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## 90 Champagne Avenue South Transportation Impact Assessment

Engineering excellence. Planning precision. Inspired landscapes.

**90 CHAMPAGNE AVENUE SOUTH**

**TRANSPORTATION IMPACT ASSESSMENT**

Prepared By:

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March 2019

Novatech File: 119013  
Ref: R-2019-041

March 27<sup>th</sup>, 2019

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

**Attention: Mr. Wally Dubyk**  
**Project Manager, Infrastructure Approvals**

Dear Mr. Dubyk:

**Reference: 90 Champagne Avenue**  
**Transportation Impact Assessment**  
**Novatech File No. 119013**

---

We are pleased to submit the following Transportation Impact Assessment in support of Zoning By-law Amendment and Site Plan Control applications for 90 Champagne Avenue. The structure and format of this report is in accordance with the City of Ottawa Transportation Impact Assessment Guidelines (June 2017).

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

Yours truly,

**NOVATECH**



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



## **TIA Plan Reports**

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

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

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

## **CERTIFICATION**

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

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



Dated at Ottawa this 27th day of March, 2019.  
(City)

Name: Brad Byvelds, P.Eng.  
(Please Print)

Professional Title: Project Coordinator, Transportation/Traffic

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

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## EXECUTIVE SUMMARY

This Transportation Impact Assessment has been prepared in support of Zoning By-law Amendment and Site Plan Control applications for the property located at 90 Champagne Avenue. The subject site previously served as a parking lot for the residential development immediately to the west.

The subject site is designated as 'Mixed Use Centre' on Schedule B of the City of Ottawa's Official Plan. The implemented zoning for the property is 'Fifth Density Residential' (R5), and the site is within the Preston-Carling District Secondary Plan. This secondary plan limits development of the subject site to 15 storeys.

The proposed development consists of a single high-rise residential building with 236 dwellings. A total of 91 underground parking spaces will be provided, in a two-level underground parking garage. The development will be constructed in a single phase, with a buildout year of 2021.

The proposed accesses to the site include two full-movement accesses to Champagne Avenue, one near the north property line and one near the south property line. The northerly access will exclusively serve the parking garage for the proposed development. The southerly access will exclusively serve the parking garage of the existing residential building immediately west of the subject site (285 Loretta Street).

The study area for this report includes Carling Avenue, Preston Street, Sherwood Drive, Beech Street, and Champagne Avenue. The study area includes the signalized intersections at Carling Avenue/Sherwood Drive, Carling Avenue/Champagne Avenue, Carling Avenue/Preston Street, and Beech Street/Preston Street, as well as the unsignalized intersection at Beech Street/Champagne 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. The analysis considers the buildout year 2021 and the horizon year 2026.

Background growth along the study area roadways was captured by adding traffic generated by other area developments to the existing traffic volumes. This approach is consistent with other traffic studies in the area. Site generated traffic was determined using the *TRANS Trip Generation Manual*. Site traffic was added to the projected background traffic to determine future traffic volumes.

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

### Development Design and Parking

- Pedestrian facilities will be provided between the main building entrance/exits and the sidewalk along the west side of Champagne Avenue. A new 2.0m concrete sidewalk will be provided adjacent to the curb along the frontage of the subject site.
- Bicycle parking for the proposed development will be provided in accordance with the City of Ottawa Zoning By-law. Six bicycle parking spaces are proposed at the front of the building, 84 are proposed on the first level of underground parking, and 48 on the second level.
- OC Transpo bus stops #6654, #6656, #7369, #8014 and #3061 are located within a 400m walking distance of the subject site. These bus stops provide service to OC Transpo routes 2, 56, 85, 101, and 103.

- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.
- The proposed vehicular and bicycle parking conforms to the requirements of the City's Zoning By-law.

#### Boundary Street MMLOS

- Champagne Avenue meets the target Auto LOS and Bicycle LOS (BLOS), however it does not meet the target Pedestrian LOS (PLOS). There is no target Transit LOS (TLOS) or Truck LOS (TkLOS) for Champagne Avenue.
- The proposed development will provide a 2.0m concrete sidewalk adjacent to the curb with street trees in behind along the frontage of the site, achieving a PLOS C. This is an improvement on the existing condition and is consistent with the curbside sidewalk to the north and south of the site.

#### Access Design

- The existing access to Champagne Avenue will be removed and two new accesses are proposed. The northern access will serve a parking garage containing 91 parking spaces. The southern access will serve the parking garage for the adjacent development at 285 Loretta Street. Both accesses will operate under side street stop control.
- The proposed northern access serving the underground parking lot for the subject development will be 6.0m in width and will have a maximum grade of 5-6% for a distance of 9m within the property, conforming to the requirements of the City's Zoning By-law and Private Approach By-law.
- The proposed northern access will be located 0.6m from the northern property line. A waiver to the City's Private Approach By-law is required for relief of the minimum 3m offset to the adjacent property line. The proposed access is located approximately 16m south of the existing access to 116 Beech Street, has adequate sight lines and does not create a traffic hazard.
- The proposed southern access serving a right-of-way to the parking garage at 285 Loretta Street will be 6.2m in width and will be located 3.5m from the southern property line. The proposed width and location of the southern access conforms to the City's Zoning By-law and Private Approach By-law.

#### Transportation Demand Management

- To encourage travel by sustainable modes, the following TDM measures will be implemented for the subject site:
  - Display local area maps with walking/cycling access routes and key destinations at major entrances;
  - Display relevant transit schedules and route maps at entrances; and
  - Unbundle parking cost from monthly rent.

#### Neighbourhood Traffic Management

- The proposed development is anticipated to generate 23 vehicle trips during the AM peak hour and 24 vehicle trips during the PM peak hour. Of this, the majority (18 vehicles) are anticipated to arrive/depart to/from the south via Champagne Avenue. This equates to an increase of approximately 5% compared to the existing traffic, and is not anticipated to have a significant impact to the existing operations along Champagne Avenue.

### Transit

- The proposed development is anticipated to generate 92 transit trips (70 boarding, 22 alighting) during the AM peak hour and 96 transit trips (37 boarding, 59 alighting) during the PM peak hour. OC Transpo bus stops within a 400m walking distance of the subject site serve OC Transpo Routes 2, 56, 85, 101 and 103. These transit routes operate with 15 to 30 minute headways during peak periods, and connect to various transit stations providing comprehensive transit coverage across the City of Ottawa.

### Intersection MMLOS

- Carling Avenue/Sherwood Drive
  - The Carling Avenue/Sherwood Drive intersection meets the target Auto LOS, TkLOS and TLOS.
  - This intersection does not meet the target PLOS and BLOS. The PLOS and BLOS at this intersection will be improved by the City's future Carling Avenue Transit Priority Measures project. The functional design for this intersection includes a reduction in the north-south crossing distance for pedestrians and a two-stage left turn movement for cyclists.
- Carling Avenue/Champagne Avenue
  - The Carling Avenue/Champagne Avenue intersection meets the target Auto LOS and TLOS.
  - This intersection does not meet the target PLOS, BLOS and TkLOS. The PLOS and BLOS at this intersection will be improved by the City's future Carling Avenue Transit Priority Measures project. The functional design for this intersection includes a two-stage pedestrian crossing on the east leg and two-stage left turn movements for cyclists. No improvements are proposed to the TkLOS at this intersection. It is noted that Champagne Avenue is a local roadway which does not have a target TkLOS.
- Carling Avenue/Preston Street
  - The Carling Avenue/Preston Street intersection meets the target Auto LOS and TkLOS.
  - This intersection does not meet the target PLOS, BLOS, and TLOS. The PLOS and TLOS at this intersection will be improved by the City's future Carling Avenue Transit Priority Measures project. The functional design for this intersection includes two-stage pedestrian crossing on the east and west legs, a median eastbound bus lane, and a curbside westbound bus lane.
  - No improvements are proposed to the BLOS at this intersection. The majority of cyclists are anticipated to use the Trillium Pathway to travel north-south through the study area rather than using Preston Street.
- Preston Street/Beech Street
  - The Preston Street/Beech Street intersection meets the target Auto LOS, however it does not meet the target PLOS, BLOS and TkLOS.
  - To improve the Pedestrian Exposure to Traffic at Signalized Intersections (PETSI) score to achieve a PLOS B, consideration could be given by the City to implementing right turn on red restrictions on all approaches. The implementation of right turn on red restrictions is not anticipated to have a significant impact on the existing intersection operations, which is currently operating with an Auto LOS A.
  - A review of Ontario Traffic Manual (OTM) Book 18 Desirable Cycling Facility Pre-Selection Nomograph suggests mixed-use travel lanes are appropriate for both Preston Street and Beech Street. As noted above, the majority of cyclists are anticipated to use the Trillium Pathway as an alternative to Preston Street. As such,

no improvements to the cycling facilities at this intersection are proposed. Consideration could be given by the City to reducing the operational speed along Preston Street and Beech Street to 40km/hr to achieve the target BLOS B.

- Increased radii are required on all legs to improve the TkLOS at this intersection. It is noted that Beech Street is a local roadway and is not classified as a truck route, which does not have a target TkLOS.

#### 2021 and 2026 Background Traffic

- All study area intersections are anticipated to operate with a LOS E or better during the weekday AM and PM peak hours, achieving the target within 600m of a transit station.
- The northbound and westbound left turn movements at the Carling Avenue/Preston Street intersection are anticipated to operate with a LOS F during the PM peak hour. The 95<sup>th</sup> percentile queue length for the left turn movements on all approaches to this intersection are anticipated to exceed the existing storage length of the left turn lane during the AM and PM peak hours.

#### 2021 and 2026 Total Traffic

- The addition of site generated traffic is not anticipated to have a significant impact on the study area intersection operations.
- All study area intersections are anticipated to operate with a LOS E or better during the weekday AM and PM peak hours, achieving the target within 600m of a transit station.
- Consistent with the background traffic conditions, the northbound and westbound left turn movements at the Carling Avenue/Preston Street intersection are anticipated to operate with a LOS F during the PM peak hour. The 95<sup>th</sup> percentile queue length for the left turn movements on all approaches to this intersection are not anticipated to increase significantly, compared to the background traffic conditions.

## 1.0 INTRODUCTION

This Transportation Impact Assessment (TIA) has been prepared in support of Zoning By-law Amendment and Site Plan Control applications for the property located at 90 Champagne Avenue. The subject site previously served as a parking lot for the residential development immediately to the west.

The proposed development is a 14-storey residential building containing 236 dwellings and ground-floor amenity space for residents. A total of 91 parking spaces within a two-level underground parking garage have been proposed to serve the development.

The subject site is surrounded by the following:

- Beech Street and residences to the north;
- Champagne Avenue, the O-Train Trillium Line, residences, and parkland to the east;
- Hickory Street and residences to the south;
- Loretta Avenue South and residences to the west.

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

## 2.0 PROPOSED DEVELOPMENT

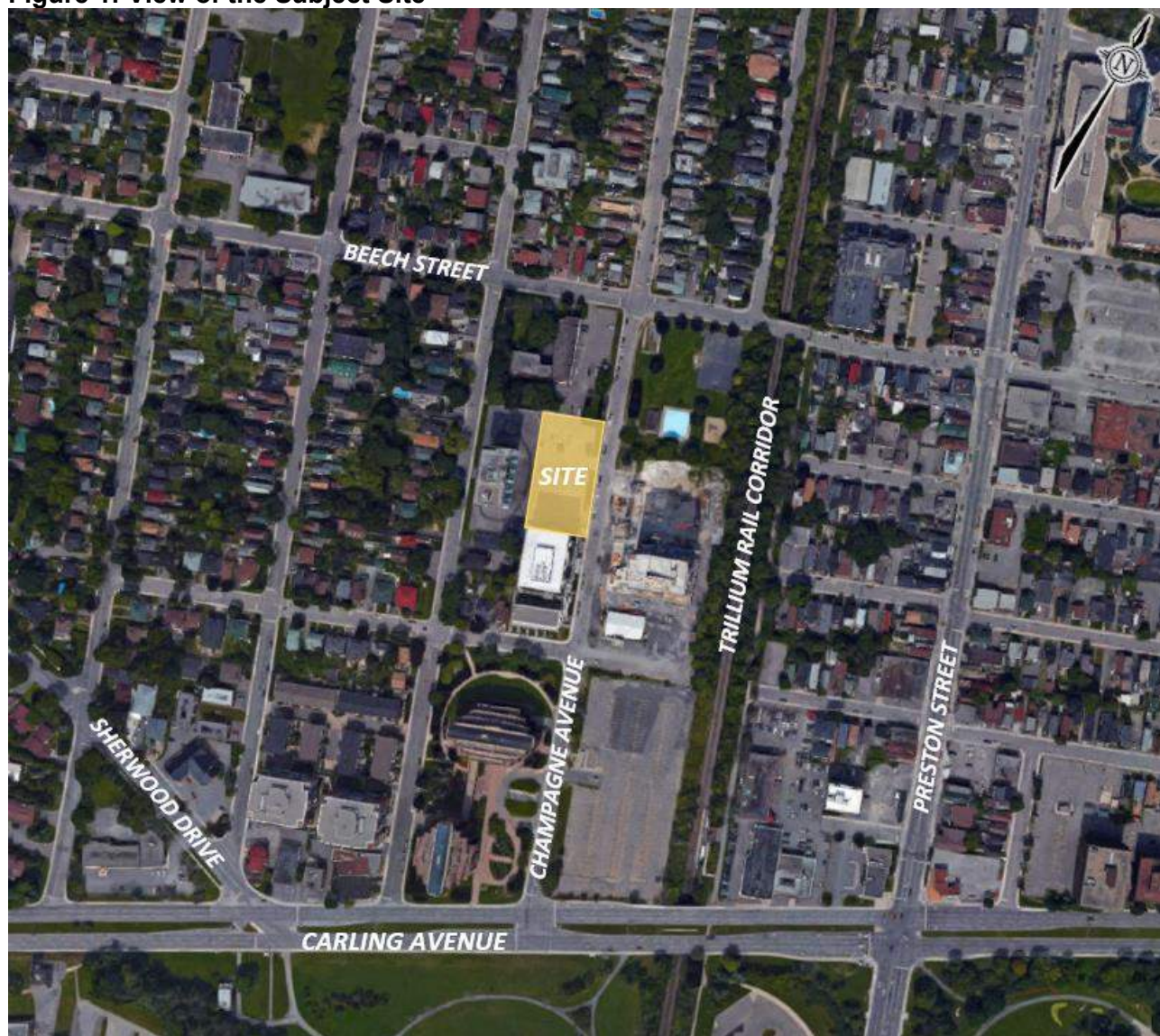
The subject site is designated as 'Mixed Use Centre' on Schedule B of the City of Ottawa's Official Plan. The implemented zoning for the property is 'Fifth Density Residential' (R5), and the site is within the Preston-Carling District Secondary Plan. This secondary plan limits development of the subject site to 15 storeys.

The proposed development consists of a single high-rise residential building with 236 dwellings. A total of 91 underground parking spaces will be provided, in a two-level underground parking garage. The development will be constructed in a single phase, with a buildout year of 2021.

The proposed accesses to the site include two full-movement accesses to Champagne Avenue, one near the north property line and one near the south property line. The northerly access will exclusively serve the parking garage for the proposed development. The southerly access will exclusively serve the parking garage of the existing residential building immediately west of the subject site (285 Loretta Street).

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



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

### **3.0 SCREENING**

#### **3.1 Screening Form**

The City's 2017 TIA Guidelines identify three triggers for completing a TIA report, including trip generation, location, and safety. The criteria for each trigger are outlined in the City's TIA Screening Form. The trigger results are as follows:

- Trip Generation Trigger – The development is expected to generate over 60 person trips/peak hour; further assessment is required based on this trigger.
- Location Triggers – The development is located within a Design Priority Area; further assessment is required based on this trigger.

- Safety Triggers – No safety triggers have been met; further assessment is not required based on this trigger.

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

## **4.0 SCOPING**

### **4.1 Existing Conditions**

#### **4.1.1 Roadways**

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

Carling Avenue is an arterial roadway that generally runs on an east-west alignment between March Road and Bronson Avenue. Within the study area, it has a six-lane divided urban cross-section, concrete sidewalks on both sides of the roadway, and a posted speed limit of 60 km/h. Carling Avenue is classified as a truck route, allowing full loads. Street parking is not permitted.

Preston Street is an arterial roadway that generally runs on a north-south alignment between Albert Street and Prince of Wales Drive. Within the study area, Preston Street has a four-lane undivided urban cross-section south of Carling Avenue, and a two-lane undivided urban cross-section north of Carling Avenue. Concrete sidewalks are provided on both sides of Preston Street, and the roadway has an unposted regulatory speed limit of 50 km/h under the Highway Traffic Act. Preston Street is classified as a truck route, allowing full loads. On-street parking lanes are provided in select locations on both sides of Preston Street north of Carling Avenue. Street parking is not permitted south of Carling Avenue.

Sherwood Drive is a collector roadway that generally runs on an east-west alignment between Holland Avenue and Reid Avenue, before running on a southeast-northwest alignment between Reid Avenue and Carling Avenue. Within the study area, Sherwood Drive has a two-lane undivided urban cross-section, concrete sidewalks on both sides of the roadway, and a posted speed limit of 40 km/h. Sherwood Drive is not classified as a truck route, and street parking is not permitted.

Beech Street is a local roadway that generally runs on an east-west alignment between Lynwood Avenue and Rochester Street. Within the study area, Beech Street has a two-lane undivided urban cross-section, sidewalks on both sides of the roadway, and an unposted regulatory speed limit of 50 km/h. Between Loretta Avenue and Preston Street, traffic calming measures such as curb extensions and flex posts have been implemented at select locations. Beech Street is not classified as a truck route. Street parking is generally permitted on the north side of Beech Street, with restrictions on weekdays between 7:00am and 7:00pm for the following locations. One-hour street parking is permitted between Champagne Avenue and Preston Street, and three-hour street parking is permitted between Loretta Avenue and Bayswater Avenue (except for permit holders). No street parking restrictions are identified west of Bayswater Avenue, or between Loretta Avenue and Champagne Avenue.

Champagne Avenue is a local roadway that generally runs on a north-south alignment between Young Street and Carling Avenue. Within the study area, Champagne Avenue has a two-lane undivided urban cross-section, concrete sidewalks on both sides of the roadway north of Beech Street, a concrete sidewalk on the west side of the roadway south of Beech Street, and a posted speed limit of 40 km/h. Champagne Avenue is not classified as a truck route. Street parking is

generally permitted on both sides of Champagne Avenue north of the subject site, with one hour restrictions for non-permit holders on weekdays between 8:00am and 5:00pm. South of the subject site, street parking is generally permitted on the west side of Champagne Avenue.

#### 4.1.2 Intersections

##### Carling Avenue/Sherwood Drive

- Signalized three-legged intersection
- North Approach: one left turn lane and one channelized right turn lane
- East Approach: one left turn lane, two through lanes, and one shared through/right turn lane
- West Approach: one left turn lane and three through lanes
- Zebra-striped crosswalks implemented for all approaches in 2018 (not shown in aerial)
- The left turn lane on the east approach previously facilitated left turn movements for a development south of Carling Avenue. Since the development was removed, this turn lane is used to facilitate U-turn movements at this intersection.



##### Carling Avenue/Champagne Avenue

- Signalized three-legged intersection
- North Approach: one left turn lane and one right turn lane
- East Approach: three through lanes and one right turn lane
- West Approach: one left turn lane and three through lanes





Carling Avenue/Preston Street

- Signalized four-legged intersection
- North Approach: one left turn lane and one shared through/right turn lane
- South Approach: one left turn lane, one through lane, and one shared through/right turn lane
- East Approach: one left turn lane, two through lanes, and one shared through/right turn lane
- West Approach: one left turn lane, three through lanes, and one right turn lane

Beech Street/Preston Street

- Signalized four-legged intersection
- North/South Approaches: one left turn lane and one shared through/right turn lane
- East Approach: one shared left turn/through lane and one right turn lane
- West Approach: one shared left turn/through/right turn lane
- Concrete textured crosswalks are provided on all approaches to this intersection

Beech Street/Champagne Avenue

- Unsignalized four-legged intersection
- All-way stop controlled
- All Approaches: one shared left turn/through/right turn lane



### 4.1.3 Driveways

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

#### Champagne Avenue, East Side:

- Two driveways to residences at 101-105 Champagne Avenue
- Two driveways to residences at 111 Champagne Avenue
- One driveway to sales centre at 115 Champagne Avenue
- One driveway to parking lot at 140 Hickory Street and 855 Carling Avenue

#### Champagne Avenue, West Side:

- One driveway to residences at 116 Beech Street
- One driveway to residences at 100 Champagne Avenue
- Four driveways to Dow's Lake Court at 875 Carling Avenue

### 4.1.4 Pedestrian and Cycling Facilities

Concrete sidewalks are provided on both sides of Carling Avenue, Preston Street, Beech Street, Sherwood Drive between Bayswater Avenue and Carling Avenue, and Champagne Avenue north of Beech Street. Concrete sidewalks are provided on one side of Sherwood Drive west of Bayswater Avenue, and Champagne Avenue north of Beech Street. A concrete sidewalk is also provided on the west side of Champagne Avenue south of Beech Street. A north-south asphalt multi-use pathway (MUP) is provided on the east side of the Trillium Rail Corridor, referred to as the Trillium Pathway.

In the City of Ottawa's primary cycling network, Carling Avenue is classified as a Spine Route, Sherwood Drive is classified as a Local Route and Neighbourhood Bikeway, and Preston Street is classified as a Local Route. The Trillium Pathway is classified as a Crosstown Bikeway. Beech Street and Champagne Avenue have no cycling route designation.

### 4.1.5 Area Traffic Management

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

Between Loretta Avenue and Preston Street, traffic calming measures such as curb extensions and flex posts have been implemented at select locations.

### 4.1.6 Transit

The following transit stops are within 400m walking distance of the subject site.

#### Carling O-Train Station

- Stop #3061 – for route 2  
(located approximately 40m north of Carling Avenue and 120m west of Preston Street)

#### Carling Avenue/Carling O-Train Station

- Stop #7369 – for routes 56, 85, 101, and 103  
(located on the south side of Carling Avenue, approximately 50m west of the Trillium Pathway)
- Stop #8014 – for routes 56, 85, 101, and 103  
(located on the north side of Carling Avenue, approximately 50m west of the Trillium Pathway)

Beech Street/Preston Street

- Stop #6654 – for route 85  
(located at the northwest corner of Beech Street/Preston Street)
- Stop #6656 – for route 85  
(located at the northeast corner of Beech Street/Preston Street)

Locations of these bus stops are shown in **Figure 2**.

OC Transpo Route 2 travels between Bayview O-Train Station and Greenboro O-Train Station. The route operates every 12 minutes from 6:00am to 12:00am on weekdays, every 12 minutes from 6:30am to 12:00am on Saturdays, and every 12 to 15 minutes from 7:30am to 11:00pm on Sundays.

OC Transpo Route 56 travels between Tunney's Pasture Station and Hurdman Station. On weekdays, the route operates every 15-30 minutes from 6:00am to 10:00am and 2:30pm to 7:30pm. The route does not operate outside of these hours, or on weekends.

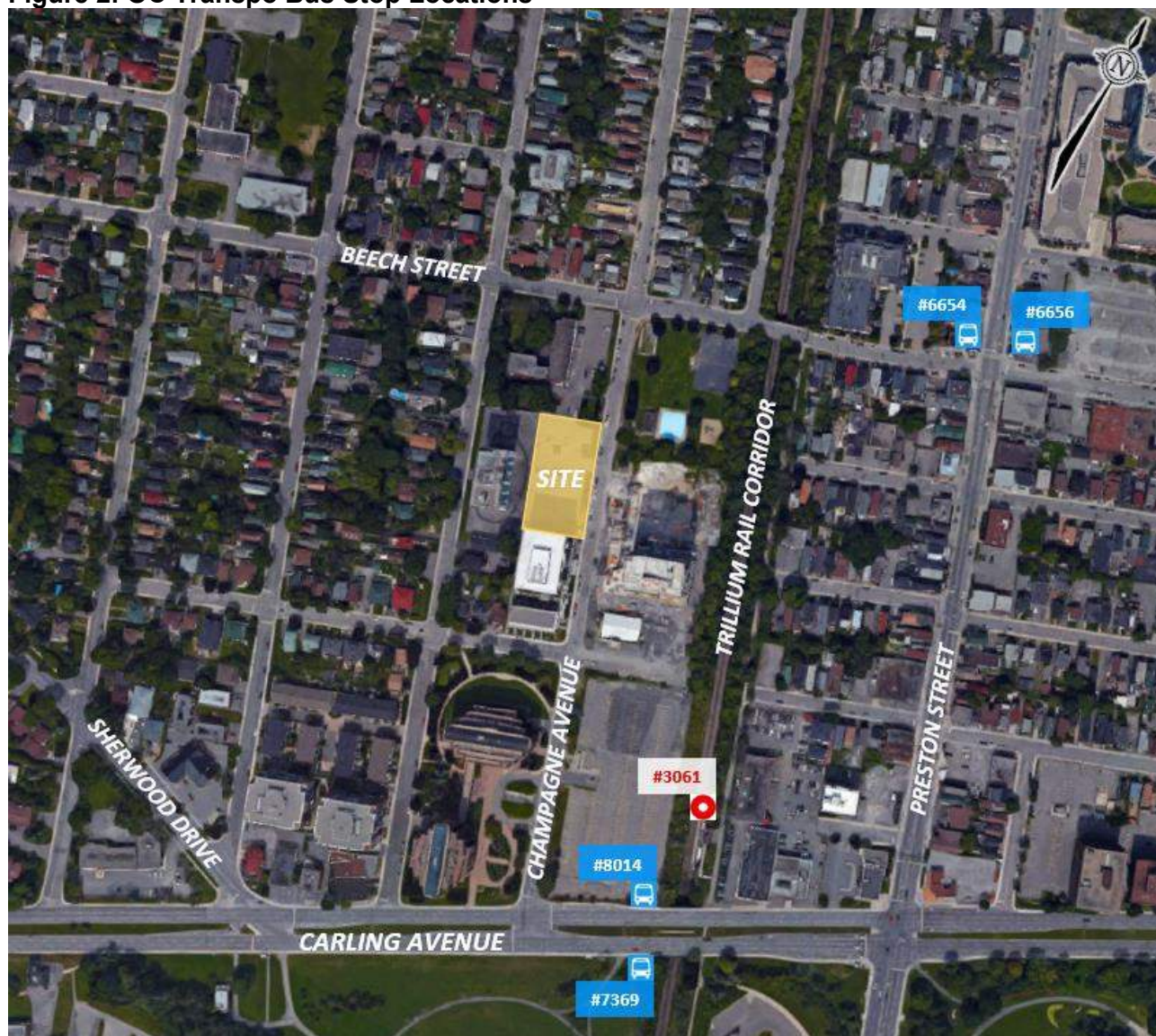
OC Transpo Route 85 travels between either Mackenzie King Station or Lees Station and Bayshore Station. The route operates every 15 to 30 minutes from 4:00am to 1:00am on weekdays and from 5:00am to 1:00am on weekends.

OC Transpo Route 101 travels between St. Laurent Station and Bayshore Station. Service extends to Moodie Station during peak hours (6:00am to 8:30am and 3:00pm to 6:00pm). On weekdays, the route operates every 15 to 20 minutes from 6:00am to 10:00pm. On Saturdays, the route operates every 15 to 30 minutes from 6:00am to 9:30pm. The route does not operate on Sundays.

OC Transpo Route 103 travels between Place d'Orléans and Moodie Station. During the AM peak period, the route operates from Place d'Orléans to Moodie Station every 15 minutes between 6:00am and 9:30am. During the PM peak period, the route operates from Moodie Station to Place d'Orléans every 15 minutes between 3:00pm and 6:30pm.

OC Transpo maps for the routes outlined previously and a copy of the December 2018 OC Transpo System Map are included in **Appendix C**.



**Figure 2: OC Transpo Bus Stop Locations**

#### 4.1.7 Existing Traffic Volumes

Weekday traffic counts completed by the City of Ottawa or Delcan were used to determine the existing pedestrian, cyclist and vehicular traffic volumes at the study area intersections. These counts were completed on the dates listed below by the following sources:

• Carling Avenue/Sherwood Drive	August 25, 2016	(City of Ottawa)
• Carling Avenue/Champagne Avenue	February 4, 2016	(City of Ottawa)
• Carling Avenue/Preston Street	June 20, 2017	(City of Ottawa)
• Beech Street/Preston Street	September 7, 2016	(City of Ottawa)
• Beech Street/Champagne Avenue	November 1, 2011	(Delcan/Parsons)

The City did not have any weekday traffic counts within the last five years on file at the intersection of Beech Street/Champagne Avenue. At the time of writing, Champagne Avenue is closed to through vehicular traffic between Beech Street and Hickory Street, due to construction of an apartment building at 105 Champagne Avenue. Based on the City's Current Roadwork and Street Closures search tool, this closure on Champagne Avenue began on February 1, 2017 and is scheduled to reopen on July 1, 2019. Therefore, a weekday count conducted at this time will be considered unreliable.

The most recent count available at Beech Street/Champagne Avenue was conducted by Delcan as part of the 101 Champagne Avenue Transportation Overview, prepared in November 2011. Since 2011, a high-rise residential development has been constructed at 125 Hickory Avenue. Traffic volumes from this development have been added to the 2011 traffic volumes at the Beech Street/Champagne Avenue intersection, consistent with the 101 Champagne Avenue Transportation Overview. This is considered representative of existing conditions at this intersection.

All traffic count data previously discussed and relevant excerpts from the 101 Champagne Avenue Transportation Overview are included in **Appendix D**. Traffic volumes within the study area are shown in **Figure 3**. Based on the 2016 count data at the Carling Avenue/Champagne Avenue intersection, Champagne Avenue north of Carling Avenue has an annual average daily traffic (AADT) of 3,801 vehicles/day.

#### 4.1.8 Collision Records

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

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

**Table 1: Reported Collisions**

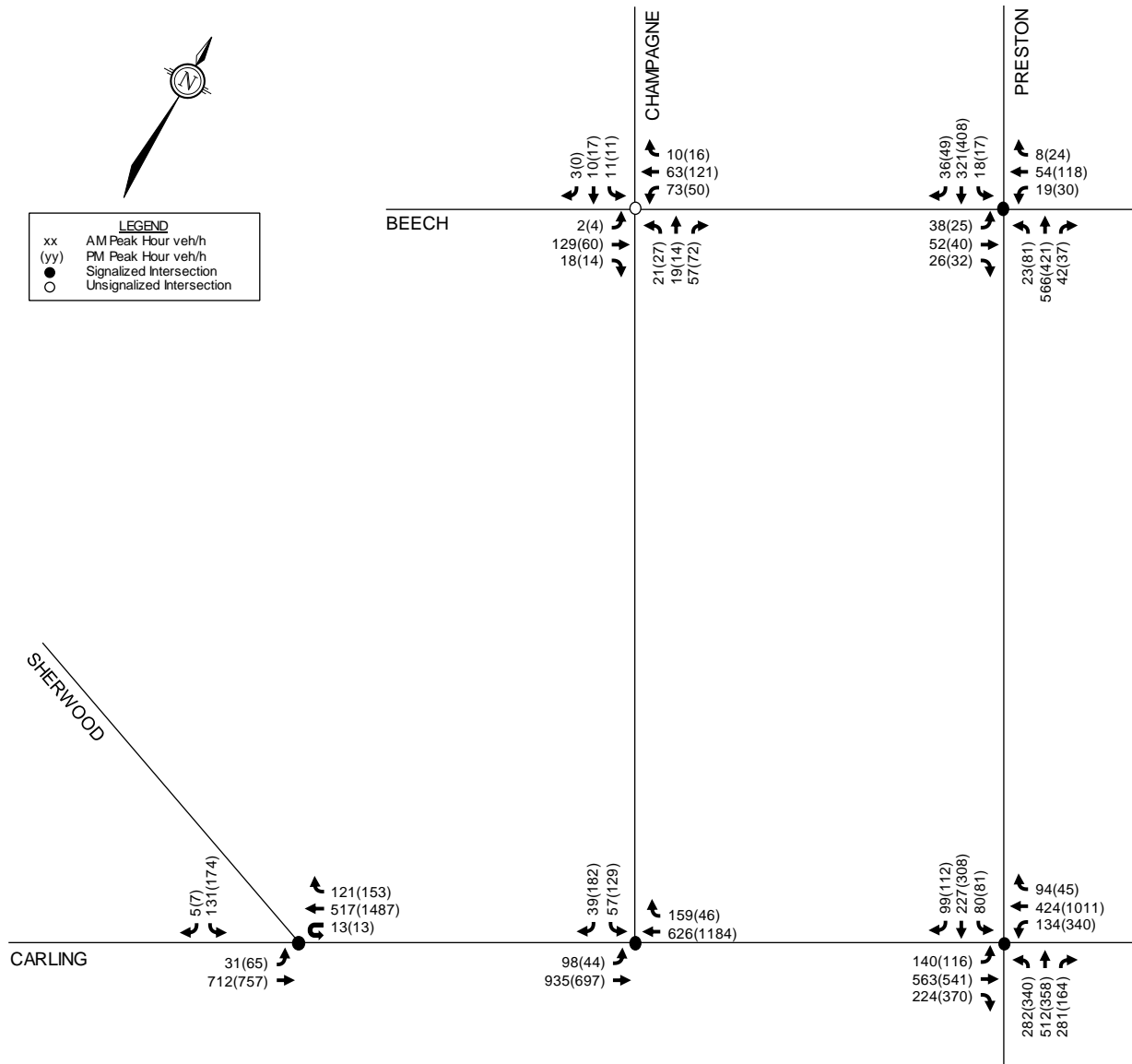
Intersection	Number of Reported Collisions
Carling Avenue/Sherwood Drive	4
Carling Avenue/Champagne Avenue	5
Carling Avenue/Preston Street	43
Beech Street/Preston Street	9
Beech Street/Champagne Avenue	1

##### Carling Avenue/Sherwood Drive

A total of four collisions were reported at this intersection over the last five years, of which there were three rear-end impacts and one single vehicle/other impact. Two of the four collisions resulted in injuries, but none caused fatalities. One collision occurred in poor driving conditions.



Figure 3: Existing Network Traffic Volumes



*Carling Avenue/Champagne Avenue*

A total of five collisions were reported at this intersection over the last five years, of which there were two rear-end impacts, one turning movement impact, one sideswipe impact, and one angle impact. One collision resulted in injuries, but none caused fatalities. Two of the five collisions occurred in poor driving conditions.

*Carling Avenue/Preston Street*

A total of 43 collisions were reported at this intersection over the last five years, of which there were 17 rear-end impacts, nine turning movement impacts, six sideswipe impacts, seven angle impacts, and four single vehicle/other impacts. Sixteen of the 43 collisions resulted in injuries, but none caused fatalities. One of the single vehicle impacts involved a pedestrian, which resulted in injuries. Nine of the 43 collisions occurred in poor driving conditions.

Of the 17 rear-end impacts, two occurred at the northbound approach (one left turn incident and one through vehicle incident), two occurred at the southbound approach (two through vehicle incidents), six occurred at the eastbound approach (six through vehicle incidents), and seven occurred at the westbound approach (one left turn incident, five through vehicle incidents, and one right turn incident). Two of the 17 collisions occurred in poor driving conditions.

Of the nine turning movement impacts, two involved southbound left turning vehicles colliding with northbound through vehicles, and seven involved cyclists. Of the seven cyclist impacts, five were travelling northbound and two were travelling southbound. Four of the five northbound cyclist impacts involved a southbound left turning vehicle, and the other impact involved a northbound right turning vehicle.

It is likely that some or all of the northbound cyclists entered the intersection from the MUP approach at the southeast corner of Carling Avenue/Preston Street. Cyclists coming from the MUP enter the intersection on an angle, rather than parallel with northbound or westbound traffic. As such, drivers may not recognize which direction cyclists are heading until the cyclist has entered the intersection. It is noted that as crossrides are not provided for cyclists at this intersection, cyclists are required to dismount when crossing. The Carling Avenue Transit Priority Measures functional design may address this pattern of collisions, as a realignment of the MUP approach at this intersection is identified in the design. The functional design does not include crossrides for cyclists crossing Carling Avenue from the MUP, and cyclists will still be required to dismount when crossing.

Of the seven angle impacts, one involved a northbound vehicle and an eastbound vehicle, one involved a northbound vehicle and an eastbound cyclist, two involved a northbound vehicle and a westbound vehicle, two involved a southbound vehicle and an eastbound vehicle, and one involved a southbound vehicle and a westbound vehicle. Two of the seven collisions occurred in poor driving conditions.

Of the six sideswipe impacts, one occurred at the northbound approach, two occurred at the southbound approach, one occurred at the eastbound approach, and two occurred at the westbound approach. One collision occurred in poor driving conditions.

*Beech Street/Preston Street*

A total of nine collisions were reported at this intersection over the last five years, of which there were two turning movement impacts, one sideswipe impact, four angle impacts, and two single vehicle/other impacts. One of the single vehicle impacts involved a pedestrian, which resulted in

injuries. Three of the nine collisions resulted in injuries, but none caused fatalities. Two of the nine collisions occurred in poor driving conditions.

#### Beech Street/Champagne Avenue

One collision was reported at this intersection over the last five years, a single vehicle impact involving a pedestrian which resulted in injuries.

## 4.2 Planned Conditions

Within the study area, the 2013 Ottawa Cycling Plan identifies the planned Westboro Neighbourhood Bikeway which includes shared use lanes on Sherwood Drive between Fairmont Avenue and Carling Avenue as a Phase 1 (2014-2019) project. The 2013 Ottawa Pedestrian Plan does not identify any improvements within the study area.

The City's 2013 Transportation Master Plan (TMP) does not identify any roadway projects within the study area in its Affordable Road Network. The Carling Avenue Transit Priority Measures project is identified in the 2013 TMP as an improvement in the Affordable Rapid Transit and Transit Priority (RTTP) Network.

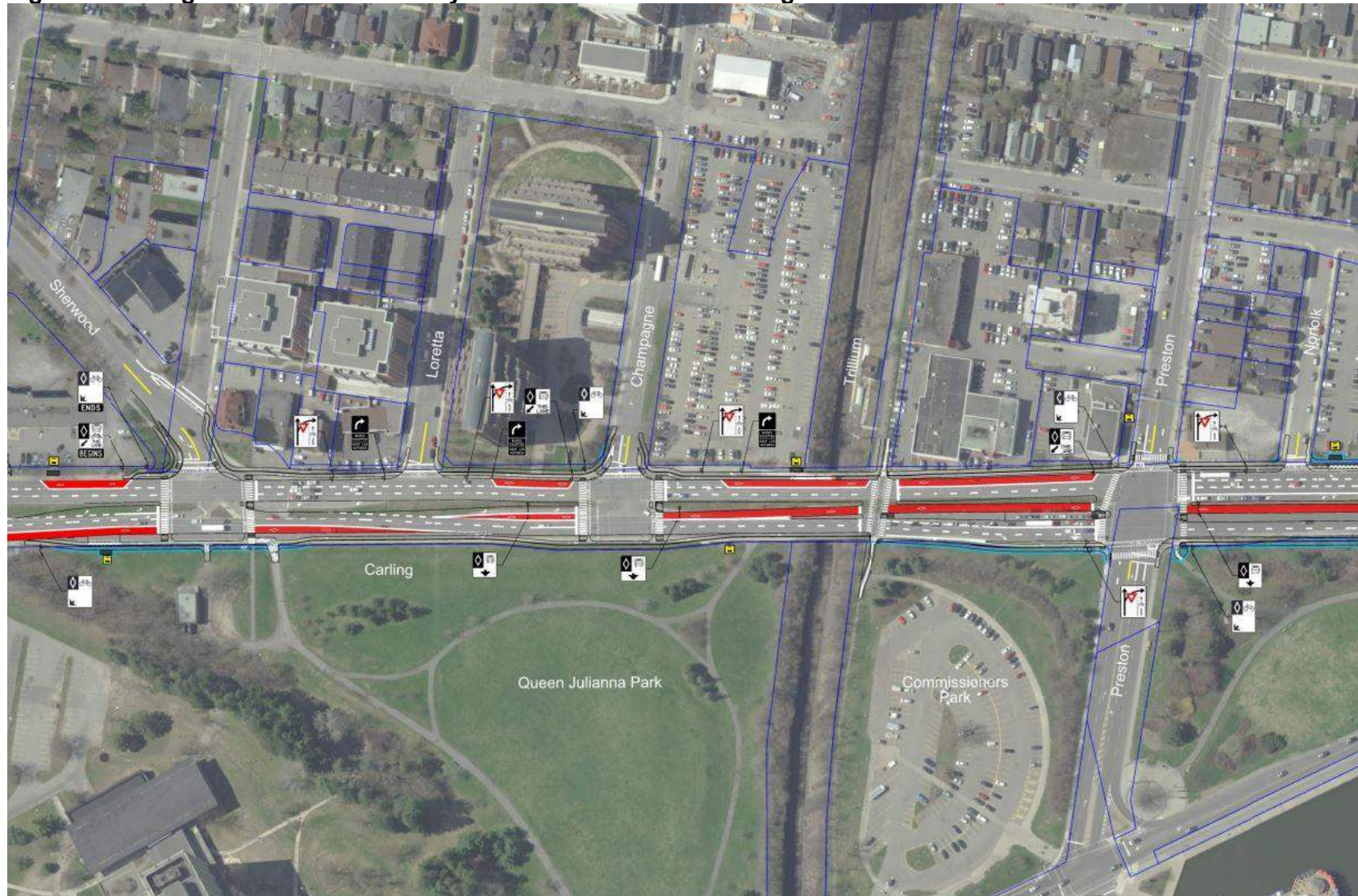
The TMP indicates that between Lincoln Fields Station and Carling O-Train Station, exclusive bus lanes will be made available via reallocation of existing traffic lanes. Between Carling O-Train Station and Bronson Avenue, transit signal priority and queue jump lanes will be implemented at select intersections. The preliminary functional design of the Carling Avenue Transit Priority Measures project for the section within the study area is shown in **Figure 4**.

In proximity of the proposed development, there are multiple other residential and mixed-use developments are under construction, approved, or in the approval process. The other area developments included in this analysis are shown in **Table 2**, and discussed further in the forecasting section of this TIA.

**Table 2: Other Area Developments**

Address	Land Use	Status
845 Carling Avenue	1,123 condominiums	Agreement registered
101-105 Champagne Avenue	540 apartments	Under construction
125 Hickory Street	445 condominiums and townhomes	Phase 1 completed;
93-105 Norman Street	117 condominiums	Application pending
500 Preston Street	301 condominiums, 5,077 ft <sup>2</sup> commercial space, and 27,297 ft <sup>2</sup> of office space	Application approved
505 Preston Street	252 condominiums, 4,786 ft <sup>2</sup> commercial space, and 16,047 ft <sup>2</sup> of office space	Under construction
17 Aberdeen Street	Increase of 197 residential units	Request for Agreement Received
552 Booth Street	1,000 dwelling units, 142,200 ft <sup>2</sup> retail/office	Application pending

**Figure 4: Carling Avenue Transit Priority Measures – Functional Design**





### 4.3 Study Area and Time Periods

The study area for this report includes Carling Avenue, Preston Street, Sherwood Drive, Beech Street, and Champagne Avenue. The study area includes the signalized intersections at Carling Avenue/Sherwood Drive, Carling Avenue/Champagne Avenue, Carling Avenue/Preston Street, and Beech Street/Preston Street, as well as the unsignalized intersection at Beech Street/Champagne 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. The proposed development is expected to be completed in one phase, with full occupancy by the year 2021. Therefore, the analysis considers the buildout year 2021 and the horizon year 2026.

### 4.4 Exemptions Review

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

**Table 3: TIA Exemptions**

Module	Element	Exemption Criteria	Exemption Status
<b>Design Review Component</b>			
<b>4.1</b> 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
<b>4.2</b> 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
<b>Network Impact Component</b>			
<b>4.5</b> Transportation Demand Management	<i>All elements</i>	• Not required for non-residential site plans expected to have fewer than 60 employees and/or students on location at any given time	Not Exempt
<b>4.6</b> Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	• Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Not Exempt
<b>4.8</b> Network Concept	<i>All elements</i>	• Only required when proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by the established zoning	Exempt

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

- Module 4.1: Development Design
- Module 4.2: Parking
- Module 4.3: Boundary Streets
- Module 4.4: Access Design
- Module 4.5: Transportation Demand Management
- Module 4.6: Neighbourhood Traffic Management
- Module 4.7: Transit
- Module 4.9: Intersection Design

## 5.0 FORECASTING

### 5.1 Development-Generated Travel Demand

#### 5.1.1 Trip Generation

The proposed 14-storey development will include 236 apartment dwellings. Trips generated by this land use have been estimated using the relevant recommended rates outlined in the *TRANS Trip Generation Manual*. The vehicle trip generation rates, taken from Table 6.3 of the TRANS report, correspond to the High-Rise Apartments (10+ floors) land use within the Urban Area (inside the greenbelt). The directional split between inbound and outbound trips are based on the blended splits presented in Table 3.17 of the report.

Estimates of the trips generated by the proposed development are summarized in **Table 4**.

**Table 4: Proposed Residential Vehicle Trip Generation**

Land Use	TRANS Rate	Units	AM Peak (VPH)			PM Peak (VPH)		
			IN	OUT	TOT	IN	OUT	TOT
High-Rise Apartments (10+ floors)	AM: 0.24 PM: 0.27	236 units	14	43	57	39	25	64

It is recognized that use of the *TRANS Trip Generation Manual* is preferred by the City to estimate the trip generation of residential developments. For comparison, the trip generation rates outlined in the *ITE Trip Generation Manual, 10<sup>th</sup> Edition* for the Multifamily Housing (High-Rise) land use have been included.

The number of person trips generated by the proposed development as estimated by the TRANS rates are based on the modal shares presented in Table 3.13 of the TRANS report, while the number of person trips estimated by the ITE rates are based on a 1.28 ITE Trip to Person Trip Factor, consistent with the 2017 TIA Guidelines. The projected number of person trips generated by the proposed development as estimated by both the TRANS and ITE rates are included in **Table 5**.

**Table 5: Proposed Residential Person Trip Generation**

Land Use	TRANS Auto Share	AM Peak (PPH)			PM Peak (PPH)			
		IN	OUT	TOT	IN	OUT	TOT	
High-Rise Apartments (10+ floors)	AM: 37% PM: 40%	37	117	154	99	61	160	
Land Use	ITE Code	Units	AM Peak (PPH)			PM Peak (PPH)		
			IN	OUT	TOT	IN	OUT	TOT
Multifamily Housing (High-Rise)	222	236 units	24	77	101	70	44	114
Difference			13	40	53	28	18	46

Based on the foregoing table, the trip generation rates outlined in the TRANS report can generally be considered more conservative compared to the ITE rates. As such, the TRANS rates will be carried forward for the remainder of this study. At full buildout, the proposed apartments are projected to generate 154 person trips during the AM peak hour and 160 person trips during the PM peak hour.

The *2011 TRANS O-D Survey Report* indicates that within the study area, the lands west of the Trillium Rail Corridor belong to the Merivale district, while the lands east belong to the Ottawa Inner Area. While the proposed development is located in the Merivale district, its proximity to Preston Street and the Trillium Rail Corridor likely results in higher non-auto shares than what is reflected in the survey for that district. Additionally, the site is located within 600m of the Carling O-Train 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 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 Merivale and Ottawa Inner Area districts, is presented in **Table 6**.

**Table 6: Modal Shares by District/Zone**

Mode of Transportation	TOD Zone	Merivale	Ottawa Inner Area
Auto Driver	15%	55%	35%
Auto Passenger	5%	15%	10%
Transit	65%	20%	20%
Non-Auto	15%	10%	35%

Given the sites proximity to Preston Street, Carleton University and the future Ottawa Civic Hospital Campus south of Carling Avenue, the assumed modal shares associated with a TOD have been adjusted to reflect higher non-auto shares associated with the Ottawa Inner Area district. The modal shares assumed for this TIA are as follows:

- Auto Driver: 15%
- Auto Passenger: 5%
- Transit: 60%
- Non-Auto: 20%

A full breakdown of the projected site-generated person trips by modal share is shown in **Table 7**.

**Table 7: Person Trips by Modal Share**

Travel Mode	Modal Share	AM Peak			PM Peak		
		IN	OUT	TOT	IN	OUT	TOT
Person Trips		37	117	154	99	61	160
Auto Driver	15%	6	17	23	15	9	24
Auto Passenger	5%	2	6	8	5	3	8
Transit	60%	22	70	92	59	37	96
Non-Auto	20%	7	24	31	20	12	32

Based on the foregoing table, the proposed apartment building is projected to generate 23 vehicle trips during the AM peak hour and 24 vehicle trips during the PM peak hour.

### 5.1.2 Trip Distribution

The assumed distribution of trips generated by the proposed development has been derived from existing traffic patterns within the study area. Site-generated trips are anticipated to follow the traffic patterns associated with the typical commute (i.e. departing the study area during the AM peak hour, and entering the study area during the PM peak hour). The distribution of site-generated trips can be described as follows:

- 15% to/from the north via Preston Street;
- 20% to/from the south via Preston Street;
- 30% to/from the east via Carling Avenue;
- 5% to/from the east via Beech Street;
- 20% to/from the west via Carling Avenue;
- 5% to/from the west via Sherwood Avenue; and
- 5% to/from the west via Beech Street.

Trips generated by the subject site are shown in **Figure 5**.

## 5.2 Background Traffic

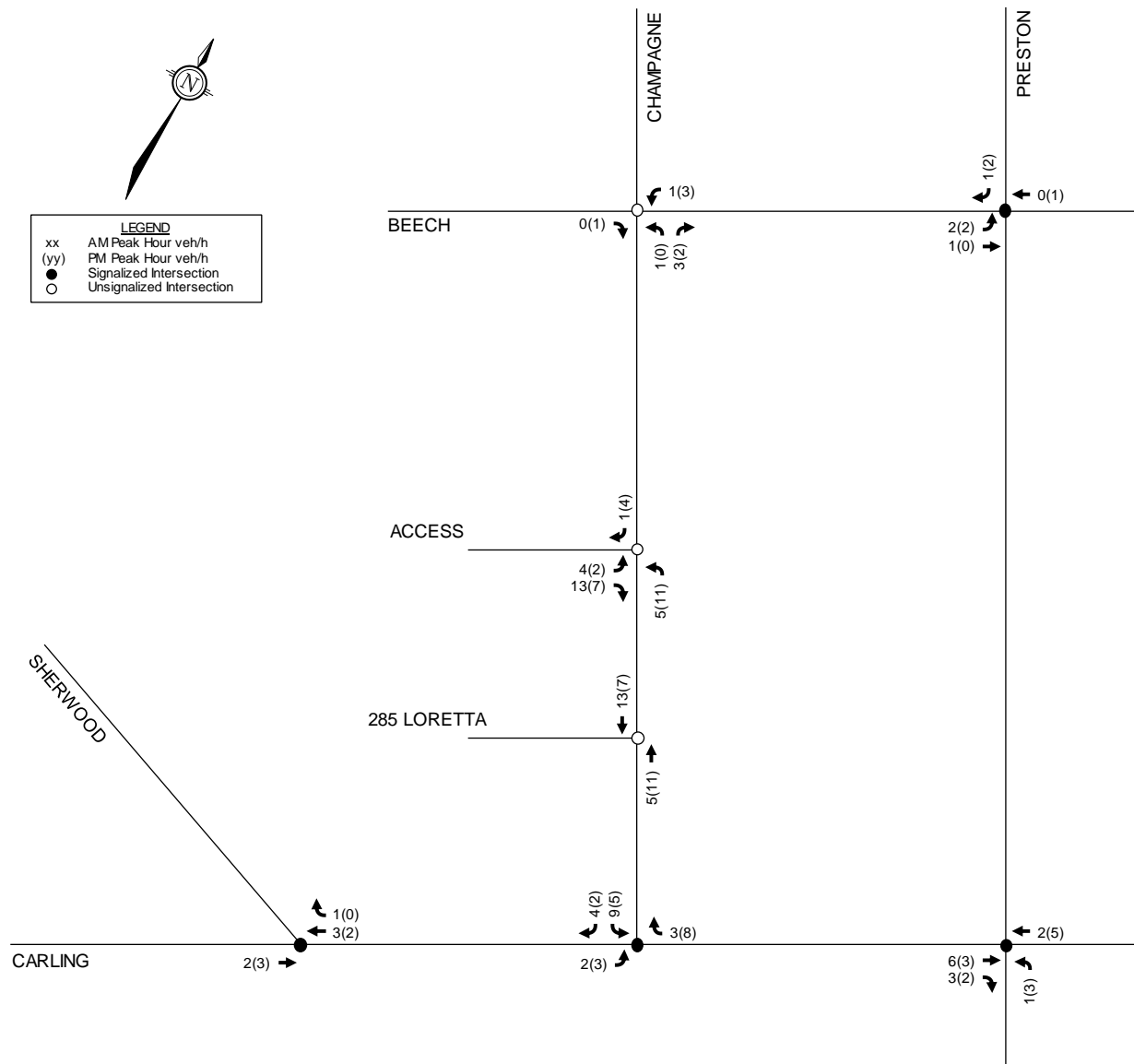
### 5.2.1 General Background Growth Rate

A review of the City of Ottawa's Strategic Long-Range Model was conducted. Comparing snapshots of the 2011 and 2031 AM peak hour traffic volumes suggests Carling Avenue between Sherwood Drive and Preston Street will not grow significantly, while Preston Street between Carling Avenue and Beech Street will grow at a rate of 1% per annum. A review of City of Ottawa traffic count data at the Carling Avenue/Preston Street intersection from June 2015 and June 2017 suggests the Annual Average Daily Traffic (AADT) at this intersection has not grown significantly over the two years.

Based on the foregoing, no growth rate has been applied to the existing traffic volumes. As described in Section 5.2.2 below, background growth along the study area roadways will be captured by adding traffic generated by other area developments to the background traffic volumes. This approach is consistent with other traffic studies in the area.



