

## Engineering

- Land/Site Development
- Municipal Infrastructure
- Environmental/Water Resources
- Traffic/Transportation
- Recreational

## Planning

- Land/Site Development
- Planning Application Management
- Municipal Planning
- Urban Design
- Expert Witness (LPAT)
- Wireless Industry

## Landscape Architecture

- Streetscapes & Public Amenities
- Open Space, Parks & Recreation
- Community & Residential
- Commercial & Institutional
- Environmental Restoration



## Proposed Residential High-Rise 829 Carling Avenue, Ottawa Transportation Impact Assessment

**Proposed Residential High-Rise  
829 Carling Avenue  
Transportation Impact Assessment**

Prepared By:

**NOVATECH**

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

Dated: May 2021

*Revised: April 2023*

Novatech File: 121008

Ref: R-2021-015

April 27, 2023

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

**Attention: Mr. Mike Giampa**  
**Project Manager, Infrastructure Approvals**

Dear Mr. Giampa:

**Reference: 829 Carling Avenue**  
**Revised Transportation Impact Assessment**  
**Novatech File No. 121008**

---

We are pleased to submit the following revised Transportation Impact Assessment (TIA), in support of Official Plan Amendment, Zoning By-Law Amendment, and Site Plan Control applications at 829 Carling Avenue. The structure and format of this report is in accordance with the City of Ottawa Transportation Impact Assessment Guidelines (June 2017).

The original TIA in support of this development was submitted to the City in May 2021. This version of the TIA has been revised to address changes in the proposed site plan, and to address City comments.

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

Yours truly,

**NOVATECH**



Joshua Audia, P.Eng.  
Project Engineer | Transportation



## **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 .

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

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

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

Dated at Ottawa this 27th day of April, 2023.  
(City)

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

Professional Title: Project Manager, Transportation

*B. Byvelds*

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

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

**TABLE OF CONTENTS**

**EXECUTIVE SUMMARY ..... I**

**1.0 SCREENING..... 1**

1.1 INTRODUCTION ..... 1

1.2 PROPOSED DEVELOPMENT ..... 1

1.3 SCREENING FORM ..... 1

**2.0 SCOPING..... 2**

2.1 EXISTING CONDITIONS ..... 2

2.1.1 Roadways..... 2

2.1.2 Intersections ..... 4

2.1.3 Driveways ..... 8

2.1.4 Pedestrian and Cycling Facilities ..... 8

2.1.5 Transit ..... 8

2.1.6 Area Traffic Management ..... 10

2.1.7 Existing Traffic Volumes ..... 11

2.1.8 Collision Records..... 11

2.2 PLANNED CONDITIONS ..... 15

2.2.1 Planned Roadway and Transit Projects ..... 15

2.2.2 Other Area Developments ..... 16

2.3 STUDY AREA AND TIME PERIODS ..... 19

2.4 EXEMPTIONS REVIEW..... 19

**3.0 FORECASTING ..... 21**

3.1 DEVELOPMENT-GENERATED TRAVEL DEMAND..... 21

3.1.1 Trip Generation..... 21

3.1.2 Trip Distribution..... 25

3.1.3 Trip Assignment..... 26

3.2 BACKGROUND TRAFFIC ..... 27

3.2.1 Other Area Developments ..... 27

3.2.2 General Background Growth Rate ..... 29

3.2.3 Existing Traffic Volume Balancing..... 30

3.3 FUTURE TRAFFIC CONDITIONS..... 30

3.4 DEMAND RATIONALIZATION..... 41

3.4.1 Existing Intersection Operations ..... 41

3.4.2 2028 Background Intersection Operations ..... 43

3.4.3 2033 Background Intersection Operations ..... 46

**4.0 ANALYSIS..... 48**

4.1 DEVELOPMENT DESIGN ..... 48

4.1.1 Design for Sustainable Modes ..... 48

4.1.2 Circulation and Access ..... 49

4.2 PARKING ..... 49

4.3 BOUNDARY STREETS ..... 50

4.4 ACCESS DESIGN ..... 52

4.5 TRANSPORTATION DEMAND MANAGEMENT ..... 53

4.5.1 Context for TDM ..... 53

4.5.2 Need and Opportunity..... 53

4.5.3 TDM Program ..... 54

4.6 NEIGHBOURHOOD TRAFFIC MANAGEMENT..... 54

4.7 TRANSIT ..... 54

4.8 INTERSECTION DESIGN..... 57

    4.8.1 Intersection MMLOS Review.....57

    4.8.2 2028 Total Intersection Operations .....62

    4.8.3 2033 Total Intersection Operations .....64

**5.0 CONCLUSIONS AND RECOMMENDATIONS .....66**

**Figures**

Figure 1: View of the Subject Site ..... 2

Figure 2: OC Transpo Bus Stop Locations ..... 10

Figure 3: Existing Network Traffic Volumes..... 12

Figure 4: Carling Avenue Transit Priority Measures – Functional Design ..... 17

Figure 5: LRT Phase 2..... 18

Figure 6: Balanced Existing Traffic Volumes ..... 31

Figure 7: Existing Site-Generated Traffic Volumes..... 32

Figure 8: Proposed Site-Generated Traffic Volumes ..... 33

Figure 9: Net Site-Generated Traffic Volumes..... 34

Figure 10: 2028 Other Area Development-Generated Traffic Volumes ..... 35

Figure 11: 2033 Other Area Development-Generated Traffic Volumes ..... 36

Figure 12: 2028 Background Traffic Volumes ..... 37

Figure 13: 2033 Background Traffic Volumes ..... 38

Figure 14: 2028 Total Traffic Volumes ..... 39

Figure 15: 2033 Total Traffic Volumes ..... 40

Figure 16: Desirable Cycling Facility Pre-Selection Nomograph..... 61

**Tables**

Table 1: Reported Collisions ..... 13

Table 2: TIA Exemptions ..... 20

Table 3: Mode Shares for Commercial and Residential Uses ..... 22

Table 4: Existing Development – Trip Generation ..... 22

Table 5: Existing Development – Trips by Mode Share ..... 22

Table 6: Existing Development – Primary and Pass-by Trips ..... 23

Table 7: Proposed Retail – Trip Generation ..... 23

Table 8: Proposed Retail – Trips by Mode Share ..... 23

Table 9: Proposed Residential – Peak Period Trip Generation ..... 24

Table 10: Proposed Residential – Peak Period Trips by Mode Share ..... 24

Table 11: Proposed Residential – Peak Hour Trips by Mode Share ..... 24

Table 12: Trip Generation Summary ..... 25

Table 13: New Civic Development – Person Trip Generation ..... 29

Table 14: Existing Traffic Operations ..... 41

Table 15: Existing Queues ..... 42

Table 16: 2028 Background Traffic Operations ..... 43

Table 17: 2028 Background Queues ..... 44

Table 18: 2033 Background Traffic Operations ..... 46

Table 19: 2033 Background Queues ..... 47

Table 20: Parking Requirements ..... 50

Table 21: Segment MMLOS Summary ..... 51

Table 22: Existing and Projected Transit Utilization ..... 55

Table 23: Intersection MMLOS Summary ..... 57

Table 24: 2028 Total Traffic Operations ..... 62

Table 25: 2028 Total Queues ..... 63

Table 26: 2033 Total Traffic Operations ..... 64

Table 27: 2033 Total Queues ..... 65

**Appendices**

Appendix A: Proposed Site Plan

Appendix B: TIA Screening Form

Appendix C: OC Transpo Route Maps

Appendix D: Traffic Count Data

Appendix E: Collision Records

Appendix F: Other Area Developments

Appendix G: Strategic Long-Range Model and Intersection Growth Rate Figures

Appendix H: Signal Timing Plans

Appendix I: Existing Synchro Analysis

Appendix J: Background Synchro Analysis

Appendix K: Transportation Demand Management

Appendix L: MMLOS Review

Appendix M: Total Synchro Analysis



## EXECUTIVE SUMMARY

This Transportation Impact Assessment (TIA) has been prepared for the property located at 829 Carling Avenue, in support of Official Plan Amendment, Zoning By-Law Amendment, and Site Plan Control applications. The subject site is approximately 0.38 acres in size and is currently occupied by a CIBC banking centre. The subject site is currently served by one driveway to Carling Avenue, and one driveway to Sidney Street. Both driveways are approximately 30m west of Preston Street.

The subject site is surrounded by the following:

- Sidney Street and future high-rise residential development to the north,
- Carling Avenue and Dow's Lake Public Parking to the south,
- Preston Street and future high-rise residential development to the east, and
- An existing auto dealership to the west.

The subject site is designated as 'Corridor – Mainstreet' (Carling Avenue) on Schedule B2 of the City of Ottawa's Official Plan. The implemented zoning for the property is 'Arterial Mainstreet' (AM1), and the site is within the Preston-Carling District Secondary Plan.

The proposed development consists of a single 40-storey high-rise residential building with 396 dwellings and approximately 3,628 ft<sup>2</sup> (337 m<sup>2</sup>) GFA of ground-floor retail. A total of 196 parking spaces will be provided in seven levels of underground parking. Access to the parking garage will be provided via one two-way access to Sidney Street. The development will be constructed in a single phase, with a buildout year of 2028.

The study area for this report includes the boundary roadways Carling Avenue, Preston Street, and Sidney Street, as well as the following intersections:

- Carling Avenue/Sherwood Drive
- Carling Avenue/Champagne Avenue
- Carling Avenue/Trillium Pathway
- Carling Avenue/Preston Street
- Carling Avenue/Booth Street
- Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway
- Preston Street/Beech Street
- Preston Street/Pamilla Street
- Preston Street/Adeline Street
- Preston Street/Sidney Street

The selected time periods for the analysis are the weekday AM and PM peak hours, as they represent the 'worst case' combination of site generated traffic and adjacent street traffic. Analysis will be completed for the 2028 build-out year and 2033 horizon year.

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

### Forecasting

- The proposed development is estimated to generate a net additional 140 person trips (including 17 vehicle trips) during the AM peak hour and 112 person trips (including 16 vehicle trips) during the PM peak hour.

### Development Design

- Concrete sidewalks will be provided around the north, south, and east sides of the proposed building, and will connect to existing sidewalks on Sidney Street, Preston Street, and Carling Avenue. The proposed development will include eight exterior bicycle parking spaces and 192 interior bicycle parking spaces.

- OC Transpo stops #2397, #6655, #6657, #7369, #8013, #8014, #8023, and the Dow's Lake O-Train Station are within 400m walking distance of all entrances to the proposed development.
- All required Transportation Demand Management (TDM)-supportive design and infrastructure measures in the TDM checklist are met.

### Parking

- The proposed development includes 196 vehicle parking spaces, meeting the minimum number of required parking spaces and maximum number of permitted parking spaces, as outlined in the City's *Zoning By-Law* (ZBL).
- The proposed development includes 200 bicycle parking spaces, meeting the minimum number of required spaces as outlined in the City's ZBL. Section 111 outlines a requirement to provide at least 25% of bicycle spaces within a secure area or structure, which is also met by the proposed development.

### Boundary Streets

- Sidney Street meets the target pedestrian level of service (PLOS) A and the target bicycle level of service (BLOS) D.
- Preston Street does not meet the target PLOS A or BLOS B, meets the target truck level of service (TkLOS) D, and achieves a transit level of service (TLOS) F, but has no target.
- The best possible PLOS for Preston Street is a PLOS C, which would require sidewalks with a minimum width of 2.0m and a minimum boulevard width of 2.0m. This is identified for the City's consideration. Along the site's frontage, a sidewalk width greater than 4m is proposed. Considering 2m of this width to be boulevard width, the best possible PLOS C will be achieved. The target PLOS A is anticipated to be met by the proposed development from a crowding perspective, as the sidewalk widths along the site's frontages to Carling Avenue and Preston Street are anticipated to be 3.0m or wider, and will be significantly wider at the northwest corner of Carling Avenue/Preston Street.
- The target BLOS B for Preston Street can be achieved by reducing the operating speed to 40 km/h, or a combination of curbside bike lanes with a minimum width of 1.5m and an operating speed of 50 km/h. In areas with on-street parking, a 4.25m-wide bike plus parking lane would also achieve the target BLOS B. This is identified for the City's consideration.
- A sidewalk of approximately 2m width is proposed along the site's frontage to Sidney Street. This will maintain the PLOS of Sidney Street at the target PLOS A.

### Access Design

- The existing depressed curbs to the subject site will be removed as part of the proposed development, and full-height curb and sidewalks will be reinstated per City standards. Curbs will be depressed and continuous across the proposed access to Sidney Street.

- The proposed access meets the requirements of Sections 25(a) and 25(c) of the *Private Approach By-Law*, and Section 107(1) of the ZBL. It is requested that the requirements of Sections 25(m)(ii), 25(p), and 25(u) of the *Private Approach By-Law* be waived, as the access is proposed as far from Preston Street as possible, will maintain proper sightlines, and will not create a traffic hazard.
- The proposed access will be stop-controlled, with free flow on Sidney Street. It is anticipated that the proposed access will operate acceptably during both peak hours.

