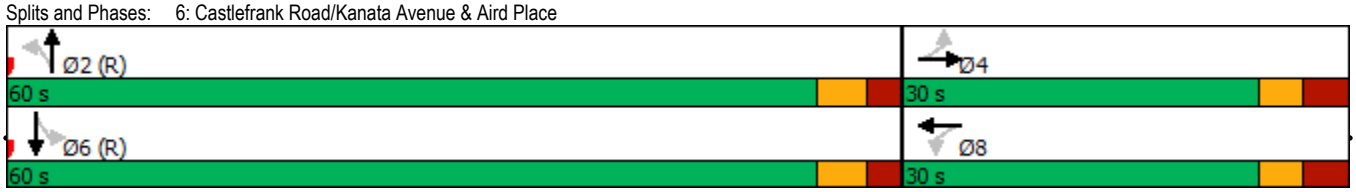


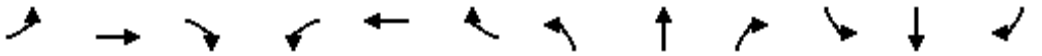
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	6	18	19	6	61	41	555	36	52	545	41
Future Volume (vph)	45	6	18	19	6	61	41	555	36	52	545	41
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.6			7.6			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97			0.96		0.99	1.00		1.00	1.00	
Frt		0.965			0.904			0.991			0.990	
Flt Protected		0.968			0.989		0.950			0.950		
Satd. Flow (prot)	0	1218	0	0	1464	0	1145	1732	0	1662	1715	0
Flt Permitted		0.809			0.909		0.408			0.405		
Satd. Flow (perm)	0	1001	0	0	1336	0	489	1732	0	706	1715	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			61			7			8	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		125.4			132.9			95.7			119.2	
Travel Time (s)		11.3			12.0			6.9			8.6	
Confl. Peds. (#/hr)	14		18	18		14	9		6	6		9
Confl. Bikes (#/hr)			1						1			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	33%	67%	39%	11%	50%	2%	51%	4%	3%	4%	5%	2%
Adj. Flow (vph)	45	6	18	19	6	61	41	555	36	52	545	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	69	0	0	86	0	41	591	0	52	586	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.2	28.2		28.2	28.2		24.7	24.7		24.7	24.7	
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Maximum Green (s)	23.8	23.8		23.8	23.8		54.3	54.3		54.3	54.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	3.2	3.2		3.2	3.2		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.2			6.2		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	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	10	10		10	10		10	10		10	10	
Act Effct Green (s)		13.0			13.0		69.5	69.5		69.5	69.5	
Actuated g/C Ratio		0.14			0.14		0.77	0.77		0.77	0.77	
v/c Ratio		0.43			0.35		0.11	0.44		0.10	0.44	
Control Delay		34.5			17.0		5.9	6.8		5.5	6.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.2	
Total Delay		34.5			17.0		5.9	6.8		5.5	6.9	
LOS		C			B		A	A		A	A	
Approach Delay		34.5			17.0			6.8			6.8	
Approach LOS		C			B			A			A	
90th %ile Green (s)	22.0	22.0		22.0	22.0		56.1	56.1		56.1	56.1	
90th %ile Term Code	Ped	Ped		Ped	Ped		Coord	Coord		Coord	Coord	
70th %ile Green (s)	12.8	12.8		12.8	12.8		65.3	65.3		65.3	65.3	
70th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord		Coord	Coord	
50th %ile Green (s)	10.1	10.1		10.1	10.1		68.0	68.0		68.0	68.0	
50th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord		Coord	Coord	
30th %ile Green (s)	10.0	10.0		10.0	10.0		68.1	68.1		68.1	68.1	
30th %ile Term Code	Min	Min		Min	Min		Coord	Coord		Coord	Coord	
10th %ile Green (s)	0.0	0.0		0.0	0.0		84.3	84.3		84.3	84.3	
10th %ile Term Code	Skip	Skip		Skip	Skip		Coord	Coord		Coord	Coord	
Stops (vph)		47			30		14	219		16	192	
Fuel Used(l)		3			3		1	13		1	14	
CO Emissions (g/hr)		64			51		16	249		22	260	
NOx Emissions (g/hr)		12			10		3	48		4	50	
VOC Emissions (g/hr)		15			12		4	57		5	60	
Dilemma Vehicles (#)		0			0		0	0		0	0	
Queue Length 50th (m)		8.4			4.0		1.5	30.0		2.6	47.9	
Queue Length 95th (m)		18.3			14.6		7.1	79.0		6.1	40.3	
Internal Link Dist (m)		101.4			108.9			71.7			95.2	
Turn Bay Length (m)							30.0			50.0		
Base Capacity (vph)		277			398		377	1339		545	1326	
Starvation Cap Reductn		0			0		0	0		0	189	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.25			0.22		0.11	0.44		0.10	0.52	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 17 (19%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.44			
Intersection Signal Delay: 8.7		Intersection LOS: A	
Intersection Capacity Utilization 69.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: Castlefrank Road/Kanata Avenue & Aird Place