Figure 5: Site Generated Traffic Volumes



### 5.2.2 Other Area Development Traffic

A review of other area development traffic has been conducted. Traffic generated by other area developments is summarized as follows:

- A mixed-use development is proposed at 845 Carling Avenue which includes 1,123 residential units and 16,000 square feet of ground floor retail. A Community Transportation Study/Transportation Impact Study, dated April 2013, was prepared by Delcan in support of a Zoning By-law Amendment application for this development. The report identified the project would result in an increase of approximately 150 veh/h during the AM peak hour and 175 veh/h during the PM peak hour. This development is anticipated to be phased over 15 to 20 years. For the purposes of this analysis, it has been assumed that this development will be 50% built-out by the 2021 and fully built-out by 2026. Site generated traffic figures from the 2013 Community Transportation Study/Transportation Impact Study are included in **Appendix F**.
- A residential development at 101 Champagne Avenue which includes 250 residential units is currently under construction. A Transportation Overview, dated November 2011, was prepared in support of Official Plan and Zoning By-law Amendment applications for this development. This report projected an increase of approximately 55 veh/h during the AM and PM peak hours respectively. Traffic generated by this development has been added to the 2021 and 2026 background traffic. Relevant excerpts from the 2011 Transportation Overview can be found in **Appendix F**.
- A residential development is proposed at 93-105 Norman Street which includes 117 residential units. A Transportation Brief, dated October 2012, and Addendum, dated October 2013, were prepared in support of Site Plan Control application for this development. This report projected an increase of 80 person trips during the AM peak hour and 70 person trips during the PM peak hour. This equates to approximately 15 vehicle trips during the AM and PM peak hours respectively, assuming a 20% auto modal share for the development. Traffic generated by this site has been distributed to the study area roadways based on the trip distribution assumptions presented above for the subject site. Traffic generated by this development has been added to the 2021 and 2026 background traffic. Relevant excerpts from the Transportation Brief and Addendum can be found in **Appendix F**.
- A mixed-use development is proposed at 500 Preston Street which includes 280 residential units and 10,000 square feet of ground floor retail. A Community Transportation Study, dated June 2011, and subsequent Addendums, dated December 2012 and October 2013, were prepared in support of a Site Plan Control application for this development. These reports projected an increase in vehicle traffic of approximately 95 veh/h during the AM peak hour and 110 veh/h during the PM peak hour. Traffic generated by this development has been added to 2021 and 2026 background traffic. Relevant excerpts from the 2011 Community Transportation Study and subsequent Addendums can be found in **Appendix F**.
- A mixed-use development at 505 Preston Street which includes 252 residential units, 4,800 square feet of ground floor retail and 16,000 square feet of office use. A Community Transportation Study, dated December 2012, and Transportation Overview, dated May 2013, were prepared by IBI Group in support of Site Plan Control and Zoning By-law Amendment applications for this development. This report projected an increase in vehicle traffic of approximately 50 veh/h during the AM peak hour and 60 veh/h during the PM peak hour. The

estimated date of full occupancy was 2016; however, this site was under construction and traffic generated by this development would not have been included in the traffic counts. Traffic generated by this development has been added to 2021 and 2026 background traffic. Site generated traffic figures from the 2012 Community Transportation Study are included in **Appendix F**.

- An expansion of the existing residential building at 17 Aberdeen Street is proposed. This expansion will include an increase of 197 residential units. A Transportation Overview was prepared by IBI Group in August 2016 in support of a Site Plan Control application for this development. The estimated date of full occupancy was not identified. The expansion is projected to increase vehicle trips to the site by approximately 40 veh/h during the AM peak hour and 50 veh/h during the PM peak hour, with vehicles assumed to be utilizing all four existing parking garage ramps. The effect on the adjacent road network was expected to be insignificant, and no trip distribution or site generated traffic figures were developed. Traffic generated by this site has been distributed to the study area roadways based on the trip distribution assumptions presented above for the subject site. Traffic generated by this development has been added to 2021 and 2026 background traffic. Relevant excerpts from the 2016 Transportation Overview can be found in **Appendix F**.
- A mixed-use development is proposed at 552 Booth Street which consists of approximately 1,000 dwelling units in five buildings and 142,200 square feet of retail/office uses. A draft TIA Strategy Report, dated December 2018, was prepared by Parsons in support of Zoning By-law and Official Plan Amendment applications for this development. This report suggests the development is anticipated to be completed with full occupancy by 2025. Trip generation was presented using both existing and future modal shares. The existing modal shares were assumed to reflect the 2025 build-out conditions, while the future modal shares were assumed to reflect the City's initiative to increase the number of transit user and were assumed for the 2030 horizon year. For the purposes of this report, the trip generation based on the existing modal shares have been added to the 2021 and 2026 background traffic. Relevant excerpts from the 2018 Draft TIA are included in **Appendix F**.
- A mixed-use development is proposed at 951 Gladstone Avenue and 145 Loretta Avenue South which consists of approximately 930 apartment units, 141,750 square feet of office and 21,700 square feet of retail space. A TIA strategy report, dated December 2018, was prepared by CGH Transportation Inc. in support of Official Plan Amendment and Zoning By-law Amendment applications for this development. This report projected an increase in vehicle traffic of approximately 185 veh/h during the AM peak hour and 160 veh/h during the PM peak hour, and suggests an anticipated build-out year of 2023 for the proposed development. Traffic generated by this development has been added to the 2026 background traffic. Site generated traffic volumes from the TIA are included in **Appendix F**.
- The existing residential development containing 144 units at 285 Loretta Street is currently accessed through the subject site and is accounted for in the traffic counts at study area intersections. Access to the residential development at 285 Loretta Street will continue to be provided through an easement at the southern limits of the subject site. Traffic at the proposed access to 285 Loretta Street at the southern limits of the subject site has been developed using the trip generation and distribution assumptions presented above for the subject site.

Background and total traffic volumes for the 2021 and 2026 build-out year are shown in **Figures 6 to 9**.

Figure 6: 2021 Background Traffic

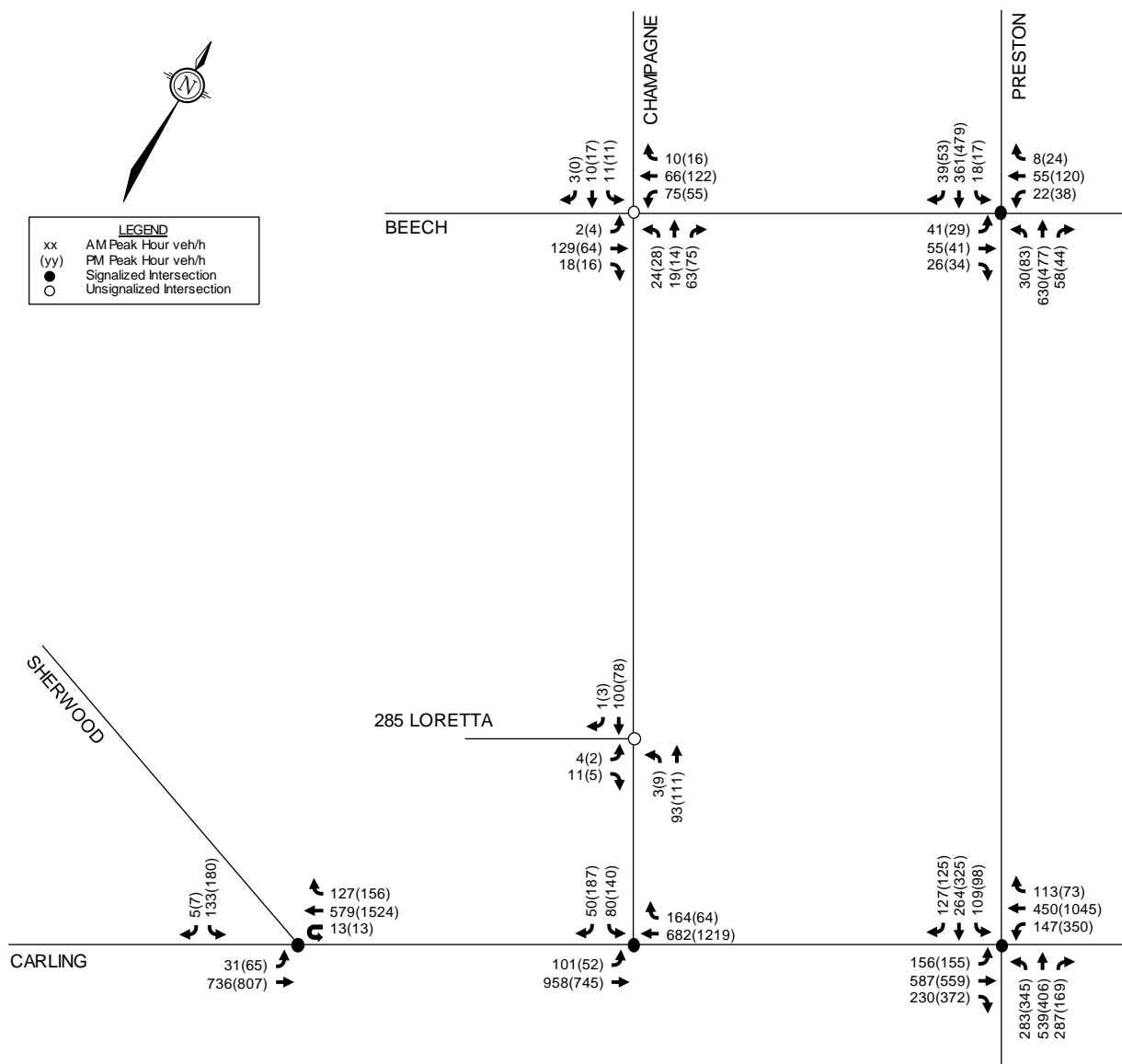


Figure 7: 2026 Background Traffic

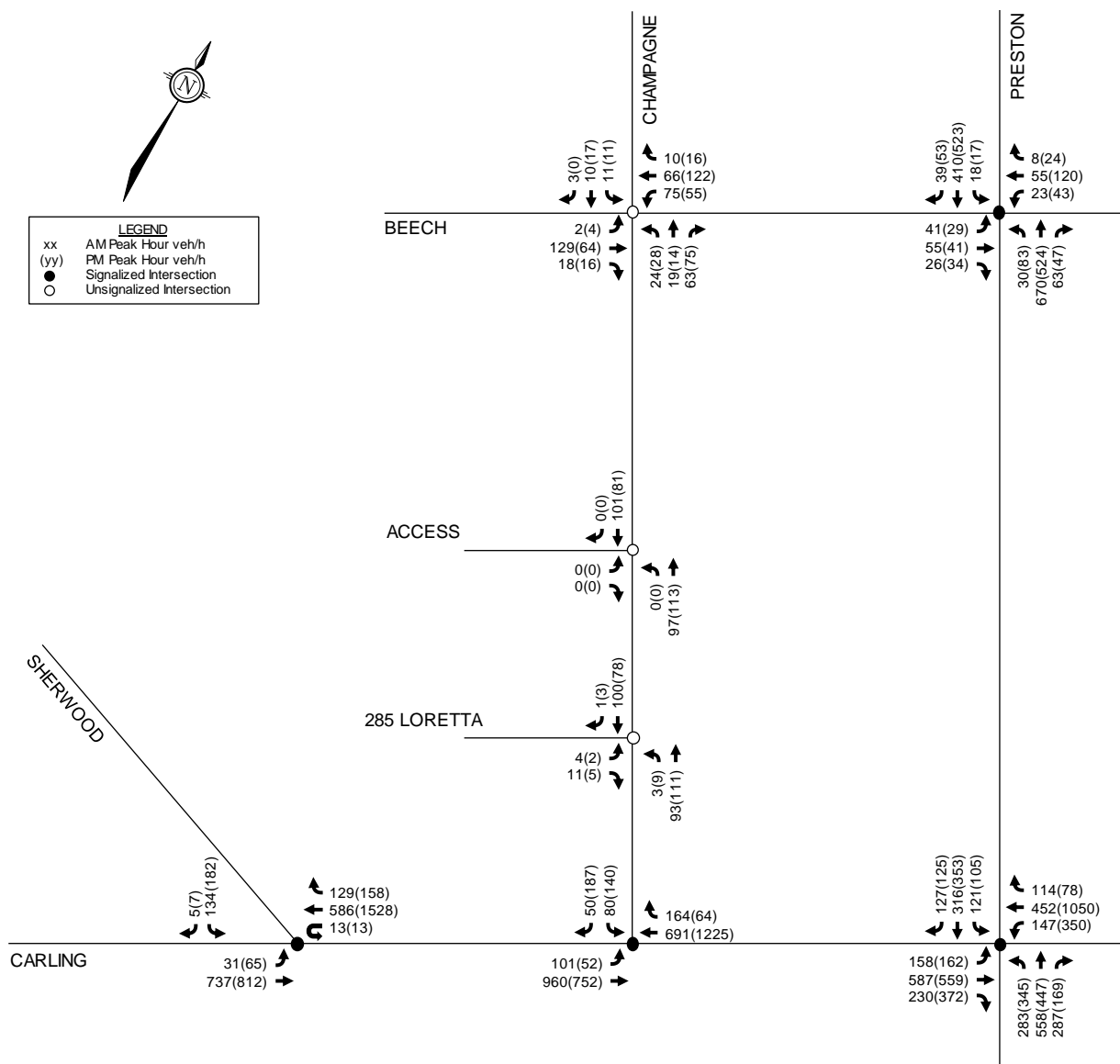
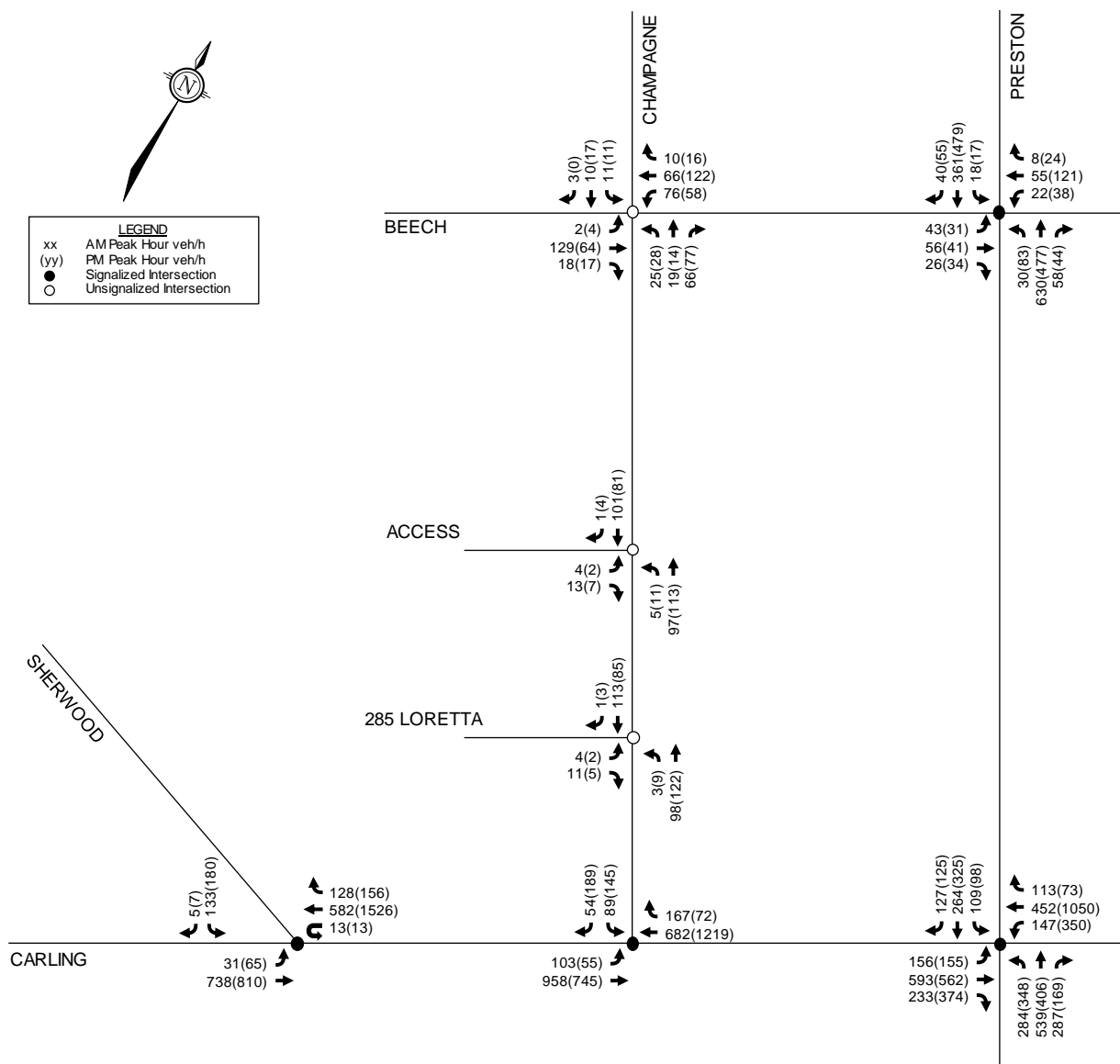
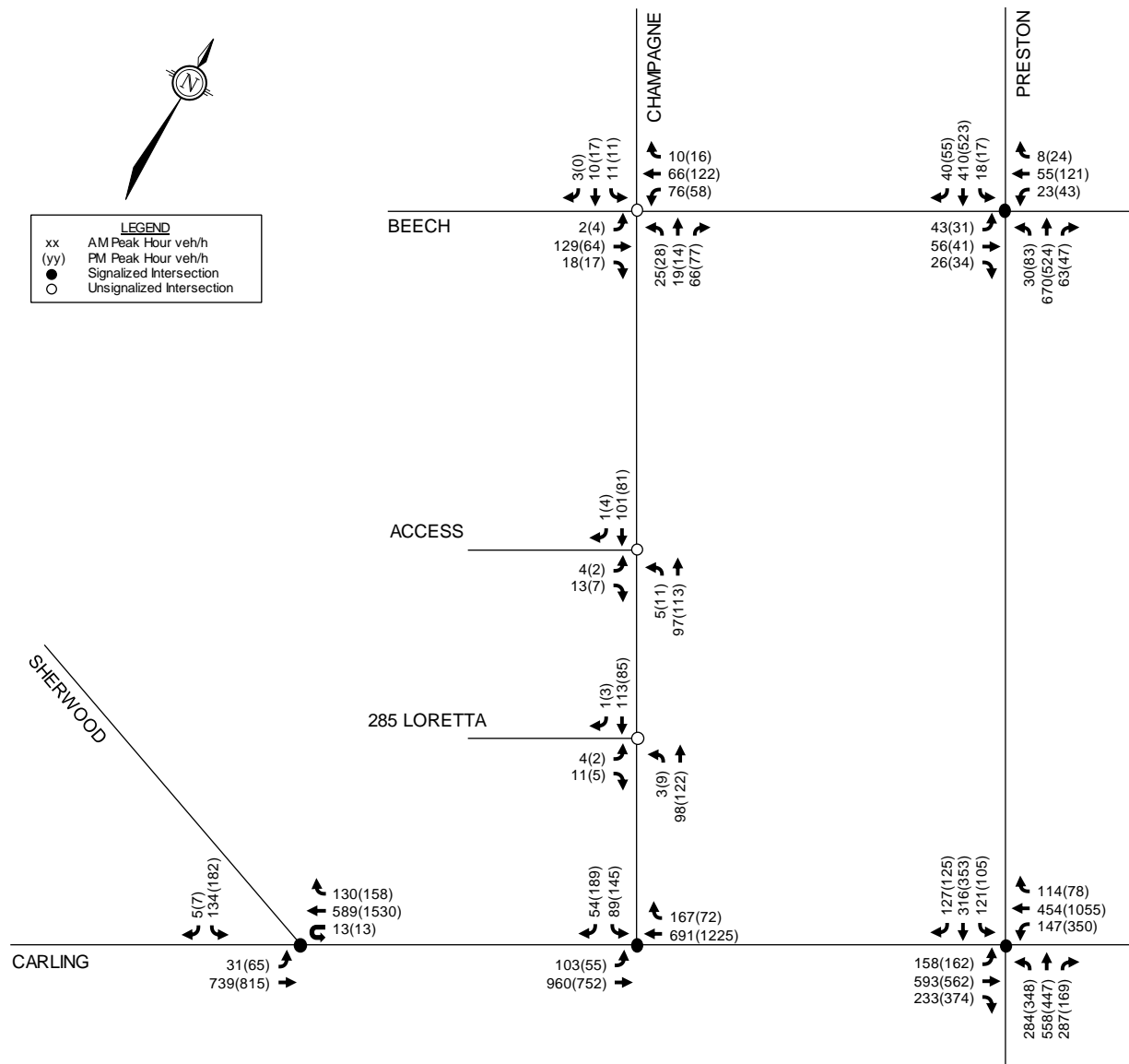


Figure 8: 2021 Total Traffic



**Figure 9: 2026 Total Traffic**


### 5.3 Demand Rationalization

Based on existing traffic volumes, critical movements at the Carling Avenue/Preston Street intersection are anticipated to operate above capacity. However based on the analysis presented in Section 6.9 below, the overall intersection is anticipated to operate with a LOS E which is consistent with the targets within 600m of a transit station.

The City of Ottawa is investing in transit, pedestrian and cycling infrastructure to reduce automobile dependency and shift modal shares towards transit/active modes. The extension of the Confederation Line LRT to the east and west, the extension of the Trillium Line LRT to the south, and the provision of transit priority measures along Carling Avenue are anticipated to increase transit ridership and reduce vehicle trips within the study area.

As the proposed development is located within 600m of the existing Carling Avenue O-Train station and is within the Ottawa Inner Area, the modal shares associated with the development have a higher emphasis on transit and active modal shares. Specific Transportation Demand Management (TDM) initiatives will be implemented to assist in achieving the target modal shares and are summarized in Section 6.5 below.

## 6.0 ANALYSIS

### 6.1 Development Design

Pedestrian facilities will be provided between the main building entrance/exits and the sidewalk along the west side of Champagne Avenue. A new 2.0m concrete sidewalk will be provided adjacent to the curb along the frontage of the subject site. Bicycle parking for the proposed development will be provided in accordance with the City of Ottawa Zoning By-law. Six bicycle parking spaces are proposed at the front of the building, 84 are proposed on the first level of underground parking, and 48 on the second level.

OC Transpo bus stops #6654, #6656, 7369, #8014 and #3061 are located within a 400m walking distance of the subject site. These bus stops provide service to OC Transpo routes 2, 56, 85, 101, and 103.

A review of the City's TDM – Supportive Development Design and Infrastructure Checklist has been conducted. A copy of the TDM checklist is included in **Appendix G**. All required TDM-supportive design and infrastructure measures in the TDM checklist are met.

### 6.2 Parking

The subject site is located in Area B of Schedule 1 and Area Z of Schedule 1A to the City's Zoning By-law. Minimum vehicular and bicycle parking rates for the proposed development are identified in the Zoning By-law, and are summarized in the following table.

Land Use	Rate	Units	Requirement	Proposed
Vehicle Parking				
Apartment	No resident parking required <sup>1</sup>	236	0	69
	0.1 per unit in excess of 12 (Visitor)		22	22
Total			22	91
Bicycle Parking				
Apartment	0.5 per unit	236	118	138
Total			118	138

1. Zoning By-law Section 101 (2)

Based on the foregoing, the proposed vehicular and bicycle parking conforms to the requirements of the City's Zoning By-law. It is noted that the existing site previously served as a parking lot for the



adjacent residential development at 285 Loretta Avenue. As identified in a Memorandum prepared by IBI Group in support of the severance application, the parking for 285 Loretta Avenue has been reduced from 115 to 48 spaces. The remaining 48 parking spaces for 285 Loretta Avenue conforms to the requirements of the City's Zoning By-law and will be accessed through a right-of-way near the southern limits of the subject site, as described in Section 6.4 below. The IBI Group memorandum is included in **Appendix H**.

### 6.3 Boundary Streets

This section provides a review of the boundary street (Champagne Avenue) 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 Champagne Avenue is in the Mixed-Use Centre. Champagne avenue is also located within 600m of the Carling O-Train station. A photo of Champagne Avenue (provided by Google Streetview) is provided below.

**Figure 10: Champagne Avenue (Looking North)**



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

**Table 8: Segment MMLOS Summary**

Segment	PLOS	BLOS	TLOS	TkLOS	Auto LOS
Champagne Avenue	F	B	D	B	C
<b>Target</b>	<b>A</b>	<b>D</b>	<b>-</b>	<b>-</b>	<b>E</b>

Champagne Avenue meets the target Auto LOS and Bicycle LOS (BLOS), however it does not meet the target Pedestrian LOS (PLOS). There is no target Transit LOS (TLOS) or Truck LOS (TkLOS) for Champagne Avenue. To achieve the target PLOS A, a 2.0m sidewalk and 2.0m boulevard is required along Champagne Avenue.

The proposed development will provide a 2.0m concrete sidewalk adjacent to the curb with street trees in behind along the frontage of the site, achieving a PLOS C. This is an improvement on the existing condition and is consistent with the curbside sidewalk to the north and south of the site.

## 6.4 Access Intersections Design

The existing access to Champagne Avenue will be removed and two new accesses are proposed. The northern access will serve a parking garage containing 91 parking spaces. The southern access will serve the parking garage for the adjacent development at 285 Loretta Street. The City's Private Approach By-law permits two two-way accesses based on the existing frontage of the subject site.

The proposed northern access serving the underground parking lot for the subject development will be 6.0m in width and will have a maximum grade of 5-6% for a distance of 9m within the property, conforming to the requirements of the City's Zoning By-law and Private Approach By-law. The proposed access will be located 0.6m from the northern property line. A waiver to the City's Private Approach By-law is required for relief of the minimum 3m offset to the adjacent property line. The proposed access is located approximately 16m south of the existing access to 116 Beech Street, has adequate sight lines and does not create a traffic hazard. As such a waiver to the City's Private Approach By-law is requested.

The proposed southern access serving a right-of-way to the parking garage at 285 Loretta Street will be 6.2m in width and will be located 3.5m from the southern property line. The proposed width and location of the access conforms to the City's Zoning By-law and Private Approach By-law. A review of this access was conducted by IBI Group in a memorandum dated September 15, 2016, and is included in **Appendix H**.

Both accesses will operate under side street stop control, maintaining free flow conditions along Champagne Avenue. Operations at the proposed accesses has been conducted for the 2021 build-out and 2026 horizon years. Based on the analysis, both accesses will operate with a LOS A during the weekday AM and PM peak hours.

## 6.5 Transportation Demand Management

A review of the TDM – Measures checklist was conducted and can be found in **Appendix G**. To encourage travel by sustainable modes, the following TDM measures will be implemented for the subject site:

- Display local area maps with walking/cycling access routes and key destinations at major entrances;
- Display relevant transit schedules and route maps at entrances; and
- Unbundle parking cost from monthly rent.

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

## 6.6 Neighbourhood Traffic Management

Champagne Avenue and Beech Street are classified as local roadways. Existing two-way traffic volumes along these roadways are summarized as follows:

- |                    |                 |                 |
|--------------------|-----------------|-----------------|
| • Beech Street     | AM Peak: 229vph | PM Peak: 345vph |
| • Champagne Avenue | AM Peak: 353vph | PM Peak: 401vph |

The City's 2017 TIA Guidelines identify an Area Traffic Management (ATM) threshold of 120vph during peak hours for local roadways. The existing traffic volumes along these roadways exceed the ATM threshold for a local roadway. However, the lane capacity along these roadways is estimated at 400 vehicles per hour per lane (vphpl) based on the City's TRANS Long Range Transportation Model. Based on the foregoing, peak directional traffic along Beech Street is currently operating with a v/c ratio of 0.29 during the AM peak hour and 0.62 during the PM peak hour. Peak directional traffic along Champagne Avenue is currently operating with a v/c ratio of 0.64 during the AM peak hour and 0.78 during the PM peak hour.

The proposed development is anticipated to generate 23 vehicle trips during the AM peak hour and 24 vehicle trips during the PM peak hour. Of this, the majority (18 vehicles) are anticipated to arrive/depart to/from the south via Champagne Avenue. This equates to an increase of approximately 5% compared to the existing traffic, and is not anticipated to have a significant impact to the existing operations along Champagne Avenue.

## 6.7 Transit

Based on the trip generation presented in Section 5.1, the proposed development is anticipated to generate 92 transit trips (70 boarding, 22 alighting) during the AM peak hour and 96 transit trips (37 boarding, 59 alighting) during the PM peak hour. OC Transpo bus stops within a 400m walking distance of the subject site serve OC Transpo Routes 2, 56, 85, 101 and 103. These transit routes operate with 15 to 30 minute headways during peak periods, and connect to various transit stations providing comprehensive transit coverage across the City of Ottawa.

## 6.8 Review of Network Concept

As identified in Section 3.4, this module is exempt.

## 6.9 Intersection Design

### 6.9.1 Existing Intersection MMLOS Analysis

This section provides a review of the signalized study area intersections using complete streets principles. The MMLOS guidelines produced by IBI Group in October 2015 were used to evaluate the LOS of all study area intersections for each mode of transportation. Schedule B of the City of Ottawa's Official Plan indicates policy areas for the study area intersections, and is summarized below:

- |                                   |   |
|-----------------------------------|---|
| • Carling Avenue/Sherwood Drive   | Arterial Mainstreet and General Urban Area  |
| • Carling Avenue/Champagne Avenue | Mixed-Use Centre                            |
| • Carling Avenue/Preston Street   | Mixed-Use Centre                            |
| • Preston Street/Beech Street     | Traditional Mainstreet and Mixed-Use Centre |

All intersections are also located within 600m of the Carling Avenue O-Train station. Aerial photos of the study area intersections are provided in Section 4.1.2. The following table summarizes the findings of the MMLOS intersection analysis. Detailed intersection MMLOS calculations are included in **Appendix J**.

**Table 9: Intersection MMLOS Summary**

Segment	PLOS	BLOS	TLOS	TkLOS	Auto LOS
Carling Avenue/ Sherwood Drive	F	F	C	D	A
<b>Target</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
Carling Avenue/ Champagne Avenue	F	F	C	F	A
<b>Target</b>	<b>A</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>E</b>
Carling Avenue/ Preston Street	F	F	F	D	E
<b>Target</b>	<b>A</b>	<b>B</b>	<b>D</b>	<b>D</b>	<b>E</b>
Preston Street/ Beech Street	D	F	B	F	A
<b>Target</b>	<b>A</b>	<b>B</b>	<b>-</b>	<b>D</b>	<b>E</b>

**Carling Avenue/Sherwood Drive**

The Carling Avenue/Sherwood Drive intersection meets the target Auto LOS, TkLOS and TLOS. However, this intersection does not meet the target PLOS and BLOS.

The PLOS and BLOS at this intersection will be improved by the City's future Carling Avenue Transit Priority Measures project. The functional design for this project includes the following improvements to this intersection:

- a reduction in the north-south crossing distance for pedestrians; and
- two-stage left turn movements for cyclists.

**Carling Avenue/Champagne Avenue**

The Carling Avenue/Champagne Avenue intersection meets the target Auto LOS and TLOS. However, this intersection does not meet the target PLOS, BLOS and TkLOS.

The PLOS and BLOS at this intersection will be improved by the City's future Carling Avenue Transit Priority Measures project. The functional design for this project includes the following improvements to this intersection:

- a two-stage pedestrian crossing on the east leg; and
- two-stage left turn movements for cyclists.

No improvements are proposed to the TkLOS at this intersection. It is noted that Champagne Avenue is a local roadway which does not have a target TkLOS.

**Carling Avenue/Preston Street**

The Carling Avenue/Preston Street intersection meets the target Auto LOS and TkLOS. However, it does not meet the target PLOS, BLOS, and TLOS.

The PLOS and TLOS at this intersection will be improved by the City's future Carling Avenue Transit Priority Measures project. The functional design for this project includes the following improvements to this intersection:

- two-stage pedestrian crossings on the east and west legs;
- a median eastbound bus lane; and
- a curbside westbound bus lane.

No improvements are proposed to the BLOS at this intersection. Alternative to using Preston Street, cyclists have the opportunity to use the Trillium Pathway which runs on a north-south alignment between the Trans Canada Trail and Queen Elizabeth Drive. The Trillium Pathway crosses Carling Avenue at a mid-block traffic signal, approximately 100m west of Preston Street. The majority of cyclists are anticipated to use the Trillium Pathway to travel north-south through the study area rather than using Preston Street.

#### Preston Street/Beech Street

The Preston Street/Beech Street intersection meets the target Auto LOS, however it does not meet the target PLOS, BLOS and TkLOS.

To improve the Pedestrian Exposure to Traffic at Signalized Intersections (PETSI) score to achieve a PLOS B, consideration could be given by the City to implementing right turn on red restrictions on all approaches. The implementation of right turn on red restrictions is not anticipated to have a significant impact on the existing intersection operations, which is currently operating with an Auto LOS A.

A review of Ontario Traffic Manual (OTM) Book 18 Desirable Cycling Facility Pre-Selection Nomograph suggests mixed-use travel lanes are appropriate for both Preston Street and Beech Street. As noted above, the majority of cyclists are anticipated to use the Trillium Pathway as an alternative to Preston Street. As such, no improvements to the cycling facilities at this intersection are proposed. Consideration could be given by the City to reducing the operational speed along Preston Street and Beech Street to 40km/hr to achieve the target BLOS B.

Increased radii are required on all legs to improve the TkLOS at this intersection. It is noted that Beech Street is a local roadway and is not classified as a truck route, which does not have a target TkLOS.

### **6.9.2 2021 Background Intersection Operations**

Intersection capacity analysis has been completed for the 2021 background traffic conditions. The intersection parameters used in the analysis are consistent with the TIA guidelines (saturation flow rate: 1800 vphpl, PHF: 1.0).

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

**Table 10: 2021 Background Intersection Operations**

Intersection	Period	Critical Movement			Intersection		
		Max V/C or Delay	LOS	Mvmt	Delay	V/C	LOS
Carling Ave/ Sherwood Dr	AM	0.55	A	SB	12 sec	0.28	A
	PM	0.68	B	SB	16 sec	0.55	A
Carling Ave/ Champagne Ave	AM	0.43	A	SBL	5 sec	0.25	A
	PM	0.50	A	SBR	11 sec	0.43	A
Carling Ave/ Preston St	AM	0.89	D	NBL	38 sec	0.69	B
	PM	1.11	F	NBL	59 sec	0.88	D
		1.04	F	WBL			
		0.94	E	SBT/R			
		0.92	E	WBT/R			
Preston St/ Beech St	AM	0.54	A	EB	11 sec	0.49	A
	PM	0.47	A	WBT/R	11 sec	0.40	A
Beech St/ Champagne Ave <sup>1</sup>	AM	9 sec	A	WB	8 sec	0.16	A
	PM	9 sec	A	WB	8 sec	0.17	A

1. Unsignalized Intersection

All study area intersections are anticipated to operate with an overall LOS D or better during the weekday AM and PM peak hours, achieving the target LOS E within 600m of a transit station. However, the northbound and westbound left turn movements at the Carling Avenue/Preston Street intersection are anticipated to operate with a LOS F during the PM peak hour. The 95<sup>th</sup> percentile queue length for the left turn movements on all approaches to this intersection are anticipated to exceed the existing storage length of the left turn lane during the AM and PM peak hours. The 95<sup>th</sup> percentile queue length for the left turn movements at this intersection are summarized as follows:

- Eastbound left            AM: 80m            PM: 60m
- Westbound left        AM: 70m            PM: 160m
- Northbound left       AM: 75m            PM: 135m
- Southbound left       AM: 40m            PM: 40m

### 6.9.3 2026 Background Intersection Operations

Intersection capacity analysis has been completed for the 2026 background traffic conditions. The intersection parameters used in the analysis are consistent with the TIA guidelines (saturation flow rate: 1800 vphpl, PHF: 1.0). The results of the intersection capacity analysis are summarized in the following table.

**Table 11: 2026 Background Intersection Operations**

Intersection	Period	Critical Movement			Intersection		
		Max V/C or Delay	LOS	Mvmt	Delay	V/C	LOS
Carling Ave/ Sherwood Dr	AM	0.55	A	SB	12 sec	0.28	A
	PM	0.69	B	SB	16 sec	0.56	A
Carling Ave/ Champagne Ave	AM	0.40	A	SBL	5 sec	0.25	A
	PM	0.50	A	SBR	12 sec	0.43	A
Carling Ave/ Preston St	AM	0.92	E	NBL	40 sec	0.74	C
		0.91	E	SBT/R			
	PM	1.15	F	NBL	64 sec	0.91	E
		1.08	F	WBL			
		0.97	E	SBT/R			
		0.97	E	WBT/R			
Preston St/ Beech St	AM	0.56	A	NBT/R	11 sec	0.52	A
	PM	0.47	A	WBT/R	11 sec	0.43	A
Beech St/ Champagne Ave <sup>1</sup>	AM	9 sec	A	WB	8 sec	0.16	A
	PM	9 sec	A	WB	8 sec	0.17	A

1. Unsignalized Intersection

All study area intersections are anticipated to operate with an overall LOS E or better during the weekday AM and PM peak hours, achieving the target within 600m of a transit station. However, the northbound and westbound left turn movements at the Carling Avenue/Preston Street intersection are anticipated to operate with a LOS F during the PM peak hour. The 95<sup>th</sup> percentile queue length for the left turn movements on all approaches to this intersection are not anticipated to increase significantly, compared to the 2021 background traffic condition.

#### 6.9.4 2021 Total Intersection Operations

Intersection capacity analysis has been completed for the 2021 total traffic conditions. The intersection parameters used in the analysis are consistent with the TIA guidelines (saturation flow rate: 1800 vphpl, PHF: 1.0). The results of the intersection capacity analysis are summarized in the following table.

**Table 12: 2021 Total Intersection Operations**

Intersection	Period	Critical Movement			Intersection		
		Max V/C or Delay	LOS	Mvmt	Delay	V/C	LOS
Carling Ave/ Sherwood Dr	AM	0.55	A	SB	12 sec	0.28	A
	PM	0.68	B	SB	16 sec	0.55	A
Carling Ave/ Champagne Ave	AM	0.43	A	SBL	6 sec	0.27	A
	PM	0.50	A	SBR	12 sec	0.43	A
Carling Ave/ Preston St	AM	0.90	D	NBL	38 sec	0.70	C
	PM	1.12	F	NBL	60 sec	0.89	D
		1.04	F	WBL			
		0.94	E	SBT/R			
		0.92	E	WBT/R			
Preston St/ Beech St	AM	0.55	A	EB	11 sec	0.49	A
	PM	0.47	A	WBT/R	11 sec	0.41	A
Beech St/ Champagne Ave <sup>1</sup>	AM	9 sec	A	WB	8 sec	0.16	A
	PM	9 sec	A	WB	8 sec	0.17	A

1. Unsignalized Intersection

The addition of site generated traffic is not anticipated to have a significant impact on the study area intersection operations. All study area intersections are anticipated to operate with an overall LOS D or better during the weekday AM and PM peak hours, achieving the target LOS E within 600m of a transit station. However, consistent with the background traffic conditions, the northbound and westbound left turn movements at the Carling Avenue/Preston Street intersection are anticipated to operate with a LOS F during the PM peak hour. The 95<sup>th</sup> percentile queue length for the left turn movements on all approaches to this intersection are not anticipated to increase significantly, compared to the 2021 background traffic condition.

### 6.9.5 2026 Total Intersection Operations

Intersection capacity analysis has been completed for the 2026 total traffic conditions. The intersection parameters used in the analysis are consistent with the TIA guidelines (saturation flow rate: 1800 vphpl, PHF: 1.0). The results of the intersection capacity analysis are summarized in the following table.



**Table 13: 2026 Total Intersection Operations**

Intersection	Period	Critical Movement			Intersection		
		Max V/C or Delay	LOS	Mvmt	Delay	V/C	LOS
Carling Ave/ Sherwood Dr	AM	0.55	A	SB	12 sec	0.28	A
	PM	0.69	B	SB	16 sec	0.56	A
Carling Ave/ Champagne Ave	AM	0.43	A	SBL	6 sec	0.27	A
	PM	0.50	A	SBR	12 sec	0.44	A
Carling Ave/ Preston St	AM	0.93	E	NBL	40 sec	0.74	C
		0.91	E	SBT/R			
	PM	1.16	F	NBL	65 sec	0.91	E
		1.08	F	WBL			
		0.97	E	SBT/R			
		0.97	E	WBT/R			
Preston St/ Beech St	AM	0.56	A	NBT/R	11 sec	0.52	A
	PM	0.47	A	WBT/R	11 sec	0.43	A
Beech St/ Champagne Ave <sup>1</sup>	AM	9 sec	A	WB	8 sec	0.16	A
	PM	9 sec	A	WB	8 sec	0.17	A

1. Unsignalized Intersection

The addition of site generated traffic is not anticipated to have a significant impact on the study area intersection operations. All study area intersections are anticipated to operate with an overall LOS E or better during the weekday AM and PM peak hours, achieving the target within 600m of a transit station. However, consistent with the background traffic conditions, the northbound and westbound left turn movements at the Carling Avenue/Preston Street intersection are anticipated to operate with a LOS F during the PM peak hour. The 95<sup>th</sup> percentile queue length for the left turn movements on all approaches to this intersection are not anticipated to increase significantly, compared to the 2026 background traffic condition.

## 7.0 CONCLUSIONS AND RECOMMENDATIONS

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

### Development Design and Parking

- Pedestrian facilities will be provided between the main building entrance/exits and the sidewalk along the west side of Champagne Avenue. A new 2.0m concrete sidewalk will be provided adjacent to the curb along the frontage of the subject site.
- Bicycle parking for the proposed development will be provided in accordance with the City of Ottawa Zoning By-law. Six bicycle parking spaces are proposed at the front of the building, 84 are proposed on the first level of underground parking, and 48 on the second level.
- OC Transpo bus stops #6654, #6656, #7369, #8014 and #3061 are located within a 400m walking distance of the subject site. These bus stops provide service to OC Transpo routes 2, 56, 85, 101, and 103.
- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.
- The proposed vehicular and bicycle parking conforms to the requirements of the City's Zoning By-law.

### Boundary Street MMLOS

- Champagne Avenue meets the target Auto LOS and Bicycle LOS (BLOS), however it does not meet the target Pedestrian LOS (PLOS). There is no target Transit LOS (TLOS) or Truck LOS (TkLOS) for Champagne Avenue.
- The proposed development will provide a 2.0m concrete sidewalk adjacent to the curb with street trees in behind along the frontage of the site, achieving a PLOS C. This is an improvement on the existing condition and is consistent with the curbside sidewalk to the north and south of the site.

### Access Design

- The existing access to Champagne Avenue will be removed and two new accesses are proposed. The northern access will serve a parking garage containing 91 parking spaces. The southern access will serve the parking garage for the adjacent development at 285 Loretta Street. Both accesses will operate under side street stop control.
- The proposed northern access serving the underground parking lot for the subject development will be 6.0m in width and will have a maximum grade of 5-6% for a distance of 9m within the property, conforming to the requirements of the City's Zoning By-law and Private Approach By-law.
- The proposed northern access will be located 0.6m from the northern property line. A waiver to the City's Private Approach By-law is required for relief of the minimum 3m offset to the adjacent property line. The proposed access is located approximately 16m south of the existing access to 116 Beech Street, has adequate sight lines and does not create a traffic hazard.
- The proposed southern access serving a right-of-way to the parking garage at 285 Loretta Street will be 6.2m in width and will be located 3.5m from the southern property line. The proposed width and location of the southern access conforms to the City's Zoning By-law and Private Approach By-law.

### Transportation Demand Management

- To encourage travel by sustainable modes, the following TDM measures will be implemented for the subject site:
  - Display local area maps with walking/cycling access routes and key destinations at major entrances;
  - Display relevant transit schedules and route maps at entrances; and
  - Unbundle parking cost from monthly rent.

### Neighbourhood Traffic Management

- The proposed development is anticipated to generate 23 vehicle trips during the AM peak hour and 24 vehicle trips during the PM peak hour. Of this, the majority (18 vehicles) are anticipated to arrive/depart to/from the south via Champagne Avenue. This equates to an increase of approximately 5% compared to the existing traffic, and is not anticipated to have a significant impact to the existing operations along Champagne Avenue.

### Transit

- The proposed development is anticipated to generate 92 transit trips (70 boarding, 22 alighting) during the AM peak hour and 96 transit trips (37 boarding, 59 alighting) during the PM peak hour. OC Transpo bus stops within a 400m walking distance of the subject site serve OC Transpo Routes 2, 56, 85, 101 and 103. These transit routes operate with 15 to 30

minute headways during peak periods, and connect to various transit stations providing comprehensive transit coverage across the City of Ottawa.

### Intersection MMLoS

- Carling Avenue/Sherwood Drive
  - The Carling Avenue/Sherwood Drive intersection meets the target Auto LOS, TkLOS and TLOS.
  - This intersection does not meet the target PLOS and BLOS. The PLOS and BLOS at this intersection will be improved by the City's future Carling Avenue Transit Priority Measures project. The functional design for this intersection includes a reduction in the north-south crossing distance for pedestrians and a two-stage left turn movement for cyclists.
- Carling Avenue/Champagne Avenue
  - The Carling Avenue/Champagne Avenue intersection meets the target Auto LOS and TLOS.
  - This intersection does not meet the target PLOS, BLOS and TkLOS. The PLOS and BLOS at this intersection will be improved by the City's future Carling Avenue Transit Priority Measures project. The functional design for this intersection includes a two-stage pedestrian crossing on the east leg and two-stage left turn movements for cyclists. No improvements are proposed to the TkLOS at this intersection. It is noted that Champagne Avenue is a local roadway which does not have a target TkLOS.
- Carling Avenue/Preston Street
  - The Carling Avenue/Preston Street intersection meets the target Auto LOS and TkLOS.
  - This intersection does not meet the target PLOS, BLOS, and TLOS. The PLOS and TLOS at this intersection will be improved by the City's future Carling Avenue Transit Priority Measures project. The functional design for this intersection includes two-stage pedestrian crossing on the east and west legs, a median eastbound bus lane, and a curbside westbound bus lane.
  - No improvements are proposed to the BLOS at this intersection. The majority of cyclists are anticipated to use the Trillium Pathway to travel north-south through the study area rather than using Preston Street.
- Preston Street/Beech Street
  - The Preston Street/Beech Street intersection meets the target Auto LOS, however it does not meet the target PLOS, BLOS and TkLOS.
  - To improve the Pedestrian Exposure to Traffic at Signalized Intersections (PETSI) score to achieve a PLOS B, consideration could be given by the City to implementing right turn on red restrictions on all approaches. The implementation of right turn on red restrictions is not anticipated to have a significant impact on the existing intersection operations, which is currently operating with an Auto LOS A.
  - A review of Ontario Traffic Manual (OTM) Book 18 Desirable Cycling Facility Pre-Selection Nomograph suggests mixed-use travel lanes are appropriate for both Preston Street and Beech Street. As noted above, the majority of cyclists are anticipated to use the Trillium Pathway as an alternative to Preston Street. As such, no improvements to the cycling facilities at this intersection are proposed. Consideration could be given by the City to reducing the operational speed along Preston Street and Beech Street to 40km/hr to achieve the target BLOS B.

- Increased radii are required on all legs to improve the TkLOS at this intersection. It is noted that Beech Street is a local roadway and is not classified as a truck route, which does not have a target TkLOS.

#### 2021 and 2026 Background Traffic

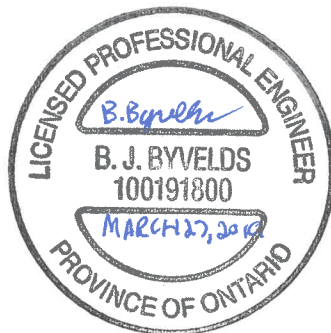
- All study area intersections are anticipated to operate with a LOS E or better during the weekday AM and PM peak hours, achieving the target within 600m of a transit station.
- The northbound and westbound left turn movements at the Carling Avenue/Preston Street intersection are anticipated to operate with a LOS F during the PM peak hour. The 95<sup>th</sup> percentile queue length for the left turn movements on all approaches to this intersection are anticipated to exceed the existing storage length of the left turn lane during the AM and PM peak hours.

#### 2021 and 2026 Total Traffic

- The addition of site generated traffic is not anticipated to have a significant impact on the study area intersection operations.
- All study area intersections are anticipated to operate with a LOS E or better during the weekday AM and PM peak hours, achieving the target within 600m of a transit station.
- Consistent with the background traffic conditions, the northbound and westbound left turn movements at the Carling Avenue/Preston Street intersection are anticipated to operate with a LOS F during the PM peak hour. The 95<sup>th</sup> percentile queue length for the left turn movements on all approaches to this intersection are not anticipated to increase significantly, compared to the background traffic conditions.