#### Transportation Demand Management

- The proponent has committed to providing the following TDM measures:
  - Display local area maps with walking/cycling access routes and key destinations at major entrances;
  - Display relevant transit schedules and route maps at entrances;
  - Unbundle parking cost from monthly rent;
  - Provide a multimodal travel option information package to new residents.

#### Neighbourhood Traffic Management

- The proposed development relies on the local roadway Sidney Street for direct vehicular access. No neighbourhood traffic management measures are required, as Sidney Street is a short, dead-end roadway that only provides access to four different lots (7 Sidney Street, 490 Preston Street, 829 Carling Avenue, and 845 Carling Avenue).

#### Transit

- The proposed development is anticipated to generate an additional 58 transit trips during the AM peak hour (including 43 boarding and 15 alighting), and an additional 51 transit trips during the PM peak hour (including 21 boarding and 30 alighting). It is anticipated that the proposed development will not require more frequent service at the Dow's Lake O-Train Station and surrounding bus stops.

#### Intersection MMLOS

- The results of the intersection MMLOS analysis can be summarized as follows:
  - All study area intersections do not meet the target PLOS;
  - All study area intersections do not meet the target BLOS, except for Carling Avenue/Trillium Pathway;
  - All study area intersections with targets meet the target TLOS, except for Carling Avenue/Preston Street and Carling Avenue/Booth Street;
  - All study area intersections do not meet the target TkLOS, except for Carling Avenue/Sherwood Drive and Carling Avenue/Preston Street;
  - All study area intersections meet the target vehicular level of service (Auto LOS), except for Carling Avenue/Preston Street.
- Pedestrian Level of Service
  - All approaches at Carling Avenue/Sherwood Drive, Carling Avenue/Champagne Avenue, Carling Avenue/Preston Street, and Carling Avenue/Booth Street, and the east and west approach at Carling Avenue/Trillium Pathway, do not meet the target PLOS A. The functional design for the Carling Avenue Transit Priority Measures outlines various measures to improve the level of comfort for pedestrians, but the target PLOS A will not be achieved at any approach.

- All approaches of Preston Street/Beech Street do not meet the target PLOS A. There is limited opportunity in improving the PLOS without the removal of auxiliary turn lanes.
- The north, south, and west approaches of Preston Street/Pamilla Street do not meet the target PLOS A. The north and south approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks. Therefore, textured crosswalks similar to the east and west approaches at this intersection could be considered. Curb bulbouts could be considered to reduce crossing distance.
- All approaches of Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway do not meet the target PLOS A. The north, east, and west approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks. This is identified for the City's consideration.
- Bicycle Level of Service
  - The west approach of Carling Avenue/Sherwood Drive, the north and west approaches of Carling Avenue/Champagne Avenue, and all approaches of Carling Avenue/Booth Street do not meet the target BLOS. The functional design for the Carling Avenue Transit Priority Measures identify segregated cycling facilities and protected intersections at these locations, which will allow all left turns for cyclists to take place off-road, and improve these approaches to a BLOS A.
  - All approaches of Carling Avenue/Preston Street does not meet the target BLOS B. The functional design for the Carling Avenue Transit Priority Measures identify segregated cycling facilities and two-stage left-turn bike boxes for eastbound and westbound cyclists, which would improve these approaches to a BLOS A. Two-stage bike boxes could be considered for northbound/southbound cyclists as well, and is identified for the City's consideration.
  - The north, south, and east approaches of Preston Street/Beech Street do not meet the target BLOS B. The *Ontario Traffic Manual – Book 18* identifies that designated bike lanes are appropriate on Beech Street, while a physically separated bikeway is appropriate for Preston Street. This is identified for the City's consideration. Alternatively, a reduction of the speed limit to 40 km/h on both roadways would improve the BLOS to the target.
  - The north and south approaches of Preston Street/Pamilla Street do not meet the target BLOS B. Designated bike lanes or a reduction in the operating speed to 40 km/h on Preston Street could be considered.
  - The north and west approaches of Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway do not meet the target BLOS B. The target BLOS can be achieved for these approaches with the implementation of two-stage left-turn bike boxes. This is identified for the City's consideration.

- Transit Level of Service
  - The north, east, and west approaches at Carling Avenue/Preston Street, and the north and east approaches at Carling Avenue/Booth Street, do not meet the target TLOS C during the AM and PM peak hours. The transit priority measures on Carling Avenue are anticipated to allow the east and west approaches to operate at a TLOS C or better. The north approaches at both intersections are anticipated to continue operating below the target TLOS in future conditions.
- Truck Level of Service
  - The east approach of Carling Avenue/Champagne Avenue does not meet the target TkLOS D. As Champagne Avenue is a local roadway and not a truck route, no modifications are recommended.
  - The east approach of Carling Avenue/Booth Street does not meet the target TkLOS D. Based on the functional design for the Carling Avenue Transit Priority Measures, the receiving lane for this movement will be a wider lane, and may accommodate trucks turning right from the east approach. Therefore, no further modifications are recommended.
  - All approaches of Preston Street/Beech Street and Preston Street/Pamilla Street do not meet the target TkLOS D. While the target TkLOS could be met by increase the curb radii, Beech Street and Pamilla Street are local roadways and not truck routes. Therefore, no modifications are recommended.
  - The south and west approaches of Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway do not meet the target TkLOS D. As these approaches involve heavy vehicles turning right into or out of the Dow's Lake Pavilion, no modifications are recommended.

#### Existing Intersection Operations

- At Carling Avenue/Preston Street, the northbound left turn, southbound through/right turn, and westbound left turn movements do not meet the target Auto LOS E during the PM peak hour.
- At Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway, the southbound left turn/through movement does not meet the target Auto LOS E during the AM and PM peak hours.
- During the AM and PM peak hours, southbound queueing at Carling Avenue/Preston Street extends through the upstream intersection at Preston Street/Sidney Street. While the Synchro analysis does not identify operational concerns at Preston Street/Sidney Street, it is acknowledged that additional traffic volumes generated by future developments may trigger a restriction of the eastbound movements on Sidney Street to right turns only, due to potential safety and congestion issues.

### Background Intersection Operations

- Traffic throughout the study area could be displaced or alleviated through a combination of increased use of non-auto modes of transportation, alternate times of travel for drivers, and alternate routes of travel. It is assumed that the Carling Avenue Transit Priority Measures project will increase the transit modal share and decrease the auto modal share by the buildout year 2028.
- As congestion increases within the study area, some motorists may alter their travel times to occur outside of the peak hours and alter their routes to other roadways within proximity of the study area.
- At Carling Avenue/Preston Street, a reduction of 10 northbound left turning vehicles during the AM peak hour, and 90 northbound left turning vehicles, 30 southbound through/right turning vehicles, 10 eastbound left turning vehicles, 70 eastbound through/right turning vehicles, and 90 westbound left turning vehicles during the PM peak hour would be required to meet the target Auto LOS E in the 2033 background conditions.
- At Carling Avenue/Booth Street, a reduction of 30 westbound through vehicles during the AM peak hour, and 10 westbound through vehicles during the PM peak hour would be required to meet the target Auto LOS E in the 2033 background conditions.
- Restriction of the eastbound left turn at Preston Street/Sidney Street would impact the southbound left turn movement at Carling Avenue/Preston Street and the eastbound left turn movement at Carling Avenue/Booth Street. The Auto LOS for both movements will downgrade to an Auto LOS F during the AM peak hour.

### Total Intersection Operations

- Traffic generated by the proposed development is anticipated to have marginal operational effects for most movements at the study area intersections.
- It is anticipated that northbound left turns and eastbound left/right turns at Preston Street/Sidney Street will rely on courtesy from queued drivers on Preston Street to complete their turns during the peak hours. As there are two northbound lanes approaching Sidney Street, northbound through vehicles can use the curbside lane to bypass a northbound left turning vehicle. This is consistent with the existing intersection operations.
- The proposed development will add:
  - Six to twelve northbound left turning vehicles (equivalent to one vehicle every five to ten minutes during the peak hours);
  - Two to three eastbound left turning vehicles (equivalent to one vehicle every 20 to 30 minutes during the peak hours), and;
  - Nine to thirteen eastbound right turning vehicles (equivalent to one vehicle every four to seven minutes during the peak hours).
- Based on the foregoing, the proposed development can be recommended from a transportation perspective.

## 1.0 SCREENING

### 1.1 Introduction

This Transportation Impact Assessment (TIA) has been prepared for the property located at 829 Carling Avenue, in support of Official Plan Amendment, Zoning By-Law Amendment, and Site Plan Control applications. The subject site is approximately 0.38 acres in size and is currently occupied by a CIBC banking centre. The subject site is currently served by one driveway to Carling Avenue, and one driveway to Sidney Street. Both driveways are approximately 30m west of Preston Street.

The subject site is surrounded by the following:

- Sidney Street and future high-rise residential development to the north,
- Carling Avenue and Dow's Lake Public Parking to the south,
- Preston Street and future high-rise residential development to the east, and
- An existing auto dealership to the west.

The site context is shown in **Figure 1**.

### 1.2 Proposed Development

The subject site is designated as 'Corridor – Mainstreet' (Carling Avenue) on Schedule B2 of the City of Ottawa's Official Plan. The implemented zoning for the property is 'Arterial Mainstreet' (AM1), and the site is within the Preston-Carling District Secondary Plan.

The proposed development consists of a single 40-storey high-rise residential building with 396 dwellings and approximately 3,628 ft<sup>2</sup> (337 m<sup>2</sup>) GFA of ground-floor retail. A total of 196 parking spaces will be provided in seven levels of underground parking. Access to the parking garage will be provided via one two-way access to Sidney Street. The development will be constructed in a single phase, with a buildout year of 2028.

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

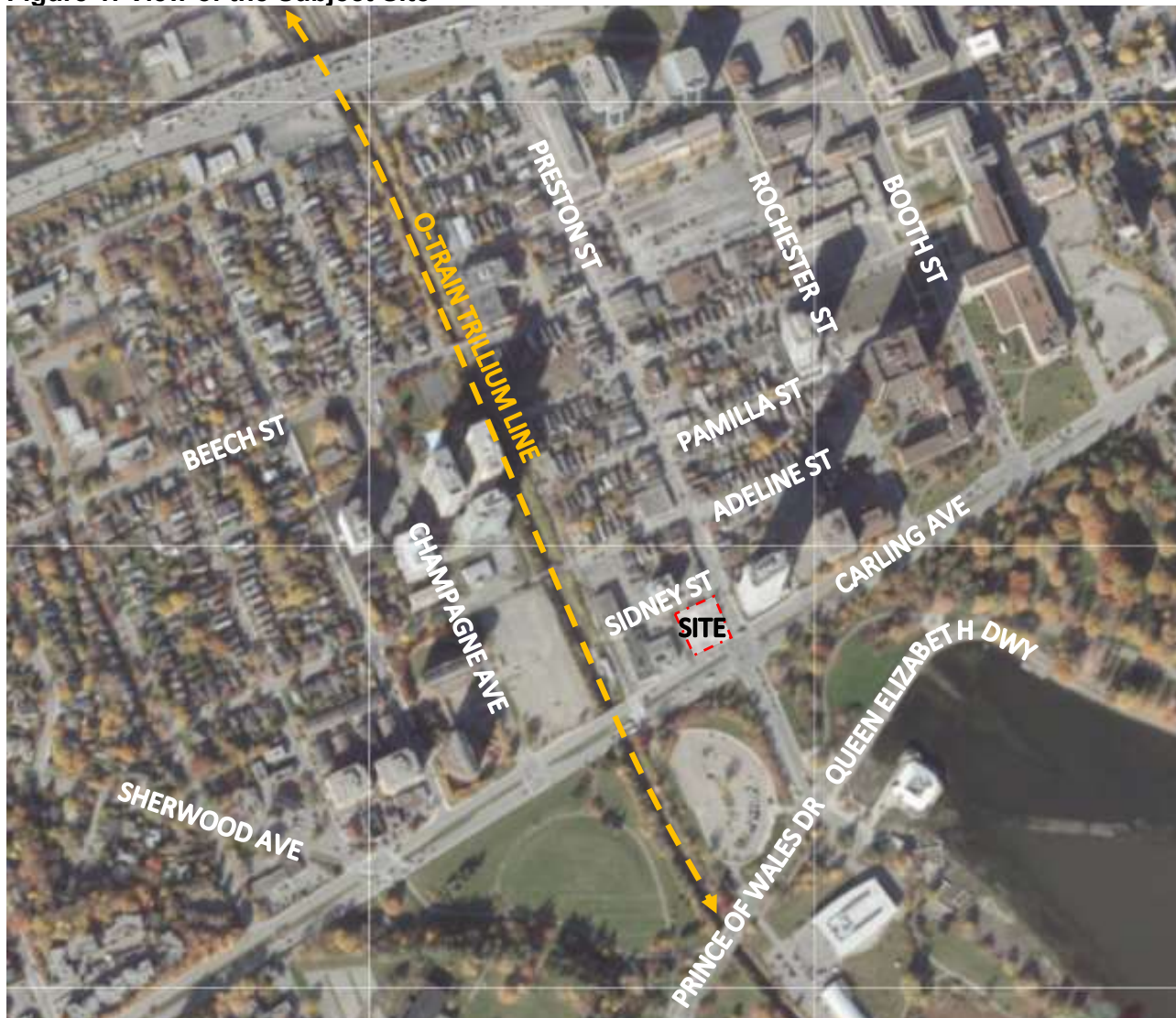
### 1.3 Screening Form

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

- Trip Generation Trigger – The development is expected to generate over 60 person trips during the peak hours; further assessment is **required** based on this trigger.
- Location Triggers – The development is located within a Transit-Oriented Development Zone; further assessment is **required** based on this trigger.
- Safety Triggers – The proposed driveway is located within the area of influence of an adjacent traffic signal; further assessment is **required** based on this trigger.