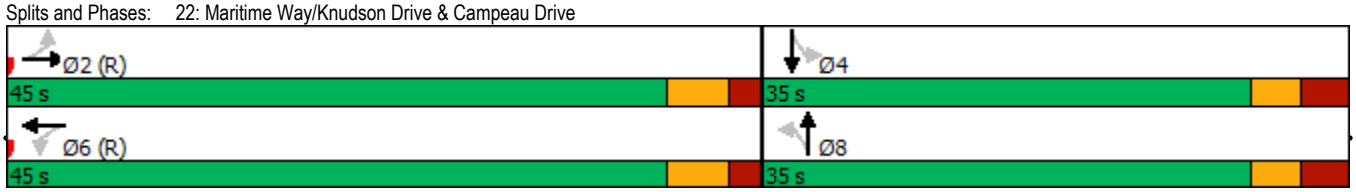
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	641	13	68	431	73	17	16	164	155	10	51
Future Volume (vph)	49	641	13	68	431	73	17	16	164	155	10	51
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	40.0			55.0			40.0			35.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		1.00	0.99		0.99	0.96		0.98	0.98	
Frt		0.997			0.978			0.863			0.875	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1718	0	1695	1592	0	1695	1473	0	1695	1494	0
Flt Permitted	0.429			0.332			0.717			0.603		
Satd. Flow (perm)	759	1718	0	590	1592	0	1268	1473	0	1052	1494	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			15			164			51	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		250.4			203.8			223.0			144.1	
Travel Time (s)		18.0			14.7			20.1			13.0	
Confl. Peds. (#/hr)	12		11	11		12	4		12	12		4
Confl. Bikes (#/hr)			1									
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	5%	33%	2%	11%	12%	2%	2%	2%	2%	14%	2%
Adj. Flow (vph)	49	641	13	68	431	73	17	16	164	155	10	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	654	0	68	504	0	17	180	0	155	61	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.7	27.7		27.7	27.7		24.0	24.0		24.0	24.0	
Total Split (s)	45.0	45.0		45.0	45.0		35.0	35.0		35.0	35.0	
Total Split (%)	56.3%	56.3%		56.3%	56.3%		43.8%	43.8%		43.8%	43.8%	
Maximum Green (s)	39.3	39.3		39.3	39.3		29.0	29.0		29.0	29.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	

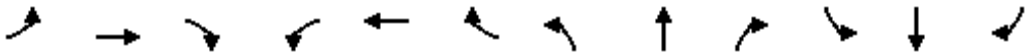
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7		5.7	5.7		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	10	10		10	10		10	10		10	10	
Act Effct Green (s)	51.7	51.7		51.7	51.7		16.6	16.6		16.6	16.6	
Actuated g/C Ratio	0.65	0.65		0.65	0.65		0.21	0.21		0.21	0.21	
v/c Ratio	0.10	0.59		0.18	0.49		0.06	0.41		0.71	0.17	
Control Delay	7.7	12.1		8.9	10.2		22.9	8.2		46.3	9.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.7	12.1		8.9	10.2		22.9	8.2		46.3	9.9	
LOS	A	B		A	B		C	A		D	A	
Approach Delay		11.8			10.1			9.5			36.0	
Approach LOS		B			B			A			D	
90th %ile Green (s)	44.4	44.4		44.4	44.4		23.9	23.9		23.9	23.9	
90th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
70th %ile Green (s)	48.8	48.8		48.8	48.8		19.5	19.5		19.5	19.5	
70th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
50th %ile Green (s)	51.9	51.9		51.9	51.9		16.4	16.4		16.4	16.4	
50th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
30th %ile Green (s)	55.0	55.0		55.0	55.0		13.3	13.3		13.3	13.3	
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
10th %ile Green (s)	58.3	58.3		58.3	58.3		10.0	10.0		10.0	10.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		Min	Min		Min	Min	
Stops (vph)	20	378		30	255		15	32		139	19	
Fuel Used(l)	2	30		2	19		2	17		10	2	
CO Emissions (g/hr)	35	560		46	362		38	323		184	31	
NOx Emissions (g/hr)	7	108		9	70		7	62		35	6	
VOC Emissions (g/hr)	8	129		11	83		9	74		42	7	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	2.4	49.3		3.6	33.1		2.1	2.0		22.1	1.2	
Queue Length 95th (m)	8.3	103.1		11.8	71.7		6.2	15.2		37.1	9.1	
Internal Link Dist (m)		226.4			179.8			199.0			120.1	
Turn Bay Length (m)	30.0			30.0			40.0			35.0		
Base Capacity (vph)	490	1110		380	1033		459	638		381	574	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.10	0.59		0.18	0.49		0.04	0.28		0.41	0.11	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 14.0 — Intersection LOS: B
Intersection Capacity Utilization 86.5% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 22: Maritime Way/Knudson Drive & Campeau Drive

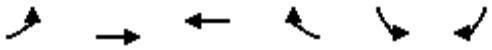




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	0	1	29	0	16	4	55	24	15	35	4
Future Volume (vph)	1	0	1	29	0	16	4	55	24	15	35	4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	0	1	29	0	16	4	55	24	15	35	4

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	2	45	83	54
Volume Left (vph)	1	29	4	15
Volume Right (vph)	1	16	24	4
Hadj (s)	-0.17	-0.05	-0.13	0.05
Departure Headway (s)	4.1	4.1	3.9	4.1
Degree Utilization, x	0.00	0.05	0.09	0.06
Capacity (veh/h)	848	839	893	856
Control Delay (s)	7.1	7.4	7.3	7.4
Approach Delay (s)	7.1	7.4	7.3	7.4
Approach LOS	A	A	A	A