#### **NOVATECH**

Prepared by:



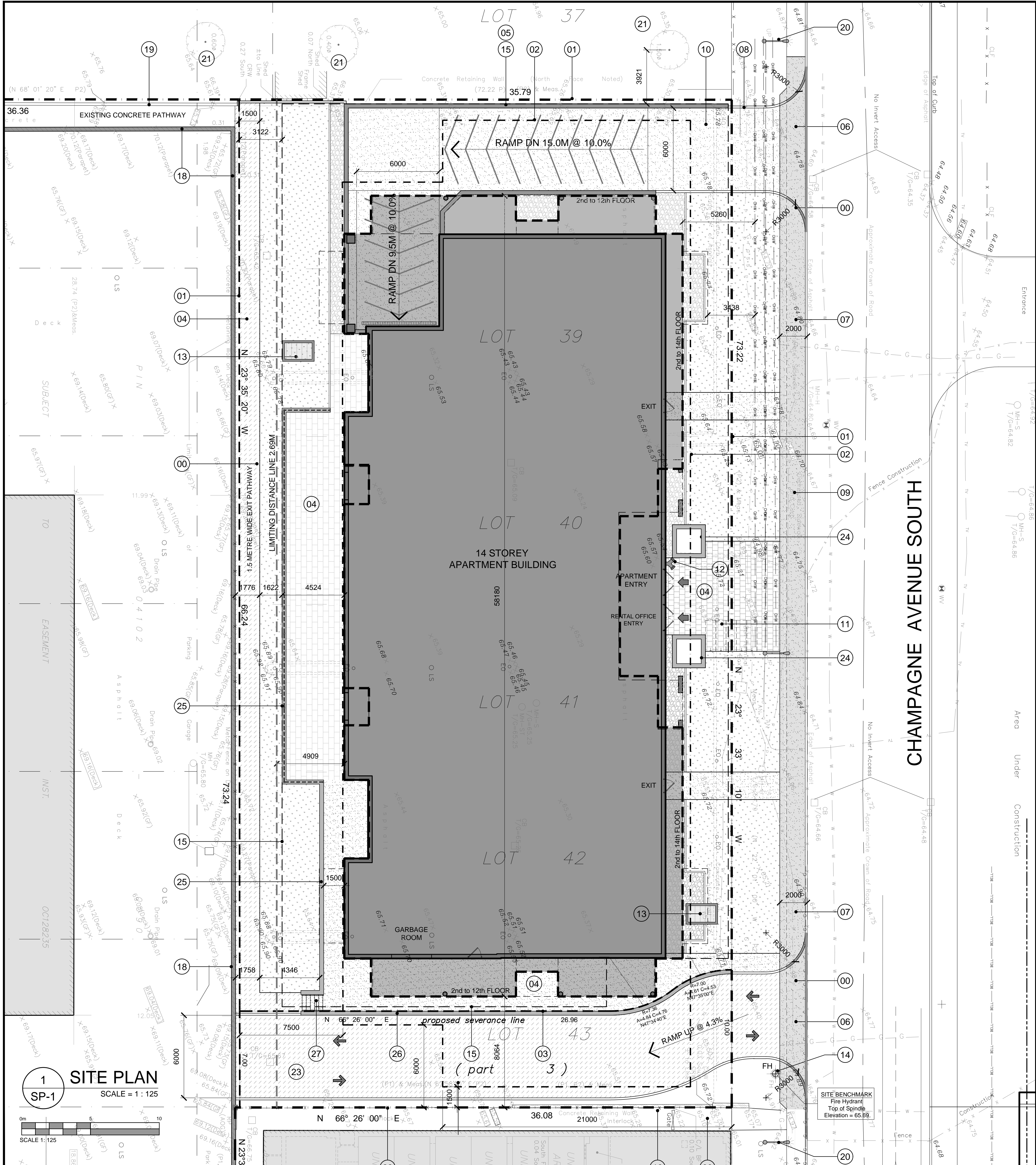
Brad Byvelds, P. Eng.  
Project Coordinator | Transportation/Traffic

## **APPENDIX A**

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Proposed Site Plan





KEY MAP

- DRAWING NOTES**
- PROPERTY LINE
  - BUILDING SETBACKS
  - EASEMENT LINE
  - HARD SURFACE PAVING, SEE LANDSCAPE PLAN FOR PATTERN AND TYPE
  - PARKING GARAGE ENTRY DRIVEWAY / RAMP WITH TRENCH DRAIN AND RETAINING WALLS AS REQUIRED
  - DEPRESSED CURB & SIDEWALK TO CITY STANDARDS
  - 2.0 M WIDE SIDEWALK & CURB TO CITY STANDARDS
  - 150mm BARRIER CURB
  - REPLACE EXISTING DEPRESSED CURB WITH BARRIER CURB, TO CITY STANDARDS
  - STORM WATER TANK (P1 LEVEL) - SEE CIVIL PLAN
  - BICYCLE PARKING SPACE
  - SIAMSE CONNECTION
  - AIR INTAKE / EXHAUST GRILL
  - EXISTING FIRE HYDRANT
  - OUTLINE OF UNDERGROUND PARKING LEVELS
  - PROPOSED LOCATION OF UNDERGROUND UTILITIES
  - GAS REGULATOR / METER EQUIPMENT AREA
  - EXISTING 1 STOREY COVERED PARKING LEVEL WITH EXPOSED SIDES
  - EXISTING RETAINING WALL & WALK TO REMAIN
  - EXISTING CITY STREET LIGHTING
  - EXISTING TREE
  - EXISTING METAL PICKETS FENCE
  - ASPHALT DRIVE WAY WITH 150 BARRIER CURBS
  - LOW PLANTER WALL WITH SEASONAL PLANTS
  - CONCRETE UNIT LANDSCAPE RETAINING WALL
  - CAST IN PLACE CONCRETE RETAINING WALL WITH CAR BARRIER
  - CONCRETE STEPS WITH HAND RAILINGS AS REQUIRED

- SITE PLAN SYMBOLS**
- CONCRETE UNIT PAVERS SURFACE ±
  - CITY SIDEWALK
  - CONCRETE SURFACE
  - ASPHALT WALK / DRIVEWAY
  - SOFT LANDSCAPING
  - RIVER STONE
  - BIKE RACK
  - TWO WAY VEHICLE CIRCULATION
  - MAIN ENTRANCE
  - COMMERCIAL DOOR / FIRE EXIT
  - PROPERTY LINE
  - CITY STREET LIGHTING

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**PROJECT INFORMATION**

**ZONING** R5B H(42)

**SITE AREA** 2,619.15 sq. m. (26,192 sq. ft.)

**FRONT YARD SETBACK** 3.0 M

**INTERIOR SIDE YARD SETBACK** 1.5 & 6.0 M

**REAR YARD SETBACK** 7.5 M

**LANDSCAPE AREA 30% MINIMUM** 1.5 & 6.0

**AMENITY SPACE - PER UNIT** 6.0 sq. m.

**PROJECT STATISTICS**

**BUILDING HEIGHT** 42.0 M

**AVERAGE MEAN GRADE** (GEO. ELEV.) 64.90

**GROSS BUILDING - AREAS**  
(CITY OF OTTAWA'S DEFINITION)

**PARKING LEVELS (2)**

**GROUND FLOOR** 334.6 sq. m. 3,602 sq. ft.

**2nd to 12th FLOOR** 11 x 1,108.5 sq. m. 12,193.7 sq. m. 11 x 11,832 sq. ft. 131,252 sq. ft.

**13th & 14th FLOOR** 2 x 1,015.1 sq. m. 2,030.1 sq. m. 2 x 10,829 sq. ft. 21,657 sq. ft.

**MECHANICAL LEVEL** 0.0 sq. m. 0.0 sq. ft.

**TOTAL AREA ABOVE GRADE** 14,558.5 sq. m. 156,706 sq. ft.

**UNIT STATISTICS**

**STUDIO UNIT** 22

**1 BEDROOM UNIT** 146

**2 BEDROOM UNIT** 63

**3 BEDROOM UNIT** 5

**TOTAL** 236

**CAR PARKING**

**REQUIRED by ZONING BY-LAW**

**RESIDENCE** - NOT REQUIRED 0

**VISITOR** - 0.1 PER DWELLING UNIT (AFTER 12 UNITS) 22

**TOTAL** 22

**PROVIDED**

**RESIDENCE** 69

**VISITOR** 22

**TOTAL** 91

**BICYCLE PARKING**

**REQUIRED**

**RESIDENCE** - 0.5 PER UNIT (236 UNITS) 118

**PROVIDED**

**BASEMENT LEVEL** 132

**EXTERIOR** 6

**TOTAL** 138

**LOT COVERAGE**

**PAVED SURFACE** = 482.6 sq. m. 19.3%

**BUILDING FOOTPRINT** = 1,160.9 sq. m. 46.5%

**LANDSCAPE OPEN SPACE** = 853.5 sq. m. 34.2%

**TOTAL** = 2,497 sq. m. 100.0%

**AMENITY SPACE**

**PRIVATE BALCONIES** = 951.0 sq. m.

**1st FLOOR COMMUNAL INTERIOR** = 317.0 sq. m.

**AT GRADE COMMUNAL EXTERIOR** = 500.0 sq. m.

**TOTAL** = 1,768.0 sq. m.

**TOTAL COMMUNAL** = 817.0 sq. m.

**REQUIRED - 6.0M<sup>2</sup> PER UNIT (236) = 1,416.0 sq. m.**

**REQUIRED COMMUNAL @ 50% = 708.0 sq. m.**

**BUILDING FOOTPRINT AREAS**  
(CONSTRUCTION AREA)

**P2 PARKING LEVEL** 2,095.2 sq. m. 0.0 sq. ft.

**P1 PARKING LEVEL** 2,095.2 sq. m. 0.0 sq. ft.

**GROUND FLOOR** 1,162.4 sq. m. 0.0 sq. ft.

**2nd to 12th FLOOR** 11 x 1,307.1 sq. m. 8,554.4 sq. m. 11 x 1,283 sq. ft. 85,079 sq. ft.

**13th & 14th FLOOR** 2 x 1,197.8 sq. m. 3,095.5 sq. m. 31,775 sq. ft.

**MECHANICAL LEVEL** 370.7 sq. m. 0.0 sq. ft.

**TOTAL AREA ABOVE GRADE** 17,373.4 sq. m. 187,006 sq. ft.

**LEGAL DESCRIPTION**

**PLAN OF SURVEY OF LOTS 38 to 43 (Inclusive), LOTS 53 to 59 (Inclusive) And PART OF THE ADJACENT LANE (As Closed by Judge's Order, Inst. CR227792) REGISTERED PLAN 131037 CITY OF OTTAWA**  
Surveyed by Annis, O'Sullivan, Vollebakk Ltd.

**PROJECT DEVELOPER**

**District Realty**  
50 Bayswater Ave.  
Ottawa, Ontario K1Y 2E9  
Tel: (613) 759-8383  
Fax: (613) 759-8448  
Email: kellykerrigan@districtrealty.com

**NOTATION SYMBOLS:**

(00) INDICATES DRAWING NOTES, LISTED ON EACH SHEET.

(00) INDICATES ASSEMBLY TYPE; REFER TO TYPICAL ASSEMBLIES SCHEDULE.

(00) INDICATES WINDOW TYPE; REFER TO WINDOW ELEVATIONS AND DETAILS ON A500 SERIES.

(000) INDICATES DOOR TYPE; REFER TO DOOR SCHEDULE AND DETAILS ON A500 SERIES.

— DETAIL NUMBER

— TITLE

— DETAIL REFERENCE PAGE

— DETAIL CROSS REFERENCE PAGE

**ISSUED FOR SITE PLAN CONTROL** Mar 22, 19

**ISSUED FOR PRE CONSULTATION** Dec 17, 18

**ARCHITECT SEAL:** OTTAWA ASSOCIATION OF ARCHITECTS

**CLIENT:** DISTRICT REALTY

**PROJECT TITLE:** 90 CHAMPAGNE AVENUE SOUTH

**OTTAWA** **ONTARIO**

**SHEET TITLE:** SITE PLAN

**DRAWN:** R.V.

**CHECKED:** R.V.

**SCALE:** 1:125

**SHEET No.:** SP-1

**PROJECT No.:** 1809



## **APPENDIX B**

---

TIA Screening Form

## City of Ottawa 2017 TIA Guidelines Screening Form

### 1. Description of Proposed Development

Municipal Address	<b>90 Champagne Avenue South</b>
Description of Location	<b>Midblock between Beech Street and Hickory Street</b>
Land Use Classification	<b>High-Rise Apartments</b>
Development Size (units)	<b>236 units</b>
Development Size (m <sup>2</sup> )	<b>-</b>
Number of Accesses and Locations	<b>Two accesses on Champagne Avenue, one each at north and south property lines</b>
Phase of Development	<b>1</b>
Buildout Year	<b>2021</b>

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

### 2. Trip Generation Trigger

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

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

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

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



### 3. Location Triggers

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

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

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

### 4. Safety Triggers

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

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

### 5. Summary

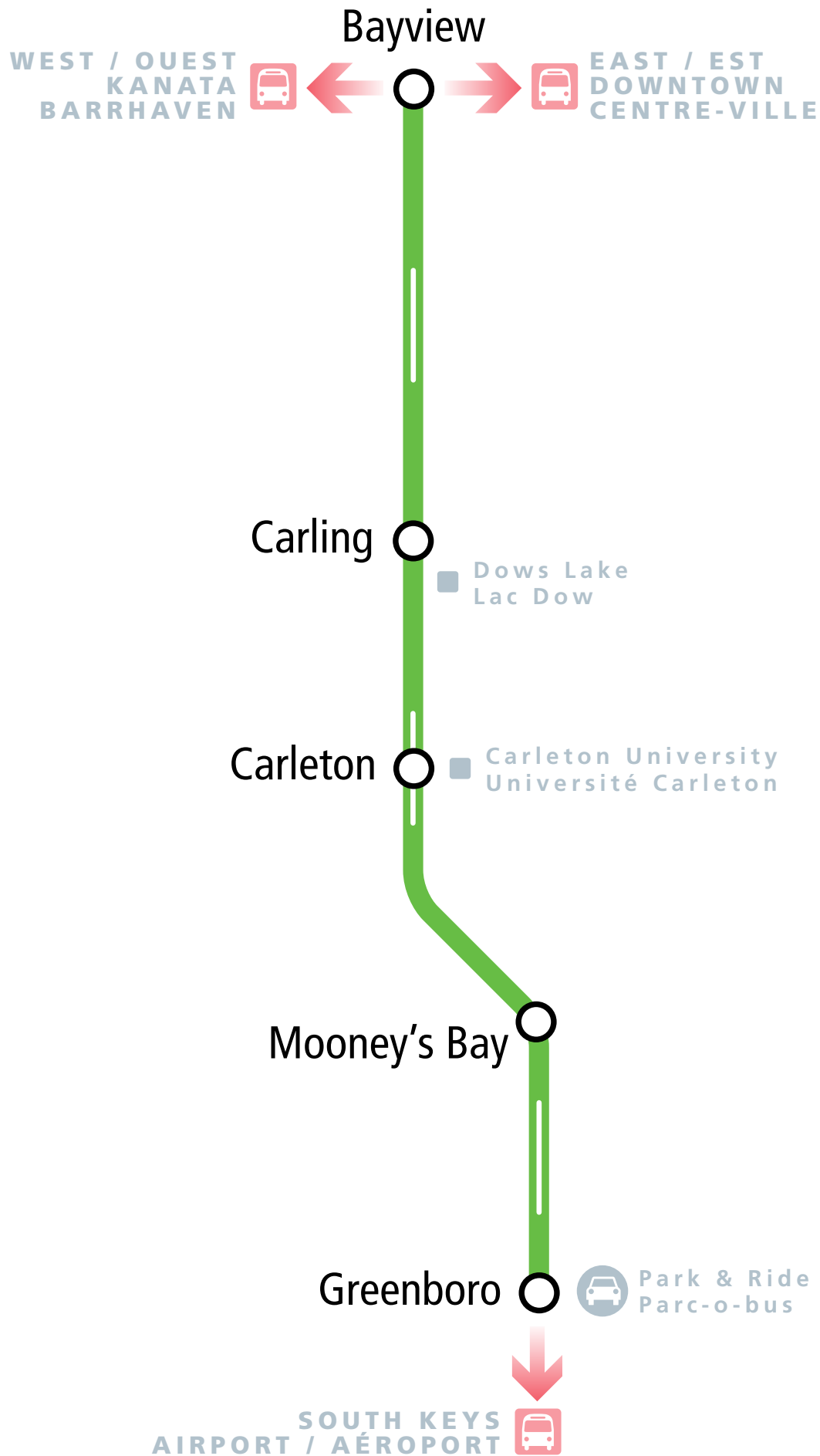
	Yes	No
Does the development satisfy the Trip Generation Trigger?	✓	
Does the development satisfy the Location Trigger?	✓	
Does the development satisfy the Safety Trigger?		✓

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

## **APPENDIX C**

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### OC Transpo Route Maps



FORMER / ANCIEN 6

**56**

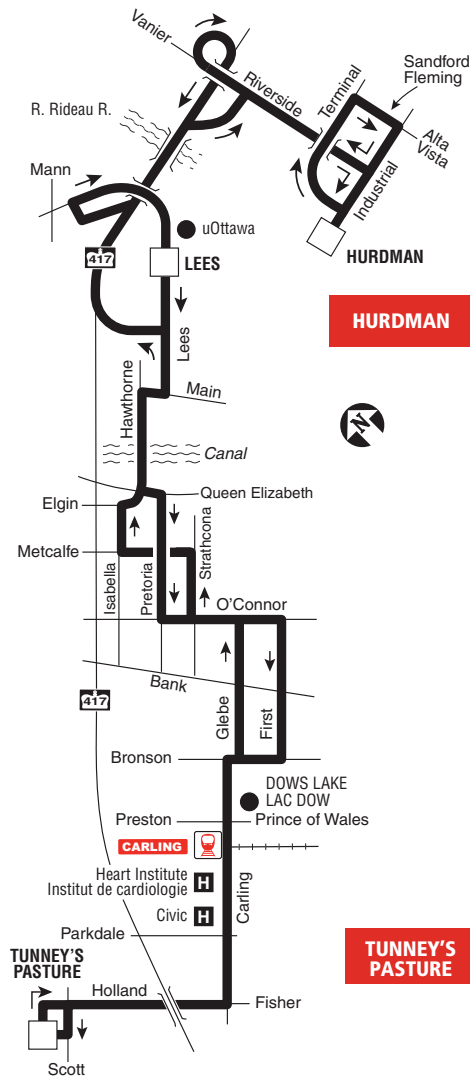
*Local*

**HURDMAN  
TUNNEY'S  
PASTURE**

**Monday to Friday / Lundi au vendredi**

Peak periods only

Périodes de pointe seulement



Legend • Légende



Transitway Station / Station du Transitway



O-Train Connection  
Correspondance avec l'O-Train

2017.04



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

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

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

Customer Relations

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

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

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

**Effective April 24, 2017**

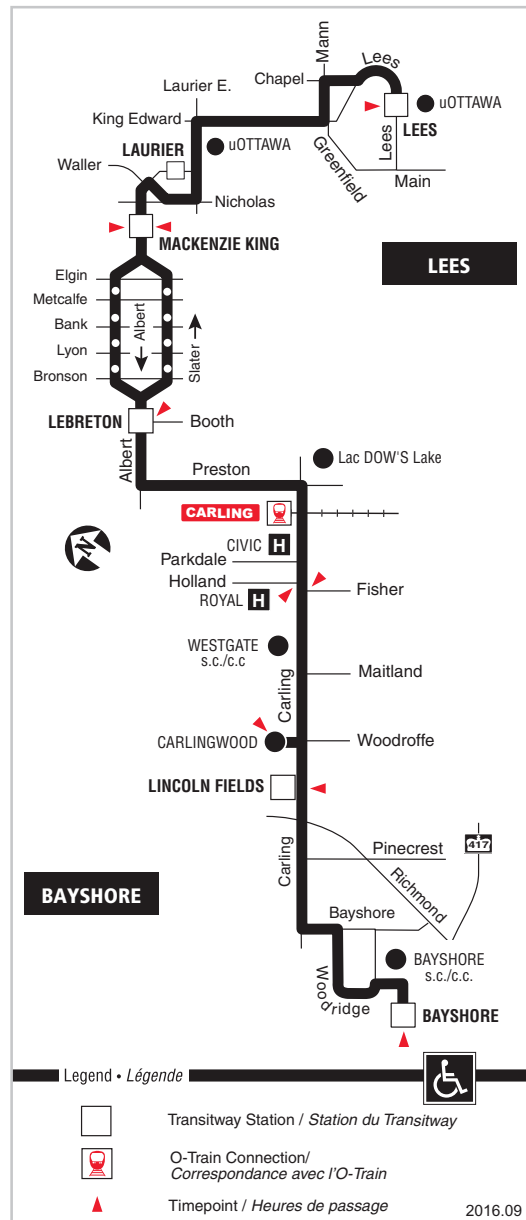
**En vigueur 24 avril 2017**



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

# 85 LEES BAYSHORE

**7 days a week / 7 jours par semaine**  
All day service  
Service toute la journée



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

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

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

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

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

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

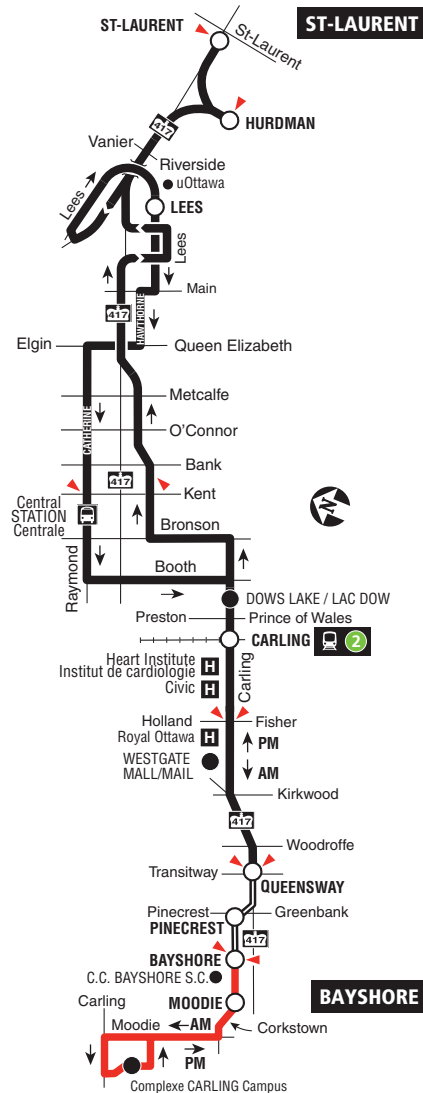
**Effective / En vigueur Sept. 4 sept. 2016**

# 101

## ST-LAURENT BAYSHORE

### Local

**Monday to Saturday / Lundi au samedi**  
No Sunday service  
Aucun service le dimanche



○ Transitway & Station  
— Peak Periods / Périodes de pointe  
▲ Timepoint / Heures de passage

2017.12



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

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

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

Customer Relations

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

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

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

**Effective December 24, 2017**

**En vigueur 24 décembre 2017**



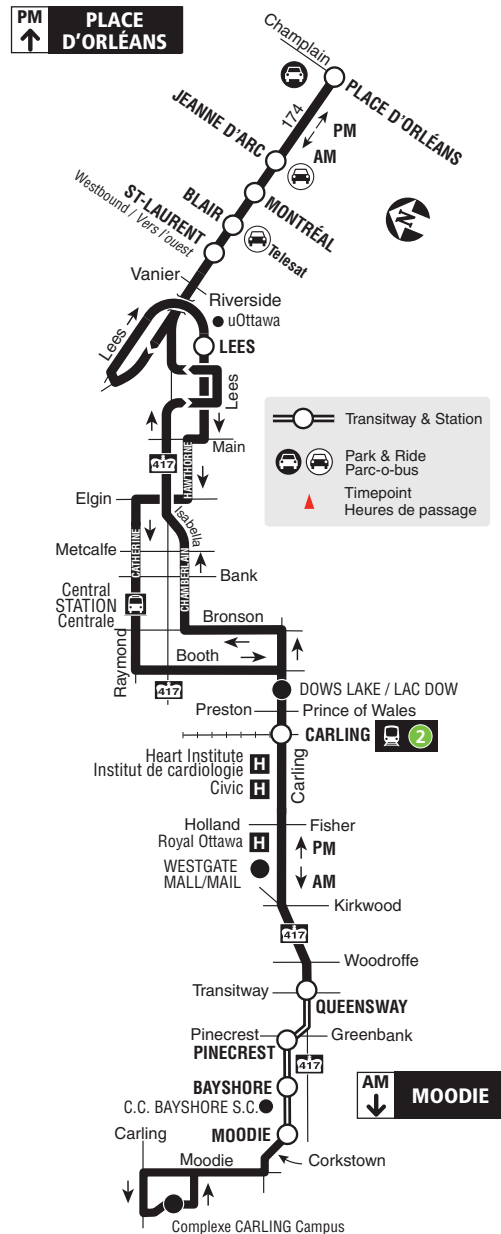
**INFO 613-741-4390**  
**octranspo.com**

103

**MOODIE**  
**PLACE D'ORLÉANS**

## Local

**Monday to FRIDAY / Lundi au vendredi**  
Peak Periods Only  
Périodes de pointe seulement



2018.10



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

Text / Texto .....560560

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

## Customer Relations

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

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

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

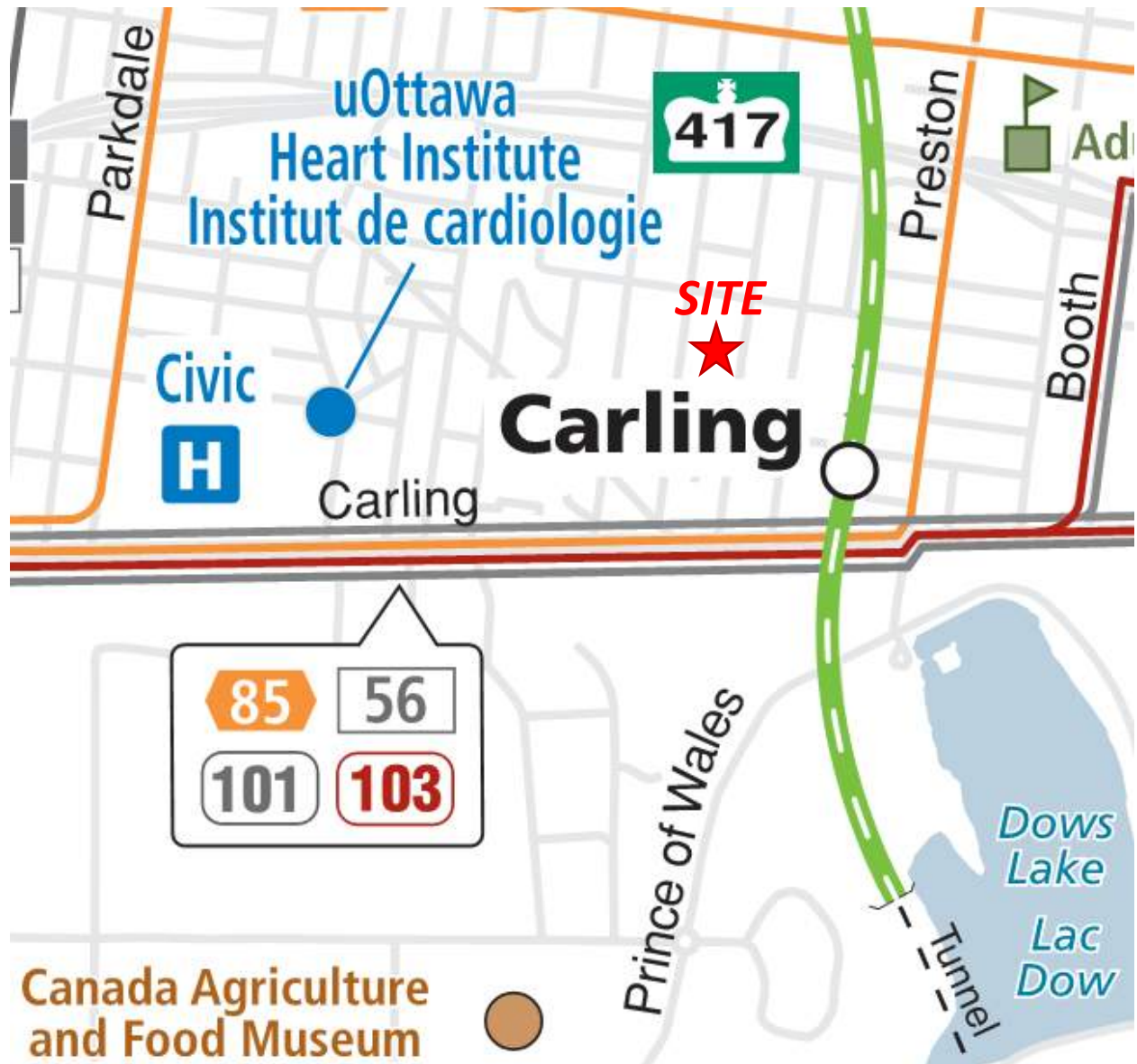
**Effective October 15, 2018**

**En vigueur 15 octobre 2018**



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





## **APPENDIX D**

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### Traffic Count Data

## Turning Movement Count - Peak Hour Diagram

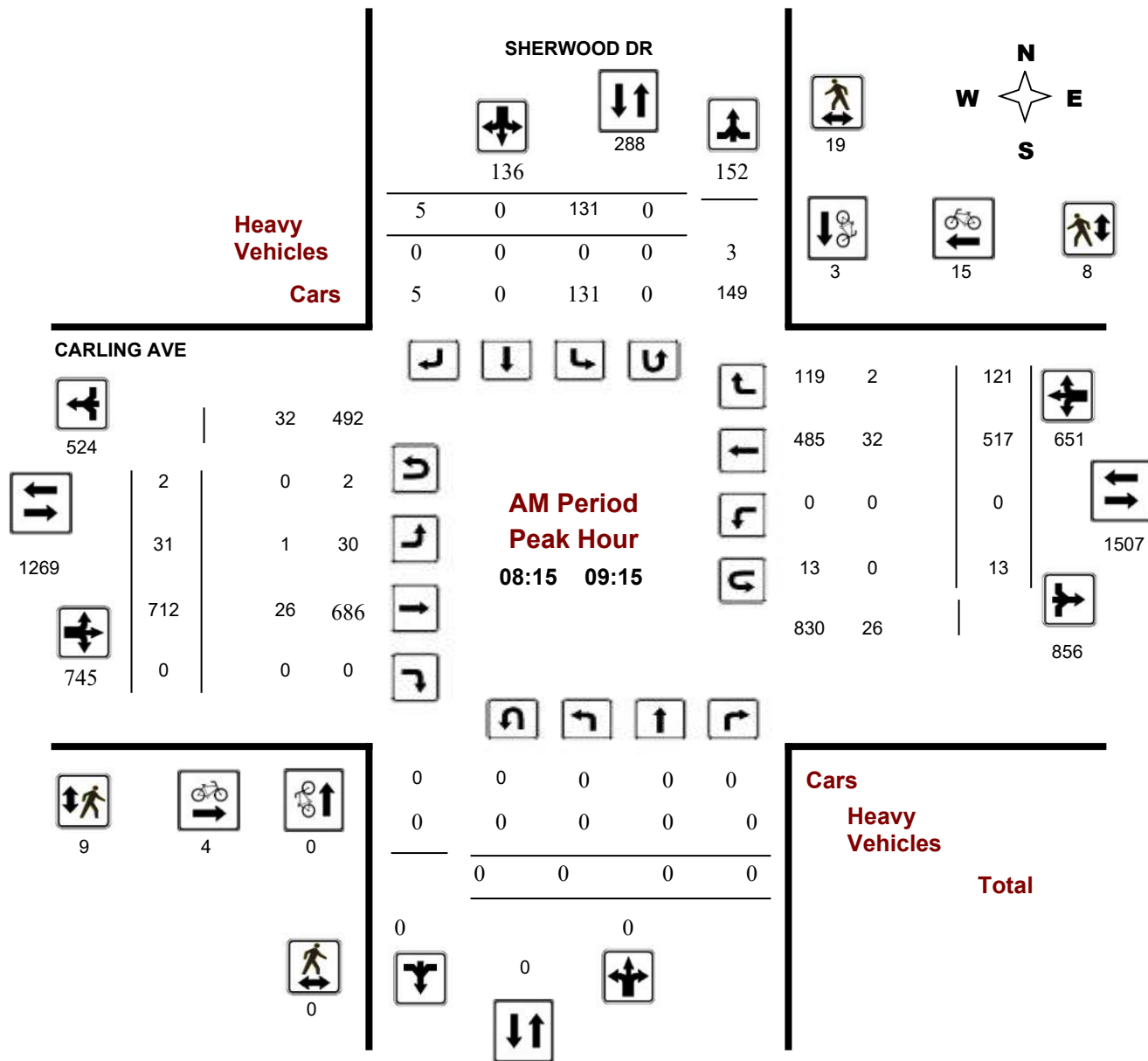
### CARLING AVE @ SHERWOOD DR

**Survey Date:** Thursday, August 25, 2016

**Start Time:** 07:00

**WO No:** 36249

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

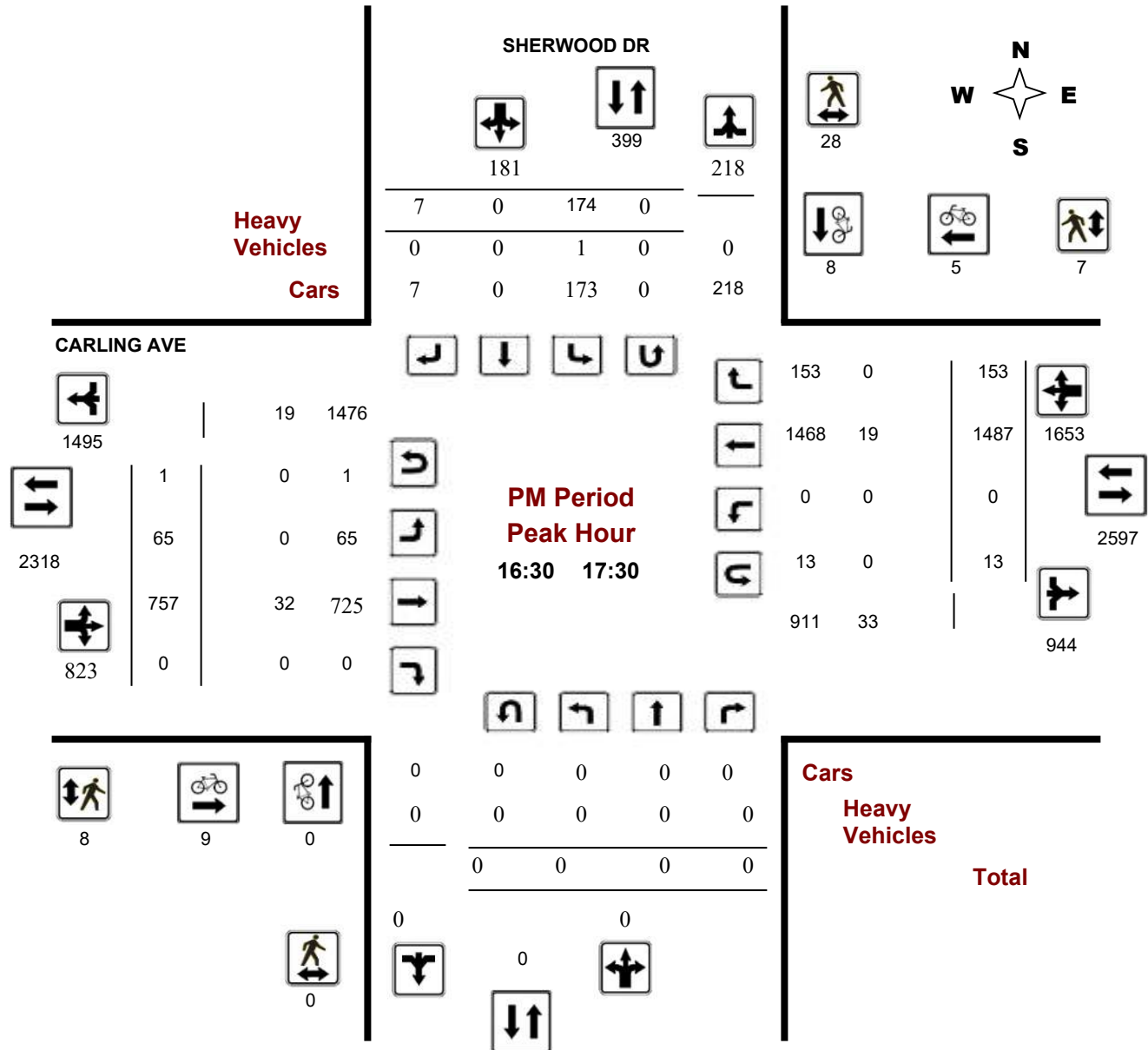
### CARLING AVE @ SHERWOOD DR

**Survey Date:** Thursday, August 25, 2016

**Start Time:** 07:00

**WO No:** 36249

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

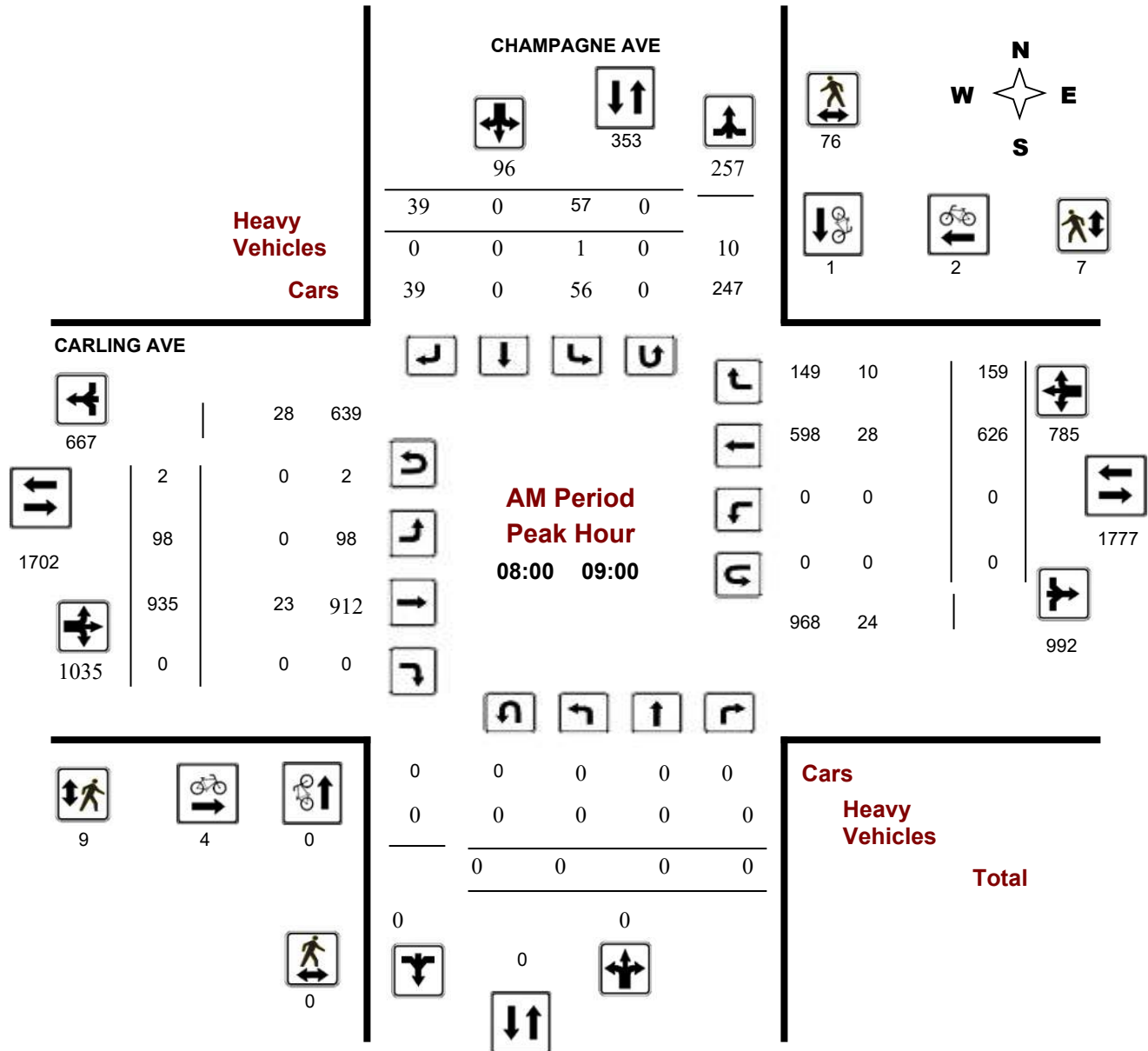
### CARLING AVE @ CHAMPAGNE AVE

**Survey Date:** Thursday, February 04, 2016

**Start Time:** 07:00

**WO No:** 35697

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

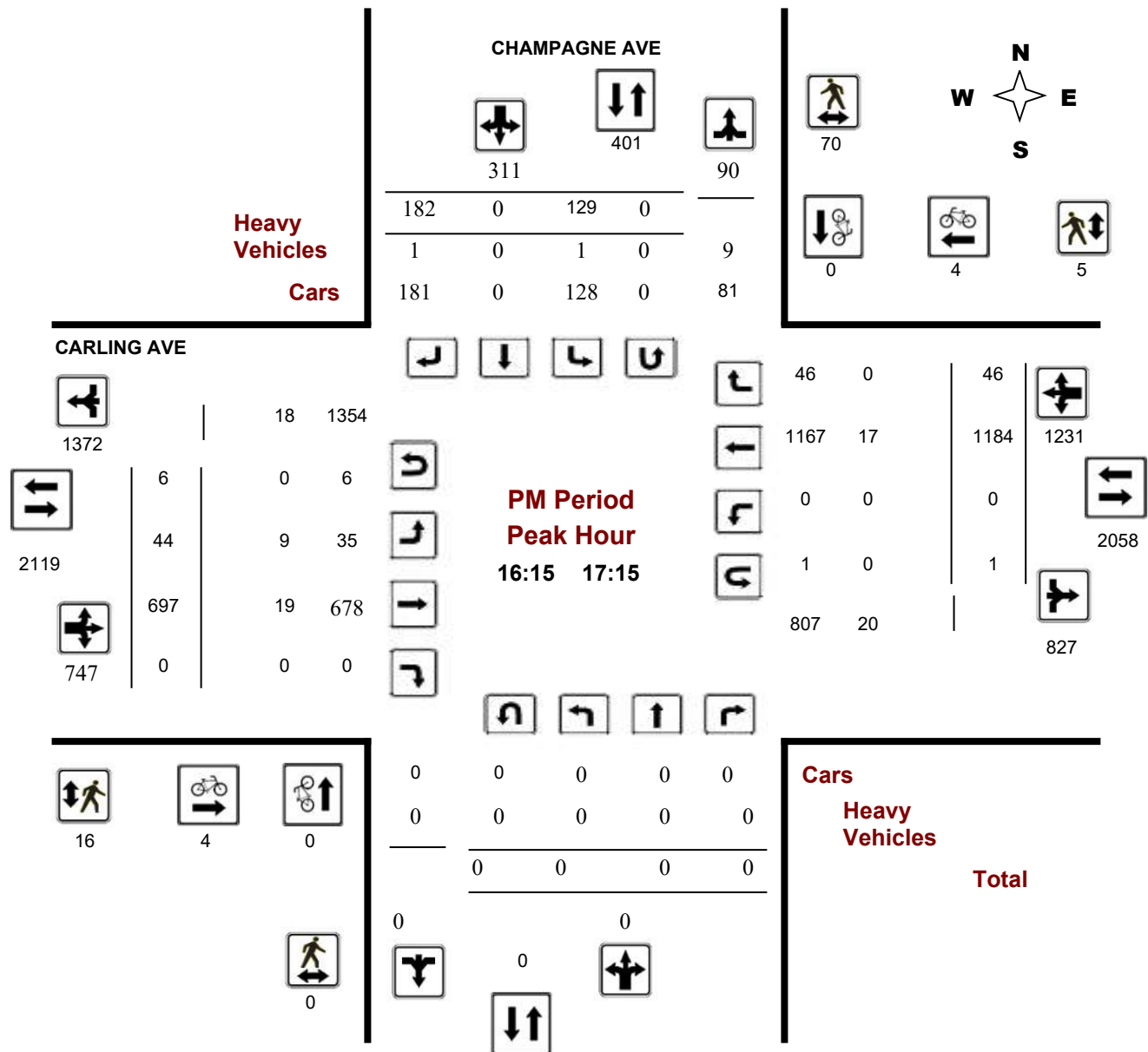
### CARLING AVE @ CHAMPAGNE AVE

**Survey Date:** Thursday, February 04, 2016

**Start Time:** 07:00

**WO No:** 35697

**Device:** Miovision



## Turning Movement Count - Full Study Summary Report

### CARLING AVE @ CHAMPAGNE AVE

**Survey Date:** Thursday, February 04, 2016

**Total Observed U-Turns**

Northbound: 0 Southbound: 0  
Eastbound: 44 Westbound: 1

**AADT Factor**

.90

**Full Study**

CHAMPAGNE AVE										CARLING AVE										STR TOT	Grand Total
Period	Northbound				Southbound				STR TOT	Eastbound				Westbound							
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT		LT	ST	RT	EB TOT	LT	ST	RT	WB TOT				
07:00	08:00	0	0	0	0	38	0	21	59	59	122	653	0	775	0	457	200	657	1432	1491	
08:00	09:00	0	0	0	0	57	0	39	96	96	98	935	0	1033	0	626	159	785	1818	1914	
09:00	10:00	0	0	0	0	32	0	32	64	64	47	539	0	586	0	481	71	552	1138	1202	
11:30	12:30	0	0	0	0	50	0	52	102	102	38	549	0	587	0	516	44	560	1147	1249	
12:30	13:30	0	0	0	0	54	0	47	101	101	27	484	0	511	0	566	40	606	1117	1218	
15:00	16:00	0	0	0	0	115	0	193	308	308	21	673	0	694	0	951	35	986	1680	1988	
16:00	17:00	0	0	0	0	135	0	189	324	324	46	725	0	771	0	1107	38	1145	1916	2240	
17:00	18:00	0	0	0	0	87	0	117	204	204	38	674	0	712	0	1050	37	1087	1799	2003	
Sub Total		0	0	0	0	568	0	690	1258	1258	437	5232	0	5669	0	5754	624	6378	12047	13305	
U Turns		0				0				0	44				1				45	45	
Total		0	0	0	0	568	0	690	1258	1258	437	5232	0	5713	0	5754	624	6379	12092	13350	
EQ 12Hr		0	0	0	0	790	0	959	1749	1749	607	7272	0	7941	0	7998	867	8867	16808	18557	
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														1.39							
AVG 12Hr		0	0	0	0	711	0	863	1574	1574	547	6545	0	7147	0	7198	781	7980	15127	16701	
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														.90							
AVG 24Hr		0	0	0	0	931	0	1131	2062	2062	716	8574	0	9363	0	9430	1023	10454	19817	21879	
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														1.31							

**Comments:**

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





# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

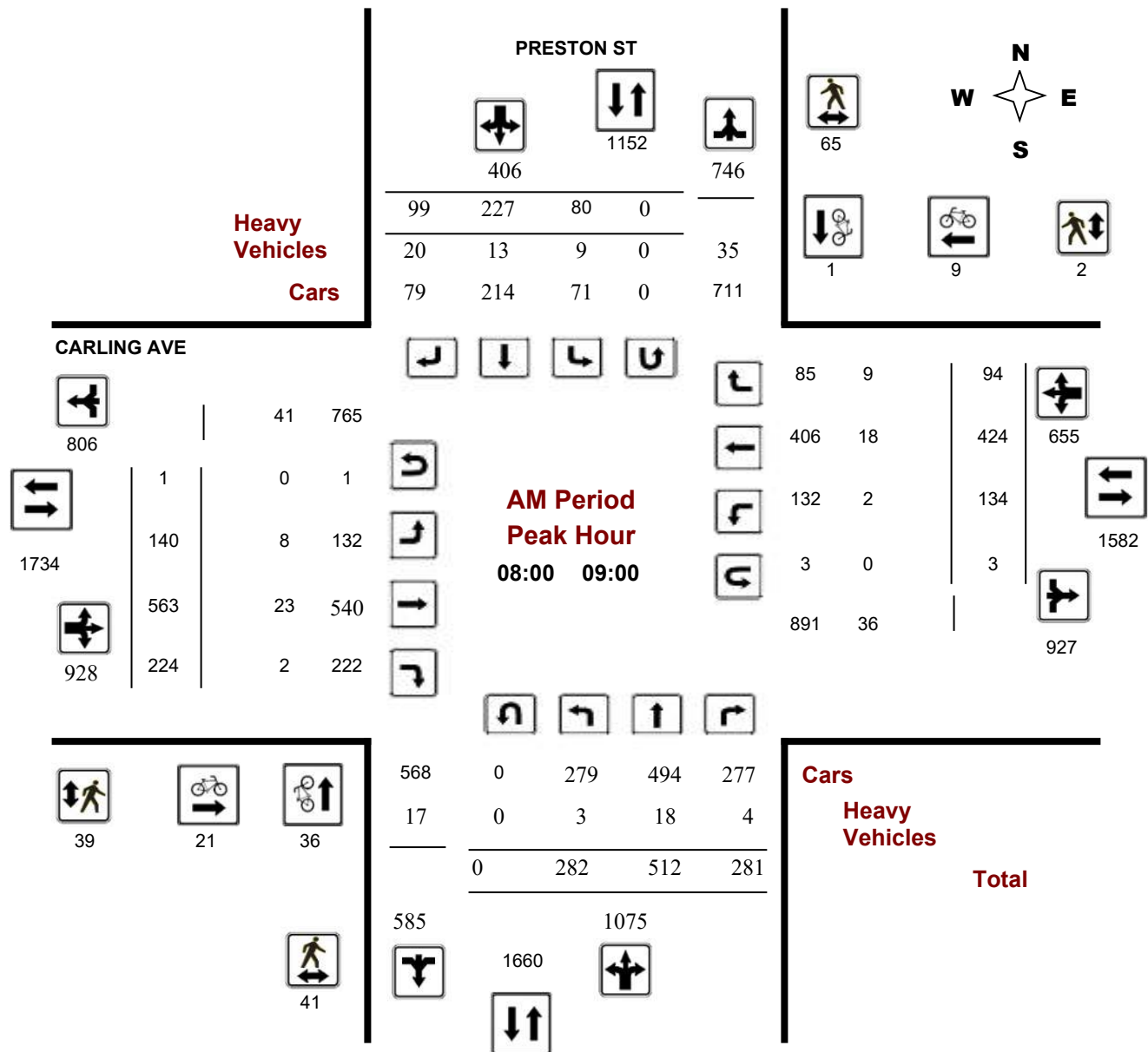
### CARLING AVE @ PRESTON ST

**Survey Date:** Tuesday, June 20, 2017

**Start Time:** 07:00

**WO No:** 37131

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

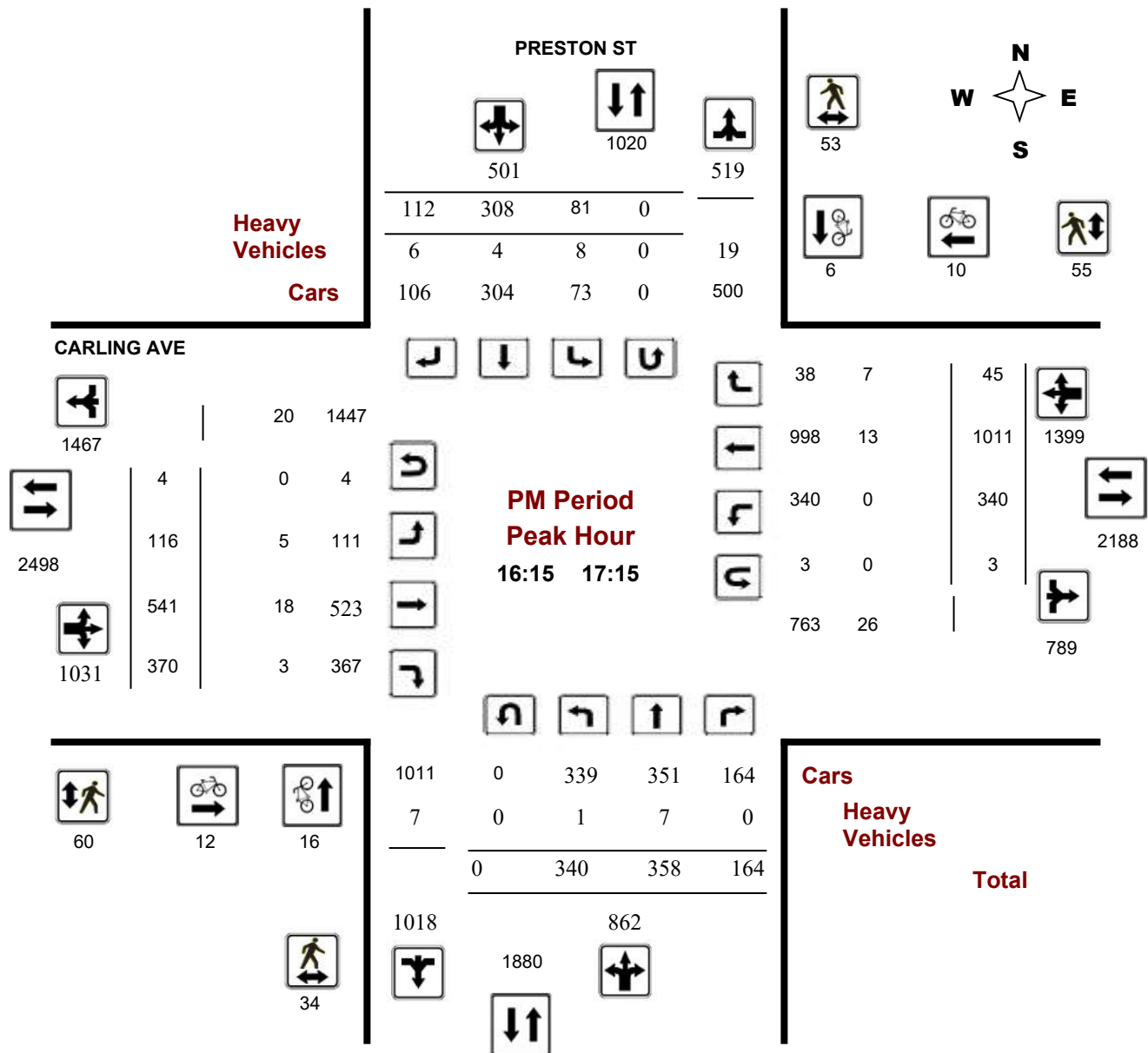
### CARLING AVE @ PRESTON ST

**Survey Date:** Tuesday, June 20, 2017

**Start Time:** 07:00

**WO No:** 37131

**Device:** Miovision



## Turning Movement Count - Full Study Summary Report

### CARLING AVE @ PRESTON ST

**Survey Date:** Tuesday, June 20, 2017

**Total Observed U-Turns**

Northbound: 0      Southbound: 0  
Eastbound: 18      Westbound: 32

**AADT Factor**

.90

#### Full Study

##### PRESTON ST

##### CARLING AVE

Period	Northbound				Southbound				STR TOT	Eastbound				Westbound				STR TOT	Grand Total
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT		LT	ST	RT	EB TOT	LT	ST	RT	WB TOT		
07:00 08:00	191	399	222	812	95	226	66	387	1199	100	409	135	644	124	387	56	567	1211	2410
08:00 09:00	282	512	281	1075	80	227	99	406	1481	140	563	224	927	134	424	94	652	1579	3060
09:00 10:00	218	357	205	780	95	238	85	418	1198	114	404	122	640	128	380	75	583	1223	2421
11:30 12:30	169	266	147	582	135	243	130	508	1090	108	342	108	558	154	351	73	578	1136	2226
12:30 13:30	180	265	133	578	124	238	103	465	1043	101	322	130	553	147	392	65	604	1157	2200
15:00 16:00	325	399	149	873	100	326	75	501	1374	152	511	260	923	306	711	61	1078	2001	3375
16:00 17:00	354	358	147	859	85	315	96	496	1355	103	552	367	1022	338	952	52	1342	2364	3719
17:00 18:00	338	390	163	891	100	299	118	517	1408	133	452	242	827	336	965	70	1371	2198	3606
<b>Sub Total</b>	2057	2946	1447	6450	814	2112	772	3698	10148	951	3555	1588	6094	1667	4562	546	6775	12869	23017
<b>U Turns</b>				0				0	0				18				32	50	50
<b>Total</b>	2057	2946	1447	6450	814	2112	772	3698	10148	951	3555	1588	6112	1667	4562	546	6807	12919	23067
<b>EQ 12Hr</b>	2859	4095	2011	8966	1131	2936	1073	5140	14106	1322	4941	2207	8496	2317	6341	759	9462	17958	32064
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.										1.39									
<b>AVG 12Hr</b>	2573	3685	1810	8069	1018	2642	966	4626	12695	1190	4447	1987	7646	2085	5707	683	8516	16162	28857
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.										.90									
<b>AVG 24Hr</b>	3371	4828	2371	10570	1334	3461	1265	6060	16630	1559	5826	2602	10016	2732	7476	895	11155	21171	37801
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.										1.31									

**Comments:**

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

## Turning Movement Count - Full Study Summary Report

### CARLING AVE @ PRESTON ST

**Survey Date:** Tuesday, June 09, 2015

**Total Observed U-Turns**

Northbound: 0 Southbound: 0  
Eastbound: 19 Westbound: 53

**AADT Factor**

.90

**Full Study**
**PRESTON ST**
**CARLING AVE**

		Northbound				Southbound				Eastbound				Westbound									
Period		LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total			
07:00	08:00	197	462	169	828	119	258	72	449	1277	86	413	189	688	115	393	69	577	1265	2542			
08:00	09:00	296	555	210	1061	96	252	73	421	1482	188	724	315	1227	143	388	90	621	1848	3330			
09:00	10:00	270	502	188	960	79	227	80	386	1346	136	425	154	715	123	361	90	574	1289	2635			
11:30	12:30	178	311	96	585	116	254	87	457	1042	95	373	133	601	130	367	98	595	1196	2238			
12:30	13:30	161	329	114	604	128	251	115	494	1098	113	369	135	617	123	372	105	600	1217	2315			
15:00	16:00	324	406	151	881	77	231	72	380	1261	95	573	268	936	273	542	63	878	1814	3075			
16:00	17:00	344	448	149	941	91	327	84	502	1443	137	504	329	970	358	797	62	1217	2187	3630			
17:00	18:00	303	422	100	825	126	344	89	559	1384	112	466	260	838	315	725	71	1111	1949	3333			
Sub Total		2073	3435	1177	6685	832	2144	672	3648	10333	962	3847	1783	6592	1580	3945	648	6173	12765	23098			
U Turns		0				0				0				19				53				72	72
Total		2073	3435	1177	6685	832	2144	672	3648	10333	962	3847	1783	6611	1580	3945	648	6226	12837	23170			
EQ 12Hr		2881	4775	1636	9292	1156	2980	934	5071	14363	1337	5347	2478	9189	2196	5484	901	8654	17843	32206			
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														1.39									
AVG 12Hr		2593	4297	1472	8363	1041	2682	841	4564	12927	1203	4813	2231	8270	1977	4935	811	7789	16059	28986			
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														.90									
AVG 24Hr		3397	5629	1929	10955	1363	3514	1101	5978	16933	1577	6305	2922	10834	2589	6465	1062	10203	21037	37970			
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														1.31									