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

Figure 1: View of the Subject Site



## 2.0 SCOPING

### 2.1 Existing Conditions

#### 2.1.1 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. 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.

Prince of Wales Drive is an arterial roadway that generally runs on a north-south alignment between Preston Street and Fourth Line Road in North Gower. Within the study area, it has a two-lane undivided urban cross section, a concrete sidewalk on the north side of the road and an asphalt sidewalk on the south side, and a posted speed limit of 60km/h. Prince of Wales Drive is classified as a truck route allowing full loads.

Queen Elizabeth Driveway is a federally owned roadway that travels between Preston Street and Laurier Avenue. It has a two-lane undivided urban cross section, a multi-use pathway on the south side of the road, and a posted speed limit of 40km/h except for the approach to Preston Street, which has a speed limit of 60 km/h. Queen Elizabeth Driveway is not classified as a truck route.

Booth Street is a major collector roadway that runs on a north-south alignment between Carling Avenue and north of the Sir John A MacDonald Parkway/Wellington Street West, where it continues as the Chaudiere Crossing interprovincial bridge to Gatineau. Within the study area it has a two-lane undivided urban cross section, sidewalks on both sides, and a regulatory speed limit of 50km/h. Booth Street is classified as a truck route allowing full loads between Carling Avenue and Raymond Street.

Rochester Street runs on a north-south alignment between Carling Avenue and north of Primrose Avenue. It is classified as a major collector roadway between Carling Avenue and Gladstone Avenue, where it continues north as a local roadway. Within the study area it has a two-lane undivided urban cross section, sidewalks on both sides, and a regulatory speed limit of 50km/h. Rochester Street is classified as a truck route allowing full loads between Carling Avenue and Gladstone 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 30 km/h. Sherwood Drive is not classified as a truck route, and street parking is not permitted.

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 30 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.

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, a posted speed limit of 30 km/h west of Preston Street, and an unposted regulatory speed limit of 50 km/h east of Preston Street. Beech Street is not classified as a truck route. Street parking is generally permitted on the north side of Beech Street.

Pamilla Street is a local roadway that runs on an east-west alignment between Rochester Street and west of Preston Street. West of Preston Street it functions as a two-lane two-way roadway with parking permitted on the north side. East of Preston Street it functions as a one-way roadway with parking permitted on the south side. Sidewalks are provided on both sides of the entire length of the roadway. Pamilla Street has an unposted regulatory speed limit of 50km/h and is not classified as a truck route.

Adeline Street is a local roadway that runs on an east-west alignment between Rochester Street and west of Preston Street. It has a two-lane undivided urban cross section, sidewalks on both sides, and parking permitted on the south side. Adeline Street is not classified as a truck route.

Sidney Street is a local roadway that runs on an east-west alignment west of Preston Street. It has a two-lane undivided urban cross section, sidewalks on both sides, and parking permitted on the south side. Sidney Street is not classified as a truck route.

## 2.1.2 Intersections

### Carling Ave/Sherwood Dr

- 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, two through lanes, and one transit-only through lane (not shown in aerial)
- Zebra-striped crosswalks implemented for all approaches in 2018
- 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 Ave/Champagne Ave

- 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, two through lanes, and one transit-only through lane (not shown in aerial)
- Standard crosswalks are provided on all approaches



Carling Ave/Trillium Pathway

- Signalized pedestrian/cyclist crossing
- North/South Approaches: a single, bidirectional multi-use pathway (MUP)
- East Approach: three through lanes
- West Approach: two through lanes and one transit-only through lane (not shown in aerial)
- Zebra-striped crosswalks provided for all approaches
- Crossside provided for cyclists crossing Carling Avenue



Carling Ave/Preston St

- 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, two through lanes, one transit-only through lane, and one right turn lane (not shown in aerial)
- Standard crosswalks are provided on all approaches



Carling Ave/Booth St

- Signalized three-legged intersection
- North Approach: one left turn and one right turn lane
- East Approach: two through lanes, and one shared right turn lane/transit-only through lane
- West Approach: one left turn lane, two through lanes, and one transit-only through lane
- Standard crosswalks are provided on all approaches



Preston St/Beech St

- 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



Preston St/Pamilla St

- Signalized four-legged intersection
- North/South/West Approaches: one shared left turn/through/right turn lane
- East approach is on-way eastbound
- Concrete textured crosswalks are provided on the east and west approaches
- Standard crosswalks are provided on the north and south approaches



Preston St/Adeline St

- Unsignalized four-legged intersection; stop control on east/west approaches
- All Approaches: one shared left turn/through/right turn lane
- East approach is on-way eastbound
- Concrete textured crosswalks are provided on the east and west approaches



Preston St/Sidney St

- Unsignalized three-legged intersection; stop control on west approaches
- All Approaches: one shared lane
- A standard crosswalk is provided on the west approach



Preston St/Prince of Wales Dr/Queen Elizabeth Dwy

- Signalized four-legged intersection
- North Approach: one left turn lane and one shared through/right turn lane
- South Approach: one shared left/through/right turn lane
- East Approach: one left turn lane, one through lane, and one channelized right turn lane
- West Approach: one left turn lane and one shared through/right turn lane
- Standard crosswalks are provided on all legs
- Bike lanes are provided on the west leg
- A MUP is provided on south side of the road on the east leg



### 2.1.3 Driveways

In accordance with the *2017 TIA Guidelines*, a review of adjacent driveways along the boundary roads are provided as follows:

**Sidney Street, North Side:**

- One access to a residential development at 7 Sidney Street
- One future access to a residential development at 500 Preston Street (under construction)
- One access to a car dealership at 845 Carling Avenue

**Sidney Street, South Side:**

- None

**Carling Avenue, North Side:**

- Two accesses to a car dealership at 845 Carling Avenue

**Carling Avenue, South Side:**

- None

**Preston Street, East Side:**

- One access to an auto repair shop at 495 Preston Street
- One access to the Claridge ICON Sales Centre at 485 Preston Street

**Preston Street, West Side:**

- None

### 2.1.4 Pedestrian and Cycling Facilities

Sidewalks are provided on both sides of Carling Avenue, Prince of Wales Drive, Sidney Street, Adeline Street, Pamilla Street, Beech Street, Booth Street, Preston Street, and Sherwood Drive, and on the west side of Champagne Avenue north of Carling Avenue. A multi-use pathway is provided on the east side of the Trillium Rail Corridor, referred to as the Trillium Pathway, and on the south side of Queen Elizabeth Driveway east of Preston Street. A multi-use pathway network is also provided through Commissioners Park east of Preston Street between Carling Avenue and Queen Elizabeth Driveway, and ties into the southeast corner of the Carling Avenue/Preston Street intersection. On-street bike lanes are provided on Prince of Wales Drive.

In the City of Ottawa's primary cycling network, Carling Avenue and Prince of Wales Drive are classified as Spine Routes, Preston Street and Adeline Street west of Preston Street are classified as Local Routes, and Sherwood Drive is classified as both a Local Route and Neighbourhood Bikeway. The Trillium Pathway is classified as a Crosstown Bikeway.

### 2.1.5 Transit

The Dow's Lake O-Train Station is located at a walking distance of approximately 120m from the proposed development. This station is currently under construction as part of the City's Phase 2 Light Rail Transit (LRT) Trillium Line extension and is scheduled to be reopen in 2023. Further details of Phase 2 LRT are provided in Section 2.2.

For the time where the Dow's Lake O-Train Station is closed for the Trillium Line Extension construction, Route 2 trains have been replaced by buses along Preston Street.

OC Transpo bus stops in proximity of the subject site are shown in **Figure 2**, and summarized as follows:

Carling Avenue/Dow's Lake O-Train Station

- Stop #7369 – for routes 55, 56, and 85  
(located on the south side of Carling Avenue, approximately 50m west of the Trillium Pathway)
- Stop #8014 – for routes 55, 56, and 85  
(located on the north side of Carling Avenue, approximately 50m west of the Trillium Pathway)

Carling Avenue/Preston Street

- Stop #2397 – for route 85  
(located on the west side of Preston Street, approximately 10m north of Carling Avenue)
- Stop #6657 – for routes 85 and 2  
(located on the east side of Preston Street, approximately 45m north of Carling Avenue)
- Stop #8023 – for routes 55 and 56  
(located on the south side of Carling Avenue at Preston Street)

Preston Street/Adeline Street

- Stop #6655 – for route 2  
(located on the west side of Preston Street, approximately 10m south of Adeline Street)

Carling Avenue/Norfolk Avenue

- Stop #8013 – for routes 55, 56, and 85  
(located on the north side of Carling Avenue, approximately 15m east of the Norfolk Avenue)

OC Transpo Route 2 travels between Bayview O-Train Station and South Keys O-Train Station. The route operates on 10- to 15- minute headways, seven days a week.

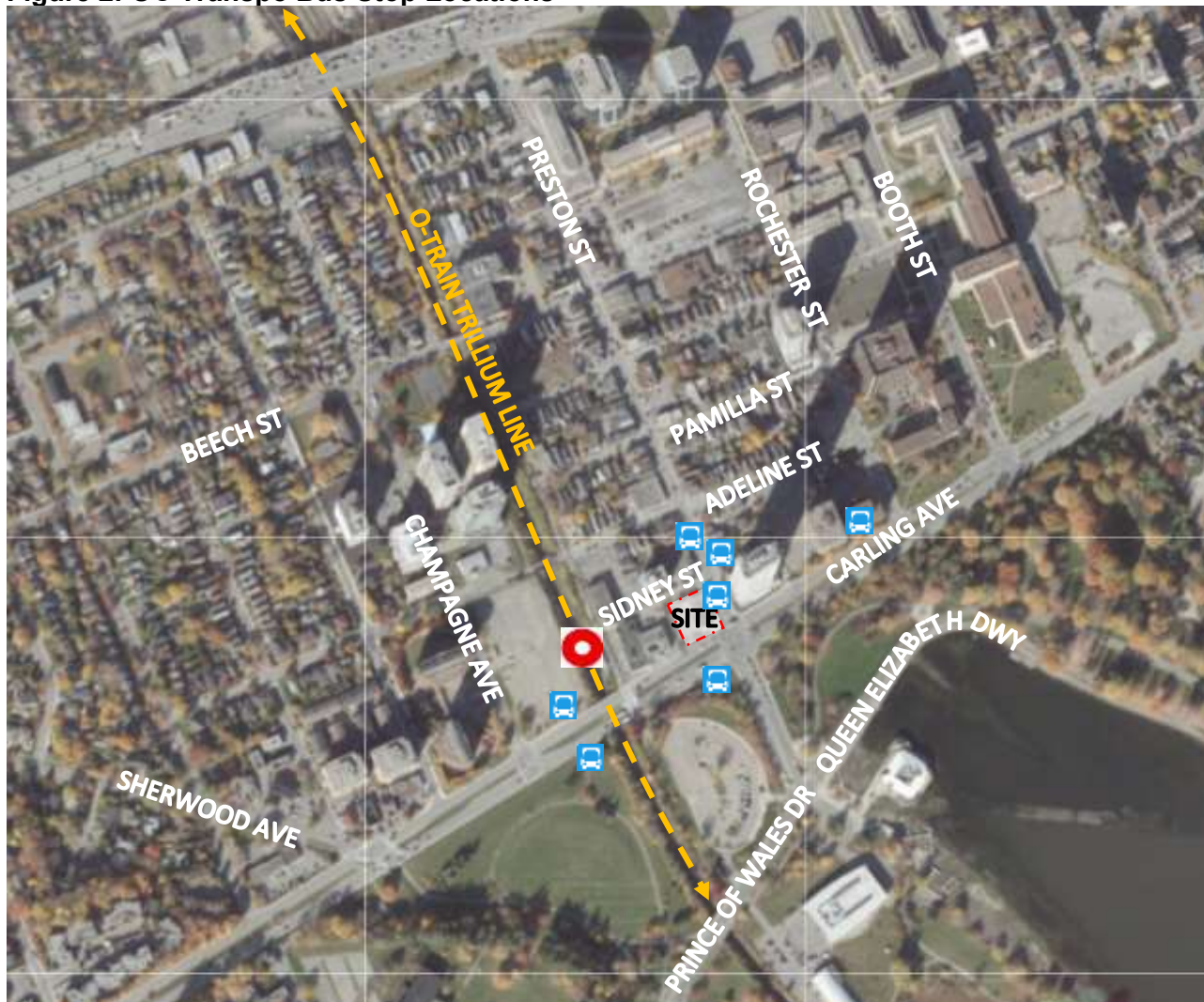
OC Transpo Route 55 travels between Elmvale and Westgate Shopping Centre. The route operates on 15-minute headways on weekdays and 30-minute headways on weekends.