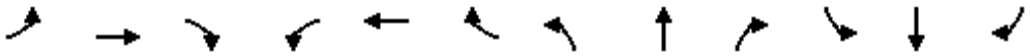
Intersection Summary				
Delay			7.3	
Level of Service			A	
Intersection Capacity Utilization			19.3%	ICU Level of Service
Analysis Period (min)			15	



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	27	20	2	4	25
Future Volume (Veh/h)	12	27	20	2	4	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	12	27	20	2	4	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	22				72	21
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	22				72	21
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1593				925	1056

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	39	22	29
Volume Left	12	0	4
Volume Right	0	2	25
cSH	1593	1700	1036
Volume to Capacity	0.01	0.01	0.03
Queue Length 95th (m)	0.2	0.0	0.7
Control Delay (s)	2.3	0.0	8.6
Lane LOS	A		A
Approach Delay (s)	2.3	0.0	8.6
Approach LOS			A

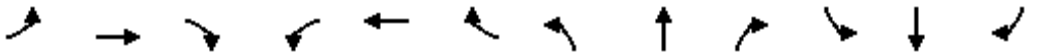
Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	18.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	615	16	26	555	2	29	0	38	4	2	11
Future Volume (Veh/h)	4	615	16	26	555	2	29	0	38	4	2	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	4	683	18	29	617	2	32	0	42	4	2	12
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					251							
pX, platoon unblocked	0.91						0.91	0.91		0.91	0.91	0.91
vC, conflicting volume	619			701			1389	1377	692	1418	1385	618
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	527			701			1377	1364	692	1409	1373	526
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			69	100	91	96	98	98
cM capacity (veh/h)	942			896			104	129	444	93	127	500

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	705	648	74	18
Volume Left	4	29	32	4
Volume Right	18	2	42	12
cSH	942	896	184	217
Volume to Capacity	0.00	0.03	0.40	0.08
Queue Length 95th (m)	0.1	0.8	13.6	2.0
Control Delay (s)	0.1	0.9	37.3	23.1
Lane LOS	A	A	E	C
Approach Delay (s)	0.1	0.9	37.3	23.1
Approach LOS			E	C

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	63.9%	ICU Level of Service	B	
Analysis Period (min)	15			



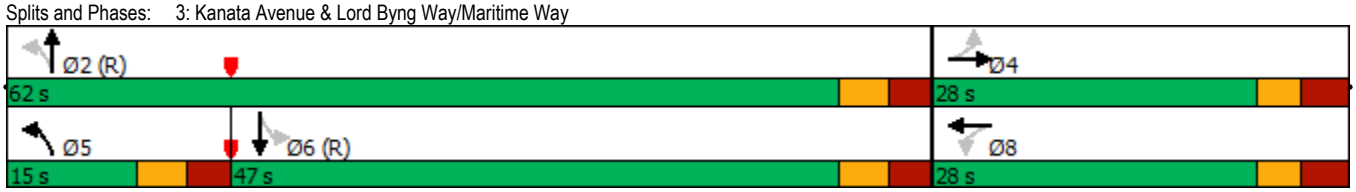
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	3	78	177	9	63	136	799	266	96	619	25
Future Volume (vph)	30	3	78	177	9	63	136	799	266	96	619	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	20.0		0.0	40.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	25.0			40.0			75.0			55.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	0.97		0.99	0.96			0.99			1.00	
Frt		0.856			0.869			0.963			0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1262	1250	0	1695	1494	0	1503	1708	0	1695	1760	0
Flt Permitted	0.710			0.704			0.223			0.145		
Satd. Flow (perm)	924	1250	0	1247	1494	0	353	1708	0	259	1760	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		78			63			35			3	
Link Speed (k/h)		50			40			50			50	
Link Distance (m)		119.6			99.0			110.4			236.0	
Travel Time (s)		8.6			8.9			7.9			17.0	
Confl. Peds. (#/hr)	11		4	4		11	3		3	3		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	37%	2%	22%	2%	2%	2%	15%	2%	2%	2%	2%	20%
Adj. Flow (vph)	30	3	78	177	9	63	136	799	266	96	619	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	81	0	177	72	0	136	1065	0	96	644	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	28.3	28.3		28.3	28.3		11.3	33.3		33.3	33.3	
Total Split (s)	28.0	28.0		28.0	28.0		15.0	62.0		47.0	47.0	
Total Split (%)	31.1%	31.1%		31.1%	31.1%		16.7%	68.9%		52.2%	52.2%	
Maximum Green (s)	21.7	21.7		21.7	21.7		8.7	55.7		40.7	40.7	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3		6.3	6.3		6.3	6.3		6.3	6.3	
Lead/Lag							Lead			Lag	Lag	
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	None	None		None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0			20.0		20.0	20.0	
Pedestrian Calls (#/hr)	10	10		10	10			10		10	10	
Act Effct Green (s)	17.1	17.1		17.1	17.1		60.3	60.3		46.0	46.0	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.67	0.67		0.51	0.51	
v/c Ratio	0.17	0.27		0.75	0.21		0.40	0.92		0.73	0.72	
Control Delay	30.8	9.8		47.6	7.4		7.4	18.7		55.6	24.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.7		0.0	0.0	
Total Delay	30.8	9.8		47.6	7.4		7.4	19.4		55.6	24.3	
LOS	C	A		D	A		A	B		E	C	
Approach Delay		15.5			36.0			18.1			28.3	
Approach LOS		B			D			B			C	
90th %ile Green (s)	21.7	21.7		21.7	21.7		8.7	55.7		40.7	40.7	
90th %ile Term Code	Ped	Ped		Ped	Ped		Max	Coord		Coord	Coord	
70th %ile Green (s)	20.9	20.9		20.9	20.9		9.5	56.5		40.7	40.7	
70th %ile Term Code	Hold	Hold		Gap	Gap		Max	Coord		Coord	Coord	
50th %ile Green (s)	17.9	17.9		17.9	17.9		8.5	59.5		44.7	44.7	
50th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
30th %ile Green (s)	14.8	14.8		14.8	14.8		7.3	62.6		49.0	49.0	
30th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
10th %ile Green (s)	10.3	10.3		10.3	10.3		6.1	67.1		54.7	54.7	
10th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Coord		Coord	Coord	
Stops (vph)	26	17		164	26		46	641		67	485	
Fuel Used(l)	2	2		25	7		5	52		8	37	
CO Emissions (g/hr)	30	36		463	131		87	975		144	694	
NOx Emissions (g/hr)	6	7		89	25		17	188		28	134	
VOC Emissions (g/hr)	7	8		107	30		20	225		33	160	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	4.3	0.4		28.9	3.3		7.2	131.5		12.7	83.9	
Queue Length 95th (m)	11.2	11.3		48.6	9.7		m8.6	m#152.7		#43.4	#151.8	
Internal Link Dist (m)		95.6			75.0			86.4			212.0	
Turn Bay Length (m)	20.0			40.0			35.0			35.0		
Base Capacity (vph)	222	360		300	408		349	1155		132	900	
Starvation Cap Reductn	0	0		0	0		0	14		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.14	0.23		0.59	0.18		0.39	0.93		0.73	0.72	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 31 (34%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 23.2 Intersection LOS: C
Intersection Capacity Utilization 103.1% ICU Level of Service G
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Kanata Avenue & Lord Byng Way/Maritime Way