**Comments:**

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

## Turning Movement Count - Peak Hour Diagram

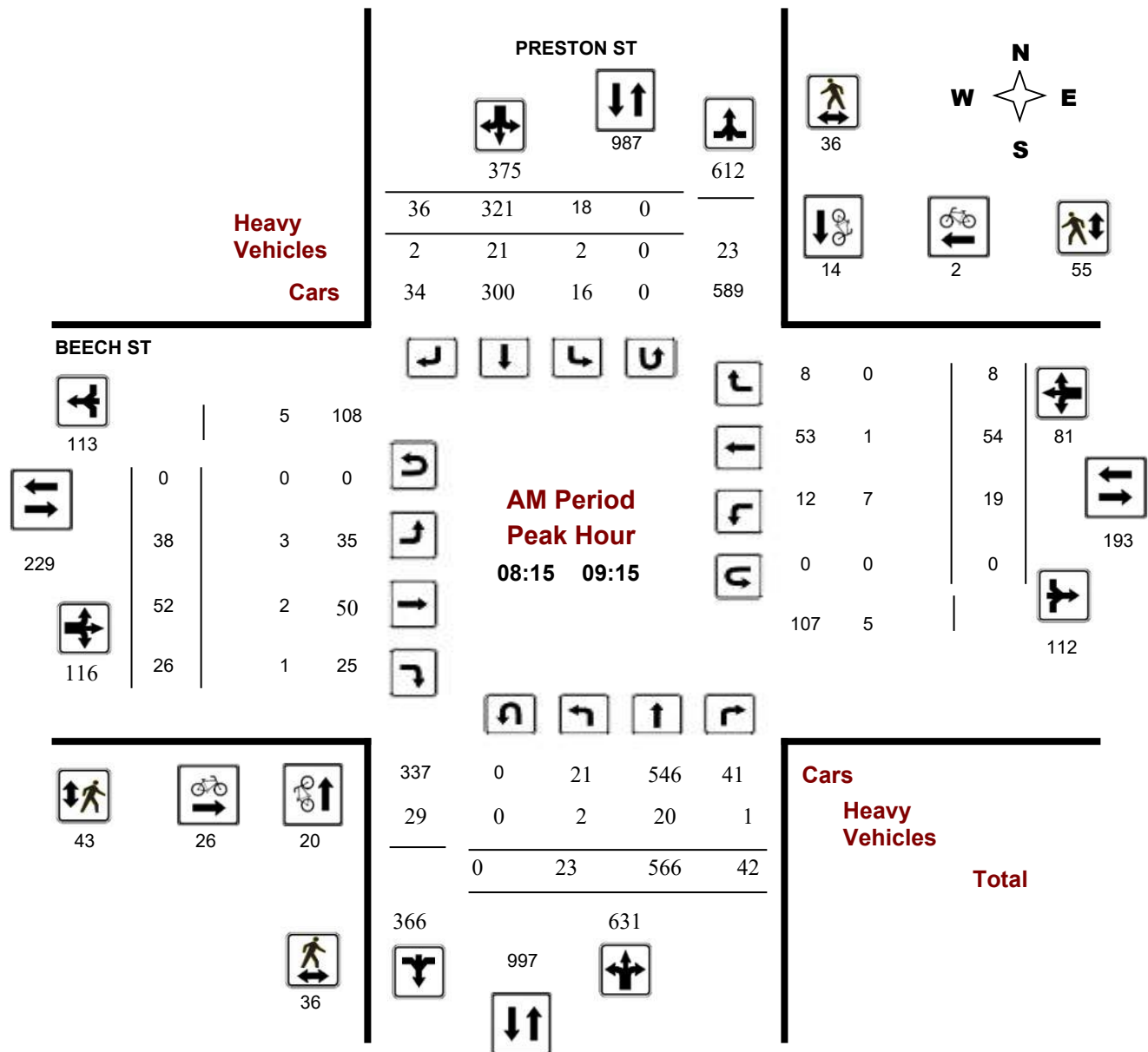
### BEECH ST @ PRESTON ST

**Survey Date:** Wednesday, September 07, 2016

**Start Time:** 07:00

**WO No:** 36281

**Device:** Miovision



**Comments**

## Turning Movement Count - Peak Hour Diagram

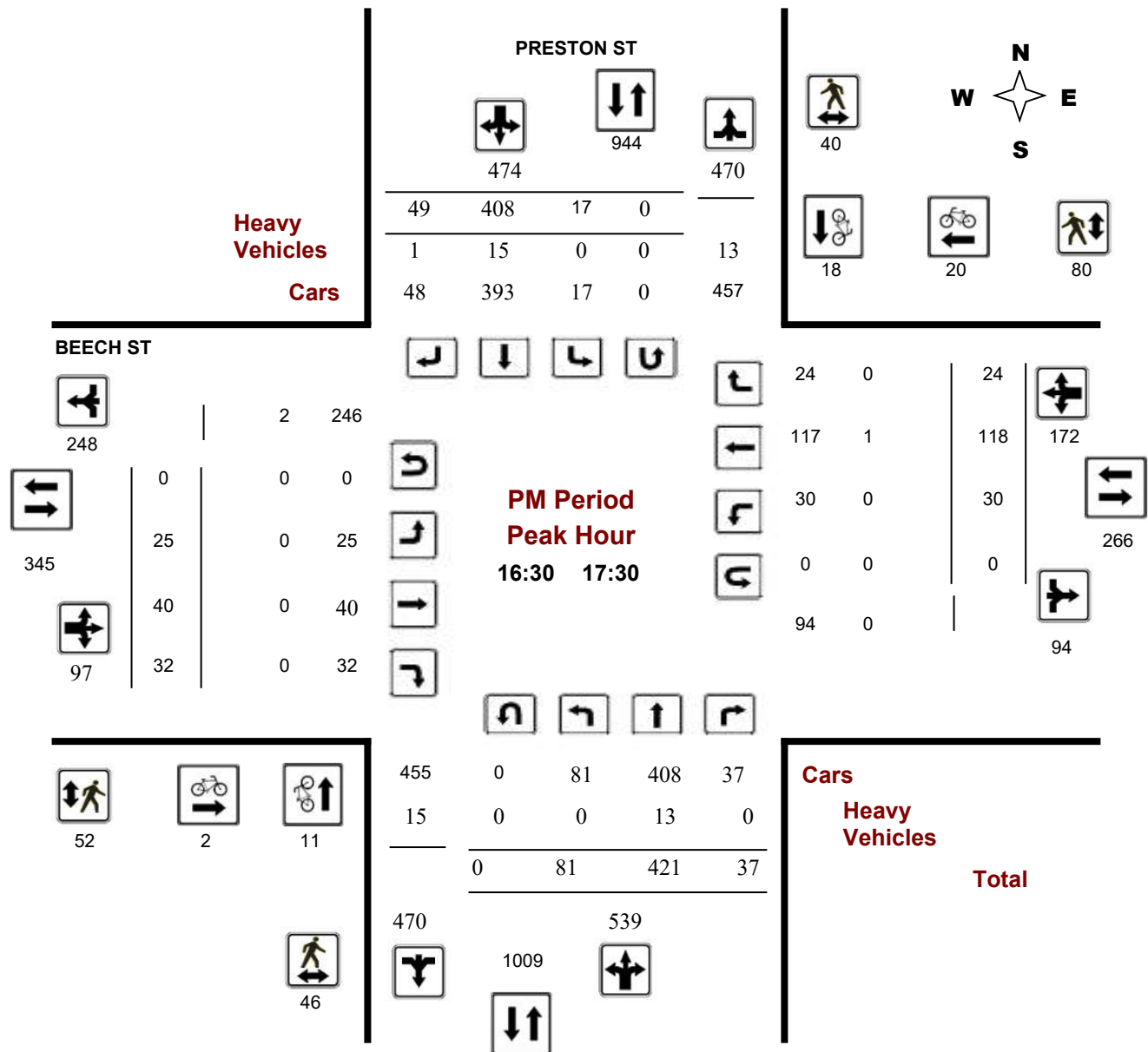
**BEECH ST @ PRESTON ST**

**Survey Date:** Wednesday, September 07, 2016

**Start Time:** 07:00

**WO No:** 36281

**Device:** Miovision



## Comments

# DIRECTIONAL TRAFFIC FLOW

Intersection: Beech at Champagne

DATE: Day: 01 Month: November Year: 2011 Day of Week: Tuesday

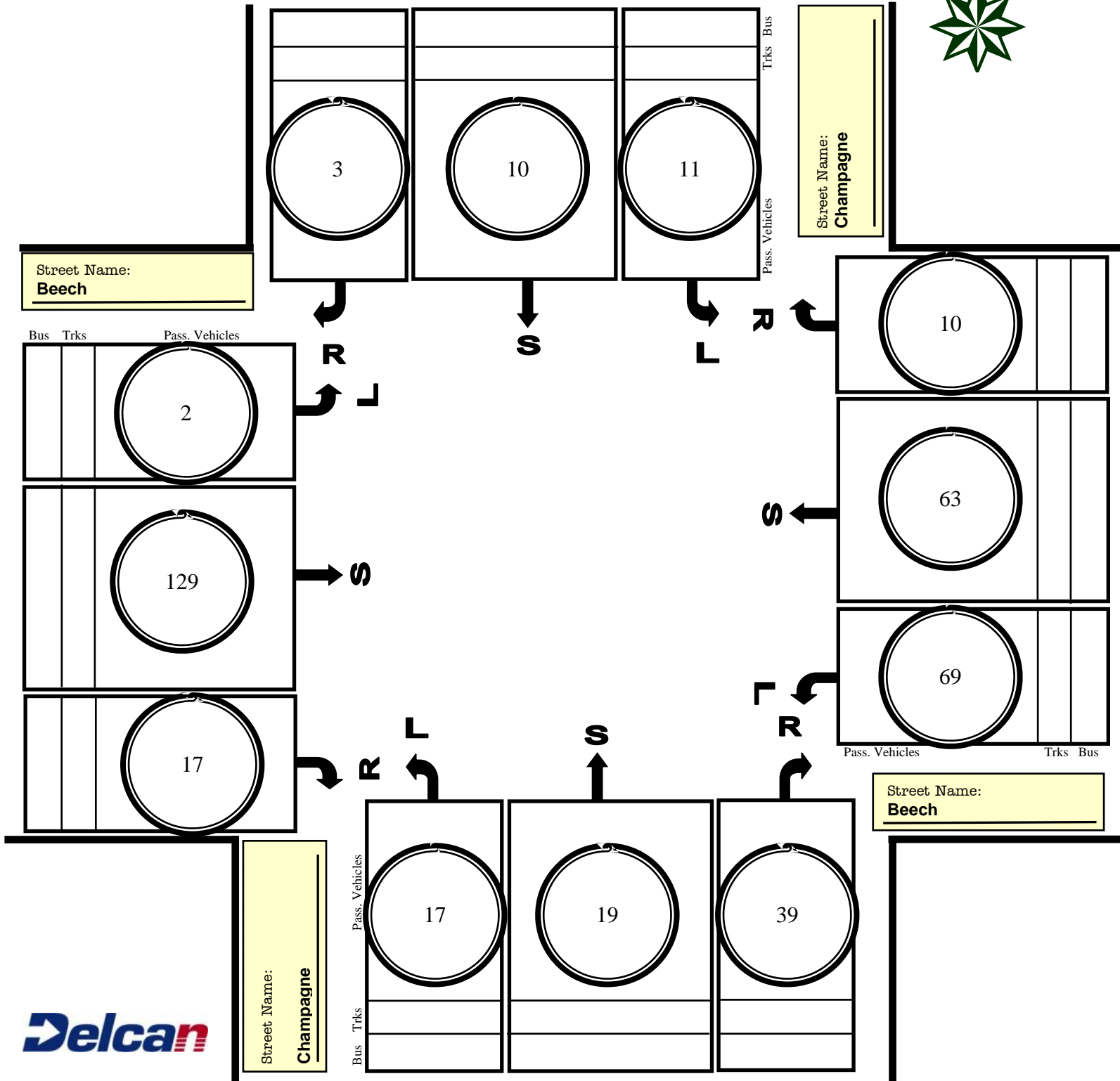
Observer: Kyle Delaney Weather: Clear

Chkd by: \_\_\_\_\_ Date: \_\_\_\_\_

TIME PERIOD: From: 8 : 00 To: 9 : 00

- Instructions: 1) Use tally marks to indicate vehicles.  
2) Use one sheet for each 15-minute period.

N





# DIRECTIONAL TRAFFIC FLOW

Intersection: Beech at Champagne

DATE: Day: 01 Month: November Year: 2011 Day of Week: Tuesday

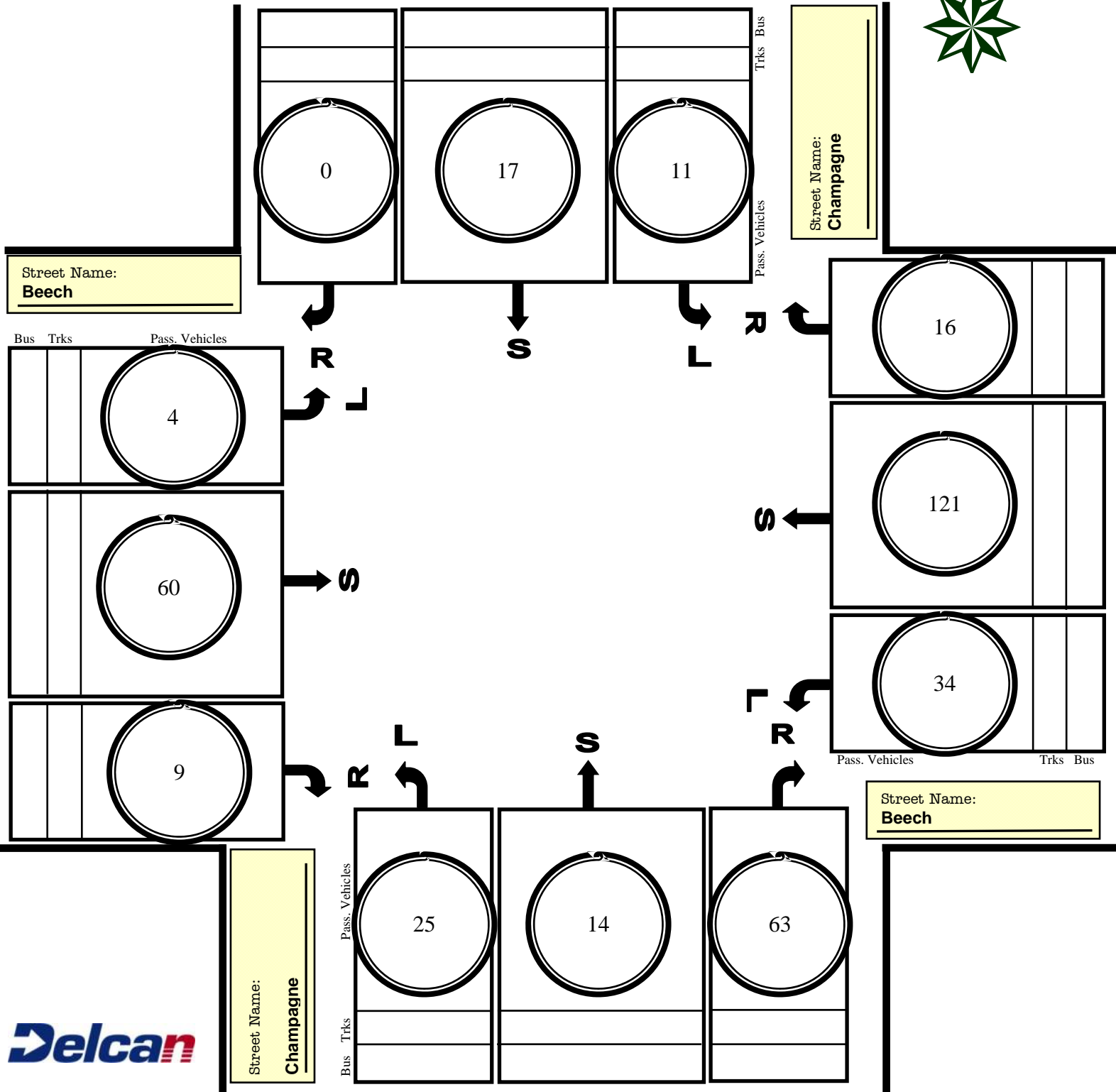
Observer: Kyle Delaney Weather: Clear

Chkd by: \_\_\_\_\_ Date: \_\_\_\_\_

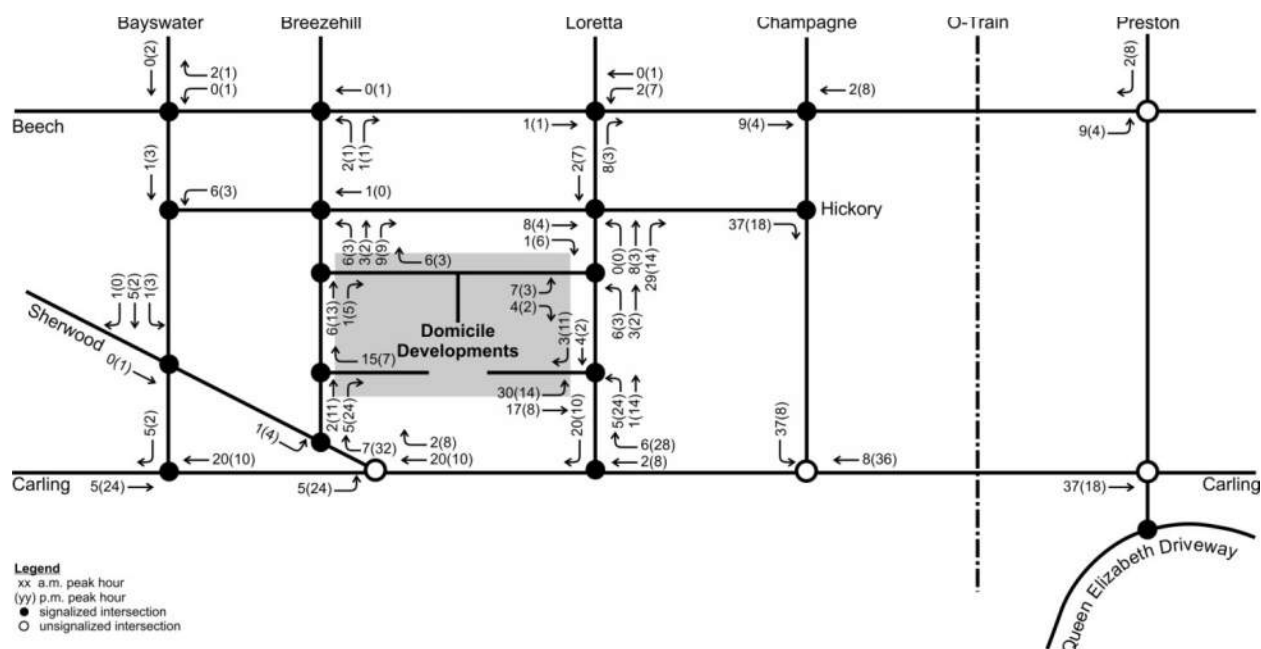
TIME PERIOD: From: 4 : 00 To: 5 : 00

- Instructions: 1) Use tally marks to indicate vehicles.  
2) Use one sheet for each 15-minute period.

N



**Figure 7: Projected Peak Hour Domicile Site Generated Traffic**



### 6.2.3 Mastercraft Starwood Residential Development: 125 Hickory Avenue

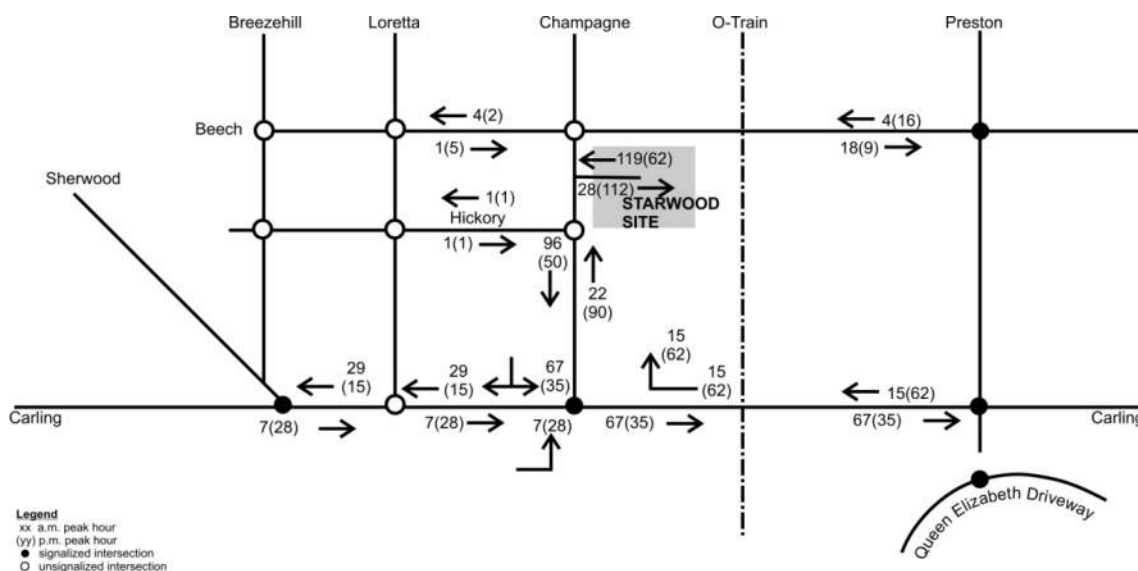
The proposed rezoning at 125 Hickory Avenue is anticipated to result in a high-rise residential development consisting of 33 townhomes and 301 apartment units. A December 2009 CTS prepared by Delcan identified the projected site-generated traffic as follows:

**Table 5: Peak Hour Generated Traffic Volume: 125 Hickory Avenue (Mastercraft)**

	vehicles/hour		
	In	Out	Total
• Morning peak hour	30	120	150
• Afternoon peak hour	110	65	175

The assignment of these volumes to area streets and intersections is depicted in Figure 8.

**Figure 8: Projected Peak Hour Mastercraft Starwood Site-Generated Traffic**



#### 6.2.4 Proposed Domicile Residential Development: 100 Champagne Avenue

The proposed rezoning at 100 Champagne Avenue is a high-rise development containing approximately 100 dwelling units. Delcan prepared and submitted a CTS for this project (March 2010).

As the proposed development is replacing the current industrially used building with an employment of 25 full-time employees and whose traffic generation is reflected in the background traffic volumes, the resulting projected peak hour traffic volumes have been appropriately modified to reflect the increased net estimated peak hour traffic volumes generated by the proposed resultant development.

The resultant net increase in projected site-generated traffic is approximately as follows and its assignment is depicted in Figure 9.

**Table 6: Peak Hour Generated Traffic Volume: 100 Champagne Avenue (Domicile)**

	vehicles/hour		
	In	Out	Total
• Morning peak hour	10	30	40
• Afternoon peak hour	30	20	50

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

## Traffic Signal Operations Unit

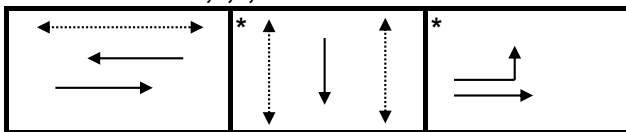
<b>Intersection:</b>	Main: Carling	Side: Sherwood
<b>Controller:</b>	ATC-3	<b>TSD:</b> 5135
<b>Author:</b>	Karson Blank	<b>Date:</b> 08-Feb-2019

## Existing Timing Plans<sup>†</sup>

	Plan				Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Walk	DW	A+R
<b>Cycle</b>	120	130	130	FREE			
<b>Offset</b>	112	41	24	X			
EB Thru	79	73	74	Min=105.4	-	-	3.7+2.7
WB Thru	66	89	89	Min=105.4	12	15	3.7+2.7
SB Thru	41	41	41	Max=40.1	26	7	3.3+3.8
EB Left (fp)	13	16	15	Max=20.2	-	-	3.7+1.5

## Phasing Sequence<sup>‡</sup>

Plan: 1,2,3,4



## Schedule

### Weekday

Time	Plan
0:15	4
6:30	1
9:30	2
15:00	3
18:30	2
22:00	4

### Saturday

Time	Plan
0:15	4
7:00	2
22:30	4

### Sunday

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

## Notes

- †: Time for each direction includes amber and all red intervals  
‡: Start of first phase should be used as reference point for offset  
Asterisk (\*) Indicates actuated phase  
(fp): Fully Protected Left Turn  
◀.....▶ Pedestrian signal

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

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

## Traffic Signal Operations Unit

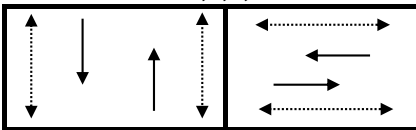
<b>Intersection:</b>	<b>Main:</b> Preston	<b>Side:</b> Beech
<b>Controller:</b>	<b>3200+</b>	<b>TSD:</b> 5413
<b>Author:</b>	Karson Blank	<b>Date:</b> February 8, 2019

## Existing Timing Plans†

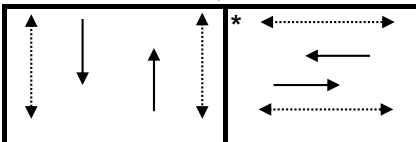
	Plan					Ped Minimum Time			
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Weekend 5	AM Peak 11	Walk	DW	A+R
Cycle	80	80	90	70	80	80			
Offset	40	11	43	X	0	40			
NB Thru	57	57	67	47	57	57	18	10	3.3+2.2
SB Thru	57	57	67	47	57	57	18	10	3.3+2.2
EB Thru	23	23	23	23	23	23	7	10	3.3+2.3
WB Thru	23	23	23	23	23	23	7	10	3.3+2.3

## Phasing Sequence‡

Plan: 1,2,3,5



Plan: 4,11



## Schedule

### Weekday

Time	Plan
0:15	4
6:00	11
7:00	1
9:30	2
15:00	3
18:00	2
22:00	4

### Saturday

Time	Plan
0:15	4
8:00	2
12:00	5
18:00	2
22:00	4

### Sunday

Time	Plan
0:15	4
8:00	2
12:00	5
18:00	2
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 \$56.50 (\$50 + HST)

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

## Traffic Signal Operations Unit

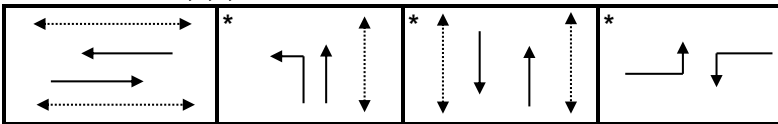
<b>Intersection:</b>	<b>Main:</b> Carling	<b>Side:</b> Preston
<b>Controller:</b>	<b>3200+</b>	<b>TSD:</b> 5183
<b>Author:</b>	Karson Blank	<b>Date:</b> February 8 2019

## Existing Timing Plans†

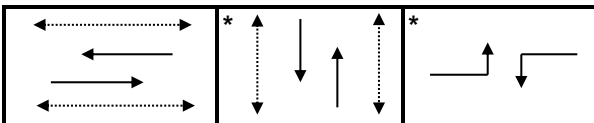
	Plan					Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Weekend 23	Walk	DW	A+R
<b>Cycle</b>	120	130	130	90	120			
<b>Offset</b>	116	0	6	6	16			
EB Thru	35	38	31	32	30	7	17	3.7+2.3
WB Thru	35	38	31	32	30	7	17	3.7+2.3
NB Left	20	20	24	-	12	-	-	3.3+3.6
NB Thru	67	65	69	45	66	7	30	3.3+3.6
SB Thru	47	45	45	45	54	7	30	3.3+3.6
EB Left (fp)	18	27	30	13	24	-	-	3.7+2.5
WB Left (fp)	18	27	30	13	24	-	-	3.7+2.5

## Phasing Sequence‡

Plan: 1,2,3,23



Plan: 4



## Schedule

### Weekday

Time	Plan
0:15	4
6:30	1
9:30	2
15:00	3
18:30	2
23:30	4

### Saturday

Time	Plan
0:15	4
7:00	2
12:05	23
23:30	4

### Sunday

Time	Plan
0:15	4
8:00	2
23:30	4

## Notes

†: Time for each direction includes amber and all red intervals  
‡: Start of first phase should be used as reference point for offset  
Asterisk (\*) Indicates actuated phase  
(fp): Fully Protected Left Turn  
◀.....▶ Pedestrian signal

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

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

## Traffic Signal Operations Unit

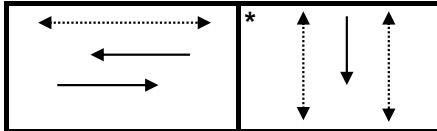
<b>Intersection:</b>	<b>Main:</b> Carling	<b>Side:</b> Champagne
<b>Controller:</b>	<b>MS-3200</b>	<b>TSD:</b> 5341
<b>Author:</b>	Karson Blank	<b>Date:</b> February 8, 2019

## Existing Timing Plans<sup>†</sup>

	Plan				Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Walk	DW	A+R
<b>Cycle</b>	120	65	65	70			
<b>Offset</b>	106	19	11	X			
EB Thru	82	27	27	32	-	-	3.7+1.6
WB Thru	82	27	27	32	10	10	3.7+1.6
SB Thru	38	38	38	38	7	25	3.3+2.6

## Phasing Sequence<sup>‡</sup>

Plan: 1,2,3,4



## Schedule

Weekday		Saturday		Sunday	
Time	Plan	Time	Plan	Time	Plan
0:15	4	0:15	4	0:15	4
6:30	1	7:00	2	8:00	2
9:30	2	23:30	4	23:30	4
15:00	3				
18:30	2				
23:30	4				

## Notes

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

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

Asterisk (\*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄.....► Pedestrian signal

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

## **APPENDIX E**

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### Collision Records





# City Operations - Transportation Services

## Collision Details Report - Public Version

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

**Location:** BEECH ST @ CHAMPAGNE AVE

**Traffic Control:** Stop sign

**Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2017-Oct-20, Fri,19:58	Clear	SMV other	Non-fatal injury	Dry	North	Turning right	Automobile, station wagon	Pedestrian	1

**Location:** BEECH ST @ PRESTON ST

**Traffic Control:** Traffic signal

**Total Collisions:** 9

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2013-Feb-21, Thu,12:18	Clear	Angle	Non-fatal injury	Wet	North	Going ahead	Pick-up truck	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2013-Aug-15, Thu,16:07	Clear	Angle	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2013-Aug-22, Thu,10:23	Clear	Angle	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2014-Oct-15, Wed,12:23	Rain	SMV other	Non-fatal injury	Wet	South	Turning left	Pick-up truck	Pedestrian	1
2015-Jan-26, Mon,12:42	Clear	Other	P.D. only	Dry	North	Reversing	Automobile, station wagon	Other motor vehicle	

					South	Stopped	Automobile, station wagon	Other motor vehicle
2015-Apr-12, Sun,19:59	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Apr-13, Thu,11:25	Clear	Turning movement	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
2017-Oct-01, Sun,15:15	Clear	Sideswipe	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Oct-24, Tue,14:26	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle

**Location:** CARLING AVE @ CHAMPAGNE AVE

**Traffic Control:** Traffic signal

**Total Collisions:** 5

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Feb-02, Mon,11:48	Snow	Angle	P.D. only	Packed snow	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2015-Mar-27, Fri,08:25	Snow	Sideswipe	P.D. only	Wet	East	Changing lanes	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

2015-Jun-16, Tue,21:15	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Pick-up truck	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2016-Oct-05, Wed,12:52	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
2017-Aug-15, Tue,16:57	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle

**Location:** CARLING AVE @ PRESTON ST

**Traffic Control:** Traffic signal

**Total Collisions:** 43

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2013-Feb-06, Wed,16:00	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Delivery van	Other motor vehicle	
2013-Mar-21, Thu,07:31	Clear	Sideswipe	P.D. only	Dry	West	Turning right	Pick-up truck	Other motor vehicle	
					West	Going ahead	Municipal transit bus	Other motor vehicle	
2013-Apr-23, Tue,21:06	Clear	Angle	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2013-Jul-26, Fri,15:50	Clear	Angle	P.D. only	Dry	East	Going ahead	Delivery van	Other motor vehicle	

					South	Turning left	Automobile, station wagon	Other motor vehicle
2013-Aug-06, Tue,12:51	Clear	Rear end	P.D. only	Dry	East	Going ahead	Delivery van	Other motor vehicle
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2013-Nov-21, Thu,14:21	Clear	SMV other	P.D. only	Dry	South	Turning left	Truck - tractor	Pole (utility, power)
2013-Nov-21, Thu,22:56	Clear	Rear end	Non-fatal injury	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2014-Jan-26, Sun,19:47	Clear	Angle	P.D. only	Loose snow	West	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Jan-30, Thu,18:00	Snow	Sideswipe	Non-reportable	Slush	North	Changing lanes	Pick-up truck	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2014-Feb-14, Fri,08:00	Snow	Rear end	P.D. only	Loose snow	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2014-Mar-28, Fri,16:30	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle

2014-May-29, Thu,15:30	Clear	Rear end	Non-fatal injury	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2014-Jun-18, Wed,07:34	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Pick-up truck	Cyclist
					North	Going ahead	Bicycle	Other motor vehicle
2014-Oct-09, Thu,12:00	Rain	Turning movement	Non-fatal injury	Wet	North	Going ahead	Bicycle	Other motor vehicle
					South	Turning left	Pick-up truck	Cyclist
2014-Oct-13, Mon,09:42	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Pick-up truck	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Jan-16, Fri,15:45	Clear	Rear end	Non-fatal injury	Loose snow	West	Turning right	Passenger van	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2015-Mar-19, Thu,19:32	Clear	Sideswipe	P.D. only	Slush	South	Changing lanes	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Apr-15, Wed,09:04	Clear	Rear end	P.D. only	Dry	East	Unknown	Automobile, station wagon	Other motor vehicle
					East	Stopped	Passenger van	Other motor vehicle
2015-Apr-29, Wed,20:00	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Cyclist

					North	Going ahead	Bicycle	Other motor vehicle
2015-May-12, Tue,18:50	Clear	Rear end	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle
2015-May-26, Tue,23:49	Clear	SMV other	P.D. only	Dry	East	Reversing	Municipal transit bus	Concrete guide rail
2015-Jun-06, Sat,21:44	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Bicycle	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Cyclist
2015-Jun-23, Tue,23:02	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Intercity bus	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2015-Jun-24, Wed,15:39	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Municipal transit bus	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
					West	Slowing or stopping	Passenger van	Other motor vehicle
2015-Jul-30, Thu,19:39	Clear	Angle	P.D. only	Dry	North	Turning right	Automobile, station wagon	Cyclist
					East	Going ahead	Bicycle	Other motor vehicle
2015-Aug-17, Mon,14:00	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle

					South	Changing lanes	Automobile, station wagon	Other motor vehicle
2015-Sep-22, Tue,16:56	Clear	Rear end	P.D. only	Dry	East	Unknown	Unknown	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2015-Oct-05, Mon,06:19	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Pick-up truck	Cyclist
					North	Going ahead	Bicycle	Other motor vehicle
2015-Oct-17, Sat,13:21	Clear	Rear end	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Pick-up truck	Other motor vehicle
2016-May-18, Wed,23:39	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Jul-06, Wed,08:39	Clear	Turning movement	Non-fatal injury	Dry	North	Turning right	Automobile, station wagon	Cyclist
					North	Going ahead	Bicycle	Other motor vehicle
2016-Jul-23, Sat,23:13	Clear	Rear end	P.D. only	Dry	West	Unknown	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2016-Nov-09, Wed,18:00	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle

					West	Stopped	Automobile, station wagon	Other motor vehicle
2017-Feb-10, Fri,13:45	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2017-Mar-06, Mon,16:53	Snow	Angle	P.D. only	Ice	South	Overtaking	Automobile, station wagon	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
2017-Mar-21, Tue,18:10	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Apr-26, Wed,16:44	Clear	Rear end	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
					West	Stopped	Passenger van	Other motor vehicle
2017-Apr-27, Thu,16:07	Clear	Rear end	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					North	Turning left	Pick-up truck	Other motor vehicle
2017-Jun-26, Mon,08:54	Clear	Turning movement	Non-fatal injury	Dry	South	Turning right	Automobile, station wagon	Cyclist
					South	Going ahead	Bicycle	Other motor vehicle



2017-Jul-29, Sat,00:57	Clear	Angle	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Oct-14, Sat,15:47	Clear	SMV other	P.D. only	Dry	South	Turning left	Automobile, station wagon	Pole (utility, power)	
2017-Nov-29, Wed,07:36	Clear	Sideswipe	P.D. only	Wet	East	Changing lanes	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Dec-01, Fri,14:10	Rain	SMV other	Non-fatal injury	Wet	South	Turning left	Automobile, station wagon	Pedestrian	1

**Location:** CARLING AVE @ SHERWOOD DR

**Traffic Control:** Traffic signal

**Total Collisions:** 4

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Jan-15, Wed,14:50	Clear	SMV other	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Curb	
2014-Jul-29, Tue,16:07	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Delivery van	Other motor vehicle	
2015-Feb-28, Sat,10:25	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Jan-05, Tue,09:01	Clear	Rear end	P.D. only	Ice	West	Slowing or stopping	Delivery van	Other motor vehicle	

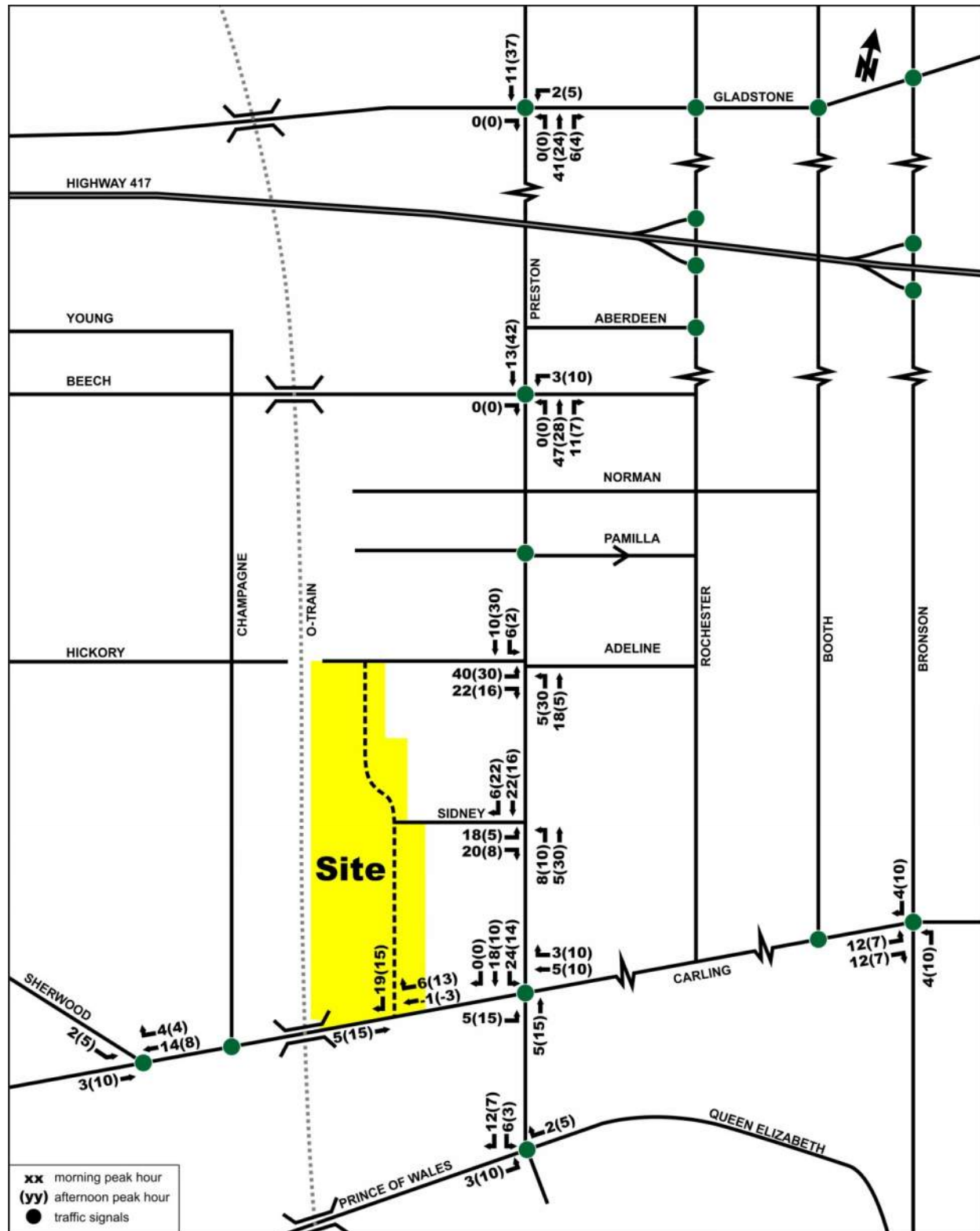


## **APPENDIX F**

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Relevant Excerpts from Other Reports

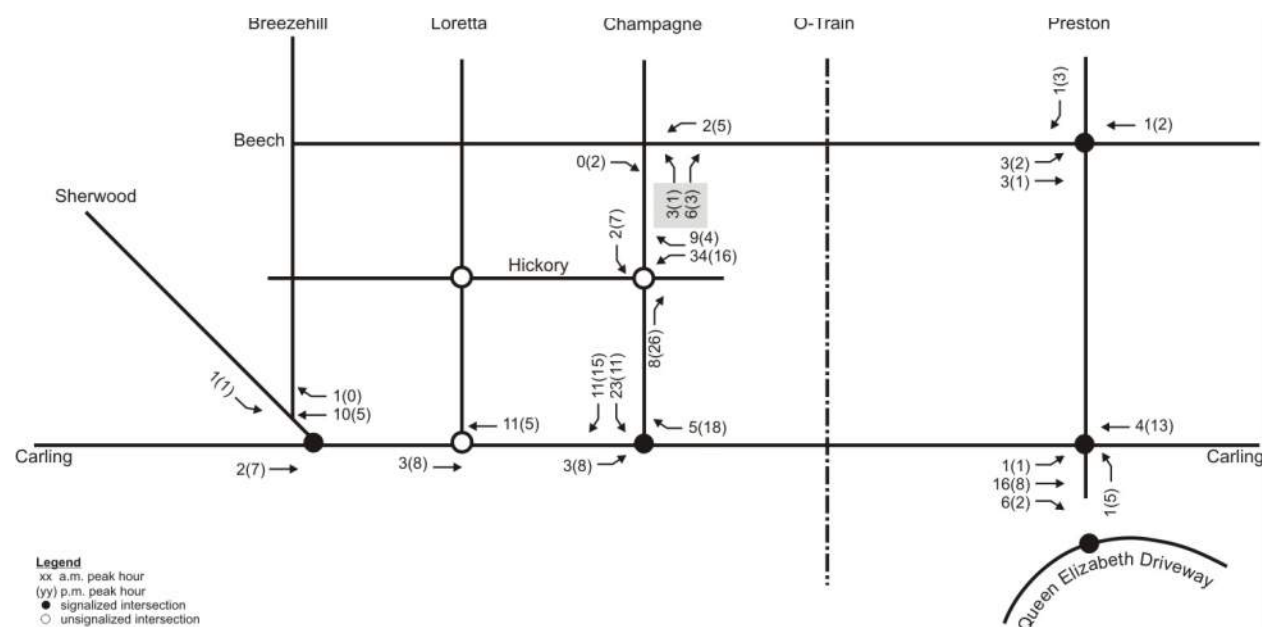
Figure 6: 'New' and 'Pass-by' Site-Generated Traffic Volumes



**Table 10: Site-Generated Traffic Summary of Study Area Development Projects  
Two-way Table (vph)**

Development	Projected Net Traffic Generated vph			
	AM Peak	%	PM Peak	%
320/330 Loretta Avenue (Domicile)	+70	9%	+85	11%
855 Champagne Avenue (Arnon)	+502	62%	+438	55%
125 Hickory Street (Mastercraft Starwood)	+147	18%	+174	22%
100 Champagne Avenue (Domicile)	+40	5%	+50	6%
101 Champagne Avenue (Ashcroft)	+53	6%	+53	6%
<b>TOTALS</b>	<b>+812</b>	<b>100%</b>	<b>+800</b>	<b>100%</b>

**Figure 10: Projected Peak Hour Ashcroft Site-Generated Traffic**



## 6.4 Analysis of Projected Future Conditions

The combined site-generated traffic for the five aforementioned projects, superimposed on current volumes (Figure 5), is depicted in Figure 11.

### 6.4.1 Traffic Signal Warrants

The existing traffic signals at the Carling/Champagne intersection are not warranted based on recent City of Ottawa traffic counts (August: 2009: Appendix A) and were not judged to be warranted based on the projected impact of the Arnon development alone. However, as reported in the CTS for the Mastercraft Starwood proposed development at 125 Hickory Street, the signals were judged to be warranted based on the combined impact of the surrounding developments.

However, ITE rates were adjusted based on vehicle occupancy and modal splits to develop the Modified Person Trips summarized in Table 5 of the original TB to better reflect the type of area where the subject site is located. The 1.15 vehicle occupancy value and the 10% transit/non-motorized modal share split used to calculate the 1.3 factor are based on recent available census data for the United States.

Given that the Site Plan has been revised, the total person trips have been re-calculated based on the revised number of dwelling units. The following Table 3 includes the total person trips calculated using the method outlined in the original TB and the total person trips calculated using the City's suggested method (outlined above) for the revised Site Plan.

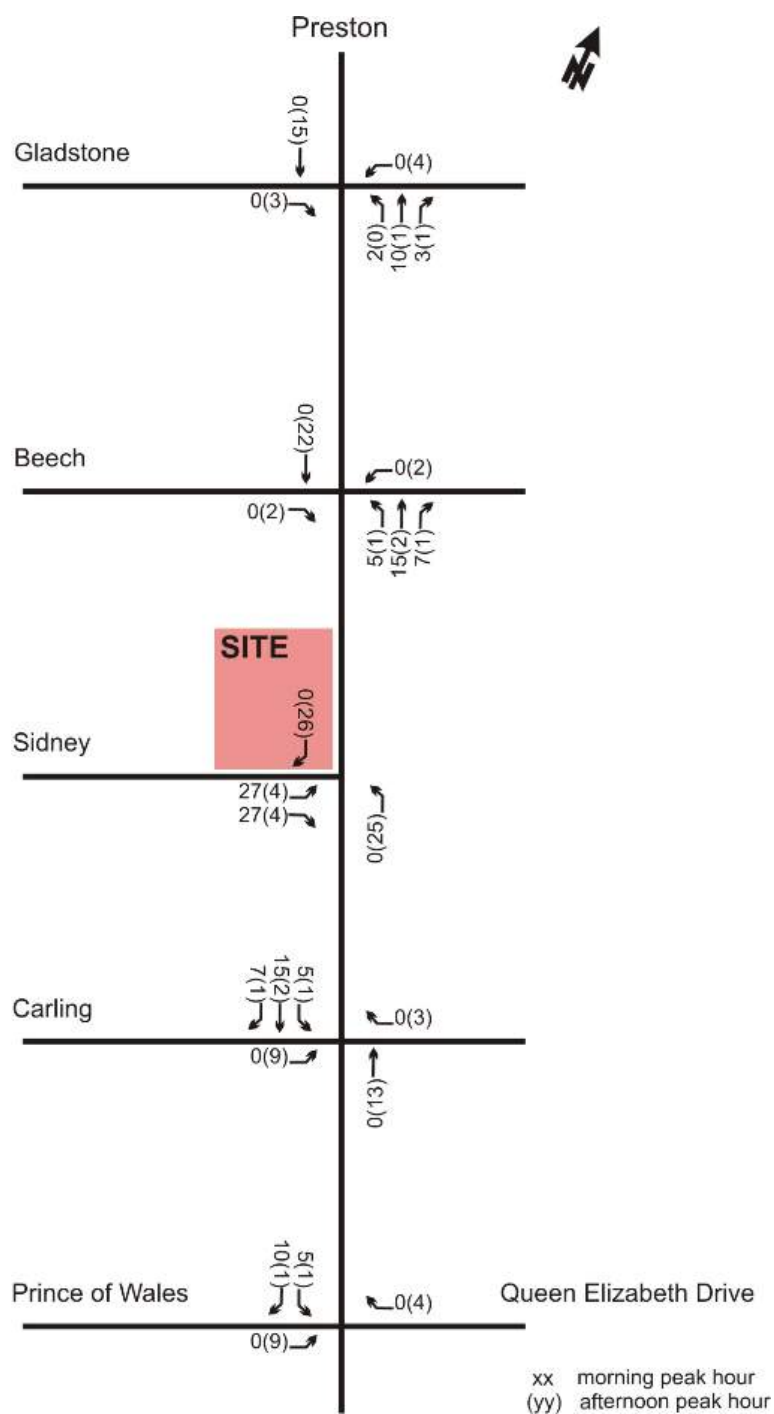
**Table 3: Modified Person Trip Generation**

Land Use	Data Source	Units	AM Peak (persons)			PM Peak (persons)		
			In	Out	Total	In	Out	Total
High-Rise Condominium <sup>(1)</sup>	ITE 232	117 Units	15	65	80	43	27	70
High-Rise Condominium <sup>(2)</sup>	-	117 Units	18	80	98	43	27	70
<b>Original TB Modified Person Trip Generation</b>								
High-Rise Condominium	ITE 232	159 Units	18	80	98	56	35	91
Note: (1) 1.3 factor to account for typical North American auto occupancy values of approximately 1.15 and combined transit and non-motorized modal shares of less than 10%. (2) The suggested rates used were as follows: 1.2 person/unit factor and 0.7 (AM peak) and 0.5 (PM peak) person trip generation rate.								

As shown in Table 3, the suggested methodology produces the same or similar results as the methodology outlined in the original TB. As both of the resultant person trip totals are less than or equal to the person trips total from the original TB, the projected Level of Service at study area intersections will be the same or better than the projected Levels of Service summarized in the original report. As such, no additional analysis is required as the original TB did not identify any required changes to the off-site roadway geometry or traffic control.

With regard to peak hour operations for this development, the analysis was performed for the hour during which the adjacent road network experiences the heaviest morning and afternoon traffic volumes. For a residential development it is appropriate to assume that this peak hour analysis will constitute the "worst case" scenario. Should the majority of person traffic from the proposed development travel outside of this peak hour, in terms of traffic operations, the impact would be less outside the peak hour, given there would be fewer vehicles overall on study area roads.