OC Transpo Route 56 travels between Tunney's Pasture Station and Civic Hospital seven days a week, and between Tunney's Pasture Station and King Edward/Union during peak periods on weekdays. The study area is served by this route during weekday peak periods only, on 30-minute headways.

OC Transpo Route 85 travels between Gatineau and Bayshore Station. The route operates every 15- to 30-minutes, seven days a week.

Detailed route information and an excerpt from the OC Transpo System Map are included in **Appendix C**.

Figure 2: OC Transpo Bus Stop Locations



### 2.1.6 Area Traffic Management

There are no completed Area Traffic Management (ATM) studies within the study area. The Sherwood Drive Traffic Calming Study was initiated in Fall 2020 to address speeding, higher traffic volumes, and non-compliance of stop signs. This study is currently in progress.

Traffic calming measures such as curb extensions and flex posts have been implemented at select locations along Sherwood Drive, Beech Street, and Booth Street, and 30 km/h speed limit area signs have been installed on Sherwood Drive, Champagne Avenue, and Beech Street. Additionally, signage indicating that drivers are entering a traffic calmed neighbourhood has been installed on Rochester Street and Booth Street.



### 2.1.7 Existing Traffic Volumes

Weekday traffic counts completed by the City of Ottawa 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
- Carling Avenue/Champagne Avenue February 4, 2016
- Carling Avenue/Trillium Pathway July 13, 2016
- Carling Avenue/Preston Street June 20, 2017
- Carling Avenue/Booth Street September 12, 2019
- Preston Street/Beech Street September 7, 2016
- Preston Street/Pamilla Street September 7, 2016
- Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway January 10, 2018

It is noted that the City of Ottawa does not have traffic counts at the Preston Street/Adeline Street and Preston Street/Sidney Street intersections. Due to COVID-19 restrictions, new traffic counts at these intersections would not be reflective of typical traffic conditions, and therefore have not been conducted.

As part of the 500 Preston Street Community Transportation Study dated June 2011, Delcan conducted a traffic count at the Preston Street/Sidney Street intersection. At the time of the 2011 traffic count, the 845 Carling Avenue site contained a car dealership. As this site is still occupied by a car dealership, vehicular traffic to/from Sidney Street from the 2011 Delcan traffic count is considered representative of traffic along Sidney Street. Northbound and southbound through traffic volumes along Preston Street have been drawn from the Carling Avenue/Preston Street intersection.

As part of the 505 Preston Street Community Transportation Study dated December 2012, IBI Group conducted a traffic count at the Preston Street/Adeline Street intersection. As newer traffic counts were unavailable at the time of writing of this report, the 2012 IBI Group count has been used to reflect traffic to/from Adeline Street. Northbound and southbound through traffic volumes along Preston Street have been drawn from the Carling Avenue/Preston Street intersection.

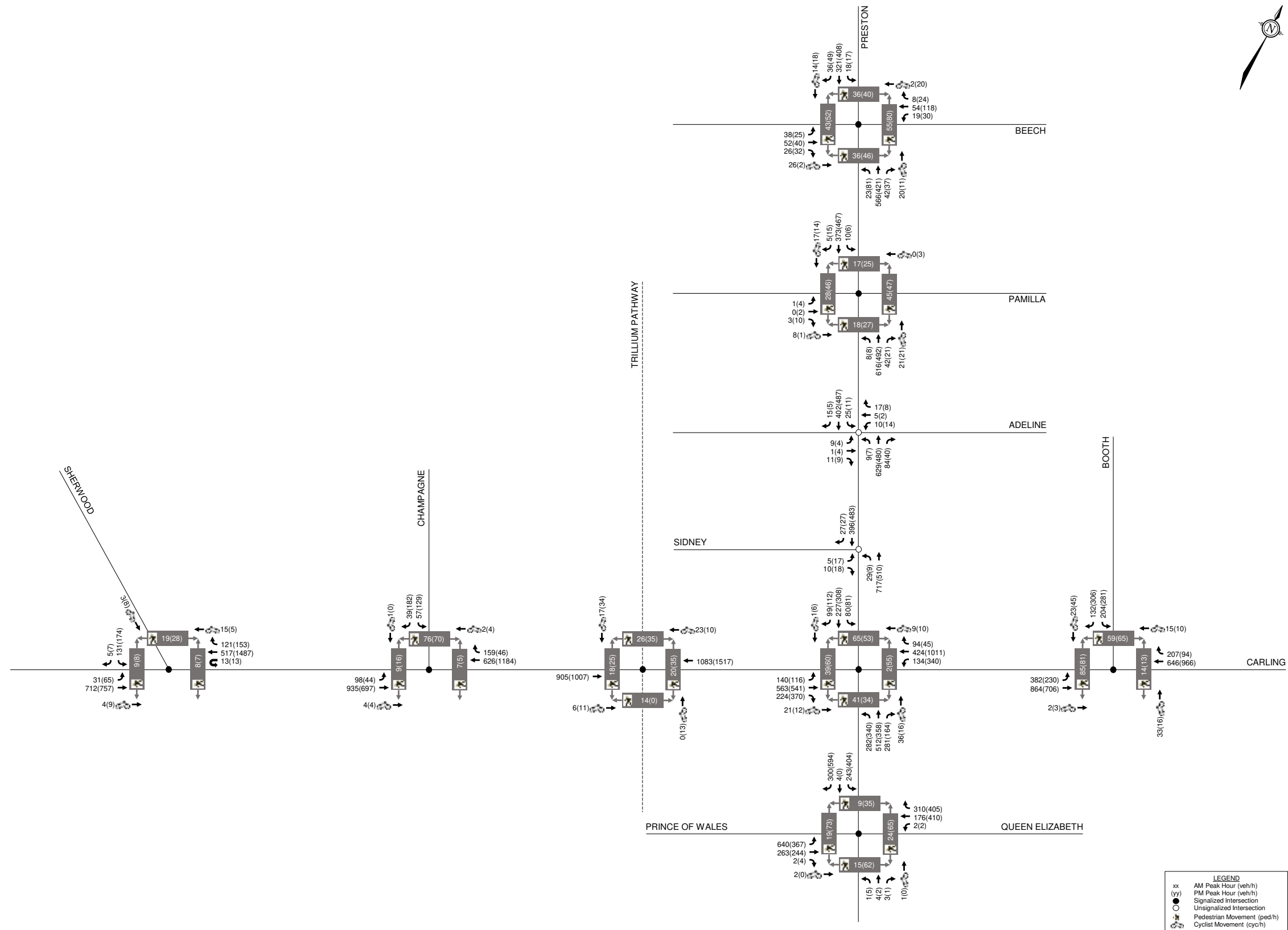
All traffic count data previously discussed are included in **Appendix D**. Traffic volumes within the study area are shown in **Figure 3**.

### 2.1.8 Collision Records

Historical collision data from the last five years was obtained from the City's Public Works and Service Department for the study area 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, 2015 to December 31, 2019 is summarized in **Table 1**.

Figure 3: Existing Network Traffic Volumes



**Table 1: Reported Collisions**

Intersection	Impact Types						Total
	Angle	Sideswipe	Rear End	Turning Movement	Approach	SMV <sup>(1)</sup> /Other	
Carling Avenue/ Sherwood Drive	-	-	5	2	-	1	<b>8</b>
Carling Avenue/ Champagne Avenue	1	4	4	2	-	-	<b>11</b>
Carling Avenue/ Trillium Pathway	-	-	1	-	-	3	<b>4</b>
Carling Avenue/ Preston Street	6	10	24	10	-	6	<b>56</b>
Carling Avenue/ Booth Street	1	2	8	9	-	-	<b>20</b>
Preston Street/ Beech Street	1	2	-	3	-	1	<b>7</b>
Preston Street/ Pamilla Street	1	-	3	1	1	1	<b>7</b>
Preston Street/ Adeline Street	1	-	1	-	-	2	<b>4</b>
Preston Street/ Sidney Street	6	1	1	1	-	-	<b>9</b>
Preston St/Prince of Wales Drive/Queen Elizabeth Dwy	5	4	11	5	-	1	<b>26</b>

1. SMV = Single Motor Vehicle

*Carling Avenue/Sherwood Drive*

A total of eight collisions were reported at this intersection over the last five years, of which there were five rear-end impacts, two turning movement impacts, and one single vehicle/other impact. Three of the collisions resulted in personal injuries, but none caused fatalities. Four of the collisions occurred in poor driving conditions. None of the collisions involved pedestrians or cyclists.

*Carling Avenue/Champagne Avenue*

A total of eleven collisions were reported at this intersection over the last five years, of which there were four rear-end impacts, four sideswipe impacts, two turning movement impacts, and one angle impact. Three of the collisions resulted in personal injuries, but none caused fatalities. Five of the collisions occurred in poor driving conditions. None of the collisions involved pedestrians or cyclists.

*Carling Avenue/Trillium Pathway*

A total of four collisions were reported at this intersection over the last five years, of which there was one rear-end impact and three impacts involving a vehicle and a cyclist. All four collisions resulted in personal injuries, but none caused fatalities. No collisions occurred in poor driving conditions.

*Carling Avenue/Preston Street*

A total of 56 collisions were reported at this intersection over the last five years, of which there were 24 rear-end impacts, ten turning movement impacts, ten sideswipe impacts, six angle impacts, and six single vehicle/other impacts. Nineteen of the 56 collisions resulted in injuries, but none caused fatalities. Twenty-four of the collisions occurred under poor driving conditions. Eight of the collisions involved cyclists and one involved a pedestrian.

Of the 24 rear-end impacts, three occurred at the northbound approach (two left turn incident and one through vehicle incident), three occurred at the southbound approach (all through vehicle incidents), ten occurred at the eastbound approach (nine through vehicle incidents and one left turn incident), and eight occurred at the westbound approach (one left turn incident, six through vehicle incidents, and one right turn incident). Eight of the 24 collision occurred in poor driving conditions.

Of the nine turning movement impacts, six involved southbound left turning vehicles (four of which involved cyclists), two involved northbound right turning vehicles (one of which involved a cyclist), one involved a southbound right turning vehicle and a cyclist, and one involved a westbound left turning vehicle. Six of the collisions resulted in personal injuries, but none caused fatalities. Six of the collisions occurred under poor driving conditions.

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 ten sideswipe impacts, one occurred at the northbound approach, four occurred at the southbound approach, two occurred at the eastbound approach, and three occurred at the westbound approach. All of the collisions resulted in property damage only. Five collisions occurred in poor driving conditions.

#### *Carling Avenue/Booth Street*

A total of 20 collisions were reported at this intersection over the last five years, of which there were nine turning movement impacts, eight rear-end impacts, two sideswipe impacts, and one angle impact. Six of the collisions resulted in personal injuries, but none caused fatalities. Seven of the collisions occurred in poor driving conditions. One of the collisions involved a cyclist and none of the involved pedestrians.

Of the nine turning movement impacts, seven involved eastbound left turning vehicles, one involved a southbound left turning vehicle, and one involved a westbound left turning vehicle making a U-turn. Three of the collisions caused personal injuries and four occurred under poor driving conditions.

Of the eight rear-end impacts, four included westbound vehicles, three included eastbound vehicles, and one included southbound vehicles. Three caused personal injuries and two occurred under in poor driving conditions.

#### *Preston Street/Beech Street*

A total of seven collisions were reported at this intersection over the last five years, of which there were three turning movement impacts, two sideswipe impact, one angle impact, and one single vehicle/other impact. Only one of the collisions resulted in personal injuries. Two of the collisions occurred in poor driving conditions. None of the collisions involved pedestrians or cyclists.