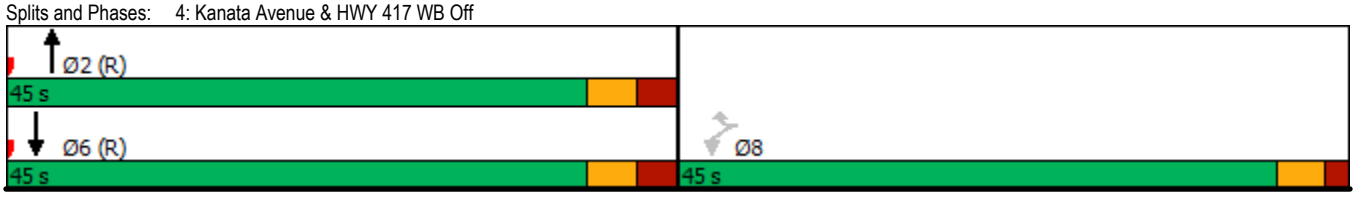


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	469	712	751	0	0	1078
Future Volume (vph)	469	712	751	0	0	1078
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1695	1517	1750	0	0	3357
Flt Permitted	0.950					
Satd. Flow (perm)	1695	1517	1750	0	0	3357
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		109				
Link Speed (k/h)	50		50			50
Link Distance (m)	332.8		126.6			114.0
Travel Time (s)	24.0		9.1			8.2
Confl. Bikes (#/hr)				3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	4%	0%	0%	3%
Adj. Flow (vph)	469	712	751	0	0	1078
Shared Lane Traffic (%)						
Lane Group Flow (vph)	469	712	751	0	0	1078
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)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
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)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+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)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA			NA
Protected Phases			2			6
Permitted Phases	8	8				
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0			10.0
Minimum Split (s)	23.0	23.0	28.1			24.1
Total Split (s)	45.0	45.0	45.0			45.0
Total Split (%)	50.0%	50.0%	50.0%			50.0%
Maximum Green (s)	40.0	40.0	38.9			38.9
Yellow Time (s)	3.3	3.3	3.3			3.3
All-Red Time (s)	1.7	1.7	2.8			2.8
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	6.1			6.1
Lead/Lag						