**Figure 5: "Net" Increase in Site-Generated Traffic**



**TABLE 5: High Rise Condo Trip Generation (Net Increase)**

Travel Mode	Mode Share	AM Peak (Persons/hr)			PM Peak (Persons/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	30%	3	12	15	6	4	10
Auto Passenger	10%	1	4	5	2	2	4
Transit	40%	3	16	19	8	5	13
Non-motorized	20%	1	7	8	3	2	5
Total Person Trips	100%	8	39	47	19	13	32
<b>Total 'New' Auto Trips</b>		<b>3</b>	<b>12</b>	<b>15</b>	<b>6</b>	<b>4</b>	<b>10</b>

**TABLE 6: Commercial Trip Generation (Net Increase)**

Travel Mode	Mode Share	AM Peak (Persons/hr)			PM Peak (Persons/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	30%	8	3	11	5	11	16
Auto Passenger	10%	2	1	3	2	4	6
Transit	40%	10	2	12	5	14	19
Non-motorized	20%	5	1	6	2	7	9
Total Person Trips	100%	25	7	32	14	36	50
<b>Total 'New' Auto Trips</b>		<b>8</b>	<b>3</b>	<b>11</b>	<b>5</b>	<b>11</b>	<b>16</b>

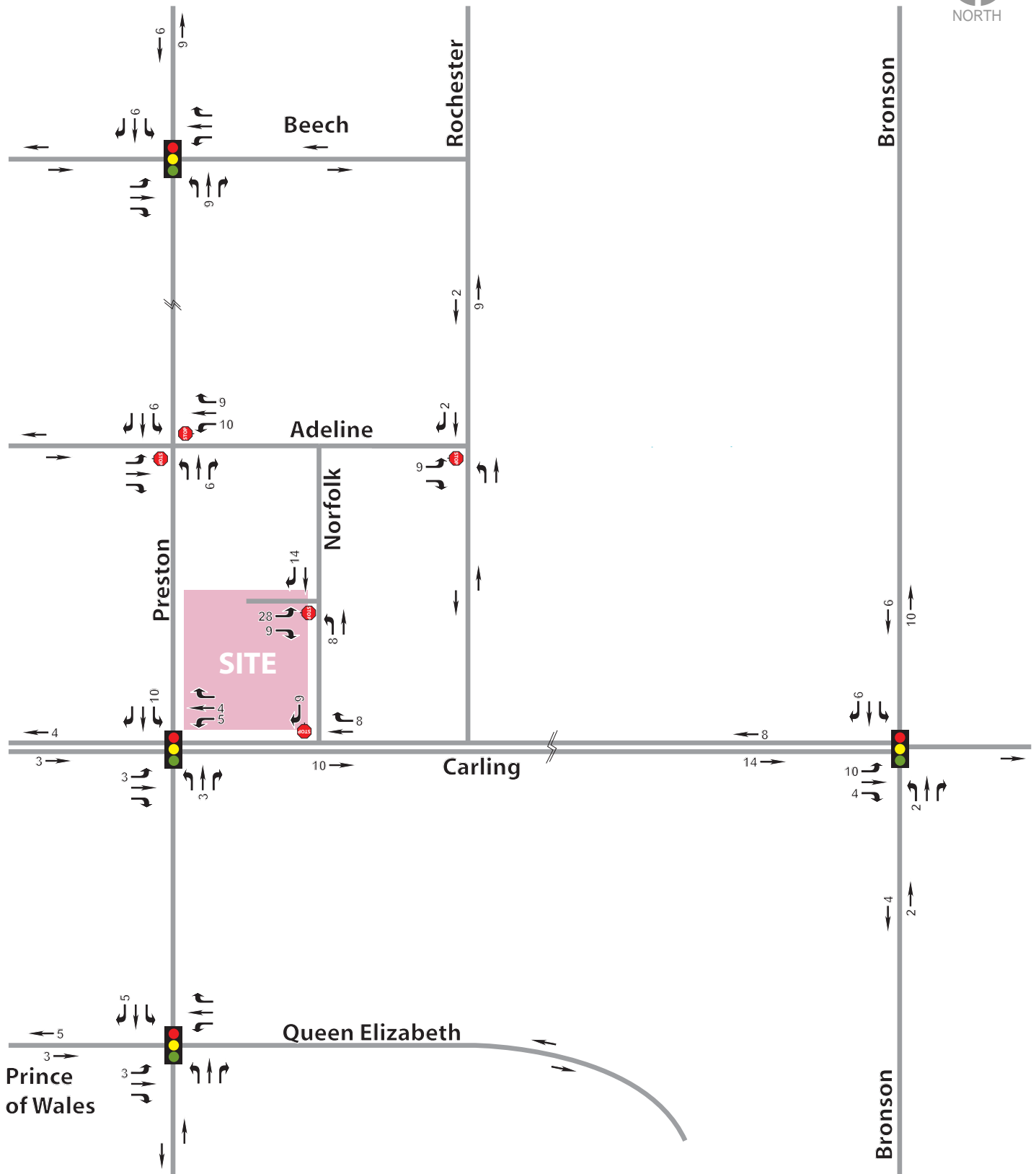
**TABLE 7: Total Additional Site Vehicle Trip Generation (condo + commercial/office)**

Travel Mode	AM Peak (veh/h)			PM Peak (veh/h)		
	In	Out	Total	In	Out	Total
High Rise Condo Trip Generation	3	12	15	6	4	10
Commercial/Office Trip Generation	8	3	11	5	11	16
<b>Total 'New' Auto Trips</b>	<b>11</b>	<b>15</b>	<b>26</b>	<b>11</b>	<b>15</b>	<b>26</b>

As summarized in Table 7, the net traffic increase associated with the proposed Site Plan changes is estimated at 26 vph during both peak periods, or less than one new vehicle every two minutes during peak hours.

As the initial proposal addressed in the June 2011 CTS had a "net" new traffic generation of 50 vph to 65 vph two-way total, as the changes per the December 2012 Addendum #1 added 8 vph and as the current Site Plan changes add 26 vph, the resultant total peak hour generation of the current proposal is in the range of 85 vph to 100 vph, with approximately

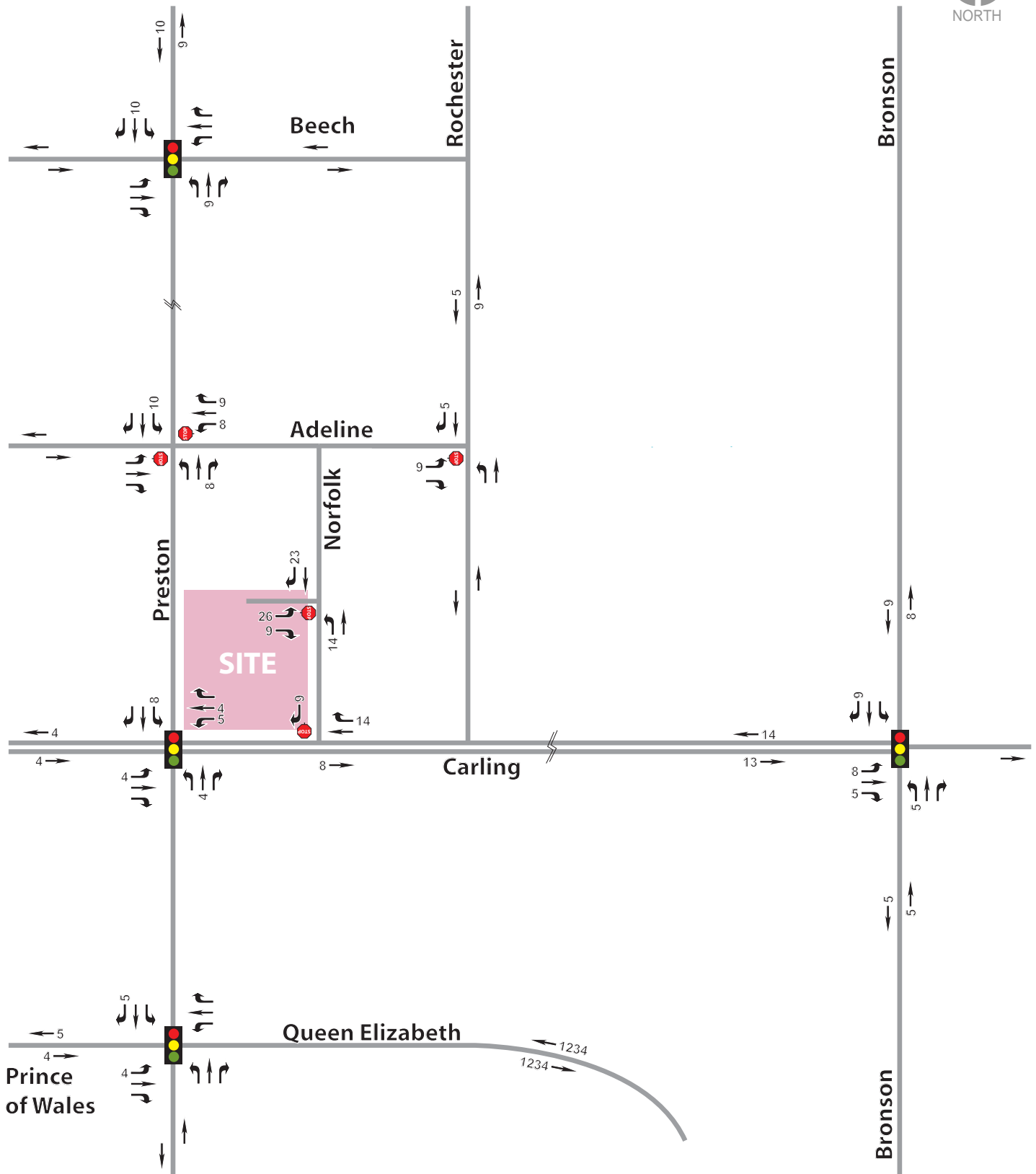




Mixed-Use Development - 505 Preston Street  
Community Transportation Study

**EXHIBIT 6A**  
Site-Generated Traffic  
AM Peak Hour

PROJECT No. 31637  
DATE: Dec. 2012  
SCALE: N.T.S.  
0m 0m 0m



Mixed-Use Development - 505 Preston Street  
Community Transportation Study

**EXHIBIT 6B**  
Site-Generated Traffic  
PM Peak Hour

PROJECT No. 31637  
DATE: Dec. 2012  
SCALE: N.T.S.  
0m 0m 0m

Claridge Homes Inc. – 2013-05-22

**TABLE 2 - TRIP GENERATION SUMMARY – BY MODE**

Travel Mode	Modal Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Total Person Trips	100%	56	101	157	101	91	192
Auto Driver	31%	17	31	49	31	28	60
Auto Passenger	7%	4	7	11	7	6	13
Public Transit	<b>35%</b>	20	36	55	36	32	67
Non-Motorized	27%	15	27	42	27	25	52
<b>New Auto Trips</b>		<b>17</b>	<b>31</b>	<b>49</b>	<b>31</b>	<b>28</b>	<b>60</b>
<i>New Auto Trips (2012 CTS)</i>		<i>22</i>	<i>37</i>	<i>59</i>	<i>37</i>	<i>35</i>	<i>72</i>

**Background Traffic**

As analysed by Delcan in transportation studies for nearby development proposals including 101 Champagne, 505 Preston and 514-532 Rochester, traffic growth has been shown to be on a decline within the study area during the period of 2001 to 2010. It is expected that this trend will continue and that there will be a stagnant rate of background traffic growth in the study area with the exception of traffic generation from known development applications.

Since the submission of the CTS for 505 Preston Street, there have been a number of additional development applications within the study area. The following table lists all of the current applications (both in the initial planning and approval stages), along with their corresponding trip generation.

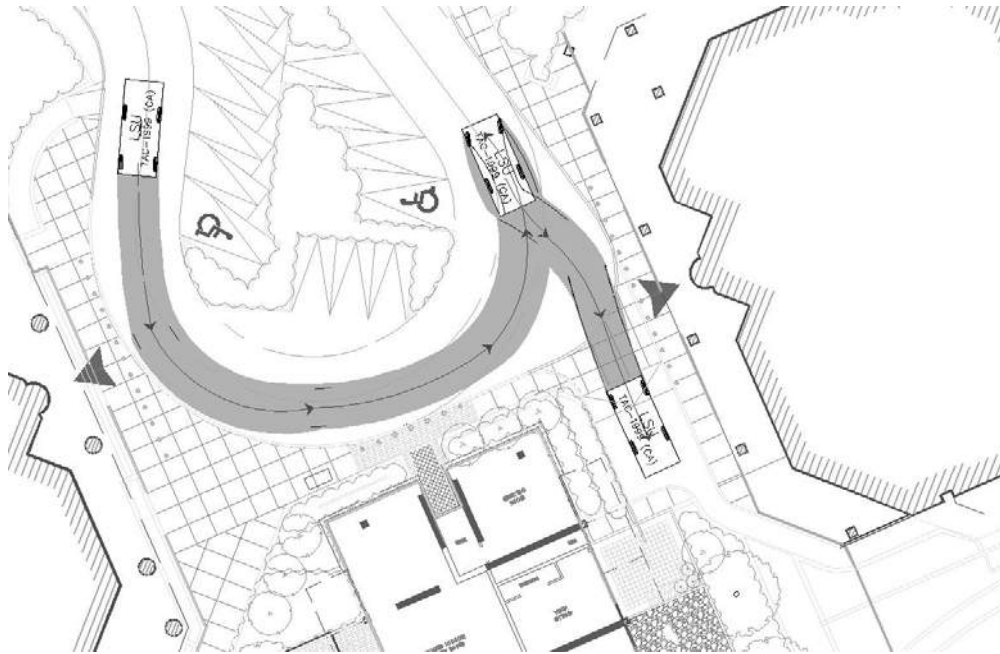
**TABLE 3 - PROPOSED TRAFFIC GENERATION FROM PROPOSED DEVELOPMENTS WITHIN THE STUDY AREA**

Development	Projected Net Traffic Generated		Status
	AM Peak Hour	PM Peak Hour	
855 Carling Avenue (Arnon) *UPDATED	+176	+208	Revision Likely
125 Hickory Street (Mastercraft Starwood)	+150	+175	Under Construction
100 Champagne Avenue (Domicile)	+40	+50	Under Construction
500 Preston Street (Mastercraft Starwood)	+65	+72	Approved
101 Champagne (Ashcroft)	+53	+53	Approved
93-105 Norman Street (Taggart) *NEW	+52	+56	Application On Hold
845 Carling (Richcraft) *NEW	+151	+175	Submitted for ZBA
320/330 Loretta Avenue (Domicile)	+83	+98	Recently Built-Out
350 Loretta Avenue (Domicile)	+90	+105	Recently Built-Out
514-532 Rochester Street (Domicile) *NEW	+54	+60	Submitted for SPA
774 Bronson Avenue (Samcon) *NEW	+37	+48	Submitted for SPA
265 Carling (Taggart) *NEW	+47	+43	Approved
<b>TOTAL</b>	<b>998</b>	<b>1,143</b>	

\* Note: Site traffic generation values have been confirmed by IBI Group.

The update to trip generation values for each of the developments listed above suggests a net increase of 31 trips in the weekday morning peak hour and 34 trips in the weekday afternoon

Figure 6-4: Loading Access (Tower 1)



## 7 Existing Traffic Volumes

Existing (2012) traffic volumes have been obtained from the City of Ottawa. Two-way peak hour traffic volumes on Aberdeen Street are in the order of 130 to 230 vehicles per hour during the weekday morning and afternoon peak hours, respectively. Two-way peak hour traffic volumes on Rochester Street are in the order of 500 to 650 vehicles per hour during the weekday morning and afternoon peak hours, respectively. Both of these roads are well under capacity for their classification of road and number of lanes.

Based on analysis of these volumes, the intersection is operating at a Level of Service 'A' with average delays of 20 seconds on the eastbound approach during the weekday morning peak hour. During the weekday afternoon peak hour, the intersection operates at approximately Level of Service 'A' with average delays of 22 seconds on the eastbound approach. These results are consistent with field observations.

## 8 Trip Generation

Based on data presented in the Institute of Transportation Engineer's (ITE) Trip Generation Manual, 9<sup>th</sup> Edition, site generated traffic associated with the proposed development is expected to increase by a maximum of 94 vehicles per hour (80% exiting, 20% entering) and 119 vehicles per hour (35% exiting, 65% entering) during the weekday morning and afternoon peak hours, respectively.

The vehicular trip generation rates referenced in the Trip Generation Manual are typically for highly suburbanized locations with little to no access to public transit. The ITE rates generally capture roughly 95% of all trips to/from a development. Since auto occupancy is assumed to be in the order of 1.2 people per vehicle, the resulting Person Trip conversion factor is 1.26.

Based on local information available in the 2011 NCR Household Origin-Destination Survey, conducted by the TRANS Committee for the City of Ottawa, the breakdown of trips by transportation mode in Ottawa Inner Area is approximated as follows:

- Auto Driver: 33%
- Auto Passenger: 10%
- Transit: 19%
- Non-Auto: 39%

The local adjustment factors above therefore indicate that the development will generate approximately 39 vehicles per hour and 49 vehicles per hour during the weekday morning and afternoon peak hours, respectively. It is important to note that these are two-way trips (in and out) and will be distributed amongst each of the four active parking garage ramps. The effect on the adjacent road network is therefore expected to be insignificant.

transit trips is estimated to be 65 to 80 additional persons/h and the increase in active trips is also 45 to 135 persons/h. These developments represent the redevelopment of the existing heritage buildings, which are currently vacant.

## Residential Trip Generation

Using the TRANS Trip Generation rates outlined in Table 1 and the TRANS Trip Generation mode splits for the residential component of the site, the total amount of person trips generated by the proposed 1,000 residential units is summarized in Table 5.

Table 5: Projected Person Trip Generation - Residential

Land Use	Area	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
High-Rise Condominiums	1,000 units	267	696	963	504	366	870

As shown in Table 5, a total of 963 and 870 person-trips per hour are projected to travel to/from the proposed residential development during the weekday morning and afternoon commuter peak hours. Using the model splits from the TRANS Trip Generation report, these person trips were broken down into people trips as outlined in Table 6.

Table 6: TRANS Model Site Trip Generation - Residential

Travel Mode	Mode Share		AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
	AM	PM	In	Out	Total	In	Out	Total
Auto Driver	27%	23%	72	188	260	116	84	200
Auto Passenger	3%	6%	7	21	28	31	21	52
Transit	27%	29%	73	188	261	146	107	253
Non-motorized	43%	42%	115	299	414	211	154	365
<b>Total Person Trips</b>	<b>100%</b>		<b>267</b>	<b>696</b>	<b>963</b>	<b>504</b>	<b>366</b>	<b>870</b>

As shown in Table 6, based on the TRANS Trip Generation rates and TRANS modal shares, the proposed residential developments are projected to generate approximately 260 and 200 'new' veh/h during the weekday morning and afternoon peak hours, respectively. The increase in two-way transit trips is estimated to be approximately 260 to 250 persons per hour, and the increase in bike/walk trips is approximately 415 and 365 persons per hour.

The total development trip generation, including the proposed office, retail and residential developments is summarized in Table 7.

Table 7: Total Site Person-Trip Generation

Travel Mode	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
	In	Out	Total	In	Out	Total
Auto Driver	132	201	333	146	156	302
Auto Passenger	24	26	50	43	44	87
Transit	128	198	326	165	167	332
Non-motorized	146	313	459	271	230	501
<i>Less Retail Pass-By (30%)</i>	-2	-2	-4	-6	-6	-12
<b>Total Person Trips</b>	<b>430</b>	<b>738</b>	<b>1,168</b>	<b>625</b>	<b>597</b>	<b>1,222</b>
<b>Total 'New' Auto Trips</b>	<b>130</b>	<b>199</b>	<b>329</b>	<b>140</b>	<b>150</b>	<b>290</b>

Table 11: Future Projected 2030/2035 Office Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	15%	20	4	24	4	19	23
Auto Passenger	5%	7	1	8	2	7	9
Transit	50%	66	11	77	11	61	72
Non-motorized	30%	39	6	45	6	36	42
<b>Total Person Trips</b>	<b>100%</b>	<b>132</b>	<b>22</b>	<b>154</b>	<b>23</b>	<b>123</b>	<b>146</b>
<b>Total 'New' Auto Trips</b>		<b>20</b>	<b>4</b>	<b>24</b>	<b>4</b>	<b>19</b>	<b>23</b>

Table 12: Future Projected 2030/2035 Retail Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	15%	5	3	8	15	17	32
Auto Passenger	5%	2	1	3	5	6	11
Transit	20%	6	4	10	20	21	41
Non-motorized	60%	18	12	30	58	64	122
Less Retail Pass-By (30%)		-1	-1	-2	-5	-5	-10
<b>Total Person Trips</b>	<b>100%</b>	<b>31</b>	<b>20</b>	<b>51</b>	<b>98</b>	<b>108</b>	<b>206</b>
<b>Total 'New' Auto Trips</b>		<b>5</b>	<b>3</b>	<b>8</b>	<b>15</b>	<b>17</b>	<b>32</b>

Table 13: Future Projected 2030/2035 Residential Trip Generation

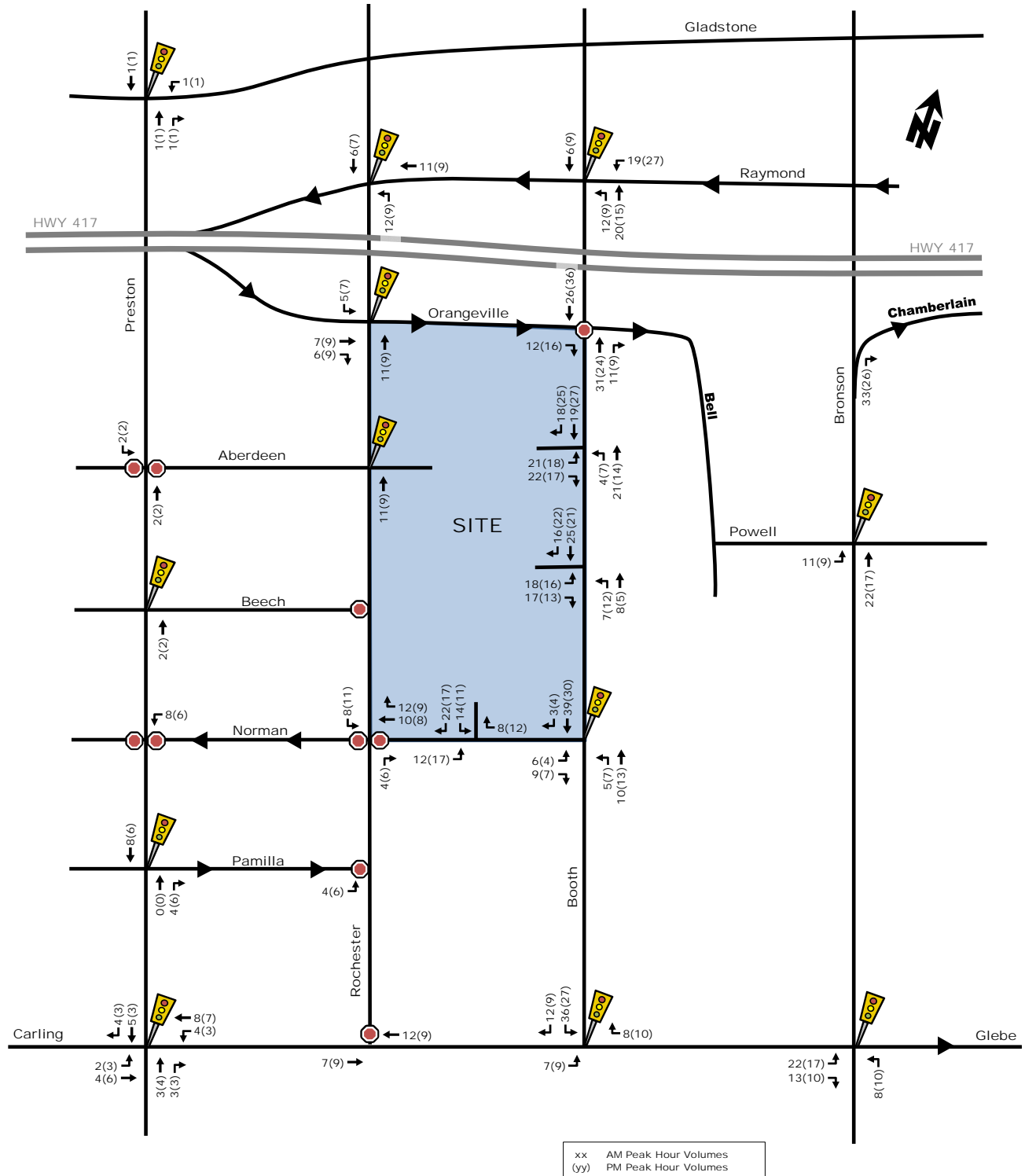
Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	15%	40	105	145	75	55	130
Auto Passenger	5%	13	35	48	25	19	44
Transit	50%	134	348	482	252	183	435
Non-motorized	30%	81	207	288	151	110	261
<b>Total Person Trips</b>	<b>100%</b>	<b>268</b>	<b>695</b>	<b>963</b>	<b>503</b>	<b>367</b>	<b>870</b>
<b>Total 'New' Auto Trips</b>		<b>40</b>	<b>105</b>	<b>145</b>	<b>75</b>	<b>55</b>	<b>130</b>

Table 14: Future Projected 2030/2035 Total Site-Generated Person Trips

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	15%	65	112	177	94	91	185
Auto Passenger	5%	22	37	59	32	32	64
Transit	50%	206	363	569	283	265	548
Non-motorized	30%	138	225	363	215	210	425
Less Retail Pass-By (30%)		-1	-1	-2	-5	-5	-10
<b>Total Person Trips</b>	<b>100%</b>	<b>431</b>	<b>737</b>	<b>1,168</b>	<b>624</b>	<b>598</b>	<b>1,222</b>
<b>Total 'New' Auto Trips</b>		<b>64</b>	<b>111</b>	<b>175</b>	<b>89</b>	<b>86</b>	<b>175</b>

As shown in Table 14, the resulting number of potential 'new' two-way vehicle trips for the proposed developments by 2030 is approximately 175 and 175 veh/h during the weekday morning and afternoon peak hours, respectively. Transit trips in

Figure 13: 'New' and 'Pass-by' 2030 Site-Generated Vehicle Traffic



## 3.2. BACKGROUND NETWORK TRAVEL DEMANDS

### 3.2.1. TRANSPORTATION NETWORK PLANS

Refer to Section 2.1.2 Planned Conditions.



Figure 9: Traffic Assignment (%)

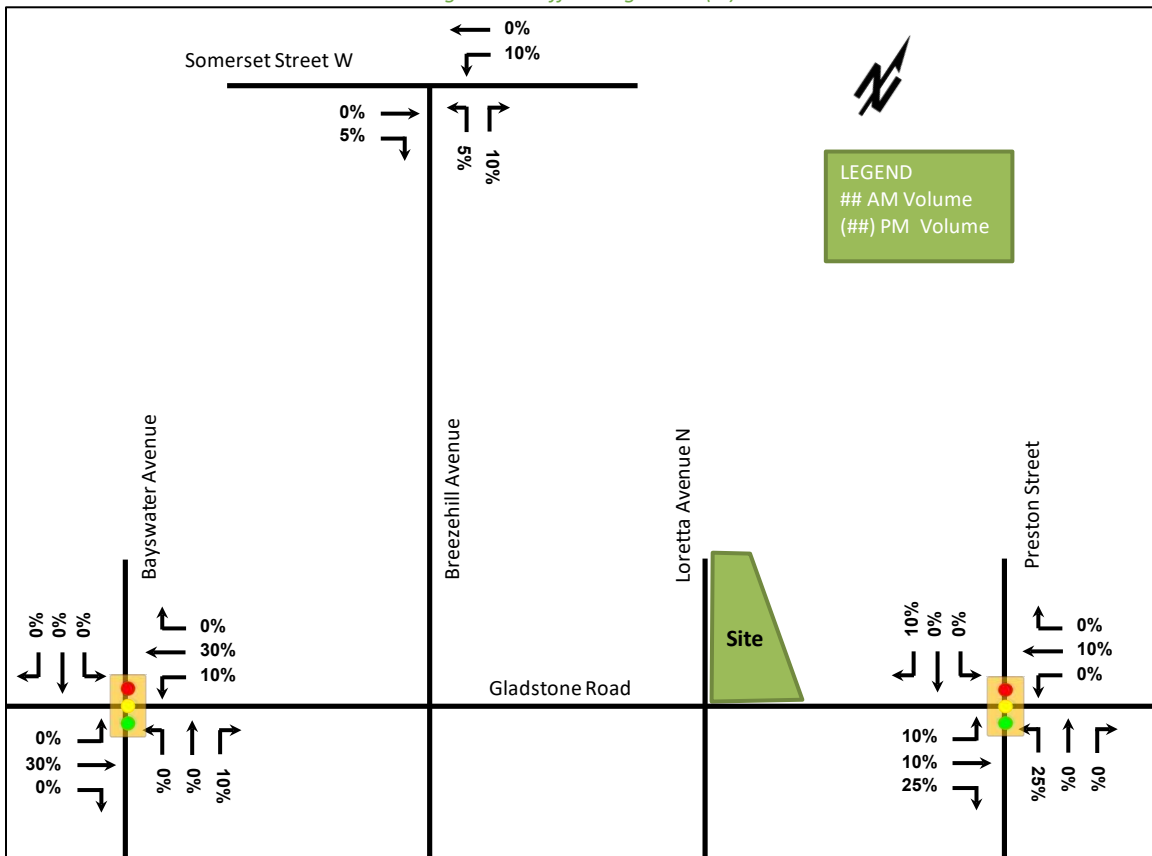
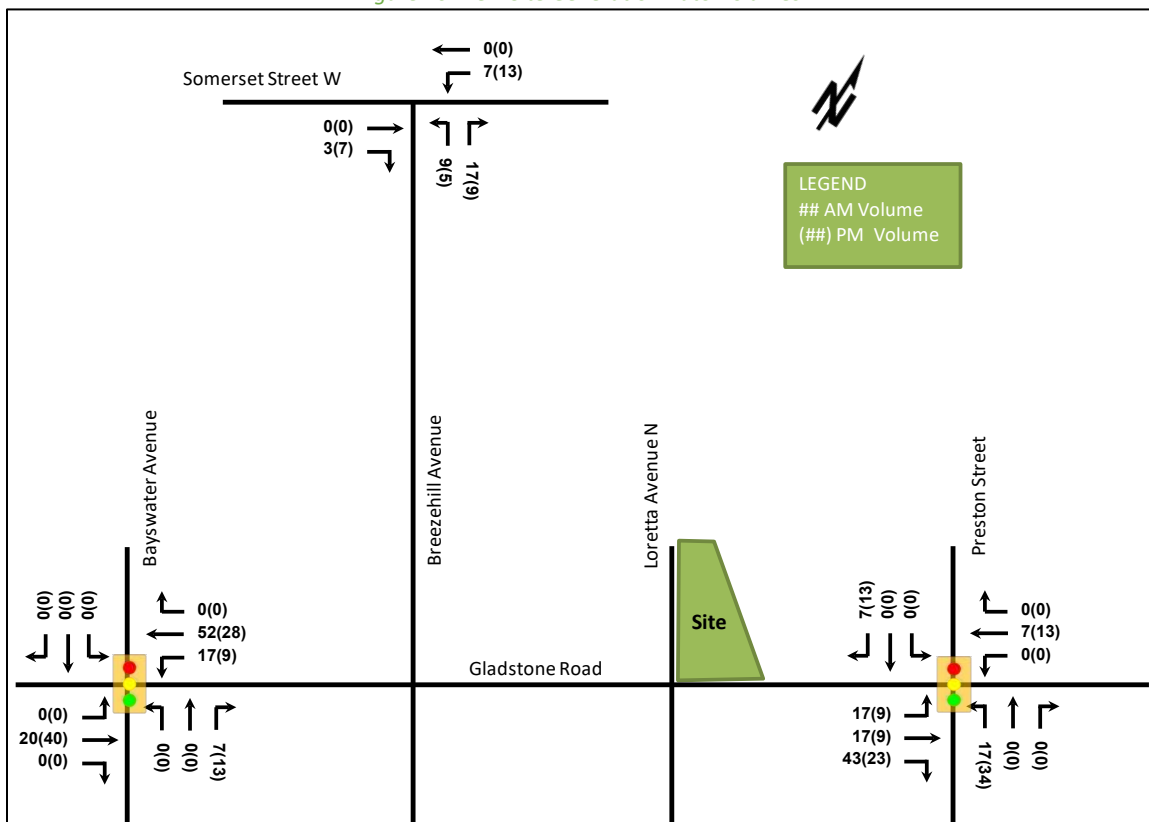


Figure 10: New Site Generation Auto Volumes



## **APPENDIX G**

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### TDM Checklists

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

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

<b>TDM-supportive design &amp; infrastructure measures:</b> <i>Residential developments</i>		<b>Check if completed &amp; add descriptions, explanations or plan/drawing references</b>
<b>1. WALKING &amp; CYCLING: ROUTES</b>		
<b>1.1 Building location &amp; access points</b>		
<b>BASIC</b>	1.1.1 Locate building close to the street, and do not locate parking areas between the street and building entrances	<input checked="" type="checkbox"/>
<b>BASIC</b>	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	<input checked="" type="checkbox"/>
<b>BASIC</b>	1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	<input checked="" type="checkbox"/>
<b>1.2 Facilities for walking &amp; cycling</b>		
<b>REQUIRED</b>	1.2.1 Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations ( <i>see Official Plan policy 4.3.3</i> )	<input checked="" type="checkbox"/>
<b>REQUIRED</b>	1.2.2 Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible ( <i>see Official Plan policy 4.3.12</i> )	<input checked="" type="checkbox"/>

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

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
<b>2. WALKING &amp; CYCLING: END-OF-TRIP FACILITIES</b>		
<b>2.1 Bicycle parking</b>		
REQUIRED	2.1.1 Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible ( <i>see Official Plan policy 4.3.6</i> )	<input checked="" type="checkbox"/>
REQUIRED	2.1.2 Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas ( <i>see Zoning By-law Section 111</i> )	<input checked="" type="checkbox"/>
REQUIRED	2.1.3 Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored ( <i>see Zoning By-law Section 111</i> )	<input checked="" type="checkbox"/>
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	<input type="checkbox"/>
<b>2.2 Secure bicycle parking</b>		
REQUIRED	2.2.1 Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers ( <i>see Zoning By-law Section 111</i> )	<input checked="" type="checkbox"/>
BETTER	2.2.2 Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	<input type="checkbox"/>
<b>2.3 Bicycle repair station</b>		
BETTER	2.3.1 Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	<input type="checkbox"/>
<b>3. TRANSIT</b>		
<b>3.1 Customer amenities</b>		
BASIC	3.1.1 Provide shelters, lighting and benches at any on-site transit stops	<input type="checkbox"/>
BASIC	3.1.2 Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	<input type="checkbox"/>
BETTER	3.1.3 Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	<input type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
<b>4. RIDESHARING</b>		
<b>4.1 Pick-up &amp; drop-off facilities</b>		
<b>BASIC</b>	4.1.1 Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	<input type="checkbox"/>
<b>5. CARSHARING &amp; BIKESHARING</b>		
<b>5.1 Carshare parking spaces</b>		
<b>BETTER</b>	5.1.1 Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses (see <i>Zoning By-law Section 94</i> )	<input type="checkbox"/>
<b>5.2 Bikeshare station location</b>		
<b>BETTER</b>	5.2.1 Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	<input type="checkbox"/>
<b>6. PARKING</b>		
<b>6.1 Number of parking spaces</b>		
<b>REQUIRED</b>	6.1.1 Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	<input checked="" type="checkbox"/>
<b>BASIC</b>	6.1.2 Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	<input type="checkbox"/>
<b>BASIC</b>	6.1.3 Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly (see <i>Zoning By-law Section 104</i> )	<input type="checkbox"/>
<b>BETTER</b>	6.1.4 Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking (see <i>Zoning By-law Section 111</i> )	<input type="checkbox"/>
<b>6.2 Separate long-term &amp; short-term parking areas</b>		
<b>BETTER</b>	6.2.1 Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	<input type="checkbox"/>

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

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

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

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



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

## **APPENDIX H**

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IBI Group – Access Review Memorandum



**IBI GROUP**  
400–333 Preston Street  
Ottawa ON K1S 5N4 Canada  
tel 613 225 1311 fax 613 225 9868  
[ibigroup.com](http://ibigroup.com)

# Memorandum

<b>To/Attention</b>	Mr. Jason Shinder Loretta Apartments Inc. c/o District Realty Corporation 50 Bayswater Ave Ottawa, ON K1Y 2E9	<b>Date</b>	September 15, 2016
<b>From</b>	David Hook	<b>Project No</b>	103074
<b>cc</b>	Debbie Belfie		
<b>Subject</b>	285 Loretta Avenue Severance – Access Review		

Dear Mr. Shinder,

We are pleased to provide you with a technical review of the proposed access driveway onto Champagne Avenue serving 285 Loretta Avenue. We understand this driveway will provide continued access to the existing Emerald Towers apartment complex through a right-of-way agreement, facilitating the severance and sale of the eastern half of the 285 Loretta Avenue property which has frontage along Champagne Avenue.

## Adjacent Developments

The subject property is within the influence area of Carling Station, which provides rail service (O-Train) via the Trillium Line. It is City of Ottawa policy to encourage intensified development within 600 meters of rapid transit stations with medium to high-density and a mix of land uses to support transit ridership while reducing urban sprawl and effectively managing automobile traffic congestion on city streets. As a result of this policy, several high-density developments have recently been constructed in the vicinity of the Carling Station with others in the planning stages. In view of this trend of 'smart' urban development, the subject property reflects a vastly-underused space in such close proximity to a rapid transit station. It is therefore the intention of the owners of 285 Loretta to maximize the potential of the under-utilized portion of the site by severing the property to permit future development.

Intensification typically comes with a potential increase in automobile traffic, however developments within mixed-use, walkable neighbourhoods that are in proximity to rapid transit generally have the least impact. There are several developments planned on Champagne Avenue which will increase traffic volumes on this street. Each development has undergone a Transportation Impact Study (TIS) and Site Plan control and has been approved by the City of Ottawa.

## Vehicular Access

The existing access to 285 Loretta is located midway along the Champagne Avenue frontage. In order to sever the property, access must be maintained in the form of a right-of-way through the severed portion. The location of the proposed access has been chosen to maximize the developable area of the site. Alternative locations for this right-of-way access would bisect the

Mr. Jason Shinder – September 15, 2016

severed portion of the site and significantly-reduce its development potential. It is acknowledged that there is a cluster of access driveways in the vicinity of the proposed access serving other high-density development, as illustrated on the attached composite plan.

A technical review of the proposed access location has been undertaken, making reference to existing and projected traffic volumes as well as ensuring conformance with the City of Ottawa Private Approach By-law.

### Traffic Volumes

Existing traffic volumes were recorded during the weekday afternoon peak hour, which in this case represents the critical peak. A review of the data collected suggests that existing volumes on Champagne Avenue are typical of a residential local street. Observation of traffic volumes found that the majority of traffic on Champagne Avenue is through-traffic and turning volumes to/from the adjacent development driveways are significantly-lower than predicted in each of their respective TIS reports. Recorded traffic volumes are presented on the attached figure and compared with predicted development volumes. Based on the recorded volumes and the presence of significant pedestrian traffic, it is evident that automobile ownership/usage for these developments is lower than originally anticipated.

The existing Emerald Towers apartment complex has 144 rental units and 115 parking spaces. Severance of the property will reduce the amount of on-site parking supply to only 48 parking spaces. Generally, for developments with less than 50 parking spaces, no access impact assessment is required as traffic volumes to/from the site are considered to be low enough that they would not have a significant operational impact to the intersecting road. This is quantified by the extremely-low volume of recorded traffic entering and exiting the site during the peak hour.

Although further development is expected in the near future (i.e. Ashcroft's 'Capital Hall' at 101 Champagne, and Phase 2 of 'SOHO Champagne'), based on existing volumes, a proportional yet minimal increase in traffic can be expected. The roadway has sufficient capacity to safely-accommodate this continued growth. Traffic generally flows in platoons along the street, metered by the traffic signals to the south at Carling Avenue, meaning there are frequent lengthy durations with no vehicular traffic on the street. This provides ample opportunity for vehicles to safely enter or exit the surrounding developments with minimal delay.

A speed survey was also conducted during the weekday afternoon peak hour and it was determined that, despite the reduced posted speed of 40km/h, the average operating speed on Champagne Avenue is 36.3km/h.

The study area was visited during the peak hour on multiple occasions with consistent observations. No operational issues have been observed along the corridor.

### Private Approach By-Law

The City of Ottawa Private-Approach By-law 2003-447 has been reviewed and has been found to be in conformance. Most importantly, the minimum offset from the property line of 3 meters has been respected and the access is in line with Ashcroft's proposed access on the east side of Champagne Avenue which is ideal in limiting future turning conflicts.

### Future Conditions

Upon development of the severed property in the future, it is recommended that the site provide its own exclusive access to the north, in line with the existing north access to 101 Champagne

Mr. Jason Shinder – September 15, 2016

(Ashcroft) to mitigate the impact of increased traffic at the proposed access to 285 Loretta, however this could be reviewed in more detail upon future site plan application of the site when development details are known. Any future development will require approval of a TIS by the City of Ottawa.

In summary, the design and location of the proposed access to 285 Loretta Avenue on Champagne Avenue meets City of Ottawa by-law regulations, however most importantly, it is our opinion that conflicting turning movements at the proposed site access will be minimal and therefore does not present a significant safety concern.

Regards,

A handwritten signature in black ink, appearing to read 'D Hook', with a stylized flourish extending to the right.

David Hook, P.Eng.



# Champagne Avenue Access Review



## Legend

- ## (##) - Weekday AM (&PM) Peak Hour Traffic - Actual
- ## (##) - Weekday AM (&PM) Peak Hour Traffic - Projected

SCALE:  
0m 5m 10m 20m



## **APPENDIX I**

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### Segment MMLOS Calculations

**Pedestrian Level of Service (PLOS)**

Sidewalk Width	Boulevard Width	Avg. Daily Curb Lane Traffic Volume	Presence of On-Street Parking	Operating Speed <sup>1</sup>	Segment PLOS
<b>Champagne Avenue</b>					
1.6m	None	<3,000 vpd	Yes	50 km/hr	F

1. Operating speed based on 10km/hr above posted speed limit

**Bicycle Level of Service (BLOS)**

Road Class	Bike Route	Type of Bikeway	Travel Lanes <sup>1</sup>	Centerline Markings	Operating Speed <sup>2</sup>	Segment BLOS
<b>Champagne Avenue</b>						
Local	N/A	Mixed Traffic	1	No	50 km/hr	B

1. Travel lanes in each direction

2. Operating speed based on 10km/hr above posted speed limit

**Transit Level of Service (TLOS)**

Facility Type	Level/Exposure to Congestion Delay, Friction and Incidents			Segment TLOS
	Congestion	Friction	Incident Potential	
Champagne Avenue				
Mixed Traffic	Yes	Low	Medium	D

**Truck Level of Service (TkLOS)**

Curb Lane Width	Number of Travel Lanes (Per Direction)	Segment TkLOS
<b>Champagne Avenue</b>		
>3.7m	1	B

**Auto LOS**

Direction	Directional Capacity <sup>1</sup>	Traffic Volumes		V/C Ratio and LOS				Auto LOS
		AM Peak	PM Peak	AM Peak		PM Peak		
				v/c	LOS	v/c	LOS	
Champagne Avenue								
NB	400vph	257	90	0.64	B	0.23	A	C
SB	400vph	96	311	0.24	A	0.78	C	

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



## Segment MMLOS Summary

	Segment	Champagne Avenue
Pedestrian	Sidewalk Width	1.6m
	Boulevard Width	None
	Average Daily Curb Lane Traffic Volume	<3000 vpd
	On-Street Parking	Yes
	Operating Speed	50 km/h
	Level of Service	F
	Target	A
Cyclist	Road Classification	Local
	Bike Route Classification	N/A
	Type of Bikeway	Mixed Traffic
	Travel Lanes (Each Direction)	1
	Centerline Markings	No
	Operating Speed	50 km/h
	Level of Service	B
	Target	D
Transit	Facility Type	Mixed Traffic
	Congestion	Yes
	Friction	Low
	Incident Potential	Medium
	Level of Service	D
	Target	-
Truck	Lane Width	>3.7m
	Travel Lanes (per direction)	1
	Level of Service	B
	Target	-
Auto	Volume	311 vph
	Capacity	400 vph
	Volume to Capacity Ratio	0.78
	Level of Service	C
	Target	E

## **APPENDIX J**

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### Intersection MMLOS Calculations

## Pedestrian Level of Service (PLOS)

Criteria	North Approach		East Approach		West Approach	
Carling Avenue/Sherwood Drive						
PETS I SCORE						
CROSSING DISTANCE CONDITIONS						
Median > 2.4m in Width	No	72	No	23	No	6
Lanes Crossed (3.5m Lane Width)	5		8		9	
SIGNAL PHASING AND TIMING						
Left Turn Conflict	Protected	0	Permissive	-8	No Left Turn/Prohibited	0
Right Turn Conflict	Permissive or Yield	-5	No Right Turn/Prohibited	0	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	RTOR Allowed	-3	N/A	0
Leading Pedestrian Interval	No	-2	No	-2	No	-2
CORNER RADIUS						
Parallel Radius	> 25m	-9	No Right Turn	0	> 5m to 10m	-5
Parallel Right Turn Channel	No Right Turn Channel	-4	No Right Turn	0	Conventional without Receiving	0
Perpendicular Radius	> 5m to 10m	-5	N/A	0	N/A	0
Perpendicular Right Turn Channel	Conventional without Receiving	0	N/A	0	N/A	0
CROSSING TREATMENT						
Treatment	Zebra Stripe	-4	Zebra Stripe	-4	Zebra Stripe	-4
PETS I SCORE		40			6	-10
LOS		E			F	F
DELAY SCORE						
Cycle Length	130		130		130	
Pedestrian Walk Time	52.6		26.9		26.9	
DELAY SCORE		23	40.9		40.9	
LOS		C	E		E	
OVERALL		E	F		F	

Criteria	North Approach		East Approach		West Approach	
Carling Avenue/Champagne Avenue						
PETSI SCORE						
CROSSING DISTANCE CONDITIONS						
Median > 2.4m in Width	No	88	No	23	No	23
Lanes Crossed (3.5m Lane Width)	4		8		8	
SIGNAL PHASING AND TIMING						
Left Turn Conflict	Permissive	-8	Permissive	-8	No Left Turn/Prohibited	0
Right Turn Conflict	Permissive or Yield	-5	No Right Turn/Prohibited	0	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	RTOR Allowed	-3	N/A	0
Leading Pedestrian Interval	No	-2	No	-2	No	-2
CORNER RADIUS						
Parallel Radius	> 3m to 5m	-4	No Right Turn	0	> 10m to 15m	-6
Parallel Right Turn Channel	No Right Turn Channel	-4	No Right Turn	0	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT						
Treatment	Standard	-7	Standard	-7	Standard	-7
PETSI SCORE		55		3		-1
LOS		D		F		F
DELAY SCORE						
Cycle Length		120		120		120
Pedestrian Walk Time		66.7		7.1		7.1
DELAY SCORE		11.8		53.1		53.1
LOS		B		E		E
OVERALL		D		F		F

Criteria	North Approach		South Approach		East Approach		West Approach	
Carling Avenue/Preston Street								
PETSİ SCORE								
CROSSİNG DISTANCE CONDITIONS								
Median > 2.4m in Width	No	88	No	55	No	6	No	6
Lanes Crossed (3.5m Lane Width)	4		6		9		9	
SİGNAL PHASİNG AND TİMİNG								
Left Turn Conflict	Protected	0	Protected	0	Permissive	-8	Perm + Prot	-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
CORNİR RADİUS								
Parallel Radius	> 3m to 5m	-4	> 3m to 5m	-4	> 10m to 15m	-6	> 3m to 5m	-4
Parallel Right Turn Channel	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSİNG TREATMENT								
Treatment	Standard	-7	Standard	-7	Standard	-7	Standard	-7
PETSİ SCORE		63	30		-29		-27	
LOS		C	E		F		F	
DELAY SCORE								
Cycle Length	130		130		130		130	
Pedestrian Walk Time	8		8		32.1		8.1	
DELAY SCORE		57.2	57.2		36.9		57.2	
LOS		E	E		D		E	
OVERALL		E	E		F		F	

Criteria	North Approach		South Approach		East Approach		West Approach	
Preston Street/Beech Street								
PETS I SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	105	No	105	No	105	No	105
Lanes Crossed (3.5m Lane Width)	3		3		3		3	
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	> 5m to 10m	-5	> 5m to 10m	-5	> 3m to 5m	-4	> 5m to 10m	-5
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	Textured	-4	Textured	-4	Textured	-4	Textured	-4
PETS I SCORE		74			74			74
LOS		C			C			C
DELAY SCORE								
Cycle Length		90		90		90		90
Pedestrian Walk Time		7.4		7.4		51.5		51.5
DELAY SCORE		37.9			37.9			8.2
LOS		D			D			A
OVERALL		D			D			B
								C

**Bicycle Level of Service (BLOS)**

Approach	Bikeway Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
Carling Avenue/Sherwood Avenue				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact to LTS	A
		Left Turn Accommodation	No lane crossed, 50km/hr	B
East Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact to LTS	A
		Left Turn Accommodation	N/A	-
West Approach	Mixed Traffic	Right Turn Lane Characteristics	N/A	-
		Left Turn Accommodation	Three lanes crossed, >60km/hr	F
Carling Avenue/Champagne Avenue				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact to LTS	A
		Left Turn Accommodation	One lane crossed, 50km/hr	D
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane <50m, Turning speed <25km/hr	D
		Left Turn Accommodation	N/A	-
West Approach	Mixed Traffic	Right Turn Lane Characteristics	N/A	-
		Left Turn Accommodation	Three lanes crossed, >60km/hr	F
Carling Avenue/Preston Street				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact to LTS	A
		Left Turn Accommodation	One lane crossed, 60km/hr	F
South Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact to LTS	A
		Left Turn Accommodation	Two lane crossed, 60km/hr	F
East Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact to LTS	A
		Left Turn Accommodation	Three lanes crossed, >60km/hr	F
West Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane <50m, Turning speed <25km/hr	D
		Left Turn Accommodation	Three lanes crossed, >60km/hr	F

Approach	Bikeway Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
<b>Preston Street/Beech Street</b>				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact to LTS	A
		Left Turn Accommodation	One lane crossed, 60km/hr	F
South Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact to LTS	A
		Left Turn Accommodation	One lane crossed, 60km/hr	F
East Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact to LTS	A
		Left Turn Accommodation	One lane crossed, 50km/hr	D
West Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact to LTS	A
		Left Turn Accommodation	No lane crossed, 50km/hr	B



**Transit Level of Service (TLOS)**

Approach	Facility Type	Delay <sup>1</sup>	Movement	TLOS
<b>Carling Avenue/Sherwood Drive</b>				
North Approach <sup>2</sup>	Mixed Traffic (No TSP)	-	-	-
East Approach	Mixed Traffic (No TSP)	13 sec	WBT/R	C
West Approach	Mixed Traffic (No TSP)	7 sec	EBT	B
<b>Carling Avenue/Champagne Avenue</b>				
North Approach <sup>2</sup>	Mixed Traffic (No TSP)	-	-	-
East Approach	Mixed Traffic (No TSP)	11 sec	WBT	C
West Approach	Mixed Traffic (No TSP)	7 sec	EBT	B
<b>Carling Avenue/Preston Street</b>				
North Approach	Mixed Traffic (No TSP)	75 sec	SBT/R	F
South Approach <sup>2</sup>	Mixed Traffic (No TSP)	-	-	-
East Approach	Mixed Traffic (No TSP)	59 sec	WBT/R	F
West Approach	Mixed Traffic (No TSP)	74 sec	EBL	F
<b>Preston Street/Beech Street</b>				
North Approach	Mixed Traffic (No TSP)	8 sec	SBT/R	B
South Approach	Mixed Traffic (No TSP)	8 sec	NBT/R	B
East Approach <sup>2</sup>	Mixed Traffic (No TSP)	-	-	-
West Approach <sup>2</sup>	Mixed Traffic (No TSP)	-	-	-

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

2. No OC Transpo Service on Sherwood Drive, Champagne Avenue, Beech Street and Preston Street south of Carling Avenue

**Truck Level of Service (TkLOS)**

Approach	Effective Corner Radius	Number of Receiving Lanes on Departure from Intersection	LOS
<b>Carling Avenue/Sherwood Drive</b>			
North Approach	< 10m	Three	D
East Approach	> 15m	One	C
West Approach	N/A	N/A	-
<b>Carling Avenue/Champagne Avenue</b>			
North Approach	10m to 15m	Three	B
East Approach	< 10m	One	F
West Approach	N/A	N/A	-
<b>Carling Avenue/Preston Street</b>			
North Approach	< 10m	Three	D
South Approach	10m to 15m	Three	B
East Approach	< 10m	Two	D
West Approach	< 10m	Two	D
<b>Preston Street/Beech Street</b>			
North Approach	< 10m	One	F
South Approach	< 10m	One	F
East Approach	< 10m	One	F
West Approach	< 10m	One	F

**Auto LOS**

Intersection	Period	Critical Movement			Intersection		
		V/C	LOS	Mvmt	Delay	V/C	LOS
Carling Avenue/ Sherwood Drive	AM	0.58	A	SB	12 sec	0.29	A
	PM	0.71	C	SB	15 sec	0.60	A
Carling Avenue/ Champagne Avenue	AM	0.33	A	SBL	5 sec	0.26	A
	PM	0.52	A	SBR	11 sec	0.47	A
Carling Avenue/ Preston Avenue	AM	0.98	E	NBL	39 sec	0.68	B
	PM	1.24	F	NBL	67 sec	0.95	E
		1.15	F	WBL			
		0.95	E	SBT/R			
		0.92	E	WBT/R			
Preston Avenue/ Beech Street	AM	0.56	A	EB	11 sec	0.49	A
	PM	0.51	A	WBT/R	11 sec	0.42	A

## Notes:

- Intersection parameters used in the analysis are consistent with the TIA guidelines (saturation flow rate: 1800vphpl, PHF: 0.90).
- Traffic signal timings obtained from City of Ottawa, included in Appendix D.
- Detailed Synchro reports are included in Appendix K.