### Preston Street/Pamilla Street

A total of seven collisions were reported at this intersection over the last five years, of which there were three rear-end impacts, one angle impact, one turning movement impact, one approach impact, and one single vehicle/other impact. Only one of the collisions resulted in personal injuries. Two of the collisions occurred in poor driving conditions. One of the collisions involved a pedestrian and none involved cyclists.

### Preston Street/Adeline Street

A total of four collisions were reported at this intersection over the last five years, of which there were two single vehicle/other impacts, one angle impact, and one rear-end impact. All of the collisions caused property damage only. Three of the collisions occurred under poor driving conditions. None of the collisions involved pedestrians or cyclists. None of the collisions involved pedestrians or cyclists.

### Preston Street/Sidney Street

A total of nine collisions were reported at this intersection over the last five years, of which there were six angle impacts, one sideswipe impact, one rear-end impact, and one turning movement impact. All of the collisions caused property damage only. Five of the collisions occurred in poor driving conditions. None of the collisions involved pedestrians or cyclists.

Of the six angle impacts, four involved eastbound left turning vehicles, one involved an eastbound right turning vehicle and one involved an eastbound vehicle performing an unknown maneuver.

### Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway

A total of 26 collisions were reported at this intersection over the last five years, of which there were 11 rear-end impacts, five turning movement impacts, five angle impacts, four sideswipe impacts, and one single vehicle/other impact. Six of the collisions resulted in personal injuries, but none caused fatalities. Ten of the collisions occurred in poor driving conditions. Four of the collisions involved a cyclists and none of the involved pedestrians.

Of the 11 rear-end impacts, five included southbound vehicles, three involved eastbound vehicles, and three involved westbound vehicles. One caused personal injuries and four occurred under in poor driving conditions.

## **2.2 Planned Conditions**

### **2.2.1 Planned Roadway and Transit Projects**

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 Dow's Lake O-Train Station, exclusive bus lanes will be made available via reallocation of existing traffic lanes. Between Dow's Lake 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**.

Construction for Phase 2 of the LRT began in 2019. Phase 2 of LRT will extend the Confederation Line east and west and will extend the Trillium Line south. The Trillium Line extension will continue the Trillium Line from Greenboro Station to Limebank Road in Riverside South, along with a link to the Ottawa Macdonald-Cartier International Airport. Revenue service for this extension is planned for 2023. A map of the planned Phase 2 LRT extensions are shown in **Figure 5**.

## 2.2.2 Other Area Developments

In proximity of the proposed development, there are multiple other residential and mixed-use developments are under construction, approved, or in the approval process. Other developments in the area include:

A residential expansion containing 197 residential units is proposed for 17 Aberdeen Street. A Transportation Overview dated August 2016 was prepared in support of this development.

A mixed-use development containing 1,000 residential units and 142,200 ft<sup>2</sup> of commercial space is proposed at 552 Booth Street. A TIA dated December 2018 was prepared in support of a Zoning By-law Amendment and Official Plan Amendment application for this development.

A residential development containing 207 apartment dwellings and 71 student housing dwellings is proposed at 770-774 Bronson Avenue. A TIA dated December 2022 was prepared in support of a Site Plan Control application for this development.

A mixed-use building containing 40 residential units and 1,000 ft<sup>2</sup> of Office space is proposed at 289 Carling Avenue. A TIA dated August 2019 was prepared in support of this development.

A mixed-use development containing 1,123 units and 16,255 ft<sup>2</sup> of commercial space is proposed at 845 Carling Avenue. A Community Transportation Study/Transportation Impact Study was prepared in support of a Zoning By-law Amendment application for this development in April 2013.

A residential development containing 236 units is proposed at 90 Champagne Avenue. A TIA dated November 2019 was prepared in support of this development.

Two high-rise residential towers containing a combined 540 units are currently under construction at 101 and 105 Champagne Avenue. A Transportation Overview dated November 2011 and Parking Requirements Study dated November 2015 were prepared in support of this development.

A residential development containing 117 units is proposed for 93-105 Norman Street. A Transportation Brief Addendum 1 dated October 2013 was prepared in support of this application.

A mixed-use development containing 280 residential units and 10,441 ft<sup>2</sup> of commercial space is currently under construction at 500 Preston Street. A Community Transportation Study dated June 2011, Addendum dated July 2013, and Addendum 2 dated October 2013 in support of this application.

Figure 4: Carling Avenue Transit Priority Measures – Functional Design

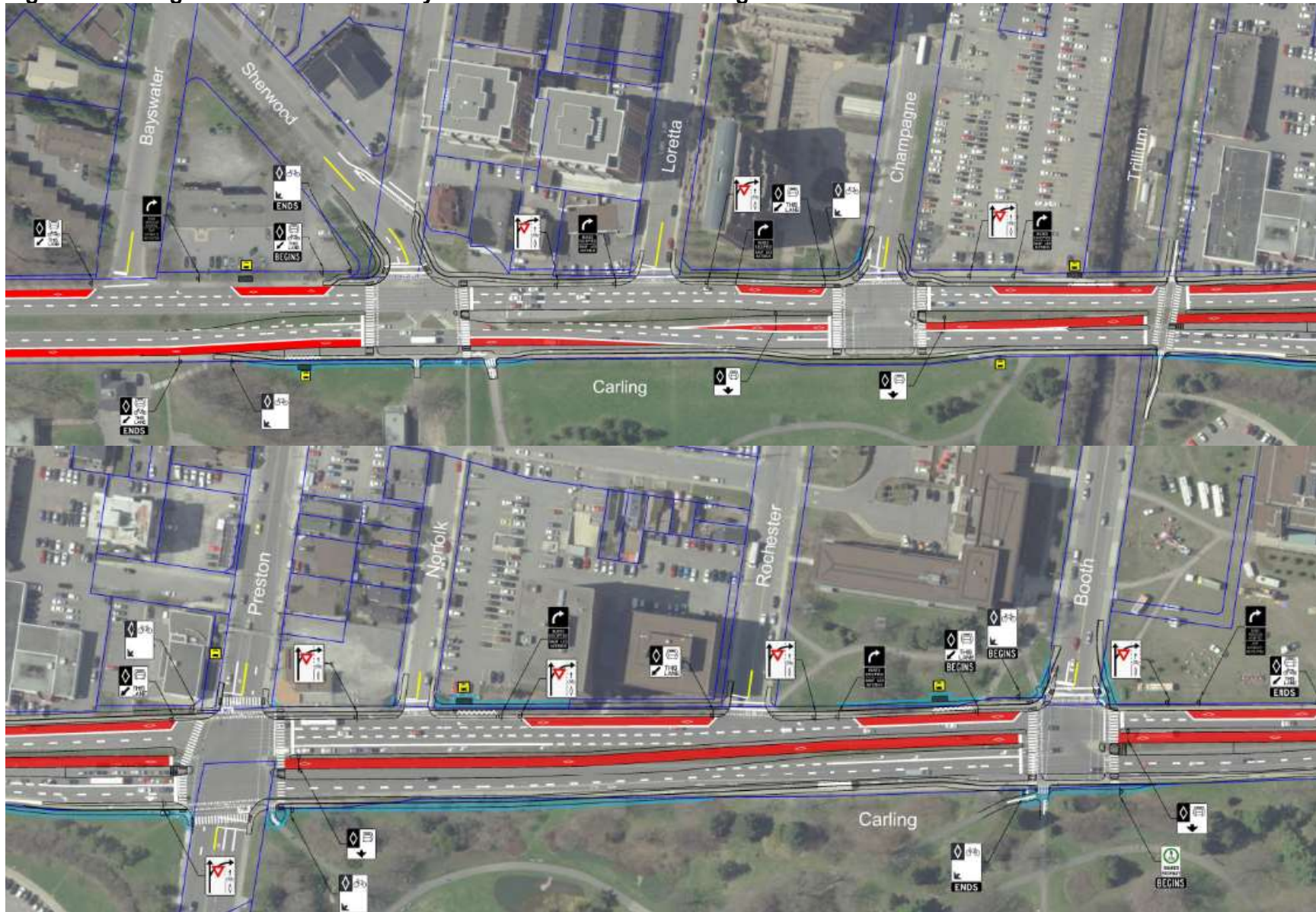
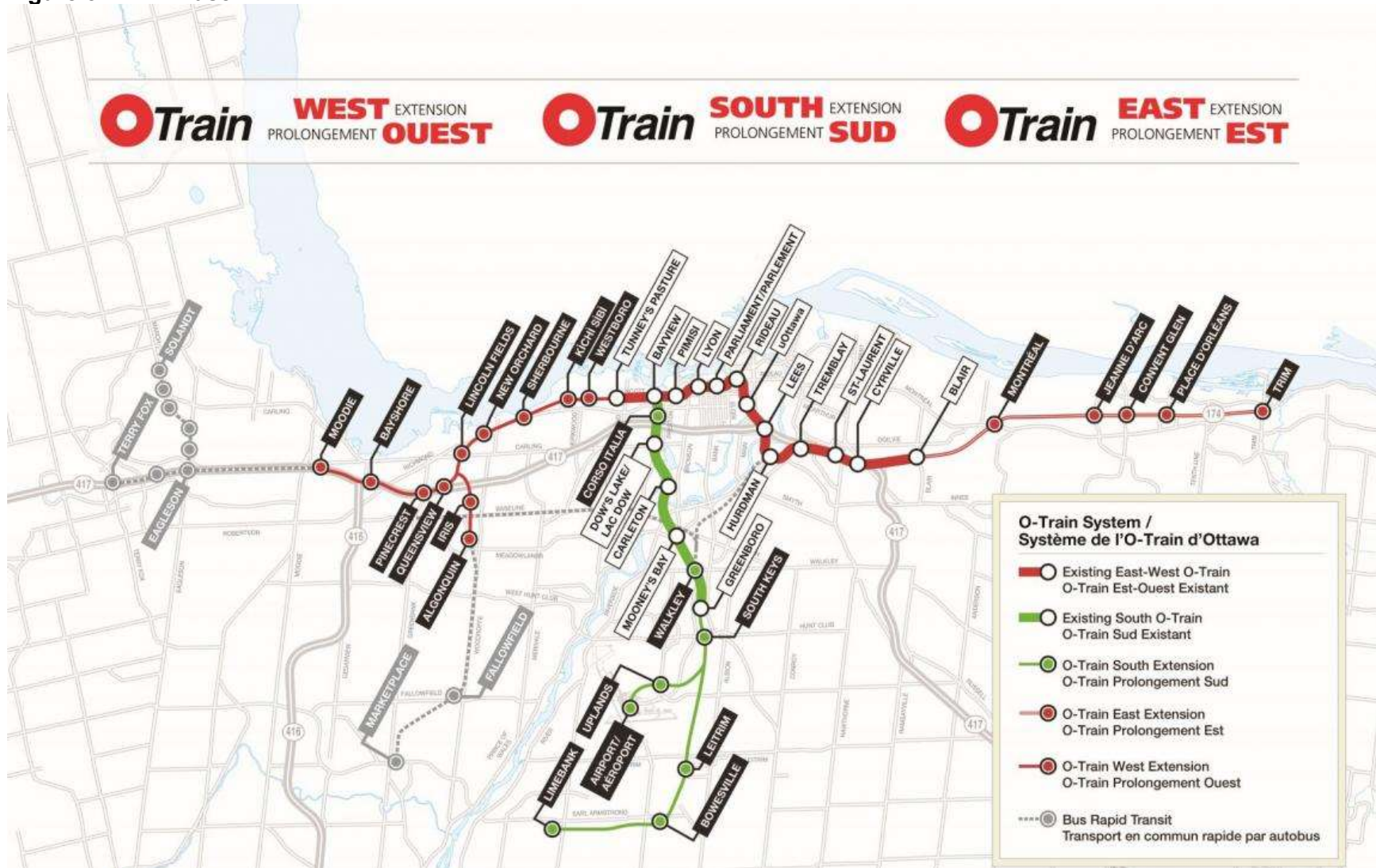


Figure 5: LRT Phase 2





A mixed-use development containing 252 residential units, 4,786 ft<sup>2</sup> of retail space, and 16,047 ft<sup>2</sup> of office space is currently under construction at 505 Preston Street. A Community Transportation Study dated December 2012 and Transportation Overview dated May 2013 were prepared in support of this development.

A mixed-use development containing 540 residential units and 59,182 ft<sup>2</sup> of commercial space is proposed at 450 Rochester Street. A TIA dated October 2019 was prepared in support of this report.

The New Civic Development of the Ottawa Civic Hospital is planned at 930 Carling Avenue (north and west of Prince of Wales Drive, south of Carling Avenue, and east of Birch Drive). Opening day of the development is estimated to occur in 2028, and will include approximately 5,000 full-time staff and 641 patient beds, with a gross floor area of approximately 2,686,000 ft<sup>2</sup>. Ultimate buildout of the New Civic Development is estimated to occur in 2048 (i.e. beyond the timeframe of this study), consisting of three towers with office, commercial, and residential uses. The ultimate development will also include an expansion of the hospital, such that the entire hospital consists of approximately 9,956 full-time staff, 1,136 patient beds, and a gross floor area of approximately 4,940,000 ft<sup>2</sup>. TIA reports were prepared by Parsons in July 2021, December 2021, and November 2022, in support of this development.