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)	7.0	7.0	7.0			
Flash Dont Walk (s)	11.0	11.0	15.0			
Pedestrian Calls (#/hr)	10	10	10			
Act Effct Green (s)	39.7	39.7	39.2			39.2
Actuated g/C Ratio	0.44	0.44	0.44			0.44
v/c Ratio	0.63	0.98	0.99			0.74
Control Delay	24.0	50.6	45.8			21.8
Queue Delay	0.3	1.1	37.8			0.0
Total Delay	24.3	51.8	83.6			21.8
LOS	C	D	F			C
Approach Delay	40.8		83.6			21.8
Approach LOS	D		F			C
90th %ile Green (s)	40.0	40.0	38.9			38.9
90th %ile Term Code	Max	Max	Coord			Coord
70th %ile Green (s)	40.0	40.0	38.9			38.9
70th %ile Term Code	Max	Max	Coord			Coord
50th %ile Green (s)	40.0	40.0	38.9			38.9
50th %ile Term Code	Max	Max	Coord			Coord
30th %ile Green (s)	40.0	40.0	38.9			38.9
30th %ile Term Code	Max	Max	Coord			Coord
10th %ile Green (s)	38.5	38.5	40.4			40.4
10th %ile Term Code	Gap	Gap	Coord			Coord
Stops (vph)	353	531	534			676
Fuel Used(l)	31	62	47			56
CO Emissions (g/hr)	584	1156	883			1045
NOx Emissions (g/hr)	113	223	170			202
VOC Emissions (g/hr)	135	267	204			241
Dilemma Vehicles (#)	0	0	0			0
Queue Length 50th (m)	60.3	103.0	126.3			47.8
Queue Length 95th (m)	92.0	#180.1	#195.5			77.3
Internal Link Dist (m)	308.8		102.6			90.0
Turn Bay Length (m)						
Base Capacity (vph)	753	734	762			1461
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	44	5	90			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.66	0.98	1.12			0.74

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 32 (36%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 44.7		Intersection LOS: D	
Intersection Capacity Utilization 126.5%		ICU Level of Service H	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 4: Kanata Avenue & HWY 417 WB Off

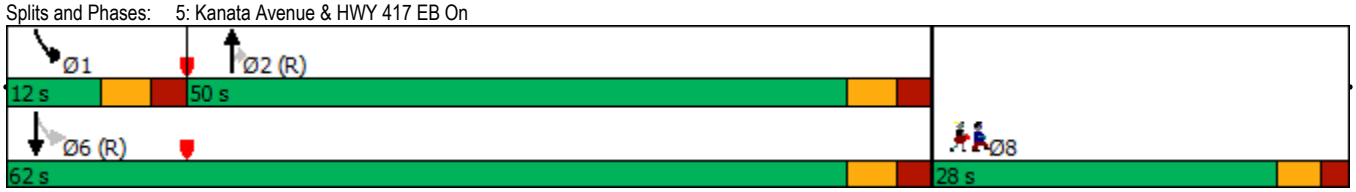


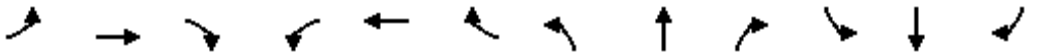
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lane Configurations							
Traffic Volume (vph)	0	0	621	199	419	957	
Future Volume (vph)	0	0	621	199	419	957	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)	0.0	0.0		50.0	0.0		
Storage Lanes	0	0		1	1		
Taper Length (m)	7.6				7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor				0.98			
Frt				0.850			
Flt Protected					0.950		
Satd. Flow (prot)	0	0	1733	1517	1662	1784	
Flt Permitted					0.255		
Satd. Flow (perm)	0	0	1733	1479	446	1784	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)				191			
Link Speed (k/h)	48		50			50	
Link Distance (m)	278.4		119.2			126.6	
Travel Time (s)	20.9		8.6			9.1	
Confl. Peds. (#/hr)				2	2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	0%	0%	5%	2%	4%	2%	
Adj. Flow (vph)	0	0	621	199	419	957	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	621	199	419	957	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(m)	0.0		3.7			3.7	
Link Offset(m)	0.0		0.0			0.0	
Crosswalk Width(m)	4.9		4.9			4.9	
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)	24	14		14	24		
Number of Detectors			2	1	1	2	
Detector Template			Thru	Right	Left	Thru	
Leading Detector (m)			30.5	6.1	6.1	30.5	
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)			1.8	6.1	6.1	1.8	
Detector 1 Type			Cl+Ex	Cl+Ex	Cl+Ex	Cl+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)			28.7			28.7	
Detector 2 Size(m)			1.8			1.8	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type			NA	Perm	pm+pt	NA	
Protected Phases			2		1	6	8
Permitted Phases				2	6		
Detector Phase			2	2	1	6	
Switch Phase							
Minimum Initial (s)			10.0	10.0	5.0	10.0	5.0
Minimum Split (s)			23.7	23.7	10.7	23.7	27.0
Total Split (s)			50.0	50.0	12.0	62.0	28.0
Total Split (%)			55.6%	55.6%	13.3%	68.9%	31%
Maximum Green (s)			44.3	44.3	6.3	56.3	23.0
Yellow Time (s)			3.3	3.3	3.3	3.3	3.0
All-Red Time (s)			2.4	2.4	2.4	2.4	2.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lost Time Adjust (s)			0.0	0.0	0.0	0.0	
Total Lost Time (s)			5.7	5.7	5.7	5.7	
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?			Yes	Yes	Yes		
Vehicle Extension (s)			3.0	3.0	3.0	3.0	3.0
Recall Mode			C-Max	C-Max	None	C-Max	None
Walk Time (s)			7.0	7.0			7.0
Flash Dont Walk (s)			11.0	11.0			15.0
Pedestrian Calls (#/hr)			10	10			10
Act Effct Green (s)			52.4	52.4	78.9	83.5	
Actuated g/C Ratio			0.58	0.58	0.88	0.93	
v/c Ratio			0.62	0.21	0.62	0.58	
Control Delay			10.4	1.1	17.4	5.6	
Queue Delay			2.9	0.0	0.0	0.1	
Total Delay			13.2	1.1	17.4	5.7	
LOS			B	A	B	A	
Approach Delay			10.3			9.2	
Approach LOS			B			A	
90th %ile Green (s)			44.3	44.3	7.3	57.3	22.0
90th %ile Term Code			Coord	Coord	Max	Coord	Ped
70th %ile Green (s)			60.0	60.0	18.6	84.3	0.0
70th %ile Term Code			Coord	Coord	Gap	Coord	Skip
50th %ile Green (s)			58.8	58.8	19.8	84.3	0.0
50th %ile Term Code			Coord	Coord	Gap	Coord	Skip
30th %ile Green (s)			54.7	54.7	23.9	84.3	0.0
30th %ile Term Code			Coord	Coord	Gap	Coord	Skip
10th %ile Green (s)			44.3	44.3	34.3	84.3	0.0
10th %ile Term Code			Coord	Coord	Max	Coord	Skip
Stops (vph)			370	16	153	177	
Fuel Used(l)			20	3	14	20	
CO Emissions (g/hr)			377	52	262	364	
NOx Emissions (g/hr)			73	10	50	70	
VOC Emissions (g/hr)			87	12	60	84	
Dilemma Vehicles (#)			0	0	0	0	
Queue Length 50th (m)			55.5	1.9	26.3	7.5	
Queue Length 95th (m)			83.4	m2.9	m#78.4	#108.2	
Internal Link Dist (m)	254.4		95.2			102.6	
Turn Bay Length (m)				50.0			
Base Capacity (vph)			1009	940	671	1654	
Starvation Cap Reductn			179	0	0	6	
Spillback Cap Reductn			272	0	0	91	
Storage Cap Reductn			0	0	0	0	
Reduced v/c Ratio			0.84	0.21	0.62	0.61	