Intersection		Carling Avenue/Sherwood Drive			Carling Avenue/Champagne Avenue		
		North	East	West	North	East	West
Pedestrian	Median > 2.4m in Width	No	No	No	No	No	No
	Lanes (3.5m Lane Width)	Five	Eight	Nine	Four	Eight	Eight
	Conflicting Left Turns	Protected	Permissive	No Left Turn	Permissive	Permissive	No Left Turn
	Conflicting Right Turns	Permissive	No Right Turn	Permissive	Permissive	No Right Turn	Permissive
	Right Turn on Red	Allowed	Allowed	N/A	Allowed	Allowed	N/A
	Pedestrian Leading Interval	No	No	No	No	No	No
	Parallel Radius	>25m	No Right Turn	>5m to 10m	>3m to 5m	No Right Turn	>10m to 15m
	Parallel Channel	No Channel	No Right Turn	Conventional	No Channel	No Right Turn	No Channel
	Perpendicular Radius	>5m to 10m	N/A	N/A	N/A	>10m to 15m	N/A
	Perpendicular Channel	Conventional	N/A	N/A	N/A	Smart Channel	N/A
	Crosswalk Type	Zebra Striped	Zebra Striped	Zebra Striped	Standard	Standard	Standard
	PETSI Score	40	6	-18	55	3	-1
	Delay Score	23	40.9	40.9	11.8	53.1	53.1
	Level of Service	E	F	F	D	F	F
	Target	F			F		
Cyclist	Type of Bikeway	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Turning Speed	N/A	N/A	N/A	N/A	<25km/hr	N/A
	Right Turn Storage	N/A	N/A	N/A	N/A	<50m	N/A
	Dual Right Turn Lanes	No	No	N/A	No	No	N/A
	Shared Through-Right Lane	Yes	Yes	N/A	Yes	No	N/A
	Bike Box	No	N/A	No	No	N/A	No
	Lanes Crossed for Left Turns	None	N/A	Three	One	N/A	Three
	Dual Left Turn Lanes	No	N/A	No	No	N/A	No
	Approach Speed	50km/hr	N/A	60km/hr	50km/hr	N/A	60km/hr
	Level of Service	B	A	F	A	D	F
		F			F		
	Target	B			C		
Transit	Average Signal Delay	-	13 seconds	7 seconds	-	11 seconds	7 seconds
	Level of Service	-	C	B	-	C	B
		C			C		
Truck	Target	C			C		
	Turning Radius	<10m	>15m	N/A	10m to 15m	<10m	N/A
	Receiving Lanes	Three	One	N/A	Three	One	N/A
	Level of Service	D	C	-	B	F	-
Auto		D			F		
	Target	D			D		
	Volume to Capacity Ratio	0.60			0.47		
	Level of Service	A			A		
	Target	E			E		

	Intersection	Carling Avenue/Preston Street				Preston Street/Beech Street			
		North	South	East	West	North	South	East	West
Pedestrian	Median > 2.4m in Width	No	No	No	No	No	No	No	No
	Lanes (3.5m Lane Width)	Four	Six	Nine	Nine	Three	Three	Three	Three
	Conflicting Left Turns	Protected	Protected	Permissive	Perm + Prot	Permissive	Permissive	Permissive	Permissive
	Conflicting Right Turns	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
	Right Turn on Red	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed
	Pedestrian Leading Interval	No	No	No	No	No	No	No	No
	Parallel Radius	>3m to 5m	>3m to 5m	>10m to 15m	>3m to 5m	>5m to 10m	>5m to 10m	>3m to 5m	>5m to 10m
	Parallel Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel
	Perpendicular Radius	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Perpendicular Channel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Crosswalk Type	Standard	Standard	Standard	Standard	Textured	Textured	Textured	Textured
	PETSI Score	63	30	-29	-27	74	74	75	74
	Delay Score	57.2	57.2	36.9	57.2	37.9	37.9	8.2	8.2
	Level of Service	E	E	F	F	D	D	D	C
	Target	F				D			
Cyclist	Type of Bikeway	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Turning Speed	N/A	N/A	N/A	<25km/hr	N/A	N/A	N/A	N/A
	Right Turn Storage	N/A	N/A	N/A	<50m	N/A	N/A	N/A	N/A
	Dual Right Turn Lanes	No	No	No	No	No	No	No	No
	Shared Through-Right Lane	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
	Bike Box	No	No	No	No	No	No	No	No
	Lanes Crossed for Left Turns	One	Two	Three	Three	One	One	One	None
	Dual Left Turn Lanes	No	No	No	No	No	No	No	No
	Approach Speed	60km/hr	60km/hr	> 60km/hr	> 60km/hr	60km/hr	60km/hr	50km/hr	50km/hr
	Level of Service	F	F	F	F	F	F	D	B
		F				F			
	Target	B				A			
Transit	Average Signal Delay	75 seconds	-	59 seconds	74 seconds	8 seconds	8 seconds	-	-
	Level of Service	F	-	F	F	B	B	-	-
		F				B			
Truck	Turning Radius	<10m	10m to 15m	<10m	<10m	<10m	<10m	<10m	<10m
	Receiving Lanes	Three	Three	Two	Two	One	One	One	One
	Level of Service	D	B	D	D	F	F	F	F
		D				F			
Auto	Volume to Capacity Ratio	0.95				0.49			
	Level of Service	E				A			
	Target	E				E			






















## **APPENDIX K**

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Synchro Reports













3: Preston Street & Carling Avenue  
AM Peak

90 Champagne Avenue  
Existing Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	563	224	134	424	94	282	512	281	80	227	99
Future Volume (vph)	140	563	224	134	424	94	282	512	281	80	227	99
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		40.0	45.0		0.0	65.0		0.0	30.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	45.0			45.0			40.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.93		0.85	0.96	0.97		0.98	0.99		1.00	0.98	
Frt			0.850		0.973			0.947			0.954	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1631	4777	1532	1712	4442	0	1712	3148	0	1558	1551	0
Flt Permitted	0.950			0.950			0.234			0.323		
Satd. Flow (perm)	1512	4777	1303	1638	4442	0	415	3148	0	529	1551	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			249		38			123			20	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		239.3			272.5			187.5			369.8	
Travel Time (s)		14.4			16.4			13.5			26.6	
Confl. Peds. (#/hr)	65		41	41		65	39		2	2		39
Confl. Bikes (#/hr)			21			9			36			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 (%)	6%	4%	1%	1%	4%	10%	1%	4%	1%	11%	6%	20%
Adj. Flow (vph)	156	626	249	149	471	104	313	569	312	89	252	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	156	626	249	149	575	0	313	881	0	89	362	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	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			2				8			4		
Detector Phase	5	2	2	1	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0	30.0	11.2	30.0		11.9	43.9		43.9	43.9	
Total Split (s)	18.0	35.0	35.0	18.0	35.0		20.0	67.0		47.0	47.0	
Total Split (%)	15.0%	29.2%	29.2%	15.0%	29.2%		16.7%	55.8%		39.2%	39.2%	
Maximum Green (s)	11.8	29.0	29.0	11.8	29.0		13.1	60.1		40.1	40.1	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3	3.3	

3: Preston Street & Carling Avenue  
AM Peak

90 Champagne Avenue  
Existing Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3		3.6	3.6		3.6	3.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.0	6.0	6.2	6.0		6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		17.0	17.0		17.0			30.0		30.0	30.0	
Pedestrian Calls (#/hr)		5	5		5			5		5	5	
Act Effct Green (s)	16.0	34.7	34.7	14.3	33.1		51.9	51.9		31.9	31.9	
Actuated g/C Ratio	0.13	0.29	0.29	0.12	0.28		0.43	0.43		0.27	0.27	
v/c Ratio	0.72	0.45	0.45	0.73	0.46		0.98	0.62		0.64	0.85	
Control Delay	74.0	30.2	5.0	72.0	36.0		71.1	23.7		58.1	57.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	74.0	30.2	5.0	72.0	36.0		71.1	23.7		58.1	57.3	
LOS	E	C	A	E	D		E	C		E	E	
Approach Delay		30.8			43.4			36.1			57.5	
Approach LOS		C			D			D			E	
Queue Length 50th (m)	27.6	48.5	0.0	33.2	40.2		49.9	71.0		18.5	76.7	
Queue Length 95th (m)	#81.9	29.1	4.0	#72.9	52.6		#87.3	79.8		34.9	103.6	
Internal Link Dist (m)		215.3			248.5			163.5			345.8	
Turn Bay Length (m)	45.0		40.0	45.0			65.0			30.0		
Base Capacity (vph)	217	1381	553	204	1252		320	1638		176	531	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.72	0.45	0.45	0.73	0.46		0.98	0.54		0.51	0.68	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 116 (97%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 38.9

Intersection LOS: D

Intersection Capacity Utilization 94.2%

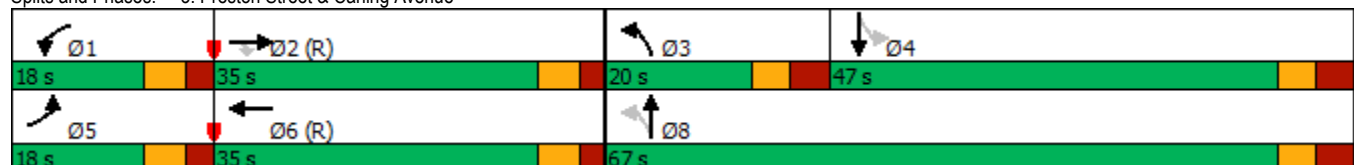
ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.




















Splits and Phases: 3: Preston Street & Carling Avenue

















6: Preston Street & Beech Street  
AM Peak

90 Champagne Avenue  
Existing Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	52	26	19	54	8	23	566	42	18	321	36
Future Volume (vph)	38	52	26	19	54	8	23	566	42	18	321	36
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.6			20.0			20.0			20.0		
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		0.94		0.94	0.99		0.97	0.99		0.98	0.99	
Frt		0.970			0.980			0.990			0.985	
Flt Protected		0.984		0.950			0.950			0.950		
Satd. Flow (prot)	0	1597	0	1281	1729	0	1586	1722	0	1558	1662	0
Flt Permitted		0.865		0.646			0.523			0.356		
Satd. Flow (perm)	0	1368	0	815	1729	0	844	1722	0	569	1662	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			9			9			14	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		237.2			186.9			369.8			155.9	
Travel Time (s)		17.1			13.5			26.6			11.2	
Confl. Peds. (#/hr)	36		36	36		36	43		55	55		43
Confl. Bikes (#/hr)			26			2			20			14
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 (%)	8%	4%	4%	35%	2%	0%	9%	4%	2%	11%	7%	6%
Adj. Flow (vph)	42	58	29	21	60	9	26	629	47	20	357	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	129	0	21	69	0	26	676	0	20	397	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	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
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		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
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)	22.5	22.5		22.5	22.5		33.6	33.6		33.6	33.6	
Total Split (s)	23.0	23.0		23.0	23.0		57.0	57.0		57.0	57.0	
Total Split (%)	28.8%	28.8%		28.8%	28.8%		71.3%	71.3%		71.3%	71.3%	
Maximum Green (s)	17.5	17.5		17.5	17.5		51.4	51.4		51.4	51.4	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	

6: Preston Street & Beech Street  
AM Peak

90 Champagne Avenue  
Existing Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.2	2.2		2.2	2.2		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5		5.5	5.5		5.6	5.6		5.6	5.6	
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		18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		12.6		12.6	12.6		60.5	60.5		60.5	60.5	
Actuated g/C Ratio		0.16		0.16	0.16		0.76	0.76		0.76	0.76	
v/c Ratio		0.56		0.16	0.25		0.04	0.52		0.05	0.32	
Control Delay		36.1		30.6	27.5		4.7	7.6		4.9	5.4	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		36.1		30.6	27.5		4.7	7.6		4.9	5.4	
LOS		D		C	C		A	A		A	A	
Approach Delay		36.1			28.2			7.5			5.3	
Approach LOS		D			C			A			A	
Queue Length 50th (m)		16.0		2.8	8.2		1.0	39.2		0.7	17.8	
Queue Length 95th (m)		30.3		8.5	17.7		3.8	81.2		3.3	38.0	
Internal Link Dist (m)		213.2			162.9			345.8			131.9	
Turn Bay Length (m)				15.0			20.0			20.0		
Base Capacity (vph)		312		178	385		638	1305		430	1260	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.41		0.12	0.18		0.04	0.52		0.05	0.32	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 40 (50%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 11.0

Intersection LOS: B

Intersection Capacity Utilization 57.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 6: Preston Street & Beech Street



11: Carling Avenue & Champagne Avenue  
AM Peak

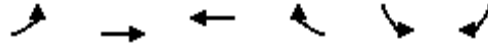
90 Champagne Avenue  
Existing Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	98	935	626	159	57	39
Future Volume (vph)	98	935	626	159	57	39
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			30.0	20.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				30.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Ped Bike Factor	0.92			0.76	0.99	0.98
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1729	4871	4777	1459	1695	1547
Flt Permitted	0.376				0.950	
Satd. Flow (perm)	628	4871	4777	1103	1682	1512
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				177		43
Link Speed (k/h)		60	60		40	
Link Distance (m)		168.7	239.3		408.2	
Travel Time (s)		10.1	14.4		36.7	
Confl. Peds. (#/hr)	76			76	7	9
Confl. Bikes (#/hr)				2		1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	4%	6%	2%	0%
Adj. Flow (vph)	109	1039	696	177	63	43
Shared Lane Traffic (%)						
Lane Group Flow (vph)	109	1039	696	177	63	43
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8	6.1	6.1	6.1
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	23.3	23.3	26.3	26.3	37.9	37.9
Total Split (s)	82.0	82.0	82.0	82.0	38.0	38.0
Total Split (%)	68.3%	68.3%	68.3%	68.3%	31.7%	31.7%
Maximum Green (s)	76.7	76.7	76.7	76.7	32.1	32.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3

11: Carling Avenue & Champagne Avenue  
AM Peak

90 Champagne Avenue  
Existing Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
All-Red Time (s)	1.6	1.6	1.6	1.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.9	5.9
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)			10.0	10.0	7.0	7.0
Flash Dont Walk (s)			10.0	10.0	25.0	25.0
Pedestrian Calls (#/hr)			5	5	5	5
Act Effct Green (s)	98.8	98.8	98.8	98.8	13.5	13.5
Actuated g/C Ratio	0.82	0.82	0.82	0.82	0.11	0.11
v/c Ratio	0.21	0.26	0.18	0.19	0.33	0.21
Control Delay	4.6	3.0	2.9	0.7	50.4	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.6	3.0	2.9	0.7	50.4	13.6
LOS	A	A	A	A	D	B
Approach Delay		3.1	2.5		35.5	
Approach LOS		A	A		D	
Queue Length 50th (m)	4.2	14.7	8.9	0.2	14.4	0.0
Queue Length 95th (m)	9.0	21.3	m20.5	m1.2	22.8	8.8
Internal Link Dist (m)		144.7	215.3		384.2	
Turn Bay Length (m)	40.0			30.0	20.0	
Base Capacity (vph)	516	4008	3931	939	453	435
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.26	0.18	0.19	0.14	0.10

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 106 (88%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.33

Intersection Signal Delay: 4.5

Intersection LOS: A

Intersection Capacity Utilization 48.7%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 11: Carling Avenue & Champagne Avenue

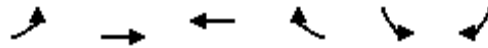
 <b>02 (R)</b> <b>32 s</b>	 <b>04</b> <b>38 s</b>
 <b>06 (R)</b> <b>32 s</b>	

12: Carling Avenue & Sherwood Drive  
AM Peak

90 Champagne Avenue  
Existing Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	31	712	517	121	131	5
Future Volume (vph)	31	712	517	121	131	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor	0.98		0.99		0.99	
Frt			0.972		0.995	
Flt Protected	0.950				0.954	
Satd. Flow (prot)	1679	4777	4526	0	1726	0
Flt Permitted	0.950				0.954	
Satd. Flow (perm)	1652	4777	4526	0	1711	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			64		2	
Link Speed (k/h)		60	60		40	
Link Distance (m)		181.5	168.7		309.1	
Travel Time (s)		10.9	10.1		27.8	
Confl. Peds. (#/hr)	19			19	8	9
Confl. Bikes (#/hr)				15		3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	4%	6%	2%	0%	0%
Adj. Flow (vph)	34	791	574	134	146	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	34	791	708	0	152	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (m)	6.1	30.5	30.5		6.1	
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	1.8	1.8		6.1	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA		Prot	
Protected Phases	5	2	6		4	
Permitted Phases						
Detector Phase	5	2	6		4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0		10.0	
Minimum Split (s)	10.2	16.4	33.4		40.1	
Total Split (s)	13.0	79.0	66.0		41.0	
Total Split (%)	10.8%	65.8%	55.0%		34.2%	
Maximum Green (s)	7.8	72.6	59.6		33.9	
Yellow Time (s)	3.7	3.7	3.7		3.3	
All-Red Time (s)	1.5	2.7	2.7		3.8	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	5.2	6.4	6.4		7.1	



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Walk Time (s)			12.0		26.0	
Flash Dont Walk (s)			15.0		7.0	
Pedestrian Calls (#/hr)			5		5	
Act Effct Green (s)	7.5	88.4	80.2		18.1	
Actuated g/C Ratio	0.06	0.74	0.67		0.15	
v/c Ratio	0.32	0.22	0.23		0.58	
Control Delay	61.7	6.0	7.8		54.1	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	61.7	6.0	7.8		54.1	
LOS	E	A	A		D	
Approach Delay		8.3	7.8		54.1	
Approach LOS		A	A		D	
Queue Length 50th (m)	7.8	17.1	13.5		34.1	
Queue Length 95th (m)	18.2	36.5	14.4		46.6	
Internal Link Dist (m)		157.5	144.7		285.1	
Turn Bay Length (m)						
Base Capacity (vph)	115	3519	3046		489	
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	0.30	0.22	0.23		0.31	

#### Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 112 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 85  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.58  
 Intersection Signal Delay: 12.2  
 Intersection Capacity Utilization 51.7%  
 Analysis Period (min) 15

















Intersection LOS: B  
 ICU Level of Service A

#### Splits and Phases: 12: Carling Avenue & Sherwood Drive





























9: Champagne Avenue & Beech Street  
AM Peak

90 Champagne Avenue  
Existing Traffic

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	129	18	73	63	10	21	19	57	11	10	3
Future Volume (vph)	2	129	18	73	63	10	21	19	57	11	10	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
Hourly flow rate (vph)	2	143	20	81	70	11	23	21	63	12	11	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	165	162	107	26								
Volume Left (vph)	2	81	23	12								
Volume Right (vph)	20	11	63	3								
Hadj (s)	-0.04	0.09	-0.28	0.06								
Departure Headway (s)	4.4	4.5	4.4	4.8								
Degree Utilization, x	0.20	0.20	0.13	0.03								
Capacity (veh/h)	794	765	759	679								
Control Delay (s)	8.4	8.6	8.1	8.0								
Approach Delay (s)	8.4	8.6	8.1	8.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.4								
Level of Service				A								
Intersection Capacity Utilization				33.2%	ICU Level of Service	A						
Analysis Period (min)				15								

3: Preston Street & Carling Avenue  
PM Peak

90 Champagne Avenue  
Existing Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	116	541	370	340	1011	45	340	358	164	81	308	112
Future Volume (vph)	116	541	370	340	1011	45	340	358	164	81	308	112
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		40.0	45.0		0.0	65.0		0.0	30.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	45.0			45.0			40.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.97		0.87	0.96	0.99		0.98	0.98		0.97	0.98	
Frt			0.850		0.994			0.953			0.960	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	4824	1532	1729	4822	0	1729	3174	0	1572	1676	0
Flt Permitted	0.950			0.950			0.130			0.434		
Satd. Flow (perm)	1616	4824	1331	1660	4822	0	232	3174	0	699	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			323		5			78			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		239.3			272.5			187.5			369.8	
Travel Time (s)		14.4			16.4			13.5			26.6	
Confl. Peds. (#/hr)	53		34	34		53	60		55	55		60
Confl. Bikes (#/hr)			12			10			16			6
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 (%)	4%	3%	1%	0%	1%	16%	0%	2%	0%	10%	1%	5%
Adj. Flow (vph)	129	601	411	378	1123	50	378	398	182	90	342	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	129	601	411	378	1173	0	378	580	0	90	466	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	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			2				8			4		
Detector Phase	5	2	2	1	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0	30.0	11.2	30.0		11.9	43.9		43.9	43.9	
Total Split (s)	30.0	31.0	31.0	30.0	31.0		24.0	69.0		45.0	45.0	
Total Split (%)	23.1%	23.8%	23.8%	23.1%	23.8%		18.5%	53.1%		34.6%	34.6%	
Maximum Green (s)	23.8	25.0	25.0	23.8	25.0		17.1	62.1		38.1	38.1	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3	3.3	



3: Preston Street & Carling Avenue  
PM Peak

90 Champagne Avenue  
Existing Traffic

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3		3.6	3.6		3.6	3.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.0	6.0	6.2	6.0		6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		17.0	17.0		17.0			30.0		30.0	30.0	
Pedestrian Calls (#/hr)		5	5		5			5		5	5	
Act Effct Green (s)	15.4	25.0	25.0	24.8	34.4		61.1	61.1		37.1	37.1	
Actuated g/C Ratio	0.12	0.19	0.19	0.19	0.26		0.47	0.47		0.29	0.29	
v/c Ratio	0.66	0.65	0.80	1.15	0.92		1.24	0.38		0.45	0.95	
Control Delay	73.1	48.0	24.9	142.5	58.5		161.6	19.6		46.3	75.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	73.1	48.0	24.9	142.5	58.5		161.6	19.6		46.3	75.2	
LOS	E	D	C	F	E		F	B		D	E	
Approach Delay		42.5			78.9			75.6			70.5	
Approach LOS		D			E			E			E	
Queue Length 50th (m)	32.6	47.2	0.1	~117.0	108.1		~97.8	41.6		18.7	113.3	
Queue Length 95th (m)	52.7	61.7	#61.8	#177.1	#158.4		#158.9	55.2		36.1	#177.6	
Internal Link Dist (m)		215.3			248.5			163.5			345.8	
Turn Bay Length (m)	45.0		40.0	45.0			65.0			30.0		
Base Capacity (vph)	304	927	516	329	1280		305	1556		204	501	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.42	0.65	0.80	1.15	0.92		1.24	0.37		0.44	0.93	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 6 (5%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.24

Intersection Signal Delay: 67.2

Intersection LOS: E

Intersection Capacity Utilization 111.5%

ICU Level of Service H

Analysis Period (min) 15

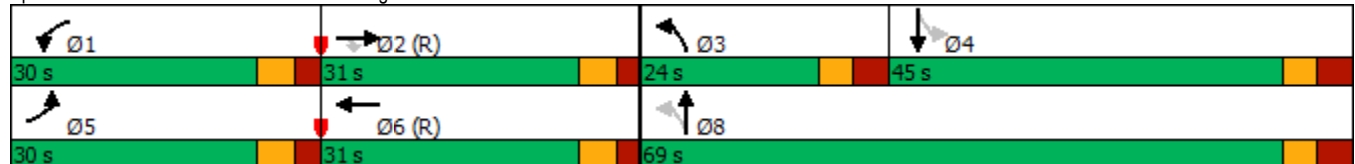
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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




















Queue shown is maximum after two cycles.

Splits and Phases: 3: Preston Street & Carling Avenue



6: Preston Street & Beech Street  
PM Peak

90 Champagne Avenue  
Existing Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	40	32	30	118	24	81	421	37	17	408	49
Future Volume (vph)	25	40	32	30	118	24	81	421	37	17	408	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.6			20.0			20.0			20.0		
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		0.95		0.92	0.98		0.97	0.99		0.96	0.99	
Frt		0.955			0.974			0.988			0.984	
Flt Protected		0.987		0.950			0.950			0.950		
Satd. Flow (prot)	0	1649	0	1729	1720	0	1729	1732	0	1729	1708	0
Flt Permitted		0.875		0.756			0.441			0.440		
Satd. Flow (perm)	0	1437	0	1267	1720	0	779	1732	0	765	1708	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		34			14			11			15	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		237.2			186.9			369.8			155.9	
Travel Time (s)		17.1			13.5			26.6			11.2	
Confl. Peds. (#/hr)	40		46	46		40	52		80	80		52
Confl. Bikes (#/hr)			2			20			11			18
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	3%	0%	0%	4%	2%
Adj. Flow (vph)	28	44	36	33	131	27	90	468	41	19	453	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	108	0	33	158	0	90	509	0	19	507	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	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
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		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
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)	22.5	22.5		22.5	22.5		33.6	33.6		33.6	33.6	
Total Split (s)	23.0	23.0		23.0	23.0		47.0	47.0		47.0	47.0	
Total Split (%)	32.9%	32.9%		32.9%	32.9%		67.1%	67.1%		67.1%	67.1%	
Maximum Green (s)	17.5	17.5		17.5	17.5		41.4	41.4		41.4	41.4	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	

6: Preston Street & Beech Street  
PM Peak

90 Champagne Avenue  
Existing Traffic

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.2	2.2		2.2	2.2		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5		5.5	5.5		5.6	5.6		5.6	5.6	
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		18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		12.2		12.2	12.2		46.7	46.7		46.7	46.7	
Actuated g/C Ratio		0.17		0.17	0.17		0.67	0.67		0.67	0.67	
v/c Ratio		0.39		0.15	0.51		0.17	0.44		0.04	0.44	
Control Delay		21.8		24.7	29.1		6.2	7.4		5.2	7.4	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		21.8		24.7	29.1		6.2	7.4		5.2	7.4	
LOS		C		C	C		A	A		A	A	
Approach Delay		21.8			28.3			7.2			7.3	
Approach LOS		C			C			A			A	
Queue Length 50th (m)		8.7		3.8	17.5		3.5	24.0		0.7	23.9	
Queue Length 95th (m)		19.7		9.7	30.6		11.1	53.5		3.2	53.4	
Internal Link Dist (m)		213.2			162.9			345.8			131.9	
Turn Bay Length (m)				15.0			20.0			20.0		
Base Capacity (vph)		384		316	440		519	1158		509	1143	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.28		0.10	0.36		0.17	0.44		0.04	0.44	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 43 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 11.2

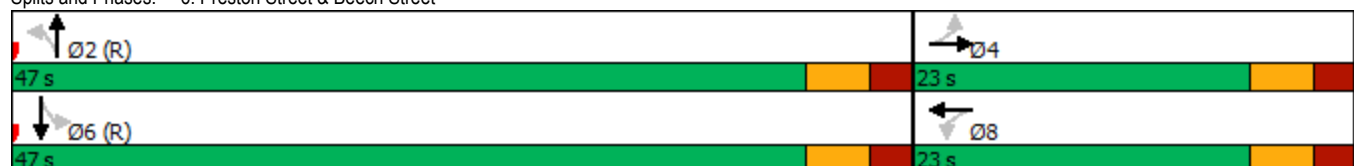
Intersection LOS: B

Intersection Capacity Utilization 78.2%

ICU Level of Service D

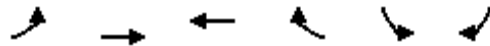
Analysis Period (min) 15

Splits and Phases: 6: Preston Street & Beech Street



11: Carling Avenue & Champagne Avenue  
PM Peak

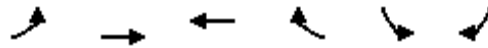
90 Champagne Avenue  
Existing Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	44	697	1184	46	129	182
Future Volume (vph)	44	697	1184	46	129	182
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			30.0	20.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				30.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Ped Bike Factor	0.99			0.86	1.00	0.98
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1441	4824	4919	1547	1712	1547
Flt Permitted	0.172				0.950	
Satd. Flow (perm)	257	4824	4919	1338	1707	1514
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				44		2
Link Speed (k/h)		60	60		40	
Link Distance (m)		168.7	239.3		408.2	
Travel Time (s)		10.1	14.4		36.7	
Confl. Peds. (#/hr)	70			70	5	16
Confl. Bikes (#/hr)				4		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	20%	3%	1%	0%	1%	0%
Adj. Flow (vph)	49	774	1316	51	143	202
Shared Lane Traffic (%)						
Lane Group Flow (vph)	49	774	1316	51	143	202
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8	6.1	6.1	6.1
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	23.3	23.3	26.3	26.3	37.9	37.9
Total Split (s)	27.0	27.0	27.0	27.0	38.0	38.0
Total Split (%)	41.5%	41.5%	41.5%	41.5%	58.5%	58.5%
Maximum Green (s)	21.7	21.7	21.7	21.7	32.1	32.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3

11: Carling Avenue & Champagne Avenue  
PM Peak

90 Champagne Avenue  
Existing Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
All-Red Time (s)	1.6	1.6	1.6	1.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.9	5.9
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)			10.0	10.0	7.0	7.0
Flash Dont Walk (s)			10.0	10.0	25.0	25.0
Pedestrian Calls (#/hr)			5	5	5	5
Act Effct Green (s)	37.3	37.3	37.3	37.3	16.5	16.5
Actuated g/C Ratio	0.57	0.57	0.57	0.57	0.25	0.25
v/c Ratio	0.33	0.28	0.47	0.06	0.33	0.52
Control Delay	18.9	6.7	11.4	6.7	19.4	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	18.9	6.7	11.4	6.7	19.4	23.8
LOS	B	A	B	A	B	C
Approach Delay		7.4	11.2		22.0	
Approach LOS		A	B		C	
Queue Length 50th (m)	2.6	14.0	49.5	1.0	14.8	21.9
Queue Length 95th (m)	#16.9	25.4	m74.3	m2.6	17.5	24.7
Internal Link Dist (m)		144.7	215.3		384.2	
Turn Bay Length (m)	40.0			30.0	20.0	
Base Capacity (vph)	147	2769	2824	786	845	748
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	27	0	0	71
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.28	0.47	0.06	0.17	0.30

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 65

Offset: 11 (17%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 11.4

Intersection LOS: B

Intersection Capacity Utilization 61.7%

ICU Level of Service B

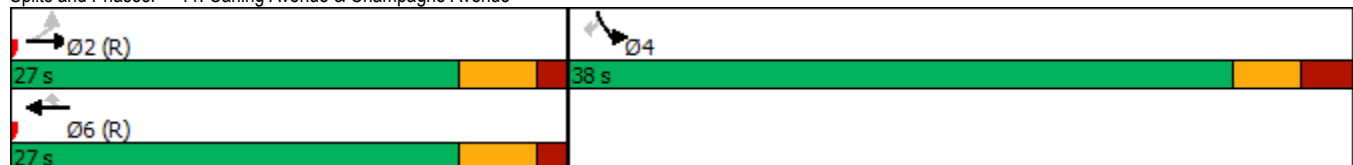
Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 11: Carling Avenue & Champagne Avenue



12: Carling Avenue & Sherwood Drive  
PM Peak

90 Champagne Avenue  
Existing Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	35	757	1487	153	174	7
Future Volume (vph)	35	757	1487	153	174	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor	0.99		0.99		0.99	
Frt			0.986		0.995	
Flt Protected	0.950				0.954	
Satd. Flow (prot)	1729	4777	4815	0	1709	0
Flt Permitted	0.950				0.954	
Satd. Flow (perm)	1720	4777	4815	0	1696	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			20		2	
Link Speed (k/h)		60	60		40	
Link Distance (m)		181.5	168.7		309.1	
Travel Time (s)		10.9	10.1		27.8	
Confl. Peds. (#/hr)	28			28	7	8
Confl. Bikes (#/hr)				5		8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	4%	1%	0%	1%	0%
Adj. Flow (vph)	39	841	1652	170	193	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	39	841	1822	0	201	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (m)	6.1	30.5	30.5		6.1	
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	1.8	1.8		6.1	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA		Prot	
Protected Phases	5	2	6		4	
Permitted Phases						
Detector Phase	5	2	6		4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0		10.0	
Minimum Split (s)	10.2	16.4	33.4		40.1	
Total Split (s)	15.0	89.0	74.0		41.0	
Total Split (%)	11.5%	68.5%	56.9%		31.5%	
Maximum Green (s)	9.8	82.6	67.6		33.9	
Yellow Time (s)	3.7	3.7	3.7		3.3	
All-Red Time (s)	1.5	2.7	2.7		3.8	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	5.2	6.4	6.4		7.1	



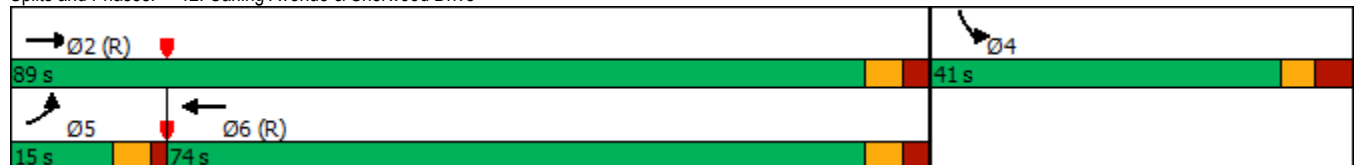
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Walk Time (s)			12.0		26.0	
Flash Dont Walk (s)			15.0		7.0	
Pedestrian Calls (#/hr)			5		5	
Act Effct Green (s)	8.2	95.0	83.7		21.5	
Actuated g/C Ratio	0.06	0.73	0.64		0.17	
v/c Ratio	0.36	0.24	0.59		0.71	
Control Delay	66.7	6.6	12.4		63.3	
Queue Delay	0.0	0.0	0.3		0.0	
Total Delay	66.7	6.6	12.7		63.3	
LOS	E	A	B		E	
Approach Delay		9.2	12.7		63.3	
Approach LOS		A	B		E	
Queue Length 50th (m)	9.8	22.0	35.4		49.3	
Queue Length 95th (m)	21.1	38.7	169.0		67.2	
Internal Link Dist (m)		157.5	144.7		285.1	
Turn Bay Length (m)						
Base Capacity (vph)	132	3490	3106		447	
Starvation Cap Reductn	0	0	521		0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.30	0.24	0.70		0.45	

#### Intersection Summary

Area Type: Other  
Cycle Length: 130  
Actuated Cycle Length: 130  
Offset: 24 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
Natural Cycle: 85  
Control Type: Actuated-Coordinated  
Maximum v/c Ratio: 0.71  
Intersection Signal Delay: 15.1  
Intersection Capacity Utilization 60.0%  
Analysis Period (min) 15

















Intersection LOS: B  
ICU Level of Service B

#### Splits and Phases: 12: Carling Avenue & Sherwood Drive



9: Champagne Avenue & Beech Street  
PM Peak




















90 Champagne Avenue  
Existing Traffic

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	60	14	50	121	16	27	14	72	11	17	0
Future Volume (vph)	4	60	14	50	121	16	27	14	72	11	17	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	67	16	56	134	18	30	16	80	12	19	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	87	208	126	31								
Volume Left (vph)	4	56	30	12								
Volume Right (vph)	16	18	80	0								
Hadj (s)	-0.07	0.04	-0.30	0.11								
Departure Headway (s)	4.4	4.4	4.3	4.8								
Degree Utilization, x	0.11	0.25	0.15	0.04								
Capacity (veh/h)	773	781	779	683								
Control Delay (s)	8.0	8.9	8.1	8.1								
Approach Delay (s)	8.0	8.9	8.1	8.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.4								
Level of Service				A								
Intersection Capacity Utilization				32.0%	ICU Level of Service	A						
Analysis Period (min)				15								



6: Preston Street & Beech Street  
AM Peak

90 Champagne Avenue  
Existing Traffic (No RTOR)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	52	26	19	54	8	23	566	42	18	321	36
Future Volume (vph)	38	52	26	19	54	8	23	566	42	18	321	36
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.6			20.0			20.0			20.0		
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		0.94		0.94	0.99		0.97	0.99		0.98	0.99	
Frt		0.970			0.980			0.990			0.985	
Flt Protected		0.984		0.950			0.950			0.950		
Satd. Flow (prot)	0	1597	0	1281	1729	0	1586	1722	0	1558	1662	0
Flt Permitted		0.865		0.650			0.522			0.353		
Satd. Flow (perm)	0	1368	0	820	1729	0	842	1722	0	565	1662	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		237.2			186.9			369.8			155.9	
Travel Time (s)		17.1			13.5			26.6			11.2	
Confl. Peds. (#/hr)	36		36	36		36	43		55	55		43
Confl. Bikes (#/hr)			26			2			20			14
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 (%)	8%	4%	4%	35%	2%	0%	9%	4%	2%	11%	7%	6%
Adj. Flow (vph)	42	58	29	21	60	9	26	629	47	20	357	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	129	0	21	69	0	26	676	0	20	397	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	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
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		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
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)	22.5	22.5		22.5	22.5		33.6	33.6		33.6	33.6	
Total Split (s)	23.0	23.0		23.0	23.0		57.0	57.0		57.0	57.0	
Total Split (%)	28.8%	28.8%		28.8%	28.8%		71.3%	71.3%		71.3%	71.3%	
Maximum Green (s)	17.5	17.5		17.5	17.5		51.4	51.4		51.4	51.4	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	

6: Preston Street & Beech Street  
AM Peak

90 Champagne Avenue  
Existing Traffic (No RTOR)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.2	2.2		2.2	2.2		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5		5.5	5.5		5.6	5.6		5.6	5.6	
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		18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		13.1		13.1	13.1		60.1	60.1		60.1	60.1	
Actuated g/C Ratio		0.16		0.16	0.16		0.75	0.75		0.75	0.75	
v/c Ratio		0.58		0.16	0.24		0.04	0.52		0.05	0.32	
Control Delay		41.0		29.9	30.2		4.9	8.0		5.1	5.8	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		41.0		29.9	30.2		4.9	8.0		5.1	5.8	
LOS		D		C	C		A	A		A	A	
Approach Delay		41.0			30.1			7.9			5.7	
Approach LOS		D			C			A			A	
Queue Length 50th (m)		18.5		2.8	9.3		1.0	41.7		0.8	19.5	
Queue Length 95th (m)		32.8		8.4	18.9		3.9	83.6		3.3	39.8	
Internal Link Dist (m)		213.2			162.9			345.8			131.9	
Turn Bay Length (m)				15.0			20.0			20.0		
Base Capacity (vph)		299		179	378		632	1292		424	1247	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.43		0.12	0.18		0.04	0.52		0.05	0.32	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 40 (50%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 11.9

Intersection LOS: B

Intersection Capacity Utilization 57.8%

ICU Level of Service B




















Analysis Period (min) 15

Splits and Phases: 6: Preston Street & Beech Street















6: Preston Street & Beech Street  
PM Peak

90 Champagne Avenue  
Existing Traffic (No RTOR)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	40	32	30	118	24	81	421	37	17	408	49
Future Volume (vph)	25	40	32	30	118	24	81	421	37	17	408	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.6			20.0			20.0			20.0		
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		0.95		0.92	0.98		0.97	0.99		0.96	0.99	
Frt		0.955			0.974			0.988			0.984	
Flt Protected		0.987		0.950			0.950			0.950		
Satd. Flow (prot)	0	1649	0	1729	1720	0	1729	1732	0	1729	1708	0
Flt Permitted		0.876		0.757			0.440			0.439		
Satd. Flow (perm)	0	1439	0	1268	1720	0	778	1732	0	764	1708	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		237.2			186.9			369.8			155.9	
Travel Time (s)		17.1			13.5			26.6			11.2	
Confl. Peds. (#/hr)	40		46	46		40	52		80	80		52
Confl. Bikes (#/hr)			2			20			11			18
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	3%	0%	0%	4%	2%
Adj. Flow (vph)	28	44	36	33	131	27	90	468	41	19	453	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	108	0	33	158	0	90	509	0	19	507	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	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
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		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
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)	22.5	22.5		22.5	22.5		33.6	33.6		33.6	33.6	
Total Split (s)	23.0	23.0		23.0	23.0		47.0	47.0		47.0	47.0	
Total Split (%)	32.9%	32.9%		32.9%	32.9%		67.1%	67.1%		67.1%	67.1%	
Maximum Green (s)	17.5	17.5		17.5	17.5		41.4	41.4		41.4	41.4	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	

6: Preston Street & Beech Street  
PM Peak

90 Champagne Avenue  
Existing Traffic (No RTOR)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.2	2.2		2.2	2.2		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5		5.5	5.5		5.6	5.6		5.6	5.6	
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		18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		12.4		12.4	12.4		46.5	46.5		46.5	46.5	
Actuated g/C Ratio		0.18		0.18	0.18		0.66	0.66		0.66	0.66	
v/c Ratio		0.42		0.15	0.52		0.17	0.44		0.04	0.45	
Control Delay		30.1		24.4	31.8		6.3	7.7		5.3	7.8	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		30.1		24.4	31.8		6.3	7.7		5.3	7.8	
LOS		C		C	C		A	A		A	A	
Approach Delay		30.1			30.5			7.5			7.7	
Approach LOS		C			C			A			A	
Queue Length 50th (m)		12.9		3.7	19.2		3.6	25.6		0.7	25.6	
Queue Length 95th (m)		24.1		9.7	32.5		11.1	54.6		3.2	54.9	
Internal Link Dist (m)		213.2			162.9			345.8			131.9	
Turn Bay Length (m)				15.0			20.0			20.0		
Base Capacity (vph)		359		317	430		516	1149		507	1133	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.30		0.10	0.37		0.17	0.44		0.04	0.45	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 43 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 12.4

Intersection LOS: B

Intersection Capacity Utilization 78.2%

ICU Level of Service D






















Analysis Period (min) 15

Splits and Phases: 6: Preston Street & Beech Street















3: Preston Street & Carling Avenue  
AM Peak

90 Champagne Avenue  
2021 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	587	230	147	450	113	283	539	287	109	264	127
Future Volume (vph)	156	587	230	147	450	113	283	539	287	109	264	127
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		40.0	45.0		0.0	65.0		0.0	30.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	45.0			45.0			40.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.93		0.85	0.95	0.96		0.98	0.99		1.00	0.98	
Frt			0.850		0.970			0.948			0.951	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1631	4777	1532	1712	4406	0	1712	3151	0	1558	1540	0
Flt Permitted	0.950			0.950			0.218			0.341		
Satd. Flow (perm)	1510	4777	1303	1634	4406	0	387	3151	0	559	1540	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			230		48			117			22	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		239.3			272.5			187.5			369.8	
Travel Time (s)		14.4			16.4			13.5			26.6	
Confl. Peds. (#/hr)	65		41	41		65	39		2	2		39
Confl. Bikes (#/hr)			21			9			36			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 (%)	6%	4%	1%	1%	4%	10%	1%	4%	1%	11%	6%	20%
Adj. Flow (vph)	156	587	230	147	450	113	283	539	287	109	264	127
Shared Lane Traffic (%)												
Lane Group Flow (vph)	156	587	230	147	563	0	283	826	0	109	391	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	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			2				8			4		
Detector Phase	5	2	2	1	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0	30.0	11.2	30.0		11.9	43.9		43.9	43.9	
Total Split (s)	18.0	35.0	35.0	18.0	35.0		20.0	67.0		47.0	47.0	
Total Split (%)	15.0%	29.2%	29.2%	15.0%	29.2%		16.7%	55.8%		39.2%	39.2%	
Maximum Green (s)	11.8	29.0	29.0	11.8	29.0		13.1	60.1		40.1	40.1	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3	3.3	

3: Preston Street & Carling Avenue  
AM Peak

90 Champagne Avenue  
2021 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3		3.6	3.6		3.6	3.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.0	6.0	6.2	6.0		6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		17.0	17.0		17.0			30.0		30.0	30.0	
Pedestrian Calls (#/hr)		5	5		5			5		5	5	
Act Effct Green (s)	15.0	33.6	33.6	13.6	32.2		53.7	53.7		33.7	33.7	
Actuated g/C Ratio	0.12	0.28	0.28	0.11	0.27		0.45	0.45		0.28	0.28	
v/c Ratio	0.77	0.44	0.43	0.76	0.46		0.89	0.56		0.70	0.87	
Control Delay	76.0	30.8	5.2	76.6	35.6		52.6	21.6		60.9	58.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	76.0	30.8	5.2	76.6	35.6		52.6	21.6		60.9	58.6	
LOS	E	C	A	E	D		D	C		E	E	
Approach Delay		32.0			44.1			29.5			59.1	
Approach LOS		C			D			C			E	
Queue Length 50th (m)	26.3	46.2	0.0	33.1	38.5		42.0	61.6		22.5	81.9	
Queue Length 95th (m)	#82.0	28.5	3.6	#71.5	50.5		#73.8	73.4		42.5	114.1	
Internal Link Dist (m)		215.3			248.5			163.5			345.8	
Turn Bay Length (m)	45.0		40.0	45.0			65.0			30.0		
Base Capacity (vph)	203	1338	530	194	1218		317	1636		186	529	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.77	0.44	0.43	0.76	0.46		0.89	0.50		0.59	0.74	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 116 (97%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 37.9

Intersection LOS: D

Intersection Capacity Utilization 96.3%

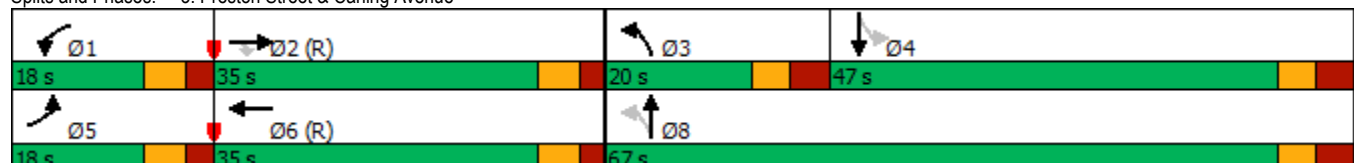
ICU Level of Service F

Analysis Period (min) 15

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




















Queue shown is maximum after two cycles.

Splits and Phases: 3: Preston Street & Carling Avenue















6: Preston Street & Beech Street  
AM Peak

90 Champagne Avenue  
2021 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	55	26	22	55	8	30	630	58	18	361	39
Future Volume (vph)	41	55	26	22	55	8	30	630	58	18	361	39
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.6			20.0			20.0			20.0		
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		0.94		0.93	0.99		0.97	0.99		0.98	0.99	
Frt		0.971			0.981			0.987			0.985	
Flt Protected		0.983		0.950			0.950			0.950		
Satd. Flow (prot)	0	1599	0	1281	1731	0	1586	1714	0	1558	1663	0
Flt Permitted		0.863		0.666			0.522			0.350		
Satd. Flow (perm)	0	1367	0	839	1731	0	842	1714	0	560	1663	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			8			12			14	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		237.2			186.9			369.8			155.9	
Travel Time (s)		17.1			13.5			26.6			11.2	
Confl. Peds. (#/hr)	36		36	36		36	43		55	55		43
Confl. Bikes (#/hr)			26			2			20			14
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	4%	4%	35%	2%	0%	9%	4%	2%	11%	7%	6%
Adj. Flow (vph)	41	55	26	22	55	8	30	630	58	18	361	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	122	0	22	63	0	30	688	0	18	400	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	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
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		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
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)	22.5	22.5		22.5	22.5		33.6	33.6		33.6	33.6	
Total Split (s)	23.0	23.0		23.0	23.0		57.0	57.0		57.0	57.0	
Total Split (%)	28.8%	28.8%		28.8%	28.8%		71.3%	71.3%		71.3%	71.3%	
Maximum Green (s)	17.5	17.5		17.5	17.5		51.4	51.4		51.4	51.4	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	

6: Preston Street & Beech Street  
AM Peak

90 Champagne Avenue  
2021 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.2	2.2		2.2	2.2		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5		5.5	5.5		5.6	5.6		5.6	5.6	
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		18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		12.4		12.4	12.4		60.7	60.7		60.7	60.7	
Actuated g/C Ratio		0.16		0.16	0.16		0.76	0.76		0.76	0.76	
v/c Ratio		0.54		0.17	0.23		0.05	0.53		0.04	0.32	
Control Delay		35.7		31.0	27.6		4.6	7.6		4.8	5.3	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		35.7		31.0	27.6		4.6	7.6		4.8	5.3	
LOS		D		C	C		A	A		A	A	
Approach Delay		35.7			28.4			7.5			5.3	
Approach LOS		D			C			A			A	
Queue Length 50th (m)		15.2		3.0	7.5		1.1	39.2		0.6	17.6	
Queue Length 95th (m)		29.1		8.8	16.6		4.2	82.9		3.1	38.1	
Internal Link Dist (m)		213.2			162.9			345.8			131.9	
Turn Bay Length (m)				15.0			20.0			20.0		
Base Capacity (vph)		311		183	384		639	1304		425	1265	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.39		0.12	0.16		0.05	0.53		0.04	0.32	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 40 (50%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 10.7

Intersection LOS: B

Intersection Capacity Utilization 62.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 6: Preston Street & Beech Street





11: Carling Avenue & Champagne Avenue  
AM Peak

90 Champagne Avenue  
2021 Background Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	101	958	682	164	80	50
Future Volume (vph)	101	958	682	164	80	50
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			30.0	20.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				30.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Ped Bike Factor	0.92			0.76	0.99	0.98
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1729	4871	4777	1459	1695	1547
Flt Permitted	0.381				0.950	
Satd. Flow (perm)	635	4871	4777	1103	1682	1512
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				164		50
Link Speed (k/h)		60	60		40	
Link Distance (m)		168.7	239.3		408.2	
Travel Time (s)		10.1	14.4		36.7	
Confl. Peds. (#/hr)	76			76	7	9
Confl. Bikes (#/hr)				2		1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	4%	6%	2%	0%
Adj. Flow (vph)	101	958	682	164	80	50
Shared Lane Traffic (%)						
Lane Group Flow (vph)	101	958	682	164	80	50
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8	6.1	6.1	6.1
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	23.3	23.3	26.3	26.3	37.9	37.9
Total Split (s)	82.0	82.0	82.0	82.0	38.0	38.0
Total Split (%)	68.3%	68.3%	68.3%	68.3%	31.7%	31.7%
Maximum Green (s)	76.7	76.7	76.7	76.7	32.1	32.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3

11: Carling Avenue & Champagne Avenue  
AM Peak

90 Champagne Avenue  
2021 Background Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
All-Red Time (s)	1.6	1.6	1.6	1.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.9	5.9
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)			10.0	10.0	7.0	7.0
Flash Dont Walk (s)			10.0	10.0	25.0	25.0
Pedestrian Calls (#/hr)			5	5	5	5
Act Effct Green (s)	98.0	98.0	98.0	98.0	14.3	14.3
Actuated g/C Ratio	0.82	0.82	0.82	0.82	0.12	0.12
v/c Ratio	0.19	0.24	0.17	0.18	0.40	0.22
Control Delay	4.6	3.1	3.1	0.8	51.6	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.6	3.1	3.1	0.8	51.6	12.8
LOS	A	A	A	A	D	B
Approach Delay		3.2	2.7		36.7	
Approach LOS		A	A		D	
Queue Length 50th (m)	3.9	13.6	8.5	0.0	18.2	0.0
Queue Length 95th (m)	8.3	19.5	m21.7	m1.9	27.5	9.5
Internal Link Dist (m)		144.7	215.3		384.2	
Turn Bay Length (m)	40.0			30.0	20.0	
Base Capacity (vph)	518	3978	3902	931	453	441
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.24	0.17	0.18	0.18	0.11

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 106 (88%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 5.1

Intersection LOS: A

Intersection Capacity Utilization 49.1%

ICU Level of Service A

Analysis Period (min) 15

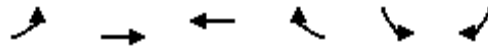
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Carling Avenue & Champagne Avenue

 <b>02 (R)</b> <b>32 s</b>	 <b>04</b> <b>38 s</b>
 <b>06 (R)</b> <b>32 s</b>	



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	31	736	579	127	133	5
Future Volume (vph)	31	736	579	127	133	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor	0.98		0.99		0.99	
Frt			0.973		0.995	
Flt Protected	0.950				0.954	
Satd. Flow (prot)	1679	4777	4532	0	1726	0
Flt Permitted	0.950				0.954	
Satd. Flow (perm)	1652	4777	4532	0	1712	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			57		2	
Link Speed (k/h)		60	60		40	
Link Distance (m)		181.5	168.7		309.1	
Travel Time (s)		10.9	10.1		27.8	
Confl. Peds. (#/hr)	19			19	8	9
Confl. Bikes (#/hr)				15		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	4%	6%	2%	0%	0%
Adj. Flow (vph)	31	736	579	127	133	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	31	736	706	0	138	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (m)	6.1	30.5	30.5		6.1	
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	1.8	1.8		6.1	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA		Prot	
Protected Phases	5	2	6		4	
Permitted Phases						
Detector Phase	5	2	6		4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0		10.0	
Minimum Split (s)	10.2	16.4	33.4		40.1	
Total Split (s)	13.0	79.0	66.0		41.0	
Total Split (%)	10.8%	65.8%	55.0%		34.2%	
Maximum Green (s)	7.8	72.6	59.6		33.9	
Yellow Time (s)	3.7	3.7	3.7		3.3	
All-Red Time (s)	1.5	2.7	2.7		3.8	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	5.2	6.4	6.4		7.1	



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Walk Time (s)			12.0		26.0	
Flash Dont Walk (s)			15.0		7.0	
Pedestrian Calls (#/hr)			5		5	
Act Effct Green (s)	7.4	89.0	80.9		17.5	
Actuated g/C Ratio	0.06	0.74	0.67		0.15	
v/c Ratio	0.30	0.21	0.23		0.55	
Control Delay	61.0	5.7	7.4		53.1	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	61.0	5.7	7.4		53.1	
LOS	E	A	A		D	
Approach Delay		8.0	7.4		53.1	
Approach LOS		A	A		D	
Queue Length 50th (m)	7.1	15.0	13.8		30.9	
Queue Length 95th (m)	17.0	33.9	16.4		42.7	
Internal Link Dist (m)		157.5	144.7		285.1	
Turn Bay Length (m)						
Base Capacity (vph)	114	3542	3073		489	
Starvation Cap Reductn	0	0	0		0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.27	0.21	0.23		0.28	

#### Intersection Summary

Area Type: Other  
Cycle Length: 120  
Actuated Cycle Length: 120  
Offset: 112 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
Natural Cycle: 85  
Control Type: Actuated-Coordinated  
Maximum v/c Ratio: 0.55  
Intersection Signal Delay: 11.6  
Intersection Capacity Utilization 51.7%  
Analysis Period (min) 15

















Intersection LOS: B  
ICU Level of Service A

#### Splits and Phases: 12: Carling Avenue & Sherwood Drive
























9: Champagne Avenue & Beech Street  
AM Peak

90 Champagne Avenue  
2021 Background Traffic

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	129	18	75	66	10	24	19	63	11	10	3
Future Volume (vph)	2	129	18	75	66	10	24	19	63	11	10	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
Hourly flow rate (vph)	2	129	18	75	66	10	24	19	63	11	10	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	149	151	106	24								
Volume Left (vph)	2	75	24	11								
Volume Right (vph)	18	10	63	3								
Hadj (s)	-0.04	0.09	-0.28	0.05								
Departure Headway (s)	4.3	4.5	4.3	4.8								
Degree Utilization, x	0.18	0.19	0.13	0.03								
Capacity (veh/h)	799	770	774	693								
Control Delay (s)	8.3	8.5	8.0	7.9								
Approach Delay (s)	8.3	8.5	8.0	7.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.3								
Level of Service				A								
Intersection Capacity Utilization				34.2%	ICU Level of Service				A			
Analysis Period (min)				15								













3: Preston Street & Carling Avenue  
PM Peak

90 Champagne Avenue  
2021 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	559	372	350	1045	73	345	406	169	98	325	125
Future Volume (vph)	155	559	372	350	1045	73	345	406	169	98	325	125
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		40.0	45.0		0.0	65.0		0.0	30.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	45.0			45.0			40.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.97		0.87	0.96	0.99		0.98	0.98		0.97	0.98	
Frt			0.850		0.990			0.956			0.958	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	4824	1532	1729	4768	0	1729	3187	0	1572	1670	0
Flt Permitted	0.950			0.950			0.142			0.436		
Satd. Flow (perm)	1612	4824	1331	1656	4768	0	253	3187	0	703	1670	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			333		7			67			15	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		239.3			272.5			187.5			369.8	
Travel Time (s)		14.4			16.4			13.5			26.6	
Confl. Peds. (#/hr)	53		34	34		53	60		55	55		60
Confl. Bikes (#/hr)			12			10			16			6
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 (%)	4%	3%	1%	0%	1%	16%	0%	2%	0%	10%	1%	5%
Adj. Flow (vph)	155	559	372	350	1045	73	345	406	169	98	325	125
Shared Lane Traffic (%)												
Lane Group Flow (vph)	155	559	372	350	1118	0	345	575	0	98	450	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	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			2				8			4		
Detector Phase	5	2	2	1	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0	30.0	11.2	30.0		11.9	43.9		43.9	43.9	
Total Split (s)	30.0	31.0	31.0	30.0	31.0		24.0	69.0		45.0	45.0	
Total Split (%)	23.1%	23.8%	23.8%	23.1%	23.8%		18.5%	53.1%		34.6%	34.6%	
Maximum Green (s)	23.8	25.0	25.0	23.8	25.0		17.1	62.1		38.1	38.1	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3	3.3	

3: Preston Street & Carling Avenue  
PM Peak

90 Champagne Avenue  
2021 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3		3.6	3.6		3.6	3.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.0	6.0	6.2	6.0		6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		17.0	17.0		17.0			30.0		30.0	30.0	
Pedestrian Calls (#/hr)		5	5		5			5		5	5	
Act Effct Green (s)	17.4	25.0	25.0	25.4	33.1		60.5	60.5		36.5	36.5	
Actuated g/C Ratio	0.13	0.19	0.19	0.20	0.25		0.47	0.47		0.28	0.28	
v/c Ratio	0.70	0.60	0.71	1.04	0.92		1.11	0.38		0.50	0.94	
Control Delay	74.1	46.7	18.3	109.4	59.8		112.6	20.3		48.5	72.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	74.1	46.7	18.3	109.4	59.8		112.6	20.3		48.5	72.7	
LOS	E	D	B	F	E		F	C		D	E	
Approach Delay		40.9			71.6			54.9			68.3	
Approach LOS		D			E			D			E	
Queue Length 50th (m)	39.3	43.7	0.0	~102.0	103.9		~76.0	42.1		20.6	107.7	
Queue Length 95th (m)	61.3	57.5	51.3	#161.1	#156.9		#135.5	55.7		39.5	#168.5	
Internal Link Dist (m)		215.3			248.5			163.5			345.8	
Turn Bay Length (m)	45.0		40.0	45.0			65.0			30.0		
Base Capacity (vph)	304	927	524	338	1218		312	1557		206	500	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.51	0.60	0.71	1.04	0.92		1.11	0.37		0.48	0.90	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 6 (5%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 59.0

Intersection LOS: E

Intersection Capacity Utilization 112.7%

ICU Level of Service H

Analysis Period (min) 15

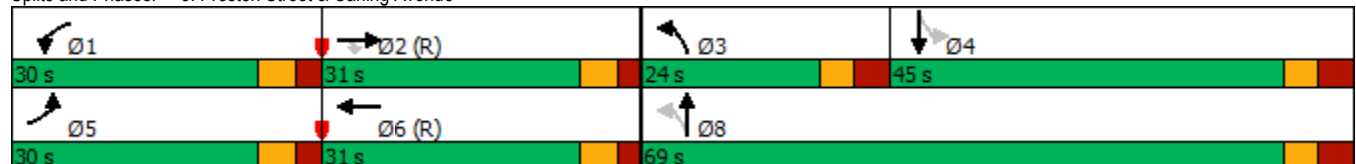
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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




















Queue shown is maximum after two cycles.