### 2.3 Study Area and Time Periods

The study area for this report includes the boundary roadways Carling Avenue, Preston Street, and Sidney Street, as well as the following intersections:

- Carling Avenue/Sherwood Drive
- Carling Avenue/Champagne Avenue
- Carling Avenue/Trillium Pathway
- Carling Avenue/Preston Street
- Carling Avenue/Booth Street
- Preston Street/Beech Street
- Preston Street/Pamilla Street
- Preston Street/Adeline Street
- Preston Street/Sidney Street
- Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway

The selected time periods for the analysis are the weekday AM and PM peak hours, as they represent the 'worst case' combination of site generated traffic and adjacent street traffic. Analysis will be completed for the 2028 build-out year and 2033 horizon year.

### 2.4 Exemptions Review

This module reviews possible exemptions from the final Transportation Impact Assessment, as outlined in the *2017 TIA Guidelines*. The applicable exemptions for this site are shown in **Table 2**.

**Table 2: TIA Exemptions**

Module	Element	Exemption Criteria	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	Not 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

### 3.0 FORECASTING

#### 3.1 Development-Generated Travel Demand

##### 3.1.1 Trip Generation

The subject site is currently occupied with a CIBC banking centre (approximately 4,300 ft<sup>2</sup> GFA in size). The proposed development will replace the existing banking centre with a total of 396 high-rise dwellings and approximately 3,628 ft<sup>2</sup> GFA of ground-floor retail. The methodology and results of estimating the trip generation for each land use are discussed in the subsequent sections.

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

##### Commercial Mode Shares

- Auto Driver: 39% AM, 22% PM
- Auto Passenger: 2% AM, 4% PM
- Transit: 16% AM, 12% PM
- Cyclist: 3% AM, 4% PM
- Pedestrian: 40% AM, 58% PM

##### Residential Mode Shares

- Auto Driver: 26% AM, 25% PM
- Auto Passenger: 6% AM, 8% PM
- Transit: 28% AM, 21% PM
- Cyclist: 5% AM, 6% PM
- Pedestrian: 34% AM, 39% PM

As the site is located within 600m of the Dow's Lake O-Train Station, the proposed development is considered a Transit-Oriented Development (TOD). In TOD zones, the transit share is assumed to increase significantly compared to any TRANS O-D district. The City has outlined sustainable mode share targets for transit-oriented developments, which can be summarized as follows:

- Auto Driver: 15% during peak periods;
- Auto Passenger: 5% during peak periods;
- Transit: 65% during peak periods;
- Non-Auto (Active): 15% during peak periods.

Given the subject site's proximity to amenities and destinations such as Preston Street and Carleton University, the assumed mode shares for the existing and proposed land uses reflect a higher non-auto mode share and a lower transit share than the TOD mode share targets described above. It is also assumed that the non-auto mode share for the existing bank and proposed retail uses is higher than the non-auto mode share for the proposed high-rise dwellings.

The mode shares carried forward in the trip generation estimates for each land use are included in **Table 3**.

**Table 3: Mode Shares for Commercial and Residential Uses**

Mode	Existing Bank		Proposed Retail		Proposed Residential	
	AM	PM	AM	PM	AM	PM
Auto Driver	15%	15%	15%	15%	15%	15%
Auto Passenger	5%	5%	5%	5%	5%	5%
Transit	35%	15%	35%	15%	40%	35%
Cyclist	5%	5%	5%	5%	5%	5%
Pedestrian	40%	60%	40%	60%	35%	40%

**3.1.1.1 Existing Bank Trip Generation**

Trips generated by the existing bank have been estimated using the Drive-in Bank land use rates included in the *ITE Trip Generation Manual, 11<sup>th</sup> Edition*. The estimated number of person trips generated by the existing development are shown in **Table 4**.

**Table 4: Existing Development – Trip Generation**

Land Use	ITE Code	GFA	AM Peak Hour (pph <sup>(1)</sup> )			PM Peak Hour (pph)		
			IN	OUT	TOT	IN	OUT	TOT
Drive-in Bank	912	4,300 ft <sup>2</sup>	30	22	52	56	56	112

1. pph: Person Trips per Hour – Calculated using an ITE Trip to Person Trip factor of 1.28, consistent with the *2017 TIA Guidelines*

Based on the previous table, the existing banking centre is estimated to generate 52 person trips during the AM peak hour and 112 person trips during the PM peak hour. A breakdown of these trips by modal share is shown in **Table 5**.

**Table 5: Existing Development – Trips by Mode Share**

Travel Mode	Mode Share		AM Peak Hour			PM Peak Hour		
	AM	PM	IN	OUT	TOT	IN	OUT	TOT
<b>Peak Hour Person Trips</b>			<b>30</b>	<b>22</b>	<b>52</b>	<b>56</b>	<b>56</b>	<b>112</b>
Auto Driver	15%	15%	5	3	8	8	8	16
Auto Passenger	5%	5%	1	1	2	3	3	6
Transit	35%	15%	11	8	19	8	8	16
Cyclist	5%	5%	1	1	2	3	3	6
Pedestrian	40%	60%	12	9	21	34	34	68

From the previous table, the existing banking centre is estimated to generate eight vehicle trips during the AM peak hour and 16 vehicle trips during the PM peak hour.

This land use is anticipated to generate two types of external peak hour trips: primary and pass-by trips. Primary trips are made for the specific purpose of visiting the site, while pass-by trips are made as intermediate stops on the way to another destination. Peak hour pass-by trips for the existing development are estimated to be approximately 35%, based on the average rate identified in the *ITE Trip Generation Handbook* for the Drive-in Bank land use. The primary and pass-by trips generated by the existing banking centre are summarized in **Table 6**.

**Table 6: Existing Development – Primary and Pass-by Trips**

Trip Type	AM Peak Hour (vph <sup>(1)</sup> )			PM Peak Hour (vph)		
	IN	OUT	TOT	IN	OUT	TOT
Existing Development Vehicle Trips	5	3	8	8	8	16
Pass-by	1	1	2	3	3	6
<b>Primary</b>	<b>4</b>	<b>2</b>	<b>6</b>	<b>5</b>	<b>5</b>	<b>10</b>

1. vph: Vehicle Trips per Hour

**3.1.1.2 Proposed Retail Trip Generation**

Since the retail uses are not known at this time, the trips generated by the proposed retail uses have been estimated using the Strip Retail Plaza land use rates included in the *ITE Trip Generation Manual, 11<sup>th</sup> Edition*. The estimated number of person trips generated by the proposed ground-floor retail are shown in **Table 7**.

**Table 7: Proposed Retail – Trip Generation**

Land Use	ITE Code	GFA	AM Peak Hour (pph)			PM Peak Hour (pph)		
			IN	OUT	TOT	IN	OUT	TOT
Strip Retail Plaza	822	3,628 ft <sup>2</sup>	11	8	19	25	25	50

Based on the previous table, the proposed retail is estimated to generate 19 person trips during the AM peak hour and 50 person trips during the PM peak hour. A breakdown of these trips by modal share is shown in **Table 8**.

**Table 8: Proposed Retail – Trips by Mode Share**

Travel Mode	Mode Share		AM Peak Hour			PM Peak Hour		
	AM	PM	IN	OUT	TOT	IN	OUT	TOT
<b>Peak Hour Person Trips</b>			<b>11</b>	<b>8</b>	<b>19</b>	<b>25</b>	<b>25</b>	<b>50</b>
Auto Driver	15%	15%	1	1	2	4	4	8
Auto Passenger	5%	5%	1	-	1	1	1	2
Transit	35%	15%	4	3	7	4	4	8
Cyclist	5%	5%	-	1	1	1	1	2
Pedestrian	40%	60%	5	3	8	15	15	30

From the previous table, the proposed retail is estimated to generate two vehicle trips during the AM peak hour and eight vehicle trips during the PM peak hour.

Given the low projected vehicular volumes generated by the proposed retail, it is not assumed to generate any pass-by trips. This is further justified since the site will only be accessed via Sidney Street, whereas the existing banking centre includes an access to Carling Avenue as well as an access to Sidney Street.

**3.1.1.3 Proposed Residential Trip Generation**

The trips generated by the 396 proposed dwellings have been estimated using the *TRANS Trip Generation Manual*, which present peak hour trip generation rates for different types of housing for the AM and PM peak periods. For the High-Rise Multifamily Housing land use, the process of converting the trip generation estimates from peak period to peak hour is shown in the following tables.

The estimated number of person trips generated by the proposed dwellings for the AM and PM peak periods are shown in **Table 9**. A breakdown of these trips by modal share is shown in **Table 10**.

**Table 9: Proposed Residential – Peak Period Trip Generation**

Land Use	TRANS Rate	Units	AM Peak Period (ppp <sup>(1)</sup> )			PM Peak Period (ppp)		
			IN	OUT	TOT	IN	OUT	TOT
High-Rise Multifamily Housing	AM: 0.80 PM: 0.90	396	98	219	317	206	150	356

1. ppp: Person Trips per Peak Period

**Table 10: Proposed Residential – Peak Period Trips by Mode Share**

Travel Mode	Mode Share		AM Peak Period			PM Peak Period		
	AM	PM	IN	OUT	TOT	IN	OUT	TOT
<b>Peak Period Person Trips</b>			<b>98</b>	<b>219</b>	<b>317</b>	<b>206</b>	<b>150</b>	<b>356</b>
Auto Driver	15%	15%	15	33	48	31	22	53
Auto Passenger	5%	5%	5	11	16	10	8	18
Transit	40%	35%	39	88	127	73	52	125
Cyclist	5%	5%	5	11	16	10	8	18
Pedestrian	35%	40%	34	76	110	82	60	142

Table 4 of the *TRANS Trip Generation Manual* includes adjustment factors to convert the estimated number of trips generated for each mode from peak period to peak hour. A breakdown of the peak hour trips by mode is shown in **Table 11**.

**Table 11: Proposed Residential – Peak Hour Trips by Mode Share**

Travel Mode	Adj. Factor <sup>(1)</sup>		AM Peak Hour			PM Peak Hour		
	AM	PM	IN	OUT	TOT	IN	OUT	TOT
Auto Driver	0.48	0.44	7	16	23	14	10	24
Auto Passenger	0.48	0.44	2	5	7	5	3	8
Transit	0.55	0.47	22	48	70	34	25	59
Cyclist	0.58	0.48	3	6	9	5	4	9
Pedestrian	0.58	0.52	20	44	64	43	31	74
<b>Peak Hour Person Trips</b>			<b>54</b>	<b>119</b>	<b>173</b>	<b>101</b>	<b>73</b>	<b>174</b>

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

From the previous table, the proposed high-rise dwellings are estimated to generate 173 person trips (including 23 vehicle trips) during the AM peak hour and 174 person trips (including 24 vehicle trips) during the PM peak hour.

### 3.1.1.4 Summary of Trip Generation Estimates

A summary of the peak hour person trips generated by the existing banking centre, proposed retail, and proposed residential are included in **Table 12**.

**Table 12: Trip Generation Summary**

Travel Mode	AM Peak Hour			PM Peak Hour		
	IN	OUT	TOT	IN	OUT	TOT
<b>Existing Development</b>						
<b>Banking Centre Trips</b>	<b>30</b>	<b>22</b>	<b>52</b>	<b>56</b>	<b>56</b>	<b>112</b>
Auto Driver	5	3	8	8	8	16
Auto Passenger	1	1	2	3	3	6
Transit	11	8	19	8	8	16
Cyclist	1	1	2	3	3	6
Pedestrian	12	9	21	34	34	68
<b>Proposed Redevelopment</b>						
<b>Retail Trips</b>	<b>11</b>	<b>8</b>	<b>19</b>	<b>25</b>	<b>25</b>	<b>50</b>
Auto Driver	1	1	2	4	4	8
Auto Passenger	1	-	1	1	1	2
Transit	4	3	7	4	4	8
Cyclist	-	1	1	1	1	2
Pedestrian	5	3	8	15	15	30
<b>Residential Trips</b>	<b>54</b>	<b>119</b>	<b>173</b>	<b>101</b>	<b>73</b>	<b>174</b>
Auto Driver	7	16	23	14	10	24
Auto Passenger	2	5	7	5	3	8
Transit	22	48	70	34	25	59
Cyclist	3	6	9	5	4	9
Pedestrian	20	44	64	43	31	74
<b>Net Additional Trips</b>	<b>35</b>	<b>107</b>	<b>140</b>	<b>70</b>	<b>42</b>	<b>112</b>
Auto Driver	3	14	17	10	6	16
Auto Passenger	2	4	6	3	1	4
Transit	15	43	58	30	21	51
Cyclist	2	6	8	3	2	5
Pedestrian	13	38	51	24	12	36

From the previous table, the proposed development is estimated to generate a net additional 140 person trips (including 17 vehicle trips) during the AM peak hour and 112 person trips (including 16 vehicle trips) during the PM peak hour.