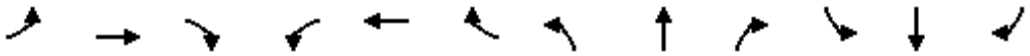
Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 27 (30%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 9.6		Intersection LOS: A	
Intersection Capacity Utilization 126.5%		ICU Level of Service H	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 5: Kanata Avenue & HWY 417 EB On





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	3	13	30	1	97	12	817	35	62	952	24
Future Volume (vph)	17	3	13	30	1	97	12	817	35	62	952	24
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.6			7.6			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.97			1.00			1.00	
Frt		0.947			0.898			0.994			0.996	
Flt Protected		0.975			0.988		0.950			0.950		
Satd. Flow (prot)	0	1627	0	0	1542	0	1695	1755	0	1695	1775	0
Flt Permitted		0.735			0.909		0.216			0.275		
Satd. Flow (perm)	0	1219	0	0	1415	0	385	1755	0	491	1775	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			97			4			3	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		125.4			132.9			95.7			119.2	
Travel Time (s)		11.3			12.0			6.9			8.6	
Confl. Peds. (#/hr)	7		6	6		7	9		5	5		9
Confl. Bikes (#/hr)									3			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	17	3	13	30	1	97	12	817	35	62	952	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	33	0	0	128	0	12	852	0	62	976	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	28.2	28.2		28.2	28.2		24.7	24.7		24.7	24.7	
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		66.7%	66.7%		66.7%	66.7%	
Maximum Green (s)	23.8	23.8		23.8	23.8		54.3	54.3		54.3	54.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3		3.3	3.3	