Splits and Phases: 3: Preston Street & Carling Avenue



6: Preston Street & Beech Street  
PM Peak

90 Champagne Avenue  
2021 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	41	34	38	120	24	83	477	44	17	479	53
Future Volume (vph)	29	41	34	38	120	24	83	477	44	17	479	53
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.6			20.0			20.0			20.0		
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		0.94		0.92	0.98		0.97	0.99		0.96	0.99	
Frt		0.956			0.975			0.987			0.985	
Flt Protected		0.986		0.950			0.950			0.950		
Satd. Flow (prot)	0	1651	0	1729	1722	0	1729	1730	0	1729	1711	0
Flt Permitted		0.856		0.769			0.435			0.442		
Satd. Flow (perm)	0	1406	0	1287	1722	0	770	1730	0	770	1711	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		33			14			12			14	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		237.2			186.9			369.8			155.9	
Travel Time (s)		17.1			13.5			26.6			11.2	
Confl. Peds. (#/hr)	40		46	46		40	52		80	80		52
Confl. Bikes (#/hr)			2			20			11			18
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	3%	0%	0%	4%	2%
Adj. Flow (vph)	29	41	34	38	120	24	83	477	44	17	479	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	104	0	38	144	0	83	521	0	17	532	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	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
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		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
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)	22.5	22.5		22.5	22.5		33.6	33.6		33.6	33.6	
Total Split (s)	23.0	23.0		23.0	23.0		47.0	47.0		47.0	47.0	
Total Split (%)	32.9%	32.9%		32.9%	32.9%		67.1%	67.1%		67.1%	67.1%	
Maximum Green (s)	17.5	17.5		17.5	17.5		41.4	41.4		41.4	41.4	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	



6: Preston Street & Beech Street  
PM Peak

90 Champagne Avenue  
2021 Background Traffic

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.2	2.2		2.2	2.2		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5		5.5	5.5		5.6	5.6		5.6	5.6	
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		18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		12.0		12.0	12.0		51.1	51.1		51.1	51.1	
Actuated g/C Ratio		0.17		0.17	0.17		0.73	0.73		0.73	0.73	
v/c Ratio		0.39		0.17	0.47		0.15	0.41		0.03	0.42	
Control Delay		22.1		25.4	28.1		5.9	6.7		5.1	6.8	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		22.1		25.4	28.1		5.9	6.7		5.1	6.8	
LOS		C		C	C		A	A		A	A	
Approach Delay		22.1			27.5			6.6			6.7	
Approach LOS		C			C			A			A	
Queue Length 50th (m)		8.4		4.4	15.9		3.1	23.9		0.6	24.7	
Queue Length 95th (m)		19.1		10.8	28.1		10.3	55.1		3.0	57.2	
Internal Link Dist (m)		213.2			162.9			345.8			131.9	
Turn Bay Length (m)				15.0			20.0			20.0		
Base Capacity (vph)		376		321	441		562	1266		562	1253	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.28		0.12	0.33		0.15	0.41		0.03	0.42	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 43 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 10.4

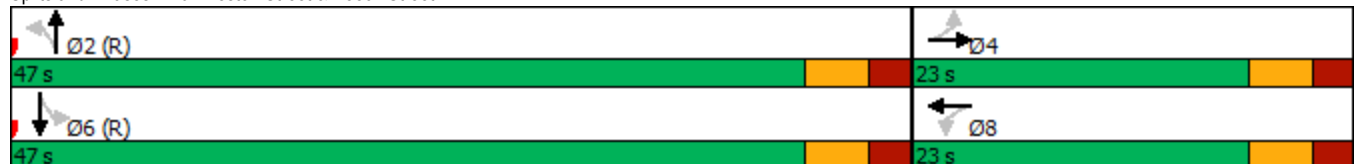
Intersection LOS: B

Intersection Capacity Utilization 82.9%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 6: Preston Street & Beech Street



11: Carling Avenue & Champagne Avenue  
PM Peak

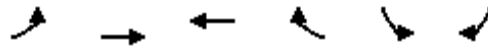
90 Champagne Avenue  
2021 Background Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	52	745	1219	64	140	187
Future Volume (vph)	52	745	1219	64	140	187
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			30.0	20.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				30.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Ped Bike Factor	0.98			0.86	1.00	0.98
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1441	4824	4919	1547	1712	1547
Flt Permitted	0.197				0.950	
Satd. Flow (perm)	294	4824	4919	1338	1707	1514
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				59		4
Link Speed (k/h)		60	60		40	
Link Distance (m)		168.7	239.3		408.2	
Travel Time (s)		10.1	14.4		36.7	
Confl. Peds. (#/hr)	70			70	5	16
Confl. Bikes (#/hr)				4		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	20%	3%	1%	0%	1%	0%
Adj. Flow (vph)	52	745	1219	64	140	187
Shared Lane Traffic (%)						
Lane Group Flow (vph)	52	745	1219	64	140	187
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8	6.1	6.1	6.1
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	23.3	23.3	26.3	26.3	37.9	37.9
Total Split (s)	27.0	27.0	27.0	27.0	38.0	38.0
Total Split (%)	41.5%	41.5%	41.5%	41.5%	58.5%	58.5%
Maximum Green (s)	21.7	21.7	21.7	21.7	32.1	32.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3

11: Carling Avenue & Champagne Avenue  
PM Peak

90 Champagne Avenue  
2021 Background Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
All-Red Time (s)	1.6	1.6	1.6	1.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.9	5.9
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)			10.0	10.0	7.0	7.0
Flash Dont Walk (s)			10.0	10.0	25.0	25.0
Pedestrian Calls (#/hr)			5	5	5	5
Act Effct Green (s)	37.9	37.9	37.9	37.9	15.9	15.9
Actuated g/C Ratio	0.58	0.58	0.58	0.58	0.24	0.24
v/c Ratio	0.30	0.27	0.43	0.08	0.33	0.50
Control Delay	16.0	6.5	11.7	6.8	19.9	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	6.5	11.7	6.8	19.9	23.4
LOS	B	A	B	A	B	C
Approach Delay		7.1	11.4		21.9	
Approach LOS		A	B		C	
Queue Length 50th (m)	2.6	13.1	46.7	1.6	14.7	20.1
Queue Length 95th (m)	#18.0	24.5	m73.5	m3.6	17.3	22.7
Internal Link Dist (m)		144.7	215.3		384.2	
Turn Bay Length (m)	40.0			30.0	20.0	
Base Capacity (vph)	171	2809	2864	803	845	749
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	57
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.27	0.43	0.08	0.17	0.27

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 65

Offset: 11 (17%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 11.4

Intersection LOS: B

Intersection Capacity Utilization 62.8%

ICU Level of Service B

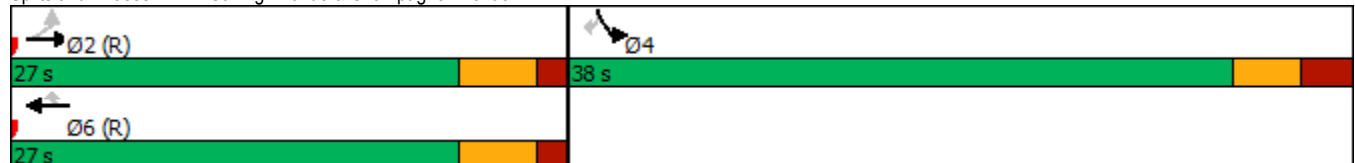
Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

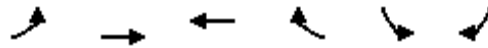
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Carling Avenue & Champagne Avenue





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	807	1524	156	180	7
Future Volume (vph)	65	807	1524	156	180	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor	0.99		0.99		0.99	
Frt			0.986		0.995	
Flt Protected	0.950				0.954	
Satd. Flow (prot)	1729	4777	4815	0	1709	0
Flt Permitted	0.950				0.954	
Satd. Flow (perm)	1718	4777	4815	0	1696	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			20		1	
Link Speed (k/h)		60	60		40	
Link Distance (m)		181.5	168.7		309.1	
Travel Time (s)		10.9	10.1		27.8	
Confl. Peds. (#/hr)	28			28	7	8
Confl. Bikes (#/hr)				5		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	4%	1%	0%	1%	0%
Adj. Flow (vph)	65	807	1524	156	180	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	65	807	1680	0	187	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (m)	6.1	30.5	30.5		6.1	
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	1.8	1.8		6.1	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA		Prot	
Protected Phases	5	2	6		4	
Permitted Phases						
Detector Phase	5	2	6		4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0		10.0	
Minimum Split (s)	10.2	16.4	33.4		40.1	
Total Split (s)	15.0	89.0	74.0		41.0	
Total Split (%)	11.5%	68.5%	56.9%		31.5%	
Maximum Green (s)	9.8	82.6	67.6		33.9	
Yellow Time (s)	3.7	3.7	3.7		3.3	
All-Red Time (s)	1.5	2.7	2.7		3.8	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	5.2	6.4	6.4		7.1	



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Walk Time (s)			12.0		26.0	
Flash Dont Walk (s)			15.0		7.0	
Pedestrian Calls (#/hr)			5		5	
Act Effct Green (s)	9.5	95.7	83.3		20.8	
Actuated g/C Ratio	0.07	0.74	0.64		0.16	
v/c Ratio	0.52	0.23	0.54		0.68	
Control Delay	72.1	6.3	12.3		62.8	
Queue Delay	0.0	0.0	0.2		0.0	
Total Delay	72.1	6.3	12.5		62.8	
LOS	E	A	B		E	
Approach Delay		11.2	12.5		62.8	
Approach LOS		B	B		E	
Queue Length 50th (m)	16.2	20.3	33.2		46.1	
Queue Length 95th (m)	31.4	37.0	154.3		62.8	
Internal Link Dist (m)		157.5	144.7		285.1	
Turn Bay Length (m)						
Base Capacity (vph)	139	3516	3091		446	
Starvation Cap Reductn	0	0	554		0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.47	0.23	0.66		0.42	

#### Intersection Summary

Area Type: Other  
Cycle Length: 130  
Actuated Cycle Length: 130  
Offset: 24 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
Natural Cycle: 85  
Control Type: Actuated-Coordinated  
Maximum v/c Ratio: 0.68  
Intersection Signal Delay: 15.5  
Intersection Capacity Utilization 69.6%  
Analysis Period (min) 15

















Intersection LOS: B  
ICU Level of Service C

#### Splits and Phases: 12: Carling Avenue & Sherwood Drive
























9: Champagne Avenue & Beech Street  
PM Peak

90 Champagne Avenue  
2021 Background Traffic

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	64	16	55	122	16	28	14	75	11	17	0
Future Volume (vph)	4	64	16	55	122	16	28	14	75	11	17	0
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)	4	64	16	55	122	16	28	14	75	11	17	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	84	193	117	28								
Volume Left (vph)	4	55	28	11								
Volume Right (vph)	16	16	75	0								
Hadj (s)	-0.07	0.04	-0.30	0.11								
Departure Headway (s)	4.4	4.4	4.3	4.8								
Degree Utilization, x	0.10	0.23	0.14	0.04								
Capacity (veh/h)	785	787	790	694								
Control Delay (s)	7.9	8.7	8.0	8.0								
Approach Delay (s)	7.9	8.7	8.0	8.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.3								
Level of Service				A								
Intersection Capacity Utilization				32.6%	ICU Level of Service	A						
Analysis Period (min)				15								













3: Preston Street & Carling Avenue  
AM Peak

90 Champagne Avenue  
2026 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	158	587	230	147	452	114	283	558	287	121	316	127
Future Volume (vph)	158	587	230	147	452	114	283	558	287	121	316	127
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		40.0	45.0		0.0	65.0		0.0	30.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	45.0			45.0			40.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.93		0.85	0.95	0.96		0.99	0.99		1.00	0.99	
Frt			0.850		0.970			0.949			0.957	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1631	4777	1532	1712	4405	0	1712	3154	0	1558	1561	0
Flt Permitted	0.950			0.950			0.188			0.334		
Satd. Flow (perm)	1510	4777	1303	1634	4405	0	334	3154	0	547	1561	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			230		48			109			18	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		239.3			272.5			187.5			369.8	
Travel Time (s)		14.4			16.4			13.5			26.6	
Confl. Peds. (#/hr)	65		41	41		65	39		2	2		39
Confl. Bikes (#/hr)			21			9			36			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 (%)	6%	4%	1%	1%	4%	10%	1%	4%	1%	11%	6%	20%
Adj. Flow (vph)	158	587	230	147	452	114	283	558	287	121	316	127
Shared Lane Traffic (%)												
Lane Group Flow (vph)	158	587	230	147	566	0	283	845	0	121	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)		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	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			2				8			4		
Detector Phase	5	2	2	1	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0	30.0	11.2	30.0		11.9	43.9		43.9	43.9	
Total Split (s)	18.0	35.0	35.0	18.0	35.0		20.0	67.0		47.0	47.0	
Total Split (%)	15.0%	29.2%	29.2%	15.0%	29.2%		16.7%	55.8%		39.2%	39.2%	
Maximum Green (s)	11.8	29.0	29.0	11.8	29.0		13.1	60.1		40.1	40.1	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3	3.3	

3: Preston Street & Carling Avenue  
AM Peak

90 Champagne Avenue  
2026 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3		3.6	3.6		3.6	3.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.0	6.0	6.2	6.0		6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		17.0	17.0		17.0			30.0		30.0	30.0	
Pedestrian Calls (#/hr)		5	5		5			5		5	5	
Act Effct Green (s)	13.9	31.8	31.8	12.5	30.5		56.5	56.5		36.5	36.5	
Actuated g/C Ratio	0.12	0.26	0.26	0.10	0.25		0.47	0.47		0.30	0.30	
v/c Ratio	0.84	0.46	0.45	0.83	0.49		0.92	0.55		0.73	0.91	
Control Delay	86.0	32.1	5.6	86.7	36.8		57.0	20.4		62.2	61.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	86.0	32.1	5.6	86.7	36.8		57.0	20.4		62.2	61.8	
LOS	F	C	A	F	D		E	C		E	E	
Approach Delay		34.6			47.1			29.6			61.9	
Approach LOS		C			D			C			E	
Queue Length 50th (m)	26.7	46.2	0.0	34.5	38.7		38.9	59.7		24.4	93.0	
Queue Length 95th (m)	#82.9	28.4	3.6	#71.5	50.8		#81.7	76.6		#52.2	#145.8	
Internal Link Dist (m)		215.3			248.5			163.5			345.8	
Turn Bay Length (m)	45.0		40.0	45.0			65.0			30.0		
Base Capacity (vph)	188	1266	514	179	1154		307	1634		182	533	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.84	0.46	0.45	0.82	0.49		0.92	0.52		0.66	0.83	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 116 (97%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 40.1

Intersection LOS: D

Intersection Capacity Utilization 97.2%

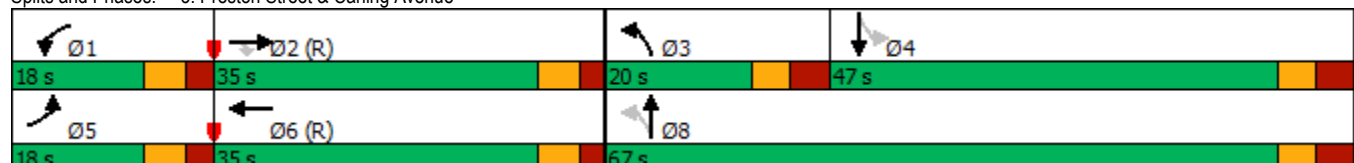
ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.




















Splits and Phases: 3: Preston Street & Carling Avenue

















6: Preston Street & Beech Street  
AM Peak

90 Champagne Avenue  
2026 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	55	26	23	55	8	30	670	63	18	410	39
Future Volume (vph)	41	55	26	23	55	8	30	670	63	18	410	39
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.6			20.0			20.0			20.0		
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		0.94		0.93	0.99		0.97	0.99		0.98	0.99	
Frt		0.971			0.981			0.987			0.987	
Flt Protected		0.983		0.950			0.950			0.950		
Satd. Flow (prot)	0	1599	0	1281	1731	0	1586	1714	0	1558	1667	0
Flt Permitted		0.863		0.666			0.490			0.326		
Satd. Flow (perm)	0	1367	0	839	1731	0	793	1714	0	523	1667	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			8			12			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		237.2			186.9			369.8			155.9	
Travel Time (s)		17.1			13.5			26.6			11.2	
Confl. Peds. (#/hr)	36		36	36		36	43		55	55		43
Confl. Bikes (#/hr)			26			2			20			14
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	4%	4%	35%	2%	0%	9%	4%	2%	11%	7%	6%
Adj. Flow (vph)	41	55	26	23	55	8	30	670	63	18	410	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	122	0	23	63	0	30	733	0	18	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)		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	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
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		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
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)	22.5	22.5		22.5	22.5		33.6	33.6		33.6	33.6	
Total Split (s)	23.0	23.0		23.0	23.0		57.0	57.0		57.0	57.0	
Total Split (%)	28.8%	28.8%		28.8%	28.8%		71.3%	71.3%		71.3%	71.3%	
Maximum Green (s)	17.5	17.5		17.5	17.5		51.4	51.4		51.4	51.4	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	

6: Preston Street & Beech Street  
AM Peak

90 Champagne Avenue  
2026 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.2	2.2		2.2	2.2		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5		5.5	5.5		5.6	5.6		5.6	5.6	
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		18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		12.4		12.4	12.4		60.7	60.7		60.7	60.7	
Actuated g/C Ratio		0.16		0.16	0.16		0.76	0.76		0.76	0.76	
v/c Ratio		0.54		0.18	0.23		0.05	0.56		0.05	0.35	
Control Delay		35.7		31.2	27.6		4.6	8.1		4.8	5.6	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		35.7		31.2	27.6		4.6	8.1		4.8	5.6	
LOS		D		C	C		A	A		A	A	
Approach Delay		35.7			28.5			8.0			5.6	
Approach LOS		D			C			A			A	
Queue Length 50th (m)		15.2		3.1	7.5		1.1	43.8		0.7	20.6	
Queue Length 95th (m)		29.1		8.9	16.6		4.2	93.3		3.1	44.4	
Internal Link Dist (m)		213.2			162.9			345.8			131.9	
Turn Bay Length (m)				15.0			20.0			20.0		
Base Capacity (vph)		311		183	384		601	1304		397	1268	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.39		0.13	0.16		0.05	0.56		0.05	0.35	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 40 (50%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 10.8

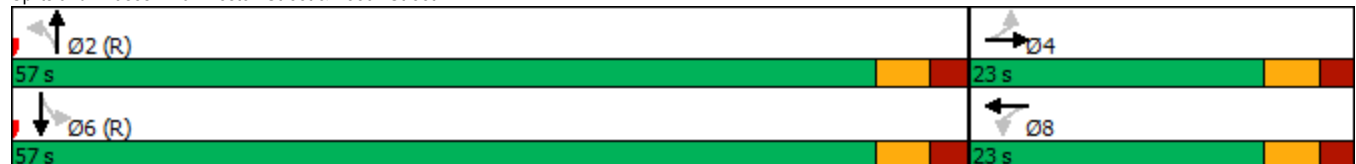
Intersection LOS: B

Intersection Capacity Utilization 65.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 6: Preston Street & Beech Street



11: Carling Avenue & Champagne Avenue  
AM Peak

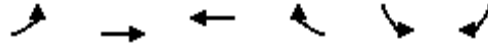
90 Champagne Avenue  
2026 Background Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	101	960	691	164	80	50
Future Volume (vph)	101	960	691	164	80	50
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			30.0	20.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				30.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Ped Bike Factor	0.92			0.76	0.99	0.98
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1729	4871	4777	1459	1695	1547
Flt Permitted	0.377				0.950	
Satd. Flow (perm)	629	4871	4777	1103	1682	1512
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				164		50
Link Speed (k/h)		60	60		40	
Link Distance (m)		168.7	239.3		408.2	
Travel Time (s)		10.1	14.4		36.7	
Confl. Peds. (#/hr)	76			76	7	9
Confl. Bikes (#/hr)				2		1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	4%	6%	2%	0%
Adj. Flow (vph)	101	960	691	164	80	50
Shared Lane Traffic (%)						
Lane Group Flow (vph)	101	960	691	164	80	50
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8	6.1	6.1	6.1
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	23.3	23.3	26.3	26.3	37.9	37.9
Total Split (s)	82.0	82.0	82.0	82.0	38.0	38.0
Total Split (%)	68.3%	68.3%	68.3%	68.3%	31.7%	31.7%
Maximum Green (s)	76.7	76.7	76.7	76.7	32.1	32.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3

11: Carling Avenue & Champagne Avenue  
AM Peak

90 Champagne Avenue  
2026 Background Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
All-Red Time (s)	1.6	1.6	1.6	1.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.9	5.9
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)			10.0	10.0	7.0	7.0
Flash Dont Walk (s)			10.0	10.0	25.0	25.0
Pedestrian Calls (#/hr)			5	5	5	5
Act Effct Green (s)	98.0	98.0	98.0	98.0	14.3	14.3
Actuated g/C Ratio	0.82	0.82	0.82	0.82	0.12	0.12
v/c Ratio	0.20	0.24	0.18	0.18	0.40	0.22
Control Delay	4.6	3.1	2.9	0.7	51.6	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.6	3.1	2.9	0.7	51.6	12.8
LOS	A	A	A	A	D	B
Approach Delay		3.2	2.5		36.7	
Approach LOS		A	A		D	
Queue Length 50th (m)	3.9	13.6	8.0	0.0	18.2	0.0
Queue Length 95th (m)	8.4	19.5	m20.9	m1.1	27.5	9.5
Internal Link Dist (m)		144.7	215.3		384.2	
Turn Bay Length (m)	40.0			30.0	20.0	
Base Capacity (vph)	513	3978	3902	931	453	441
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.24	0.18	0.18	0.18	0.11

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 106 (88%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 5.0

Intersection LOS: A

Intersection Capacity Utilization 49.1%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 11: Carling Avenue & Champagne Avenue

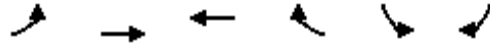
 <b>02 (R)</b> <b>32 s</b>	 <b>04</b> <b>38 s</b>
 <b>06 (R)</b> <b>32 s</b>	

12: Carling Avenue & Sherwood Drive  
AM Peak

90 Champagne Avenue  
2026 Background Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	31	737	586	129	134	5
Future Volume (vph)	31	737	586	129	134	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor	0.98		0.99		0.99	
Frt			0.973		0.995	
Flt Protected	0.950				0.954	
Satd. Flow (prot)	1679	4777	4532	0	1726	0
Flt Permitted	0.950				0.954	
Satd. Flow (perm)	1652	4777	4532	0	1712	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			58		2	
Link Speed (k/h)		60	60		40	
Link Distance (m)		181.5	168.7		309.1	
Travel Time (s)		10.9	10.1		27.8	
Confl. Peds. (#/hr)	19			19	8	9
Confl. Bikes (#/hr)				15		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	4%	6%	2%	0%	0%
Adj. Flow (vph)	31	737	586	129	134	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	31	737	715	0	139	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (m)	6.1	30.5	30.5		6.1	
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	1.8	1.8		6.1	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA		Prot	
Protected Phases	5	2	6		4	
Permitted Phases						
Detector Phase	5	2	6		4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0		10.0	
Minimum Split (s)	10.2	16.4	33.4		40.1	
Total Split (s)	13.0	79.0	66.0		41.0	
Total Split (%)	10.8%	65.8%	55.0%		34.2%	
Maximum Green (s)	7.8	72.6	59.6		33.9	
Yellow Time (s)	3.7	3.7	3.7		3.3	
All-Red Time (s)	1.5	2.7	2.7		3.8	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	5.2	6.4	6.4		7.1	



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Walk Time (s)			12.0		26.0	
Flash Dont Walk (s)			15.0		7.0	
Pedestrian Calls (#/hr)			5		5	
Act Effct Green (s)	7.4	89.0	80.8		17.5	
Actuated g/C Ratio	0.06	0.74	0.67		0.15	
v/c Ratio	0.30	0.21	0.23		0.55	
Control Delay	61.0	5.8	7.4		53.2	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	61.0	5.8	7.4		53.2	
LOS	E	A	A		D	
Approach Delay		8.0	7.4		53.2	
Approach LOS		A	A		D	
Queue Length 50th (m)	7.1	15.0	13.1		31.2	
Queue Length 95th (m)	17.0	34.0	17.2		42.9	
Internal Link Dist (m)		157.5	144.7		285.1	
Turn Bay Length (m)						
Base Capacity (vph)	114	3541	3071		489	
Starvation Cap Reductn	0	0	0		0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.27	0.21	0.23		0.28	

#### Intersection Summary

Area Type: Other  
Cycle Length: 120  
Actuated Cycle Length: 120  
Offset: 112 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
Natural Cycle: 85  
Control Type: Actuated-Coordinated  
Maximum v/c Ratio: 0.55  
Intersection Signal Delay: 11.6  
Intersection Capacity Utilization 51.7%  
Analysis Period (min) 15

















Intersection LOS: B  
ICU Level of Service A

#### Splits and Phases: 12: Carling Avenue & Sherwood Drive
























9: Champagne Avenue & Beech Street  
AM Peak

90 Champagne Avenue  
2026 Background Traffic

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	129	18	75	66	10	24	19	63	11	10	3
Future Volume (vph)	2	129	18	75	66	10	24	19	63	11	10	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
Hourly flow rate (vph)	2	129	18	75	66	10	24	19	63	11	10	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	149	151	106	24								
Volume Left (vph)	2	75	24	11								
Volume Right (vph)	18	10	63	3								
Hadj (s)	-0.04	0.09	-0.28	0.05								
Departure Headway (s)	4.3	4.5	4.3	4.8								
Degree Utilization, x	0.18	0.19	0.13	0.03								
Capacity (veh/h)	799	770	774	693								
Control Delay (s)	8.3	8.5	8.0	7.9								
Approach Delay (s)	8.3	8.5	8.0	7.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.3								
Level of Service				A								
Intersection Capacity Utilization				34.2%	ICU Level of Service				A			
Analysis Period (min)				15								

3: Preston Street & Carling Avenue  
PM Peak













90 Champagne Avenue  
2026 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	559	372	350	1050	78	345	447	169	105	353	125
Future Volume (vph)	162	559	372	350	1050	78	345	447	169	105	353	125
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		40.0	45.0		0.0	65.0		0.0	30.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	45.0			45.0			40.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.97		0.87	0.96	0.99		0.98	0.98		0.98	0.98	
Frt			0.850		0.990			0.959			0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	4824	1532	1729	4762	0	1729	3201	0	1572	1679	0
Flt Permitted	0.950			0.950			0.121			0.419		
Satd. Flow (perm)	1613	4824	1331	1656	4762	0	216	3201	0	676	1679	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			324		8			58			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		239.3			272.5			187.5			369.8	
Travel Time (s)		14.4			16.4			13.5			26.6	
Confl. Peds. (#/hr)	53		34	34		53	60		55	55		60
Confl. Bikes (#/hr)			12			10			16			6
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 (%)	4%	3%	1%	0%	1%	16%	0%	2%	0%	10%	1%	5%
Adj. Flow (vph)	162	559	372	350	1050	78	345	447	169	105	353	125
Shared Lane Traffic (%)												
Lane Group Flow (vph)	162	559	372	350	1128	0	345	616	0	105	478	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	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			2				8			4		
Detector Phase	5	2	2	1	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0	30.0	11.2	30.0		11.9	43.9		43.9	43.9	
Total Split (s)	30.0	31.0	31.0	30.0	31.0		24.0	69.0		45.0	45.0	
Total Split (%)	23.1%	23.8%	23.8%	23.1%	23.8%		18.5%	53.1%		34.6%	34.6%	
Maximum Green (s)	23.8	25.0	25.0	23.8	25.0		17.1	62.1		38.1	38.1	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3	3.3	



3: Preston Street & Carling Avenue  
PM Peak

90 Champagne Avenue  
2026 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3		3.6	3.6		3.6	3.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.0	6.0	6.2	6.0		6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		17.0	17.0		17.0			30.0		30.0	30.0	
Pedestrian Calls (#/hr)		5	5		5			5		5	5	
Act Effct Green (s)	17.8	25.0	25.0	24.4	31.6		61.5	61.5		37.5	37.5	
Actuated g/C Ratio	0.14	0.19	0.19	0.19	0.24		0.47	0.47		0.29	0.29	
v/c Ratio	0.71	0.60	0.72	1.08	0.97		1.15	0.40		0.54	0.97	
Control Delay	74.8	46.7	19.3	122.6	68.4		128.5	20.7		50.6	77.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	74.8	46.7	19.3	122.6	68.4		128.5	20.7		50.6	77.8	
LOS	E	D	B	F	E		F	C		D	E	
Approach Delay		41.6			81.3			59.4			72.9	
Approach LOS		D			F			E			E	
Queue Length 50th (m)	41.1	43.7	0.0	~102.0	105.6		~83.0	47.0		22.5	117.4	
Queue Length 95th (m)	63.5	57.6	52.7	#161.1	#159.4		#142.5	61.4		42.8	#183.8	
Internal Link Dist (m)		215.3			248.5			163.5			345.8	
Turn Bay Length (m)	45.0		40.0	45.0			65.0			30.0		
Base Capacity (vph)	304	927	517	324	1164		301	1559		198	501	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.53	0.60	0.72	1.08	0.97		1.15	0.40		0.53	0.95	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 6 (5%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.15

Intersection Signal Delay: 64.4

Intersection LOS: E

Intersection Capacity Utilization 112.9%

ICU Level of Service H

Analysis Period (min) 15

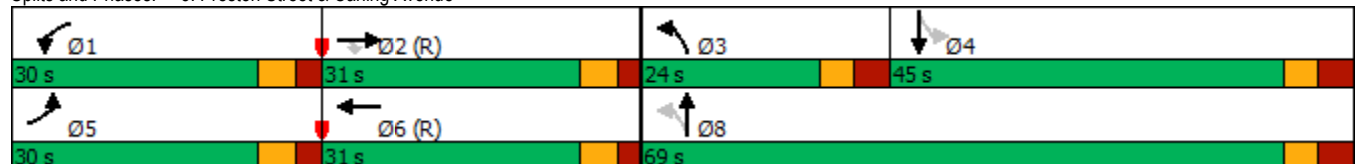
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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




















Queue shown is maximum after two cycles.

Splits and Phases: 3: Preston Street & Carling Avenue















6: Preston Street & Beech Street  
PM Peak

90 Champagne Avenue  
2026 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	41	34	43	120	24	83	524	47	17	523	53
Future Volume (vph)	29	41	34	43	120	24	83	524	47	17	523	53
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.6			20.0			20.0			20.0		
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		0.94		0.92	0.98		0.97	0.99		0.96	0.99	
Frt		0.956			0.975			0.988			0.986	
Flt Protected		0.986		0.950			0.950			0.950		
Satd. Flow (prot)	0	1651	0	1729	1722	0	1729	1732	0	1729	1714	0
Flt Permitted		0.856		0.769			0.408			0.411		
Satd. Flow (perm)	0	1406	0	1287	1722	0	724	1732	0	719	1714	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		33			14			11			13	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		237.2			186.9			369.8			155.9	
Travel Time (s)		17.1			13.5			26.6			11.2	
Confl. Peds. (#/hr)	40		46	46		40	52		80	80		52
Confl. Bikes (#/hr)			2			20			11			18
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	3%	0%	0%	4%	2%
Adj. Flow (vph)	29	41	34	43	120	24	83	524	47	17	523	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	104	0	43	144	0	83	571	0	17	576	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	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
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		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
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)	22.5	22.5		22.5	22.5		33.6	33.6		33.6	33.6	
Total Split (s)	23.0	23.0		23.0	23.0		47.0	47.0		47.0	47.0	
Total Split (%)	32.9%	32.9%		32.9%	32.9%		67.1%	67.1%		67.1%	67.1%	
Maximum Green (s)	17.5	17.5		17.5	17.5		41.4	41.4		41.4	41.4	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	

6: Preston Street & Beech Street  
PM Peak

90 Champagne Avenue  
2026 Background Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.2	2.2		2.2	2.2		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5		5.5	5.5		5.6	5.6		5.6	5.6	
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		18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		12.0		12.0	12.0		51.1	51.1		51.1	51.1	
Actuated g/C Ratio		0.17		0.17	0.17		0.73	0.73		0.73	0.73	
v/c Ratio		0.39		0.20	0.47		0.16	0.45		0.03	0.46	
Control Delay		22.1		25.8	28.1		6.1	7.1		5.1	7.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		22.1		25.8	28.1		6.1	7.1		5.1	7.2	
LOS		C		C	C		A	A		A	A	
Approach Delay		22.1			27.6			7.0			7.2	
Approach LOS		C			C			A			A	
Queue Length 50th (m)		8.4		5.0	15.9		3.1	27.5		0.6	27.9	
Queue Length 95th (m)		19.1		11.7	28.1		10.5	63.3		3.0	64.3	
Internal Link Dist (m)		213.2			162.9			345.8			131.9	
Turn Bay Length (m)				15.0			20.0			20.0		
Base Capacity (vph)		376		321	441		528	1268		525	1255	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.28		0.13	0.33		0.16	0.45		0.03	0.46	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 43 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 10.6

Intersection LOS: B

Intersection Capacity Utilization 85.3%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 6: Preston Street & Beech Street



11: Carling Avenue & Champagne Avenue  
PM Peak

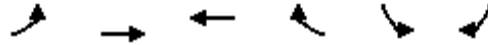
90 Champagne Avenue  
2026 Background Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	52	752	1225	64	140	187
Future Volume (vph)	52	752	1225	64	140	187
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			30.0	20.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				30.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Ped Bike Factor	0.98			0.86	1.00	0.98
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1441	4824	4919	1547	1712	1547
Flt Permitted	0.196				0.950	
Satd. Flow (perm)	292	4824	4919	1338	1707	1514
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				59		4
Link Speed (k/h)		60	60		40	
Link Distance (m)		168.7	239.3		408.2	
Travel Time (s)		10.1	14.4		36.7	
Confl. Peds. (#/hr)	70			70	5	16
Confl. Bikes (#/hr)				4		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	20%	3%	1%	0%	1%	0%
Adj. Flow (vph)	52	752	1225	64	140	187
Shared Lane Traffic (%)						
Lane Group Flow (vph)	52	752	1225	64	140	187
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8	6.1	6.1	6.1
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	23.3	23.3	26.3	26.3	37.9	37.9
Total Split (s)	27.0	27.0	27.0	27.0	38.0	38.0
Total Split (%)	41.5%	41.5%	41.5%	41.5%	58.5%	58.5%
Maximum Green (s)	21.7	21.7	21.7	21.7	32.1	32.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3

11: Carling Avenue & Champagne Avenue  
PM Peak

90 Champagne Avenue  
2026 Background Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
All-Red Time (s)	1.6	1.6	1.6	1.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.9	5.9
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)			10.0	10.0	7.0	7.0
Flash Dont Walk (s)			10.0	10.0	25.0	25.0
Pedestrian Calls (#/hr)			5	5	5	5
Act Effct Green (s)	37.9	37.9	37.9	37.9	15.9	15.9
Actuated g/C Ratio	0.58	0.58	0.58	0.58	0.24	0.24
v/c Ratio	0.31	0.27	0.43	0.08	0.33	0.50
Control Delay	16.2	6.5	12.1	6.9	19.9	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	16.2	6.5	12.1	6.9	19.9	23.4
LOS	B	A	B	A	B	C
Approach Delay		7.1	11.9		21.9	
Approach LOS		A	B		C	
Queue Length 50th (m)	2.7	13.1	50.6	1.9	14.7	20.1
Queue Length 95th (m)	#18.5	24.7	m70.4	m3.5	17.3	22.7
Internal Link Dist (m)		144.7	215.3		384.2	
Turn Bay Length (m)	40.0			30.0	20.0	
Base Capacity (vph)	170	2809	2864	803	845	749
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	59
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.27	0.43	0.08	0.17	0.27

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 65

Offset: 11 (17%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 11.6

Intersection LOS: B

Intersection Capacity Utilization 62.9%

ICU Level of Service B

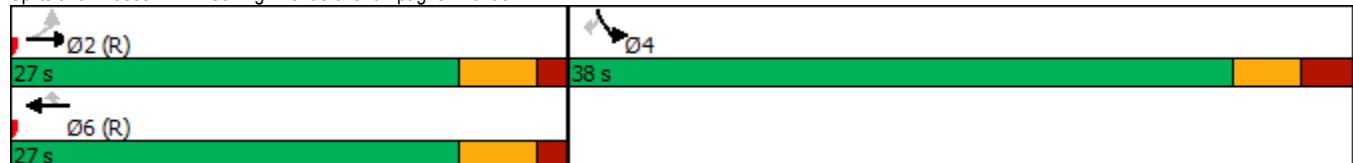
Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 11: Carling Avenue & Champagne Avenue



12: Carling Avenue & Sherwood Drive  
PM Peak

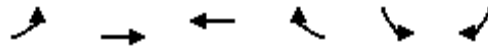
90 Champagne Avenue  
2026 Background Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	812	1528	158	182	7
Future Volume (vph)	65	812	1528	158	182	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor	0.99		0.99		0.99	
Frt			0.986		0.995	
Flt Protected	0.950				0.954	
Satd. Flow (prot)	1729	4777	4814	0	1709	0
Flt Permitted	0.950				0.954	
Satd. Flow (perm)	1718	4777	4814	0	1696	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			20		1	
Link Speed (k/h)		60	60		40	
Link Distance (m)		181.5	168.7		309.1	
Travel Time (s)		10.9	10.1		27.8	
Confl. Peds. (#/hr)	28			28	7	8
Confl. Bikes (#/hr)				5		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	4%	1%	0%	1%	0%
Adj. Flow (vph)	65	812	1528	158	182	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	65	812	1686	0	189	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (m)	6.1	30.5	30.5		6.1	
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	1.8	1.8		6.1	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA		Prot	
Protected Phases	5	2	6		4	
Permitted Phases						
Detector Phase	5	2	6		4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0		10.0	
Minimum Split (s)	10.2	16.4	33.4		40.1	
Total Split (s)	15.0	89.0	74.0		41.0	
Total Split (%)	11.5%	68.5%	56.9%		31.5%	
Maximum Green (s)	9.8	82.6	67.6		33.9	
Yellow Time (s)	3.7	3.7	3.7		3.3	
All-Red Time (s)	1.5	2.7	2.7		3.8	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	5.2	6.4	6.4		7.1	

12: Carling Avenue & Sherwood Drive  
PM Peak

90 Champagne Avenue  
2026 Background Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Walk Time (s)			12.0		26.0	
Flash Dont Walk (s)			15.0		7.0	
Pedestrian Calls (#/hr)			5		5	
Act Effct Green (s)	9.5	95.6	83.2		20.9	
Actuated g/C Ratio	0.07	0.74	0.64		0.16	
v/c Ratio	0.52	0.23	0.55		0.69	
Control Delay	72.1	6.3	12.2		62.9	
Queue Delay	0.0	0.0	0.2		0.0	
Total Delay	72.1	6.3	12.4		62.9	
LOS	E	A	B		E	
Approach Delay		11.2	12.4		62.9	
Approach LOS		B	B		E	
Queue Length 50th (m)	16.2	20.5	32.7		46.6	
Queue Length 95th (m)	31.4	37.2	155.0		63.3	
Internal Link Dist (m)		157.5	144.7		285.1	
Turn Bay Length (m)						
Base Capacity (vph)	139	3512	3086		446	
Starvation Cap Reductn	0	0	549		0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.47	0.23	0.66		0.42	

Intersection Summary

Area Type: Other  
Cycle Length: 130  
Actuated Cycle Length: 130  
Offset: 24 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
Natural Cycle: 85  
Control Type: Actuated-Coordinated  
Maximum v/c Ratio: 0.69  
Intersection Signal Delay: 15.5  
Intersection Capacity Utilization 69.8%  
Analysis Period (min) 15

















Intersection LOS: B  
ICU Level of Service C

Splits and Phases: 12: Carling Avenue & Sherwood Drive



9: Champagne Avenue & Beech Street  
PM Peak



























90 Champagne Avenue  
2026 Background Traffic

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	64	16	55	122	16	28	14	75	11	17	0
Future Volume (vph)	4	64	16	55	122	16	28	14	75	11	17	0
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)	4	64	16	55	122	16	28	14	75	11	17	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	84	193	117	28								
Volume Left (vph)	4	55	28	11								
Volume Right (vph)	16	16	75	0								
Hadj (s)	-0.07	0.04	-0.30	0.11								
Departure Headway (s)	4.4	4.4	4.3	4.8								
Degree Utilization, x	0.10	0.23	0.14	0.04								
Capacity (veh/h)	785	787	790	694								
Control Delay (s)	7.9	8.7	8.0	8.0								
Approach Delay (s)	7.9	8.7	8.0	8.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.3								
Level of Service				A								
Intersection Capacity Utilization				32.6%	ICU Level of Service	A						
Analysis Period (min)				15								















3: Preston Street & Carling Avenue  
AM Peak

90 Champagne Avenue  
2021 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	156	593	233	147	452	113	284	539	287	109	264	127
Future Volume (vph)	156	593	233	147	452	113	284	539	287	109	264	127
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		40.0	45.0		0.0	65.0		0.0	30.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	45.0			45.0			40.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.93		0.85	0.96	0.96		0.98	0.99		1.00	0.98	
Frt			0.850		0.970			0.948			0.951	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1631	4777	1532	1712	4406	0	1712	3151	0	1558	1540	0
Flt Permitted	0.950			0.950			0.218			0.341		
Satd. Flow (perm)	1510	4777	1303	1635	4406	0	387	3151	0	559	1540	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			233		48			117			22	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		239.3			272.5			187.5			369.8	
Travel Time (s)		14.4			16.4			13.5			26.6	
Confl. Peds. (#/hr)	65		41	41		65	39		2	2		39
Confl. Bikes (#/hr)			21			9			36			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 (%)	6%	4%	1%	1%	4%	10%	1%	4%	1%	11%	6%	20%
Adj. Flow (vph)	156	593	233	147	452	113	284	539	287	109	264	127
Shared Lane Traffic (%)												
Lane Group Flow (vph)	156	593	233	147	565	0	284	826	0	109	391	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	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			2				8			4		
Detector Phase	5	2	2	1	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0	30.0	11.2	30.0		11.9	43.9		43.9	43.9	
Total Split (s)	18.0	35.0	35.0	18.0	35.0		20.0	67.0		47.0	47.0	
Total Split (%)	15.0%	29.2%	29.2%	15.0%	29.2%		16.7%	55.8%		39.2%	39.2%	
Maximum Green (s)	11.8	29.0	29.0	11.8	29.0		13.1	60.1		40.1	40.1	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3	3.3	

3: Preston Street & Carling Avenue  
AM Peak

90 Champagne Avenue  
2021 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3		3.6	3.6		3.6	3.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.0	6.0	6.2	6.0		6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		17.0	17.0		17.0			30.0		30.0	30.0	
Pedestrian Calls (#/hr)		5	5		5			5		5	5	
Act Effct Green (s)	15.0	33.6	33.6	13.6	32.2		53.7	53.7		33.7	33.7	
Actuated g/C Ratio	0.12	0.28	0.28	0.11	0.27		0.45	0.45		0.28	0.28	
v/c Ratio	0.77	0.44	0.44	0.76	0.46		0.90	0.56		0.70	0.87	
Control Delay	76.1	30.6	5.1	76.6	35.7		53.1	21.6		60.9	58.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	76.1	30.6	5.1	76.6	35.7		53.1	21.6		60.9	58.6	
LOS	E	C	A	E	D		D	C		E	E	
Approach Delay		31.8			44.1			29.7			59.1	
Approach LOS		C			D			C			E	
Queue Length 50th (m)	26.4	46.8	0.0	33.1	38.7		42.2	61.6		22.5	81.9	
Queue Length 95th (m)	#81.9	29.0	3.4	#71.5	50.8		#73.8	73.4		42.5	114.1	
Internal Link Dist (m)		215.3			248.5			163.5			345.8	
Turn Bay Length (m)	45.0		40.0	45.0			65.0			30.0		
Base Capacity (vph)	203	1338	532	194	1218		317	1636		186	529	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.77	0.44	0.44	0.76	0.46		0.90	0.50		0.59	0.74	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 116 (97%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 37.9

Intersection LOS: D

Intersection Capacity Utilization 96.3%

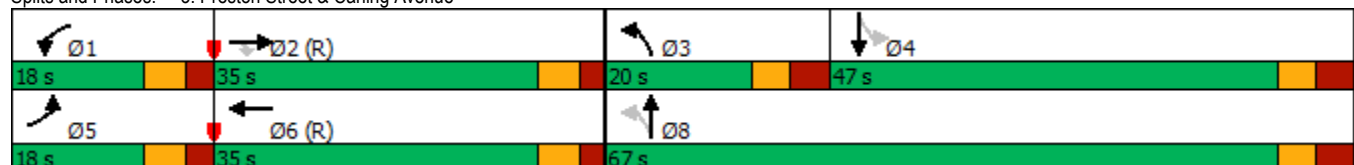
ICU Level of Service F

Analysis Period (min) 15

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




















Queue shown is maximum after two cycles.