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

### 3.1.2 Trip Distribution

The assumed distribution of trips generated by the existing and proposed developments have been derived from existing traffic patterns within the study area and logical trip routing. Site-generated retail trips are anticipated to follow the two-way traffic patterns of the PM peak hour, and site-generated residential trips are anticipated to follow the traffic patterns associated with the typical commute (i.e. departing the study area during the AM peak and arriving during the PM peak). The distribution of site-generated trips can be described as follows.

Existing Bank and Proposed Retail Distribution

- 5% to/from the north via Champagne Avenue;
- 15% to/from the north via Preston Street;
- 5% to/from the north via Booth Street;
- 20% to/from the east via Carling Avenue;
- 10% to/from the east via Queen Elizabeth Driveway;
- 5% to/from the west via Sherwood Drive;
- 25% to/from the west via Carling Avenue;
- 15% to/from the west via Prince of Wales Drive.

Proposed Residential Distribution

- 10% to/from the north via Preston Street;
- 10% to/from the north via Booth Street;
- 20% to/from the east via Carling Avenue;
- 10% to/from the east via Beech Street;
- 15% to/from the east via Queen Elizabeth Driveway;
- 5% to/from the west via Sherwood Drive;
- 15% to/from the west via Carling Avenue;
- 15% to/from the west via Prince of Wales Drive.

**3.1.3 Trip Assignment**

Trips generated by the existing banking centre have been assigned to the Carling Avenue and Sidney Street accesses. Based on the origin/destination, some trips are anticipated to arrive at one access but exit at the other. This reflects the existing condition that the Carling Avenue access is restricted to right-in/right-out (RIRO) only, whereas the Preston Street/Sidney Street intersection allows all movements. The trip assignment for the existing banking centre trips can be summarized as follows.

Carling Avenue Access

- 100% of pass-by trips;
- 100% of inbound trips from the north via Booth Street, the east via Carling Avenue and Queen Elizabeth Driveway, and the west via Prince of Wales Drive;
- 100% of outbound trips to the north via Champagne Avenue, and the west via Sherwood Drive and Carling Avenue.

Sidney Street Access

- 100% of inbound trips from the north via Preston Street and Champagne Avenue, and the west via Sherwood Drive and Carling Avenue;
- 100% of outbound trips to the north via Preston Street and Booth Street, the east via Carling Avenue and Queen Elizabeth Driveway, and the west via Prince of Wales Drive.

All trips generated by the proposed development will enter and exit the site via the proposed two-way access to Sidney Street.



## 3.2 Background Traffic

### 3.2.1 Other Area Developments

A review of other area development traffic has been conducted, per the developments listed in Section 2.2.2. Traffic generated by the following other area developments that under construction, approved, or are in the approval process have been considered for this report. Relevant excerpts of the traffic studies associated with the developments below are included in **Appendix F**.

#### 17 Aberdeen Street

A residential expansion including 197 dwellings is proposed at 17 Aberdeen Street. A Transportation Overview was prepared by IBI Group in August 2016, in support of a Site Plan Control application for this development. The study identified that the expansion would generate an increase of 40 vph during the AM peak hour and 50 vph during the PM peak hour. No trip distribution or site-generated traffic figures were developed as part of the Transportation Overview. Traffic generated by this development have been added to the 2028 and 2033 background volumes, based on the trip distribution assumptions described in Section 3.1.2.

#### 552 Booth Street

A mixed-use development including 1,000 dwellings and 142,200 ft<sup>2</sup> GFA of retail/office space is proposed at 552 Booth Street. A TIA was prepared by Parsons in December 2018, in support of Official Plan and Zoning By-Law Amendment applications for the development. The TIA presented trip generation projections for the 2025 buildout year using existing mode shares and the 2030 horizon year using target mode shares to reflect the City's initiative to increase transit ridership. In this scenario, the development is projected to generate approximately 175 vph during the peak hours. For the purposes of this TIA, the trip generation projections associated with the target mode shares have been added to the 2028 and 2033 background volumes.

#### 770-774 Bronson Avenue

A residential development including 207 apartment dwellings and 71 student housing dwellings is proposed at 770-774 Bronson Avenue. A TIA was prepared by CGH Transportation in December 2022, in support of the development. The TIA identified that the development would have negligible impact on the road network, and has not been added to the 2028 or 2033 background volumes.

#### 289 Carling Avenue

A mixed-use development including 40 dwellings and 1,000 ft<sup>2</sup> GFA of ground-floor office space is proposed at 289 Carling Avenue. A TIA was prepared by CGH Transportation in August 2019, in support of the development. The TIA identified that the development would have negligible impact on the road network, and has not been added to the 2028 or 2033 background volumes.

#### 845 Carling Avenue

A mixed-use development including 1,123 dwellings and 16,000 ft<sup>2</sup> GFA of ground-floor retail is proposed at 845 Carling Avenue. A Community Transportation Study/Transportation Impact Study (CTS/TIS) was prepared by Delcan in April 2013, in support of a Zoning By-Law Amendment application for the development. The CTS/TIS identified that the development would generate a net increase of approximately 150 vph during the AM peak hour and 175 vph during the PM peak hour. The study identified that construction of the development would be phased over a 15 to 20 year period, and the project has not advanced to the Site Plan Control stage. For the purposes of this TIA, 50% of traffic generated by this development has been added to the 2028 background volumes and 100% of traffic generated by this development has been added to the 2033 background volumes.

*90 Champagne Avenue*

A residential development including 236 dwellings is proposed at 90 Champagne Avenue. A TIA was prepared by Novatech in November 2019, in support of Zoning By-Law Amendment and Site Plan Control applications for the development. The TIA identified that the development would generate an increase of approximately 25 vph during the AM and PM peak hours. Traffic generated by this development has been added to the 2028 and 2033 background volumes.

*101-105 Champagne Avenue*

A residential development including 540 dwellings is currently under construction at 101 and 105 Champagne Avenue. A Transportation Overview and Parking Requirements Study were prepared by Delcan/Parsons in November 2011 and November 2015, respectively, in support of Official Plan Amendment, Zoning By-Law Amendment, and Site Plan Control applications for the development. The studies identified that the development would generate a net increase of approximately 55 vph during the peak hours. Traffic generated by this development has been added to the 2028 and 2033 background volumes.

*93-105 Norman Street*

A residential development including 117 dwellings is proposed at 93-105 Norman Street. A Transportation Brief and Addendum were prepared by Delcan in October 2013, in support of a Site Plan Control application for the development. The study identified that the development would generate a net increase of approximately 70 to 80 person trips during the peak hours, equating to approximately 15 vph assuming a 20% driver share. Traffic generated by this development have been added to the 2028 and 2033 background volumes, based on the trip distribution assumptions described in Section 3.1.2.

*500 Preston Street*

A mixed-use development including 280 dwellings and 10,000 ft<sup>2</sup> GFA of ground-floor retail is currently under construction at 500 Preston Street. A CTS dated June 2011, and subsequent addenda dated December 2012 and October 2013, were prepared by Delcan in support of a Site Plan Control for the development. The reports identified that the development would generate a net increase of approximately 95 vph during the AM peak hour and 110 vph during the PM peak hour. Traffic generated by this development has been added to the 2028 and 2033 background volumes.

*505 Preston Street*

A mixed-use development including 252 dwellings and 20,800 ft<sup>2</sup> GFA of office/retail uses is currently under construction at 505 Preston Street. A CTS dated December 2012, and Transportation Overview dated May 2013, were prepared by IBI Group in support of Zoning By-Law Amendment and Site Plan Control applications for the development. The studies identified that the development would generate a net increase of approximately 50 vph during the AM peak hour and 60 vph during the PM peak hour. Traffic generated by this development has been added to the 2028 and 2033 background volumes.

*450 Rochester Street*

A mixed-use development including 540 dwellings and 59,182 ft<sup>2</sup> GFA of commercial space is proposed at 450 Rochester Street. A TIA was prepared in October 2019 by Parsons, in support of Zoning By-Law Amendment and Site Plan Control applications for the development. The TIA identified that the development would generate a net increase of approximately 260 vph during the peak hours. Traffic generated by this development has been added to the 2028 and 2033 background volumes.

New Civic Development

The New Civic Development of the Ottawa Civic Hospital is planned at 930 Carling Avenue. Phase 1 of the development is anticipated to include approximately 641 beds, 5,000 full-time staff, and 2,686,000 ft<sup>2</sup> GFA of floor area. Buildout of Phase 1 is anticipated to occur in 2028. Ultimate buildout of the New Civic Development is anticipated to occur in 2048, beyond the timeframe of this study, and therefore only Phase 1 has been considered. TIA reports prepared by Parsons in July 2021, December 2021, and November 2022 have identified the trip generation estimates and necessary road modifications required to support this development. These estimates and road modifications have been considered for the 2028 and 2033 background volumes.

A summary of the estimated number of vehicle trips generated by Phase 1 of the New Civic Development of the Ottawa Civic Hospital is included in **Table 13**.

**Table 13: New Civic Development – Person Trip Generation**

Travel Mode	AM Peak Hour			PM Peak Hour		
	IN	OUT	TOT	IN	OUT	TOT
<b>Hospital Trips</b>	<b>1,408</b>	<b>385</b>	<b>1,793</b>	<b>131</b>	<b>804</b>	<b>935</b>
Auto Driver	611	233	844	102	357	459
Auto Passenger	138	62	200	23	81	104
Transit	569	76	645	4	316	320
Cyclist	38	5	43	1	21	22
Pedestrian	52	9	61	1	29	30

Vehicles will access Phase 1 of the new hospital development via a new south approach at Carling Avenue/Champagne Avenue (i.e. within the study area), two new approaches to Prince of Wales Drive (outside of the study area), and a new east approach at Maple Drive/Winding Lane (outside of the study area).

Within the study area, the TIA reports in support of the New Civic Development identified auxiliary eastbound right turn and westbound left turn lanes, plus two new northbound lanes at Carling Avenue/Champagne Avenue, and dual eastbound left turn lanes at Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway.

**3.2.2 General Background Growth Rate**

A review of snapshots of the City’s *Strategic Long-Range Model* and *Intersection Traffic Growth Rates (2000-2016)* has been conducted. Both resources are included in **Appendix G**. Comparing snapshots of the 2011 and 2031 AM peak hour traffic volumes, the *Strategic Long-Range Model* suggests positive growth on all arterial roadways, ranging from approximately 0.5% per annum on Preston Street to 4% per annum of Prince of Wales Drive. The *Intersection Traffic Growth Rates* figures, which determine growth rates based on total vehicular volumes entering the intersection, identify the following growth rates between 2000 and 2016:

- Carling Avenue/Sherwood Drive
  - AM Peak Hour: negative growth between -0.2% and -2% per annum;
  - PM Peak Hour: positive growth between +0.2% and +2% per annum.
- Carling Avenue/Champagne Avenue
  - AM Peak Hour: negative growth between -0.2% and -2% per annum;
  - PM Peak Hour: positive growth between +0.2% and +2% per annum.

- Carling Avenue/Preston Street
  - AM Peak Hour: negative growth between -0.2% and -2% per annum;
  - PM Peak Hour: negative growth between -0.2% and -2% per annum.
- Carling Avenue/Booth Street
  - AM Peak Hour: negative growth between -0.2% and -2% per annum;
  - PM Peak Hour: negative growth between -0.2% and -2% per annum.
- Preston Street/Beech Street
  - AM Peak Hour: negative growth between -0.2% and -2% per annum;
  - PM Peak Hour: negative growth between -0.2% and -2% per annum.
- Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway
  - AM Peak Hour: negative growth between -0.2% and -2% per annum;
  - PM Peak Hour: no growth (i.e. between -0.2% and +2% per annum).

It is anticipated that background growth along the study area roadways will be captured through the addition of traffic generated by other area developments, as described in the previous section. Therefore, no background growth rates have been applied to any of the study area roadways.

East-west traffic along Carling Avenue is forecasted to decrease by as much as 20% in the peak direction and 15% in the off-peak direction by 2031, through implementation of the Carling Avenue transit priority measures shown in **Figure 4**. It is anticipated that the measures will be implemented by the buildout year 2028, and will progressively reduce east-west traffic volumes. A reduction of 10% in east-west traffic on Carling Avenue has been assumed for the 2028 background traffic conditions for both the peak and off-peak directions. The full reductions of 20% in the peak direction and 15% in the off-peak direction have been assumed for the 2033 background traffic conditions.