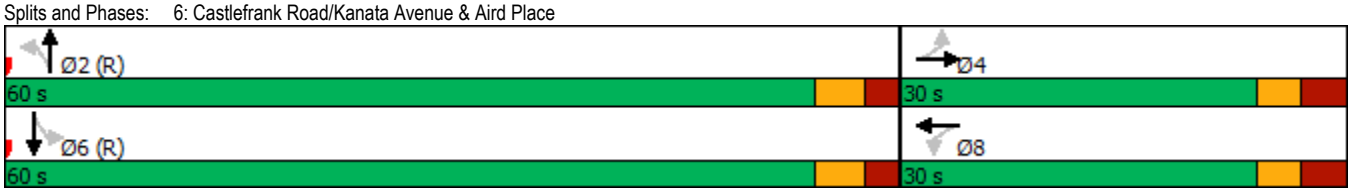
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	3.2	3.2		3.2	3.2		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.2			6.2		5.7	5.7		5.7	5.7	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	10	10		10	10		10	10		10	10	
Act Effct Green (s)		10.1			10.1		68.0	68.0		68.0	68.0	
Actuated g/C Ratio		0.11			0.11		0.76	0.76		0.76	0.76	
v/c Ratio		0.22			0.52		0.04	0.64		0.17	0.73	
Control Delay		26.2			19.2		5.2	9.6		6.9	12.4	
Queue Delay		0.0			0.0		0.0	0.1		0.0	0.0	
Total Delay		26.2			19.2		5.2	9.7		6.9	12.4	
LOS		C			B		A	A		A	B	
Approach Delay		26.2			19.2			9.7			12.1	
Approach LOS		C			B			A			B	
90th %ile Green (s)	22.0	22.0		22.0	22.0		56.1	56.1		56.1	56.1	
90th %ile Term Code	Ped	Ped		Ped	Ped		Coord	Coord		Coord	Coord	
70th %ile Green (s)	9.9	9.9		9.9	9.9		68.2	68.2		68.2	68.2	
70th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
50th %ile Green (s)	7.5	7.5		7.5	7.5		70.6	70.6		70.6	70.6	
50th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
30th %ile Green (s)	5.5	5.5		5.5	5.5		72.6	72.6		72.6	72.6	
30th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
10th %ile Green (s)	5.5	5.5		5.5	5.5		72.6	72.6		72.6	72.6	
10th %ile Term Code	Hold	Hold		Gap	Gap		Coord	Coord		Coord	Coord	
Stops (vph)		21			40		4	416		20	444	
Fuel Used(l)		1			4		0	23		1	30	
CO Emissions (g/hr)		26			79		5	435		28	564	
NOx Emissions (g/hr)		5			15		1	84		5	109	
VOC Emissions (g/hr)		6			18		1	100		6	130	
Dilemma Vehicles (#)		0			0		0	0		0	0	
Queue Length 50th (m)		3.3			5.1		0.4	46.7		3.5	85.2	
Queue Length 95th (m)		9.9			17.8		2.9	149.8		m5.8	#219.6	
Internal Link Dist (m)		101.4			108.9			71.7			95.2	
Turn Bay Length (m)							30.0			50.0		
Base Capacity (vph)		331			445		290	1327		371	1342	
Starvation Cap Reductn		0			0		0	0		0	8	
Spillback Cap Reductn		0			2		0	40		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.10			0.29		0.04	0.66		0.17	0.73	

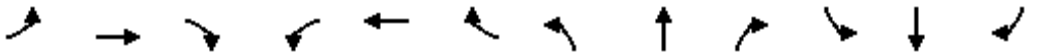
Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 10 (11%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 11.8		Intersection LOS: B	
Intersection Capacity Utilization 75.4%		ICU Level of Service D	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Castlefrank Road/Kanata Avenue & Aird Place