Splits and Phases: 3: Preston Street & Carling Avenue















6: Preston Street & Beech Street  
AM Peak

90 Champagne Avenue  
2021 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	56	26	22	55	8	30	630	58	18	361	40
Future Volume (vph)	43	56	26	22	55	8	30	630	58	18	361	40
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.6			20.0			20.0			20.0		
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		0.94		0.93	0.99		0.97	0.99		0.98	0.99	
Frt		0.972			0.981			0.987			0.985	
Flt Protected		0.983		0.950			0.950			0.950		
Satd. Flow (prot)	0	1601	0	1281	1731	0	1586	1714	0	1558	1662	0
Flt Permitted		0.861		0.659			0.521			0.350		
Satd. Flow (perm)	0	1365	0	830	1731	0	841	1714	0	560	1662	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			8			12			14	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		237.2			186.9			369.8			155.9	
Travel Time (s)		17.1			13.5			26.6			11.2	
Confl. Peds. (#/hr)	36		36	36		36	43		55	55		43
Confl. Bikes (#/hr)			26			2			20			14
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	4%	4%	35%	2%	0%	9%	4%	2%	11%	7%	6%
Adj. Flow (vph)	43	56	26	22	55	8	30	630	58	18	361	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	125	0	22	63	0	30	688	0	18	401	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	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
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		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
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)	22.5	22.5		22.5	22.5		33.6	33.6		33.6	33.6	
Total Split (s)	23.0	23.0		23.0	23.0		57.0	57.0		57.0	57.0	
Total Split (%)	28.8%	28.8%		28.8%	28.8%		71.3%	71.3%		71.3%	71.3%	
Maximum Green (s)	17.5	17.5		17.5	17.5		51.4	51.4		51.4	51.4	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	

6: Preston Street & Beech Street  
AM Peak

90 Champagne Avenue  
2021 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.2	2.2		2.2	2.2		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5		5.5	5.5		5.6	5.6		5.6	5.6	
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		18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		12.5		12.5	12.5		60.6	60.6		60.6	60.6	
Actuated g/C Ratio		0.16		0.16	0.16		0.76	0.76		0.76	0.76	
v/c Ratio		0.55		0.17	0.23		0.05	0.53		0.04	0.32	
Control Delay		36.4		30.9	27.4		4.6	7.7		4.8	5.3	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		36.4		30.9	27.4		4.6	7.7		4.8	5.3	
LOS		D		C	C		A	A		A	A	
Approach Delay		36.4			28.3			7.5			5.3	
Approach LOS		D			C			A			A	
Queue Length 50th (m)		15.7		3.0	7.5		1.1	39.9		0.7	17.9	
Queue Length 95th (m)		29.7		8.8	16.6		4.2	82.9		3.1	38.2	
Internal Link Dist (m)		213.2			162.9			345.8			131.9	
Turn Bay Length (m)				15.0			20.0			20.0		
Base Capacity (vph)		310		181	384		637	1301		424	1262	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.40		0.12	0.16		0.05	0.53		0.04	0.32	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 40 (50%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 10.8

Intersection LOS: B

Intersection Capacity Utilization 62.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 6: Preston Street & Beech Street



11: Carling Avenue & Champagne Avenue  
AM Peak

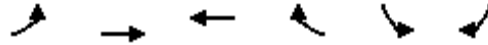
90 Champagne Avenue  
2021 Total Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	103	958	682	167	89	54
Future Volume (vph)	103	958	682	167	89	54
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			30.0	20.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				30.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Ped Bike Factor	0.92			0.76	0.99	0.98
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1729	4871	4777	1459	1695	1547
Flt Permitted	0.381				0.950	
Satd. Flow (perm)	635	4871	4777	1103	1682	1512
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				167		54
Link Speed (k/h)		60	60		40	
Link Distance (m)		168.7	239.3		260.6	
Travel Time (s)		10.1	14.4		23.5	
Confl. Peds. (#/hr)	76			76	7	9
Confl. Bikes (#/hr)				2		1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	4%	6%	2%	0%
Adj. Flow (vph)	103	958	682	167	89	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	103	958	682	167	89	54
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8	6.1	6.1	6.1
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	23.3	23.3	26.3	26.3	37.9	37.9
Total Split (s)	82.0	82.0	82.0	82.0	38.0	38.0
Total Split (%)	68.3%	68.3%	68.3%	68.3%	31.7%	31.7%
Maximum Green (s)	76.7	76.7	76.7	76.7	32.1	32.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3

11: Carling Avenue & Champagne Avenue  
AM Peak

90 Champagne Avenue  
2021 Total Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
All-Red Time (s)	1.6	1.6	1.6	1.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.9	5.9
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)			10.0	10.0	7.0	7.0
Flash Dont Walk (s)			10.0	10.0	25.0	25.0
Pedestrian Calls (#/hr)			5	5	5	5
Act Effct Green (s)	94.0	94.0	94.0	94.0	14.8	14.8
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.12	0.12
v/c Ratio	0.21	0.25	0.18	0.19	0.43	0.23
Control Delay	4.8	3.4	3.4	0.8	52.2	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.8	3.4	3.4	0.8	52.2	12.5
LOS	A	A	A	A	D	B
Approach Delay		3.5	2.9		37.2	
Approach LOS		A	A		D	
Queue Length 50th (m)	4.0	13.8	8.9	0.0	20.3	0.0
Queue Length 95th (m)	8.4	19.4	m21.6	m1.8	30.0	9.7
Internal Link Dist (m)		144.7	215.3		236.6	
Turn Bay Length (m)	40.0			30.0	20.0	
Base Capacity (vph)	497	3814	3741	900	453	444
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.25	0.18	0.19	0.20	0.12

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 106 (88%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.43

Intersection Signal Delay: 5.6

Intersection LOS: A

Intersection Capacity Utilization 49.5%

ICU Level of Service A

Analysis Period (min) 15

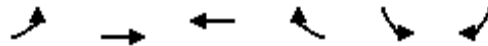
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Carling Avenue & Champagne Avenue

 <b>02 (R)</b> <b>32 s</b>	 <b>04</b> <b>38 s</b>
 <b>06 (R)</b> <b>32 s</b>	

12: Carling Avenue & Sherwood Drive  
AM Peak

90 Champagne Avenue  
2021 Total Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	31	738	582	128	133	5
Future Volume (vph)	31	738	582	128	133	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor	0.98		0.99		0.99	
Frt			0.973		0.995	
Flt Protected	0.950				0.954	
Satd. Flow (prot)	1679	4777	4532	0	1726	0
Flt Permitted	0.950				0.954	
Satd. Flow (perm)	1652	4777	4532	0	1712	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			58		2	
Link Speed (k/h)		60	60		40	
Link Distance (m)		181.5	168.7		309.1	
Travel Time (s)		10.9	10.1		27.8	
Confl. Peds. (#/hr)	19			19	8	9
Confl. Bikes (#/hr)				15		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	4%	6%	2%	0%	0%
Adj. Flow (vph)	31	738	582	128	133	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	31	738	710	0	138	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (m)	6.1	30.5	30.5		6.1	
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	1.8	1.8		6.1	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA		Prot	
Protected Phases	5	2	6		4	
Permitted Phases						
Detector Phase	5	2	6		4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0		10.0	
Minimum Split (s)	10.2	16.4	33.4		40.1	
Total Split (s)	13.0	79.0	66.0		41.0	
Total Split (%)	10.8%	65.8%	55.0%		34.2%	
Maximum Green (s)	7.8	72.6	59.6		33.9	
Yellow Time (s)	3.7	3.7	3.7		3.3	
All-Red Time (s)	1.5	2.7	2.7		3.8	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	5.2	6.4	6.4		7.1	



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Walk Time (s)			12.0		26.0	
Flash Dont Walk (s)			15.0		7.0	
Pedestrian Calls (#/hr)			5		5	
Act Effct Green (s)	7.4	89.0	80.9		17.5	
Actuated g/C Ratio	0.06	0.74	0.67		0.15	
v/c Ratio	0.30	0.21	0.23		0.55	
Control Delay	61.0	5.8	7.3		53.1	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	61.0	5.8	7.3		53.1	
LOS	E	A	A		D	
Approach Delay		8.0	7.3		53.1	
Approach LOS		A	A		D	
Queue Length 50th (m)	7.1	15.0	13.8		30.9	
Queue Length 95th (m)	17.0	34.0	16.5		42.7	
Internal Link Dist (m)		157.5	144.7		285.1	
Turn Bay Length (m)						
Base Capacity (vph)	114	3542	3073		489	
Starvation Cap Reductn	0	0	0		0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.27	0.21	0.23		0.28	

#### Intersection Summary

Area Type: Other  
Cycle Length: 120  
Actuated Cycle Length: 120  
Offset: 112 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
Natural Cycle: 85  
Control Type: Actuated-Coordinated  
Maximum v/c Ratio: 0.55  
Intersection Signal Delay: 11.6  
Intersection Capacity Utilization 51.7%  
Analysis Period (min) 15

Intersection LOS: B  
ICU Level of Service A

















#### Splits and Phases: 12: Carling Avenue & Sherwood Drive














9: Champagne Avenue & Beech Street  
AM Peak










90 Champagne Avenue  
2021 Total Traffic

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	129	18	76	66	10	25	19	66	11	10	3
Future Volume (vph)	2	129	18	76	66	10	25	19	66	11	10	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
Hourly flow rate (vph)	2	129	18	76	66	10	25	19	66	11	10	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	149	152	110	24								
Volume Left (vph)	2	76	25	11								
Volume Right (vph)	18	10	66	3								
Hadj (s)	-0.04	0.09	-0.28	0.05								
Departure Headway (s)	4.3	4.5	4.3	4.8								
Degree Utilization, x	0.18	0.19	0.13	0.03								
Capacity (veh/h)	797	768	774	692								
Control Delay (s)	8.3	8.5	8.0	7.9								
Approach Delay (s)	8.3	8.5	8.0	7.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.3								
Level of Service				A								
Intersection Capacity Utilization				34.5%	ICU Level of Service				A			
Analysis Period (min)				15								

14: Champagne Avenue & Access  
AM Peak






















90 Champagne Avenue  
2021 Total Traffic

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	13	5	97	101	1
Future Volume (Veh/h)	4	13	5	97	101	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	4	13	5	97	101	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)				322		
pX, platoon unblocked						
vC, conflicting volume	208	102	102			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	208	102	102			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	777	954	1490			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	17	102	102			
Volume Left	4	5	0			
Volume Right	13	0	1			
cSH	905	1490	1700			
Volume to Capacity	0.02	0.00	0.06			
Queue Length 95th (m)	0.4	0.1	0.0			
Control Delay (s)	9.1	0.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.1	0.4	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization		19.7%		ICU Level of Service		A
Analysis Period (min)			15			

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	11	3	98	113	1
Future Volume (Veh/h)	4	11	3	98	113	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	4	11	3	98	113	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)				261		
pX, platoon unblocked						
vC, conflicting volume	218	114	114			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	218	114	114			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	769	939	1475			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	15	101	114			
Volume Left	4	3	0			
Volume Right	11	0	1			
cSH	887	1475	1700			
Volume to Capacity	0.02	0.00	0.07			
Queue Length 95th (m)	0.4	0.0	0.0			
Control Delay (s)	9.1	0.2	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.1	0.2	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.7			
Intersection Capacity Utilization		18.0%		ICU Level of Service		A
Analysis Period (min)			15			













3: Preston Street & Carling Avenue  
PM Peak

90 Champagne Avenue  
2021 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	562	374	350	1050	73	348	406	169	98	325	125
Future Volume (vph)	155	562	374	350	1050	73	348	406	169	98	325	125
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		40.0	45.0		0.0	65.0		0.0	30.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	45.0			45.0			40.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.97		0.87	0.96	0.99		0.98	0.98		0.97	0.98	
Frt			0.850		0.990			0.956			0.958	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	4824	1532	1729	4768	0	1729	3187	0	1572	1670	0
Flt Permitted	0.950			0.950			0.142			0.436		
Satd. Flow (perm)	1612	4824	1331	1656	4768	0	253	3187	0	703	1670	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			333		7			67			15	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		239.3			272.5			187.5			369.8	
Travel Time (s)		14.4			16.4			13.5			26.6	
Confl. Peds. (#/hr)	53		34	34		53	60		55	55		60
Confl. Bikes (#/hr)			12			10			16			6
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 (%)	4%	3%	1%	0%	1%	16%	0%	2%	0%	10%	1%	5%
Adj. Flow (vph)	155	562	374	350	1050	73	348	406	169	98	325	125
Shared Lane Traffic (%)												
Lane Group Flow (vph)	155	562	374	350	1123	0	348	575	0	98	450	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	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			2				8			4		
Detector Phase	5	2	2	1	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0	30.0	11.2	30.0		11.9	43.9		43.9	43.9	
Total Split (s)	30.0	31.0	31.0	30.0	31.0		24.0	69.0		45.0	45.0	
Total Split (%)	23.1%	23.8%	23.8%	23.1%	23.8%		18.5%	53.1%		34.6%	34.6%	
Maximum Green (s)	23.8	25.0	25.0	23.8	25.0		17.1	62.1		38.1	38.1	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3	3.3	

3: Preston Street & Carling Avenue  
PM Peak

90 Champagne Avenue  
2021 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3		3.6	3.6		3.6	3.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.0	6.0	6.2	6.0		6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		17.0	17.0		17.0			30.0		30.0	30.0	
Pedestrian Calls (#/hr)		5	5		5			5		5	5	
Act Effct Green (s)	17.4	25.0	25.0	25.4	33.1		60.5	60.5		36.5	36.5	
Actuated g/C Ratio	0.13	0.19	0.19	0.20	0.25		0.47	0.47		0.28	0.28	
v/c Ratio	0.70	0.61	0.71	1.04	0.92		1.12	0.38		0.50	0.94	
Control Delay	73.9	46.8	18.5	109.4	60.2		115.8	20.3		48.5	72.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	73.9	46.8	18.5	109.4	60.2		115.8	20.3		48.5	72.7	
LOS	E	D	B	F	E		F	C		D	E	
Approach Delay		41.0			71.9			56.3			68.3	
Approach LOS		D			E			E			E	
Queue Length 50th (m)	39.3	44.1	0.0	~102.0	104.5		~77.6	42.1		20.6	107.7	
Queue Length 95th (m)	61.1	57.8	51.8	#161.1	#158.1		#137.1	55.7		39.5	#168.5	
Internal Link Dist (m)		215.3			248.5			163.5			345.8	
Turn Bay Length (m)	45.0		40.0	45.0			65.0			30.0		
Base Capacity (vph)	304	927	524	338	1218		312	1557		206	500	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.51	0.61	0.71	1.04	0.92		1.12	0.37		0.48	0.90	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 6 (5%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.12

Intersection Signal Delay: 59.5

Intersection LOS: E

Intersection Capacity Utilization 112.8%

ICU Level of Service H

Analysis Period (min) 15

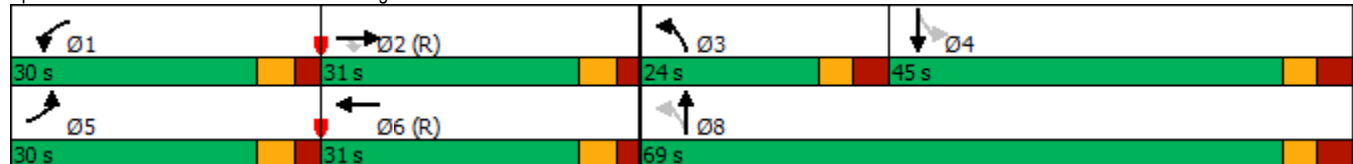
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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




















Queue shown is maximum after two cycles.

Splits and Phases: 3: Preston Street & Carling Avenue



6: Preston Street & Beech Street  
PM Peak

90 Champagne Avenue  
2021 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	41	34	38	121	24	83	477	44	17	479	55
Future Volume (vph)	31	41	34	38	121	24	83	477	44	17	479	55
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.6			20.0			20.0			20.0		
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		0.94		0.92	0.98		0.97	0.99		0.96	0.99	
Frt		0.957			0.975			0.987			0.985	
Flt Protected		0.986		0.950			0.950			0.950		
Satd. Flow (prot)	0	1654	0	1729	1723	0	1729	1730	0	1729	1710	0
Flt Permitted		0.850		0.762			0.434			0.442		
Satd. Flow (perm)	0	1398	0	1276	1723	0	768	1730	0	770	1710	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		32			14			12			14	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		237.2			186.9			369.8			155.9	
Travel Time (s)		17.1			13.5			26.6			11.2	
Confl. Peds. (#/hr)	40		46	46		40	52		80	80		52
Confl. Bikes (#/hr)			2			20			11			18
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	3%	0%	0%	4%	2%
Adj. Flow (vph)	31	41	34	38	121	24	83	477	44	17	479	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	106	0	38	145	0	83	521	0	17	534	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	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
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		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
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)	22.5	22.5		22.5	22.5		33.6	33.6		33.6	33.6	
Total Split (s)	23.0	23.0		23.0	23.0		47.0	47.0		47.0	47.0	
Total Split (%)	32.9%	32.9%		32.9%	32.9%		67.1%	67.1%		67.1%	67.1%	
Maximum Green (s)	17.5	17.5		17.5	17.5		41.4	41.4		41.4	41.4	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	

6: Preston Street & Beech Street  
PM Peak

90 Champagne Avenue  
2021 Total Traffic

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.2	2.2		2.2	2.2		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5		5.5	5.5		5.6	5.6		5.6	5.6	
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		18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		12.0		12.0	12.0		51.1	51.1		51.1	51.1	
Actuated g/C Ratio		0.17		0.17	0.17		0.73	0.73		0.73	0.73	
v/c Ratio		0.40		0.17	0.47		0.15	0.41		0.03	0.43	
Control Delay		22.7		25.4	28.2		5.9	6.7		5.1	6.8	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		22.7		25.4	28.2		5.9	6.7		5.1	6.8	
LOS		C		C	C		A	A		A	A	
Approach Delay		22.7			27.6			6.6			6.8	
Approach LOS		C			C			A			A	
Queue Length 50th (m)		8.8		4.4	16.0		3.1	23.9		0.6	24.8	
Queue Length 95th (m)		19.5		10.8	28.3		10.3	55.1		3.0	57.5	
Internal Link Dist (m)		213.2			162.9			345.8			131.9	
Turn Bay Length (m)				15.0			20.0			20.0		
Base Capacity (vph)		373		319	441		560	1266		562	1252	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.28		0.12	0.33		0.15	0.41		0.03	0.43	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 43 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 10.5

Intersection LOS: B

Intersection Capacity Utilization 83.1%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 6: Preston Street & Beech Street



11: Carling Avenue & Champagne Avenue  
PM Peak

90 Champagne Avenue  
2021 Total Traffic

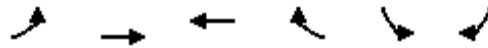


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	55	745	1219	72	145	189
Future Volume (vph)	55	745	1219	72	145	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			30.0	20.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				30.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Ped Bike Factor	0.98			0.86	1.00	0.98
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1441	4824	4919	1547	1712	1547
Flt Permitted	0.197				0.950	
Satd. Flow (perm)	294	4824	4919	1338	1707	1514
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				66		4
Link Speed (k/h)		60	60		40	
Link Distance (m)		168.7	239.3		260.8	
Travel Time (s)		10.1	14.4		23.5	
Confl. Peds. (#/hr)	70			70	5	16
Confl. Bikes (#/hr)				4		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	20%	3%	1%	0%	1%	0%
Adj. Flow (vph)	55	745	1219	72	145	189
Shared Lane Traffic (%)						
Lane Group Flow (vph)	55	745	1219	72	145	189
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8	6.1	6.1	6.1
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	23.3	23.3	26.3	26.3	37.9	37.9
Total Split (s)	27.0	27.0	27.0	27.0	38.0	38.0
Total Split (%)	41.5%	41.5%	41.5%	41.5%	58.5%	58.5%
Maximum Green (s)	21.7	21.7	21.7	21.7	32.1	32.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3



11: Carling Avenue & Champagne Avenue  
PM Peak

90 Champagne Avenue  
2021 Total Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
All-Red Time (s)	1.6	1.6	1.6	1.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.9	5.9
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)			10.0	10.0	7.0	7.0
Flash Dont Walk (s)			10.0	10.0	25.0	25.0
Pedestrian Calls (#/hr)			5	5	5	5
Act Effct Green (s)	37.8	37.8	37.8	37.8	16.0	16.0
Actuated g/C Ratio	0.58	0.58	0.58	0.58	0.25	0.25
v/c Ratio	0.32	0.27	0.43	0.09	0.34	0.50
Control Delay	16.9	6.5	11.7	6.6	20.0	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.9	6.5	11.7	6.6	20.0	23.4
LOS	B	A	B	A	C	C
Approach Delay		7.2	11.4		21.9	
Approach LOS		A	B		C	
Queue Length 50th (m)	2.9	13.2	47.2	1.9	15.3	20.3
Queue Length 95th (m)	#16.4	24.5	m73.2	m4.2	17.7	22.9
Internal Link Dist (m)		144.7	215.3		236.8	
Turn Bay Length (m)	40.0			30.0	20.0	
Base Capacity (vph)	170	2805	2860	805	845	749
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	57
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.27	0.43	0.09	0.17	0.27

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 65

Offset: 11 (17%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 11.5

Intersection LOS: B

Intersection Capacity Utilization 62.9%

ICU Level of Service B

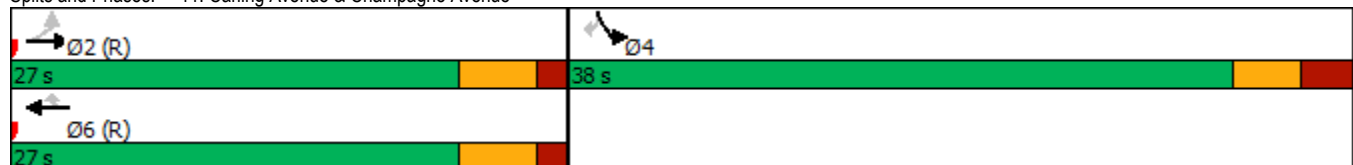
Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 11: Carling Avenue & Champagne Avenue



12: Carling Avenue & Sherwood Drive  
PM Peak

90 Champagne Avenue  
2021 Total Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	810	1526	156	180	7
Future Volume (vph)	65	810	1526	156	180	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor	0.99		0.99		0.99	
Frt			0.986		0.995	
Flt Protected	0.950				0.954	
Satd. Flow (prot)	1729	4777	4815	0	1709	0
Flt Permitted	0.950				0.954	
Satd. Flow (perm)	1718	4777	4815	0	1696	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			20		1	
Link Speed (k/h)		60	60		40	
Link Distance (m)		181.5	168.7		309.1	
Travel Time (s)		10.9	10.1		27.8	
Confl. Peds. (#/hr)	28			28	7	8
Confl. Bikes (#/hr)				5		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	4%	1%	0%	1%	0%
Adj. Flow (vph)	65	810	1526	156	180	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	65	810	1682	0	187	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (m)	6.1	30.5	30.5		6.1	
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	1.8	1.8		6.1	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA		Prot	
Protected Phases	5	2	6		4	
Permitted Phases						
Detector Phase	5	2	6		4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0		10.0	
Minimum Split (s)	10.2	16.4	33.4		40.1	
Total Split (s)	15.0	89.0	74.0		41.0	
Total Split (%)	11.5%	68.5%	56.9%		31.5%	
Maximum Green (s)	9.8	82.6	67.6		33.9	
Yellow Time (s)	3.7	3.7	3.7		3.3	
All-Red Time (s)	1.5	2.7	2.7		3.8	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	5.2	6.4	6.4		7.1	



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Walk Time (s)			12.0		26.0	
Flash Dont Walk (s)			15.0		7.0	
Pedestrian Calls (#/hr)			5		5	
Act Effct Green (s)	9.5	95.7	83.3		20.8	
Actuated g/C Ratio	0.07	0.74	0.64		0.16	
v/c Ratio	0.52	0.23	0.54		0.68	
Control Delay	72.1	6.3	12.3		62.8	
Queue Delay	0.0	0.0	0.2		0.0	
Total Delay	72.1	6.3	12.5		62.8	
LOS	E	A	B		E	
Approach Delay		11.2	12.5		62.8	
Approach LOS		B	B		E	
Queue Length 50th (m)	16.2	20.4	33.3		46.1	
Queue Length 95th (m)	31.4	37.1	154.4		62.8	
Internal Link Dist (m)		157.5	144.7		285.1	
Turn Bay Length (m)						
Base Capacity (vph)	139	3516	3091		446	
Starvation Cap Reductn	0	0	554		0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.47	0.23	0.66		0.42	

#### Intersection Summary

Area Type: Other  
Cycle Length: 130  
Actuated Cycle Length: 130  
Offset: 24 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
Natural Cycle: 85  
Control Type: Actuated-Coordinated  
Maximum v/c Ratio: 0.68  
Intersection Signal Delay: 15.5  
Intersection Capacity Utilization 69.6%  
Analysis Period (min) 15

















Intersection LOS: B  
ICU Level of Service C

#### Splits and Phases: 12: Carling Avenue & Sherwood Drive












9: Champagne Avenue & Beech Street  
PM Peak










90 Champagne Avenue  
2021 Total Traffic

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	64	17	58	122	16	28	14	77	11	17	0
Future Volume (vph)	4	64	17	58	122	16	28	14	77	11	17	0
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)	4	64	17	58	122	16	28	14	77	11	17	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	85	196	119	28								
Volume Left (vph)	4	58	28	11								
Volume Right (vph)	17	16	77	0								
Hadj (s)	-0.08	0.04	-0.31	0.11								
Departure Headway (s)	4.4	4.4	4.3	4.8								
Degree Utilization, x	0.10	0.24	0.14	0.04								
Capacity (veh/h)	784	786	789	692								
Control Delay (s)	7.9	8.7	8.0	8.0								
Approach Delay (s)	7.9	8.7	8.0	8.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.3								
Level of Service				A								
Intersection Capacity Utilization				32.9%	ICU Level of Service	A						
Analysis Period (min)				15								

14: Champagne Avenue & Access  
PM Peak






















90 Champagne Avenue  
2021 Total Traffic

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	7	11	113	81	4
Future Volume (Veh/h)	2	7	11	113	81	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2	7	11	113	81	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)				325		
pX, platoon unblocked						
vC, conflicting volume	218	83	85			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	218	83	85			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	99			
cM capacity (veh/h)	765	976	1512			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	9	124	85			
Volume Left	2	11	0			
Volume Right	7	0	4			
cSH	920	1512	1700			
Volume to Capacity	0.01	0.01	0.05			
Queue Length 95th (m)	0.2	0.2	0.0			
Control Delay (s)	9.0	0.7	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.0	0.7	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			23.6%	ICU Level of Service	A	
Analysis Period (min)			15			

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	5	9	122	85	3
Future Volume (Veh/h)	2	5	9	122	85	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2	5	9	122	85	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)				261		
pX, platoon unblocked						
vC, conflicting volume	226	86	88			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	226	86	88			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	99			
cM capacity (veh/h)	757	972	1508			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	7	131	88			
Volume Left	2	9	0			
Volume Right	5	0	3			
cSH	899	1508	1700			
Volume to Capacity	0.01	0.01	0.05			
Queue Length 95th (m)	0.2	0.1	0.0			
Control Delay (s)	9.0	0.6	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.0	0.6	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.6			
Intersection Capacity Utilization		24.0%		ICU Level of Service		A
Analysis Period (min)			15			













3: Preston Street & Carling Avenue  
AM Peak

90 Champagne Avenue  
2026 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	158	593	233	147	454	114	284	558	287	121	316	127
Future Volume (vph)	158	593	233	147	454	114	284	558	287	121	316	127
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		40.0	45.0		0.0	65.0		0.0	30.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	45.0			45.0			40.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.93		0.85	0.96	0.96		0.99	0.99		1.00	0.99	
Frt			0.850		0.970			0.949			0.957	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1631	4777	1532	1712	4406	0	1712	3154	0	1558	1561	0
Flt Permitted	0.950			0.950			0.188			0.334		
Satd. Flow (perm)	1511	4777	1303	1635	4406	0	334	3154	0	547	1561	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			233		48			109			18	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		239.3			272.5			187.5			369.8	
Travel Time (s)		14.4			16.4			13.5			26.6	
Confl. Peds. (#/hr)	65		41	41		65	39		2	2		39
Confl. Bikes (#/hr)			21			9			36			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 (%)	6%	4%	1%	1%	4%	10%	1%	4%	1%	11%	6%	20%
Adj. Flow (vph)	158	593	233	147	454	114	284	558	287	121	316	127
Shared Lane Traffic (%)												
Lane Group Flow (vph)	158	593	233	147	568	0	284	845	0	121	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)		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	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			2				8			4		
Detector Phase	5	2	2	1	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0	30.0	11.2	30.0		11.9	43.9		43.9	43.9	
Total Split (s)	18.0	35.0	35.0	18.0	35.0		20.0	67.0		47.0	47.0	
Total Split (%)	15.0%	29.2%	29.2%	15.0%	29.2%		16.7%	55.8%		39.2%	39.2%	
Maximum Green (s)	11.8	29.0	29.0	11.8	29.0		13.1	60.1		40.1	40.1	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3	3.3	

3: Preston Street & Carling Avenue  
AM Peak

90 Champagne Avenue  
2026 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3		3.6	3.6		3.6	3.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.0	6.0	6.2	6.0		6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		17.0	17.0		17.0			30.0		30.0	30.0	
Pedestrian Calls (#/hr)		5	5		5			5		5	5	
Act Effct Green (s)	13.9	31.8	31.8	12.5	30.5		56.5	56.5		36.5	36.5	
Actuated g/C Ratio	0.12	0.26	0.26	0.10	0.25		0.47	0.47		0.30	0.30	
v/c Ratio	0.84	0.47	0.45	0.83	0.49		0.93	0.55		0.73	0.91	
Control Delay	85.8	31.9	5.6	86.7	36.9		57.7	20.4		62.2	61.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	85.8	31.9	5.6	86.7	36.9		57.7	20.4		62.2	61.8	
LOS	F	C	A	F	D		E	C		E	E	
Approach Delay		34.3			47.1			29.8			61.9	
Approach LOS		C			D			C			E	
Queue Length 50th (m)	26.8	46.8	0.0	34.5	38.9		39.1	59.7		24.4	93.0	
Queue Length 95th (m)	#83.0	29.0	3.4	#71.5	51.1		#81.7	76.6		#52.2	#145.8	
Internal Link Dist (m)		215.3			248.5			163.5			345.8	
Turn Bay Length (m)	45.0		40.0	45.0			65.0			30.0		
Base Capacity (vph)	188	1266	516	179	1155		307	1634		182	533	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.84	0.47	0.45	0.82	0.49		0.93	0.52		0.66	0.83	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 116 (97%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 40.1

Intersection LOS: D

Intersection Capacity Utilization 97.2%

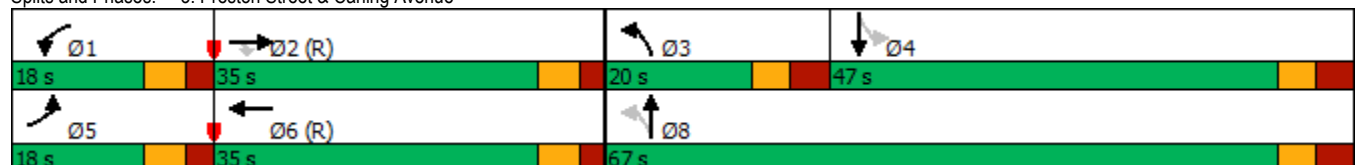
ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.




















Splits and Phases: 3: Preston Street & Carling Avenue

















6: Preston Street & Beech Street  
AM Peak

90 Champagne Avenue  
2026 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	56	26	23	55	8	30	670	63	18	410	40
Future Volume (vph)	43	56	26	23	55	8	30	670	63	18	410	40
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.6			20.0			20.0			20.0		
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		0.94		0.93	0.99		0.97	0.99		0.98	0.99	
Frt		0.972			0.981			0.987			0.987	
Flt Protected		0.983		0.950			0.950			0.950		
Satd. Flow (prot)	0	1601	0	1281	1731	0	1586	1714	0	1558	1667	0
Flt Permitted		0.861		0.659			0.489			0.326		
Satd. Flow (perm)	0	1365	0	830	1731	0	792	1714	0	523	1667	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			8			12			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		237.2			186.9			369.8			155.9	
Travel Time (s)		17.1			13.5			26.6			11.2	
Confl. Peds. (#/hr)	36		36	36		36	43		55	55		43
Confl. Bikes (#/hr)			26			2			20			14
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	4%	4%	35%	2%	0%	9%	4%	2%	11%	7%	6%
Adj. Flow (vph)	43	56	26	23	55	8	30	670	63	18	410	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	125	0	23	63	0	30	733	0	18	450	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	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
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		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
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)	22.5	22.5		22.5	22.5		33.6	33.6		33.6	33.6	
Total Split (s)	23.0	23.0		23.0	23.0		57.0	57.0		57.0	57.0	
Total Split (%)	28.8%	28.8%		28.8%	28.8%		71.3%	71.3%		71.3%	71.3%	
Maximum Green (s)	17.5	17.5		17.5	17.5		51.4	51.4		51.4	51.4	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	

6: Preston Street & Beech Street  
AM Peak

90 Champagne Avenue  
2026 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.2	2.2		2.2	2.2		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5		5.5	5.5		5.6	5.6		5.6	5.6	
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		18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		12.5		12.5	12.5		60.6	60.6		60.6	60.6	
Actuated g/C Ratio		0.16		0.16	0.16		0.76	0.76		0.76	0.76	
v/c Ratio		0.55		0.18	0.23		0.05	0.56		0.05	0.36	
Control Delay		36.4		31.1	27.4		4.7	8.2		4.9	5.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		36.4		31.1	27.4		4.7	8.2		4.9	5.7	
LOS		D		C	C		A	A		A	A	
Approach Delay		36.4			28.4			8.1			5.6	
Approach LOS		D			C			A			A	
Queue Length 50th (m)		15.7		3.1	7.5		1.1	44.5		0.7	21.1	
Queue Length 95th (m)		29.7		8.9	16.6		4.2	93.3		3.1	44.5	
Internal Link Dist (m)		213.2			162.9			345.8			131.9	
Turn Bay Length (m)				15.0			20.0			20.0		
Base Capacity (vph)		310		181	384		600	1301		396	1265	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.40		0.13	0.16		0.05	0.56		0.05	0.36	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 40 (50%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 11.0

Intersection LOS: B

Intersection Capacity Utilization 65.5%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 6: Preston Street & Beech Street



11: Carling Avenue & Champagne Avenue  
AM Peak

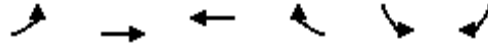
90 Champagne Avenue  
2026 Total Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	103	960	691	167	89	54
Future Volume (vph)	103	960	691	167	89	54
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			30.0	20.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				30.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Ped Bike Factor	0.92			0.76	0.99	0.98
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1729	4871	4777	1459	1695	1547
Flt Permitted	0.377				0.950	
Satd. Flow (perm)	629	4871	4777	1103	1682	1512
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				167		54
Link Speed (k/h)		60	60		40	
Link Distance (m)		168.7	239.3		260.6	
Travel Time (s)		10.1	14.4		23.5	
Confl. Peds. (#/hr)	76			76	7	9
Confl. Bikes (#/hr)				2		1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	4%	6%	2%	0%
Adj. Flow (vph)	103	960	691	167	89	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	103	960	691	167	89	54
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8	6.1	6.1	6.1
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	23.3	23.3	26.3	26.3	37.9	37.9
Total Split (s)	82.0	82.0	82.0	82.0	38.0	38.0
Total Split (%)	68.3%	68.3%	68.3%	68.3%	31.7%	31.7%
Maximum Green (s)	76.7	76.7	76.7	76.7	32.1	32.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3

11: Carling Avenue & Champagne Avenue  
AM Peak

90 Champagne Avenue  
2026 Total Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
All-Red Time (s)	1.6	1.6	1.6	1.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.9	5.9
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)			10.0	10.0	7.0	7.0
Flash Dont Walk (s)			10.0	10.0	25.0	25.0
Pedestrian Calls (#/hr)			5	5	5	5
Act Effct Green (s)	94.0	94.0	94.0	94.0	14.8	14.8
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.12	0.12
v/c Ratio	0.21	0.25	0.18	0.19	0.43	0.23
Control Delay	4.9	3.4	3.2	0.7	52.2	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	3.4	3.2	0.7	52.2	12.5
LOS	A	A	A	A	D	B
Approach Delay		3.6	2.7		37.2	
Approach LOS		A	A		D	
Queue Length 50th (m)	4.0	13.8	8.3	0.0	20.3	0.0
Queue Length 95th (m)	8.4	19.5	m20.9	m1.0	30.0	9.7
Internal Link Dist (m)		144.7	215.3		236.6	
Turn Bay Length (m)	40.0			30.0	20.0	
Base Capacity (vph)	492	3814	3741	900	453	444
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.25	0.18	0.19	0.20	0.12

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 106 (88%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.43

Intersection Signal Delay: 5.5

Intersection LOS: A

Intersection Capacity Utilization 49.5%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 11: Carling Avenue & Champagne Avenue

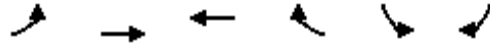
 <b>02 (R)</b> <b>32 s</b>	 <b>04</b> <b>38 s</b>
 <b>06 (R)</b> <b>32 s</b>	

12: Carling Avenue & Sherwood Drive  
AM Peak

90 Champagne Avenue  
2026 Total Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	31	739	589	130	134	5
Future Volume (vph)	31	739	589	130	134	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor	0.98		0.99		0.99	
Frt			0.973		0.995	
Flt Protected	0.950				0.954	
Satd. Flow (prot)	1679	4777	4532	0	1726	0
Flt Permitted	0.950				0.954	
Satd. Flow (perm)	1653	4777	4532	0	1712	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			58		2	
Link Speed (k/h)		60	60		40	
Link Distance (m)		181.5	168.7		309.1	
Travel Time (s)		10.9	10.1		27.8	
Confl. Peds. (#/hr)	19			19	8	9
Confl. Bikes (#/hr)				15		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	4%	6%	2%	0%	0%
Adj. Flow (vph)	31	739	589	130	134	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	31	739	719	0	139	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (m)	6.1	30.5	30.5		6.1	
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	1.8	1.8		6.1	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA		Prot	
Protected Phases	5	2	6		4	
Permitted Phases						
Detector Phase	5	2	6		4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0		10.0	
Minimum Split (s)	10.2	16.4	33.4		40.1	
Total Split (s)	13.0	79.0	66.0		41.0	
Total Split (%)	10.8%	65.8%	55.0%		34.2%	
Maximum Green (s)	7.8	72.6	59.6		33.9	
Yellow Time (s)	3.7	3.7	3.7		3.3	
All-Red Time (s)	1.5	2.7	2.7		3.8	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	5.2	6.4	6.4		7.1	



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Walk Time (s)			12.0		26.0	
Flash Dont Walk (s)			15.0		7.0	
Pedestrian Calls (#/hr)			5		5	
Act Effct Green (s)	7.4	89.0	80.8		17.5	
Actuated g/C Ratio	0.06	0.74	0.67		0.15	
v/c Ratio	0.30	0.21	0.23		0.55	
Control Delay	61.0	5.8	7.4		53.2	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	61.0	5.8	7.4		53.2	
LOS	E	A	A		D	
Approach Delay		8.0	7.4		53.2	
Approach LOS		A	A		D	
Queue Length 50th (m)	7.1	15.1	13.2		31.2	
Queue Length 95th (m)	17.0	34.1	17.5		42.9	
Internal Link Dist (m)		157.5	144.7		285.1	
Turn Bay Length (m)						
Base Capacity (vph)	114	3541	3071		489	
Starvation Cap Reductn	0	0	0		0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.27	0.21	0.23		0.28	

#### Intersection Summary

Area Type: Other  
Cycle Length: 120  
Actuated Cycle Length: 120  
Offset: 112 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
Natural Cycle: 85  
Control Type: Actuated-Coordinated  
Maximum v/c Ratio: 0.55  
Intersection Signal Delay: 11.6  
Intersection Capacity Utilization 51.7%  
Analysis Period (min) 15

















Intersection LOS: B  
ICU Level of Service A

#### Splits and Phases: 12: Carling Avenue & Sherwood Drive












9: Champagne Avenue & Beech Street  
AM Peak

90 Champagne Avenue  
2026 Total Traffic

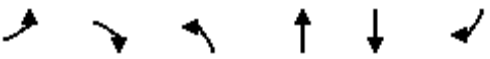



												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	129	18	76	66	10	25	19	66	11	10	3
Future Volume (vph)	2	129	18	76	66	10	25	19	66	11	10	3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2	129	18	76	66	10	25	19	66	11	10	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	149	152	110	24								
Volume Left (vph)	2	76	25	11								
Volume Right (vph)	18	10	66	3								
Hadj (s)	-0.04	0.09	-0.28	0.05								
Departure Headway (s)	4.3	4.5	4.3	4.8								
Degree Utilization, x	0.18	0.19	0.13	0.03								
Capacity (veh/h)	797	768	774	692								
Control Delay (s)	8.3	8.5	8.0	7.9								
Approach Delay (s)	8.3	8.5	8.0	7.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.3								
Level of Service				A								
Intersection Capacity Utilization				34.5%	ICU Level of Service				A			
Analysis Period (min)				15								

14: Champagne Avenue & Access  
AM Peak

90 Champagne Avenue  
2026 Total Traffic






















						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	13	5	97	101	1
Future Volume (Veh/h)	4	13	5	97	101	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	4	13	5	97	101	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)				322		
pX, platoon unblocked						
vC, conflicting volume	208	102	102			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	208	102	102			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	777	954	1490			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	17	102	102			
Volume Left	4	5	0			
Volume Right	13	0	1			
cSH	905	1490	1700			
Volume to Capacity	0.02	0.00	0.06			
Queue Length 95th (m)	0.4	0.1	0.0			
Control Delay (s)	9.1	0.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.1	0.4	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		0.9				
Intersection Capacity Utilization		19.7%		ICU Level of Service		A
Analysis Period (min)		15				



						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	11	3	98	113	1
Future Volume (Veh/h)	4	11	3	98	113	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	4	11	3	98	113	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)				261		
pX, platoon unblocked						
vC, conflicting volume	218	114	114			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	218	114	114			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	769	939	1475			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	15	101	114			
Volume Left	4	3	0			
Volume Right	11	0	1			
cSH	887	1475	1700			
Volume to Capacity	0.02	0.00	0.07			
Queue Length 95th (m)	0.4	0.0	0.0			
Control Delay (s)	9.1	0.2	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.1	0.2	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization		18.0%		ICU Level of Service		A
Analysis Period (min)			15			













3: Preston Street & Carling Avenue  
PM Peak

90 Champagne Avenue  
2026 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	562	374	350	1055	78	348	447	169	105	353	125
Future Volume (vph)	162	562	374	350	1055	78	348	447	169	105	353	125
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		40.0	45.0		0.0	65.0		0.0	30.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	45.0			45.0			40.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.97		0.87	0.96	0.99		0.98	0.98		0.98	0.98	
Frt			0.850		0.990			0.959			0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	4824	1532	1729	4762	0	1729	3201	0	1572	1679	0
Flt Permitted	0.950			0.950			0.121			0.419		
Satd. Flow (perm)	1613	4824	1331	1656	4762	0	216	3201	0	676	1679	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			324		8			58			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		239.3			272.5			187.5			369.8	
Travel Time (s)		14.4			16.4			13.5			26.6	
Confl. Peds. (#/hr)	53		34	34		53	60		55	55		60
Confl. Bikes (#/hr)			12			10			16			6
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 (%)	4%	3%	1%	0%	1%	16%	0%	2%	0%	10%	1%	5%
Adj. Flow (vph)	162	562	374	350	1055	78	348	447	169	105	353	125
Shared Lane Traffic (%)												
Lane Group Flow (vph)	162	562	374	350	1133	0	348	616	0	105	478	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	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			2				8			4		
Detector Phase	5	2	2	1	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0	30.0	11.2	30.0		11.9	43.9		43.9	43.9	
Total Split (s)	30.0	31.0	31.0	30.0	31.0		24.0	69.0		45.0	45.0	
Total Split (%)	23.1%	23.8%	23.8%	23.1%	23.8%		18.5%	53.1%		34.6%	34.6%	
Maximum Green (s)	23.8	25.0	25.0	23.8	25.0		17.1	62.1		38.1	38.1	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3	3.3	

3: Preston Street & Carling Avenue  
PM Peak

90 Champagne Avenue  
2026 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3		3.6	3.6		3.6	3.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.0	6.0	6.2	6.0		6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		17.0	17.0		17.0			30.0		30.0	30.0	
Pedestrian Calls (#/hr)		5	5		5			5		5	5	
Act Effct Green (s)	17.8	25.0	25.0	24.4	31.6		61.5	61.5		37.5	37.5	
Actuated g/C Ratio	0.14	0.19	0.19	0.19	0.24		0.47	0.47		0.29	0.29	
v/c Ratio	0.71	0.61	0.72	1.08	0.97		1.16	0.40		0.54	0.97	
Control Delay	74.8	46.8	19.5	122.6	69.3		132.0	20.7		50.6	77.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	74.8	46.8	19.5	122.6	69.3		132.0	20.7		50.6	77.8	
LOS	E	D	B	F	E		F	C		D	E	
Approach Delay		41.6			81.8			60.9			72.9	
Approach LOS		D			F			E			E	
Queue Length 50th (m)	41.1	44.0	0.0	~102.0	106.3		~84.7	47.0		22.5	117.4	
Queue Length 95th (m)	63.4	57.8	53.0	#161.1	#160.4		#144.1	61.4		42.8	#183.8	
Internal Link Dist (m)		215.3			248.5			163.5			345.8	
Turn Bay Length (m)	45.0		40.0	45.0			65.0			30.0		
Base Capacity (vph)	304	927	517	324	1164		301	1559		198	501	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.53	0.61	0.72	1.08	0.97		1.16	0.40		0.53	0.95	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 6 (5%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.16

Intersection Signal Delay: 65.0

Intersection LOS: E

Intersection Capacity Utilization 113.0%

ICU Level of Service H

Analysis Period (min) 15

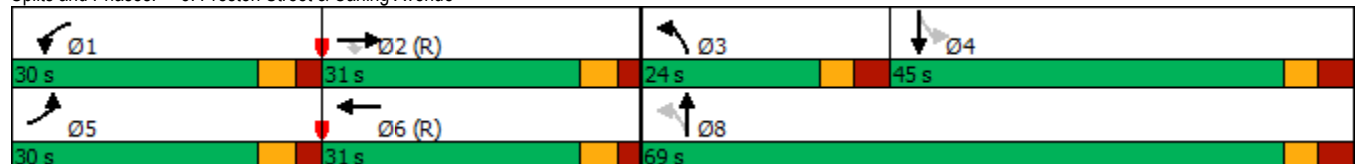
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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




















Queue shown is maximum after two cycles.

Splits and Phases: 3: Preston Street & Carling Avenue















6: Preston Street & Beech Street  
PM Peak

90 Champagne Avenue  
2026 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	41	34	43	121	24	83	524	47	17	523	55
Future Volume (vph)	31	41	34	43	121	24	83	524	47	17	523	55
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.6			20.0			20.0			20.0		
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		0.94		0.92	0.98		0.97	0.99		0.96	0.99	
Frt		0.957			0.975			0.988			0.986	
Flt Protected		0.986		0.950			0.950			0.950		
Satd. Flow (prot)	0	1654	0	1729	1723	0	1729	1732	0	1729	1713	0
Flt Permitted		0.850		0.762			0.407			0.411		
Satd. Flow (perm)	0	1398	0	1276	1723	0	722	1732	0	719	1713	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		32			14			11			13	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		237.2			186.9			369.8			155.9	
Travel Time (s)		17.1			13.5			26.6			11.2	
Confl. Peds. (#/hr)	40		46	46		40	52		80	80		52
Confl. Bikes (#/hr)			2			20			11			18
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	3%	0%	0%	4%	2%
Adj. Flow (vph)	31	41	34	43	121	24	83	524	47	17	523	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	106	0	43	145	0	83	571	0	17	578	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	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
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		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
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)	22.5	22.5		22.5	22.5		33.6	33.6		33.6	33.6	
Total Split (s)	23.0	23.0		23.0	23.0		47.0	47.0		47.0	47.0	
Total Split (%)	32.9%	32.9%		32.9%	32.9%		67.1%	67.1%		67.1%	67.1%	
Maximum Green (s)	17.5	17.5		17.5	17.5		41.4	41.4		41.4	41.4	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	

6: Preston Street & Beech Street  
PM Peak

90 Champagne Avenue  
2026 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.2	2.2		2.2	2.2		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5		5.5	5.5		5.6	5.6		5.6	5.6	
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		18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	5	5		5	5		5	5		5	5	
Act Effct Green (s)		12.0		12.0	12.0		51.1	51.1		51.1	51.1	
Actuated g/C Ratio		0.17		0.17	0.17		0.73	0.73		0.73	0.73	
v/c Ratio		0.40		0.20	0.47		0.16	0.45		0.03	0.46	
Control Delay		22.7		25.9	28.2		6.1	7.1		5.1	7.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		22.7		25.9	28.2		6.1	7.1		5.1	7.2	
LOS		C		C	C		A	A		A	A	
Approach Delay		22.7			27.7			7.0			7.2	
Approach LOS		C			C			A			A	
Queue Length 50th (m)		8.8		5.0	16.0		3.1	27.5		0.6	28.1	
Queue Length 95th (m)		19.5		11.7	28.3		10.5	63.3		3.0	64.9	
Internal Link Dist (m)		213.2			162.9			345.8			131.9	
Turn Bay Length (m)				15.0			20.0			20.0		
Base Capacity (vph)		373		319	441		527	1268		525	1254	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.28		0.13	0.33		0.16	0.45		0.03	0.46	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 43 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 10.7

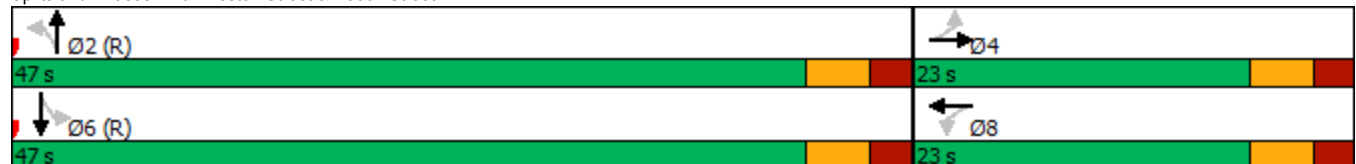
Intersection LOS: B

Intersection Capacity Utilization 85.5%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 6: Preston Street & Beech Street



11: Carling Avenue & Champagne Avenue  
PM Peak

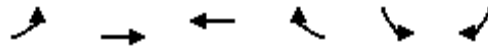
90 Champagne Avenue  
2026 Total Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	55	752	1225	72	145	189
Future Volume (vph)	55	752	1225	72	145	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			30.0	20.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				30.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Ped Bike Factor	0.98			0.86	1.00	0.98
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1441	4824	4919	1547	1712	1547
Flt Permitted	0.195				0.950	
Satd. Flow (perm)	291	4824	4919	1338	1707	1514
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				66		4
Link Speed (k/h)		60	60		40	
Link Distance (m)		168.7	239.3		260.8	
Travel Time (s)		10.1	14.4		23.5	
Confl. Peds. (#/hr)	70			70	5	16
Confl. Bikes (#/hr)				4		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	20%	3%	1%	0%	1%	0%
Adj. Flow (vph)	55	752	1225	72	145	189
Shared Lane Traffic (%)						
Lane Group Flow (vph)	55	752	1225	72	145	189
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8	6.1	6.1	6.1
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	23.3	23.3	26.3	26.3	37.9	37.9
Total Split (s)	27.0	27.0	27.0	27.0	38.0	38.0
Total Split (%)	41.5%	41.5%	41.5%	41.5%	58.5%	58.5%
Maximum Green (s)	21.7	21.7	21.7	21.7	32.1	32.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3

11: Carling Avenue & Champagne Avenue  
PM Peak

90 Champagne Avenue  
2026 Total Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
All-Red Time (s)	1.6	1.6	1.6	1.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.9	5.9
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)			10.0	10.0	7.0	7.0
Flash Dont Walk (s)			10.0	10.0	25.0	25.0
Pedestrian Calls (#/hr)			5	5	5	5
Act Effct Green (s)	37.8	37.8	37.8	37.8	16.0	16.0
Actuated g/C Ratio	0.58	0.58	0.58	0.58	0.25	0.25
v/c Ratio	0.33	0.27	0.43	0.09	0.34	0.50
Control Delay	17.1	6.5	12.2	6.8	20.0	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	17.1	6.5	12.2	6.8	20.0	23.4
LOS	B	A	B	A	C	C
Approach Delay		7.2	11.9		21.9	
Approach LOS		A	B		C	
Queue Length 50th (m)	2.9	13.2	51.3	2.2	15.3	20.3
Queue Length 95th (m)	#16.7	24.7	m70.0	m3.7	17.7	22.9
Internal Link Dist (m)		144.7	215.3		236.8	
Turn Bay Length (m)	40.0			30.0	20.0	
Base Capacity (vph)	169	2805	2860	805	845	749
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	59
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.27	0.43	0.09	0.17	0.27

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 65

Offset: 11 (17%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 11.7

Intersection LOS: B

Intersection Capacity Utilization 63.1%

ICU Level of Service B

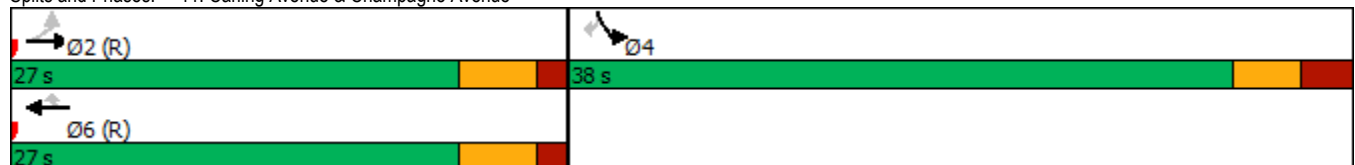
Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 11: Carling Avenue & Champagne Avenue





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	815	1530	158	182	7
Future Volume (vph)	65	815	1530	158	182	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor	0.99		0.99		0.99	
Frt			0.986		0.995	
Flt Protected	0.950				0.954	
Satd. Flow (prot)	1729	4777	4814	0	1709	0
Flt Permitted	0.950				0.954	
Satd. Flow (perm)	1718	4777	4814	0	1696	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			20		1	
Link Speed (k/h)		60	60		40	
Link Distance (m)		181.5	168.7		309.1	
Travel Time (s)		10.9	10.1		27.8	
Confl. Peds. (#/hr)	28			28	7	8
Confl. Bikes (#/hr)				5		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	4%	1%	0%	1%	0%
Adj. Flow (vph)	65	815	1530	158	182	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	65	815	1688	0	189	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		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	24	14
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (m)	6.1	30.5	30.5		6.1	
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	1.8	1.8		6.1	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA		Prot	
Protected Phases	5	2	6		4	
Permitted Phases						
Detector Phase	5	2	6		4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0		10.0	
Minimum Split (s)	10.2	16.4	33.4		40.1	
Total Split (s)	15.0	89.0	74.0		41.0	
Total Split (%)	11.5%	68.5%	56.9%		31.5%	
Maximum Green (s)	9.8	82.6	67.6		33.9	
Yellow Time (s)	3.7	3.7	3.7		3.3	
All-Red Time (s)	1.5	2.7	2.7		3.8	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	5.2	6.4	6.4		7.1	





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Walk Time (s)			12.0		26.0	
Flash Dont Walk (s)			15.0		7.0	
Pedestrian Calls (#/hr)			5		5	
Act Effct Green (s)	9.5	95.6	83.2		20.9	
Actuated g/C Ratio	0.07	0.74	0.64		0.16	
v/c Ratio	0.52	0.23	0.55		0.69	
Control Delay	72.1	6.3	12.2		62.9	
Queue Delay	0.0	0.0	0.2		0.0	
Total Delay	72.1	6.3	12.5		62.9	
LOS	E	A	B		E	
Approach Delay		11.2	12.5		62.9	
Approach LOS		B	B		E	
Queue Length 50th (m)	16.2	20.6	32.8		46.6	
Queue Length 95th (m)	31.4	37.4	155.1		63.3	
Internal Link Dist (m)		157.5	144.7		285.1	
Turn Bay Length (m)						
Base Capacity (vph)	139	3512	3086		446	
Starvation Cap Reductn	0	0	549		0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.47	0.23	0.67		0.42	

#### Intersection Summary

Area Type: Other  
Cycle Length: 130  
Actuated Cycle Length: 130  
Offset: 24 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
Natural Cycle: 85  
Control Type: Actuated-Coordinated  
Maximum v/c Ratio: 0.69  
Intersection Signal Delay: 15.5  
Intersection Capacity Utilization 69.9%  
Analysis Period (min) 15

















Intersection LOS: B  
ICU Level of Service C

#### Splits and Phases: 12: Carling Avenue & Sherwood Drive












9: Champagne Avenue & Beech Street  
PM Peak










90 Champagne Avenue  
2026 Total Traffic

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	64	17	58	122	16	28	14	77	11	17	0
Future Volume (vph)	4	64	17	58	122	16	28	14	77	11	17	0
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)	4	64	17	58	122	16	28	14	77	11	17	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	85	196	119	28								
Volume Left (vph)	4	58	28	11								
Volume Right (vph)	17	16	77	0								
Hadj (s)	-0.08	0.04	-0.31	0.11								
Departure Headway (s)	4.4	4.4	4.3	4.8								
Degree Utilization, x	0.10	0.24	0.14	0.04								
Capacity (veh/h)	784	786	789	692								
Control Delay (s)	7.9	8.7	8.0	8.0								
Approach Delay (s)	7.9	8.7	8.0	8.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.3								
Level of Service				A								
Intersection Capacity Utilization				32.9%	ICU Level of Service	A						
Analysis Period (min)				15								

14: Champagne Avenue & Access  
PM Peak

90 Champagne Avenue  
2026 Total Traffic

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	7	11	113	81	4
Future Volume (Veh/h)	2	7	11	113	81	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2	7	11	113	81	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)				325		
pX, platoon unblocked						
vC, conflicting volume	218	83	85			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	218	83	85			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	99			
cM capacity (veh/h)	765	976	1512			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	9	124	85			
Volume Left	2	11	0			
Volume Right	7	0	4			
cSH	920	1512	1700			
Volume to Capacity	0.01	0.01	0.05			
Queue Length 95th (m)	0.2	0.2	0.0			
Control Delay (s)	9.0	0.7	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.0	0.7	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.8			
Intersection Capacity Utilization		23.6%		ICU Level of Service		A
Analysis Period (min)			15			

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	5	9	122	85	3
Future Volume (Veh/h)	2	5	9	122	85	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2	5	9	122	85	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)				261		
pX, platoon unblocked						
vC, conflicting volume	226	86	88			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	226	86	88			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	99			
cM capacity (veh/h)	757	972	1508			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	7	131	88			
Volume Left	2	9	0			
Volume Right	5	0	3			
cSH	899	1508	1700			
Volume to Capacity	0.01	0.01	0.05			
Queue Length 95th (m)	0.2	0.1	0.0			
Control Delay (s)	9.0	0.6	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.0	0.6	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		0.6				
Intersection Capacity Utilization		24.0%		ICU Level of Service		A
Analysis Period (min)		15				