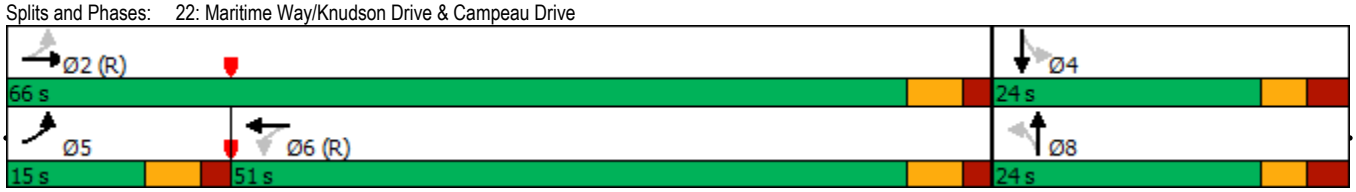


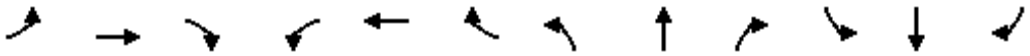
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	444	31	142	609	100	12	13	100	37	11	71
Future Volume (vph)	64	444	31	142	609	100	12	13	100	37	11	71
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	40.0			55.0			40.0			35.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	0.99		0.98	0.97		0.99	0.96	
Frt		0.990			0.979			0.867			0.870	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1763	0	1695	1735	0	1695	1505	0	1679	1498	0
Flt Permitted	0.266			0.491			0.704			0.684		
Satd. Flow (perm)	475	1763	0	872	1735	0	1232	1505	0	1198	1498	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			13			100			71	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		237.7			203.8			223.0			144.1	
Travel Time (s)		17.1			14.7			20.1			13.0	
Confl. Peds. (#/hr)	15		4	4		15	8		4	4		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	64	444	31	142	609	100	12	13	100	37	11	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	475	0	142	709	0	12	113	0	37	82	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	10.7	27.7		27.7	27.7		24.0	24.0		24.0	24.0	
Total Split (s)	15.0	66.0		51.0	51.0		24.0	24.0		24.0	24.0	
Total Split (%)	16.7%	73.3%		56.7%	56.7%		26.7%	26.7%		26.7%	26.7%	
Maximum Green (s)	9.3	60.3		45.3	45.3		18.0	18.0		18.0	18.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.7	5.7		5.7	5.7		6.0	6.0		6.0	6.0	
Lead/Lag	Lead			Lag	Lag							
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	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)		10		10	10		10	10		10	10	
Act Effct Green (s)	70.1	71.2		61.3	61.3		11.4	11.4		11.4	11.4	
Actuated g/C Ratio	0.78	0.79		0.68	0.68		0.13	0.13		0.13	0.13	
v/c Ratio	0.14	0.34		0.24	0.60		0.08	0.41		0.24	0.33	
Control Delay	4.3	4.7		10.1	14.0		30.0	16.8		38.5	14.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	4.3	4.7		10.1	14.0		30.0	16.8		38.5	14.5	
LOS	A	A		B	B		C	B		D	B	
Approach Delay		4.7			13.3			18.0			21.9	
Approach LOS		A			B			B			C	
90th %ile Green (s)	7.8	61.3		47.8	47.8		17.0	17.0		17.0	17.0	
90th %ile Term Code	Gap	Coord		Coord	Coord		Ped	Ped		Ped	Ped	
70th %ile Green (s)	6.7	68.3		55.9	55.9		10.0	10.0		10.0	10.0	
70th %ile Term Code	Gap	Coord		Coord	Coord		Min	Min		Min	Min	
50th %ile Green (s)	6.3	68.3		56.3	56.3		10.0	10.0		10.0	10.0	
50th %ile Term Code	Gap	Coord		Coord	Coord		Min	Min		Min	Min	
30th %ile Green (s)	5.9	68.3		56.7	56.7		10.0	10.0		10.0	10.0	
30th %ile Term Code	Gap	Coord		Coord	Coord		Min	Min		Min	Min	
10th %ile Green (s)	0.0	84.3		84.3	84.3		0.0	0.0		0.0	0.0	
10th %ile Term Code	Skip	Coord		Coord	Coord		Skip	Skip		Skip	Skip	
Stops (vph)	17	140		65	415		15	57		34	23	
Fuel Used(l)	2	16		5	31		2	12		2	2	
CO Emissions (g/hr)	38	290		99	570		30	230		40	46	
NOx Emissions (g/hr)	7	56		19	110		6	44		8	9	
VOC Emissions (g/hr)	9	67		23	131		7	53		9	11	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	2.2	21.1		9.9	68.6		2.1	8.5		6.0	1.8	
Queue Length 95th (m)	6.9	46.6		25.2	136.4		m2.3	m12.6		13.8	13.1	
Internal Link Dist (m)		213.7			179.8			199.0			120.1	
Turn Bay Length (m)	30.0			30.0			40.0			35.0		
Base Capacity (vph)	495	1397		594	1186		246	381		239	356	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.13	0.34		0.24	0.60		0.05	0.30		0.15	0.23	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 11.5		Intersection LOS: B	
Intersection Capacity Utilization 69.2%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 22: Maritime Way/Knudson Drive & Campeau Drive

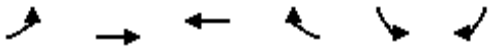




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	0	7	21	0	11	2	58	28	21	41	2
Future Volume (vph)	5	0	7	21	0	11	2	58	28	21	41	2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	0	7	21	0	11	2	58	28	21	41	2

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	12	32	88	64
Volume Left (vph)	5	21	2	21
Volume Right (vph)	7	11	28	2
Hadj (s)	-0.23	-0.04	-0.15	0.08
Departure Headway (s)	4.0	4.2	3.9	4.2
Degree Utilization, x	0.01	0.04	0.10	0.07
Capacity (veh/h)	855	826	898	849
Control Delay (s)	7.1	7.4	7.3	7.5
Approach Delay (s)	7.1	7.4	7.3	7.5
Approach LOS	A	A	A	A

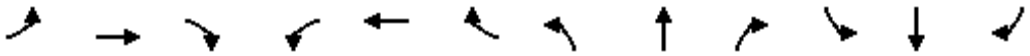
Intersection Summary				
Delay			7.4	
Level of Service			A	
Intersection Capacity Utilization			20.3%	ICU Level of Service
Analysis Period (min)			15	



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	31	18	7	6	5	25
Future Volume (Veh/h)	31	18	7	6	5	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	31	18	7	6	5	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	13				90	10
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	13				90	10
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	98
cM capacity (veh/h)	1606				893	1071

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	49	13	5	25
Volume Left	31	0	5	0
Volume Right	0	6	0	25
cSH	1606	1700	893	1071
Volume to Capacity	0.02	0.01	0.01	0.02
Queue Length 95th (m)	0.4	0.0	0.1	0.5
Control Delay (s)	4.7	0.0	9.1	8.4
Lane LOS	A		A	A
Approach Delay (s)	4.7	0.0	8.5	
Approach LOS			A	

Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	19.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	547	29	40	668	6	19	1	49	3	0	11
Future Volume (Veh/h)	19	547	29	40	668	6	19	1	49	3	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	21	608	32	44	742	7	21	1	54	3	0	12
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					238							
pX, platoon unblocked	0.77						0.77	0.77		0.77	0.77	0.77
vC, conflicting volume	749			640			1512	1503	624	1554	1516	746
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	529			640			1515	1504	624	1570	1520	524
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			95			70	99	89	95	100	97
cM capacity (veh/h)	803			944			70	87	485	58	85	428

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	661	793	76	15
Volume Left	21	44	21	3
Volume Right	32	7	54	12
cSH	803	944	179	188
Volume to Capacity	0.03	0.05	0.42	0.08
Queue Length 95th (m)	0.6	1.1	14.6	2.0
Control Delay (s)	0.7	1.2	39.2	25.9
Lane LOS	A	A	E	D
Approach Delay (s)	0.7	1.2	39.2	25.9
Approach LOS			E	D

Intersection Summary					
Average Delay	3.1				
Intersection Capacity Utilization	68.7%	ICU Level of Service	C		
Analysis Period (min)	15				