### 3.2.3 Existing Traffic Volume Balancing

To account for discrepancies in the different traffic counts conducted, the existing through traffic volumes have been balanced throughout the study area for any through movements with discrepancies of greater than 10%. Volumes between the study area intersections along the Carling Avenue and Preston Street corridors have therefore been adjusted to be within 10% of each other. The balanced existing traffic volumes are shown in **Figure 6**.

### 3.3 Future Traffic Conditions

The figures listed below present the following future traffic conditions:

- Existing site-generated traffic volumes are shown in **Figure 7**;
- Proposed site-generated traffic volumes are shown in **Figure 8**;
- Net site-generated traffic volumes are shown in **Figure 9**;
- Other area development-generated traffic volumes in 2028 are shown in **Figure 10**;
- Other area development-generated traffic volumes in 2033 are shown in **Figure 11**;
- Background traffic volumes in 2028 are shown in **Figure 12**;
- Background traffic volumes in 2033 are shown in **Figure 13**;
- Total traffic volumes in 2028 are shown in **Figure 14**;
- Total traffic volumes in 2033 are shown in **Figure 15**.

Figure 6: Balanced Existing Traffic Volumes

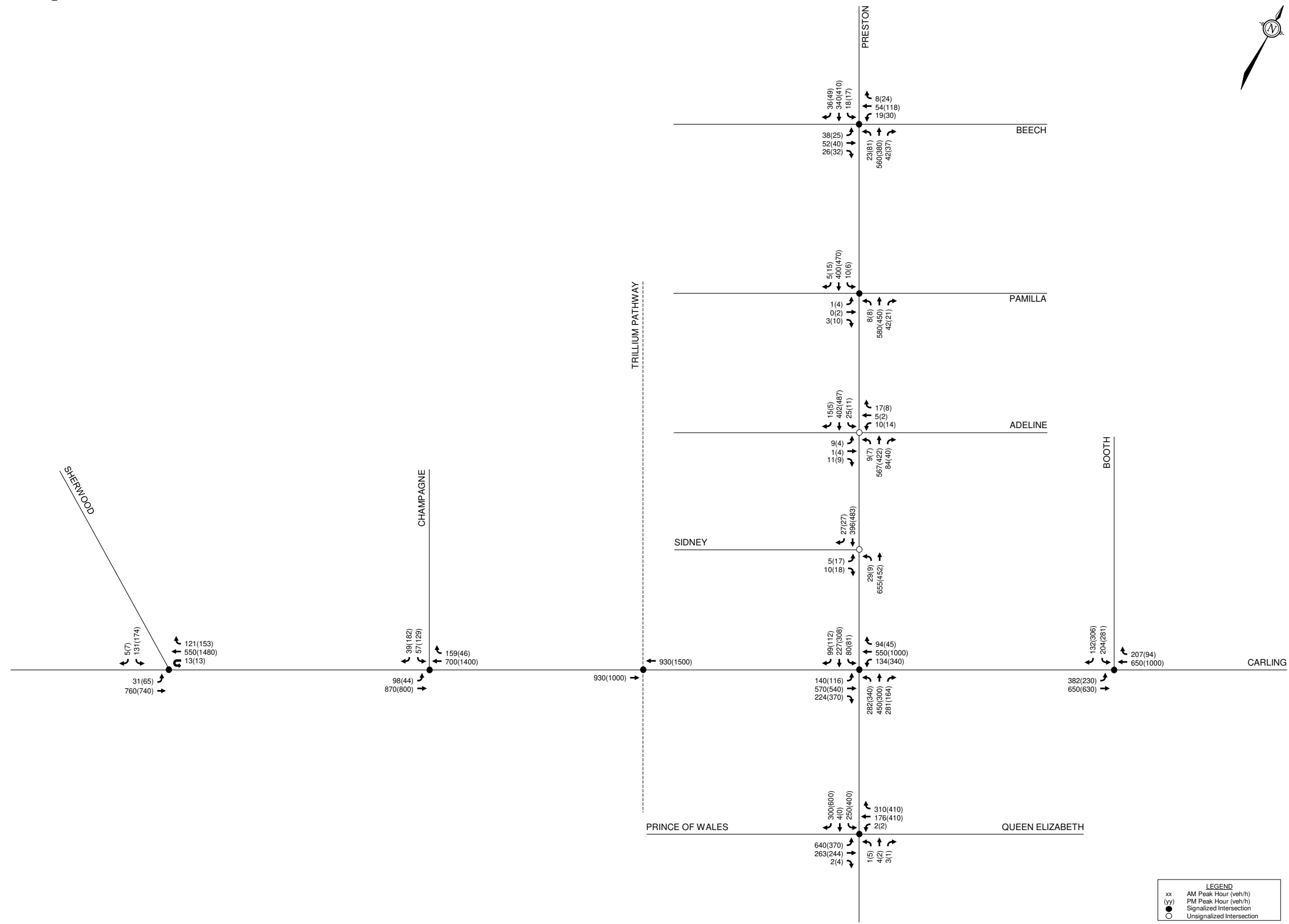


Figure 7: Existing Site-Generated Traffic Volumes

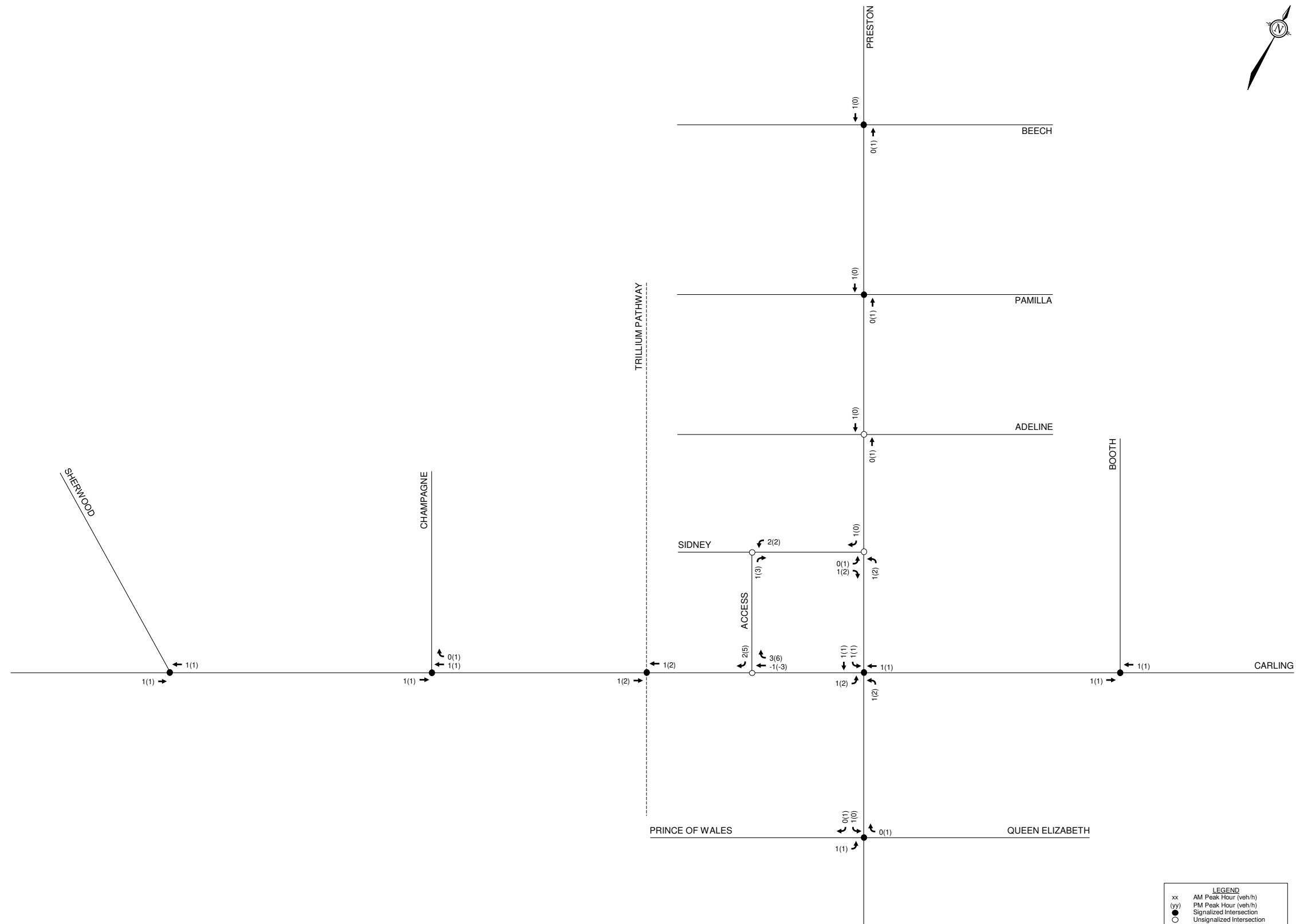


Figure 8: Proposed Site-Generated Traffic Volumes

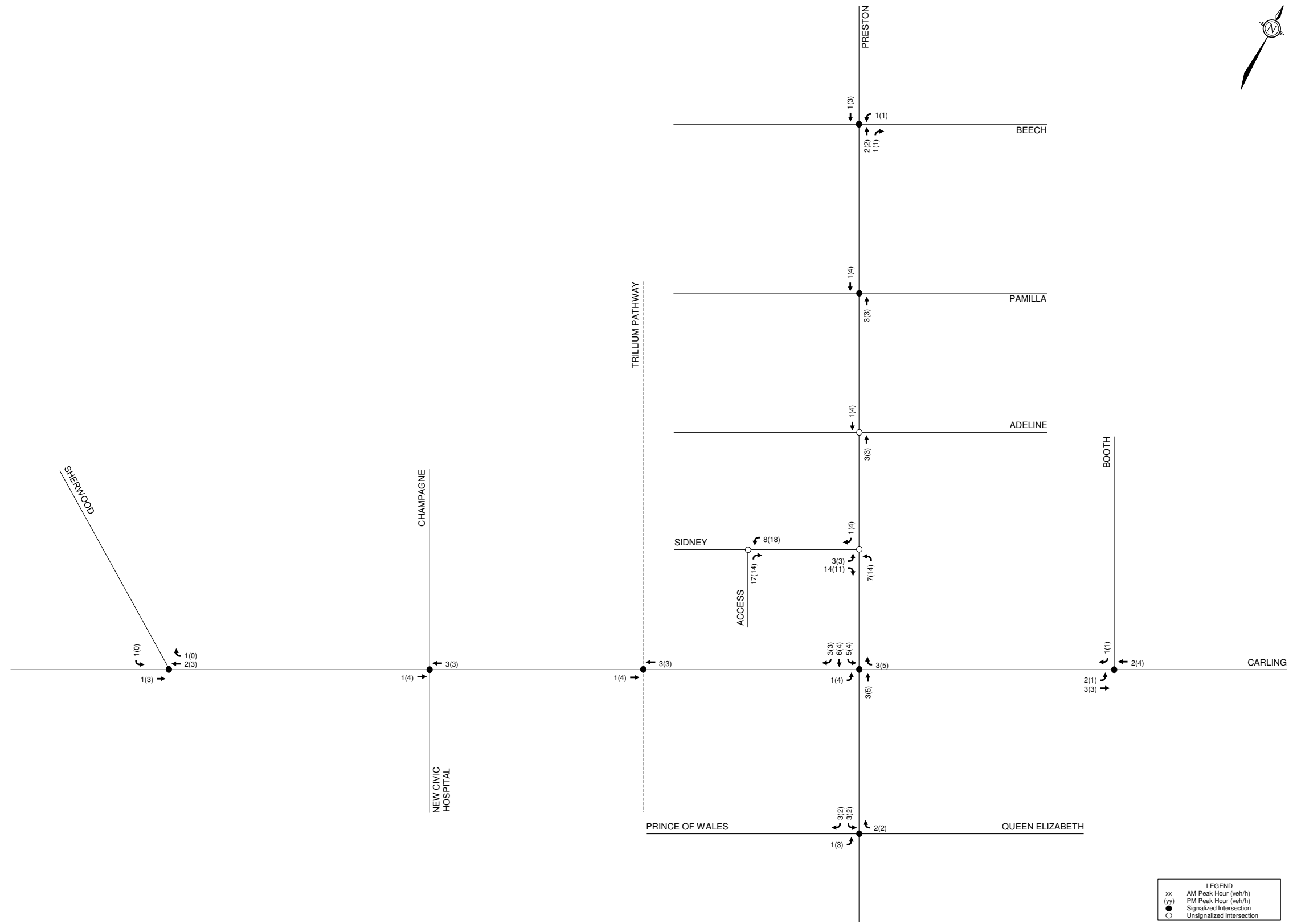


Figure 9: Net Site-Generated Traffic Volumes

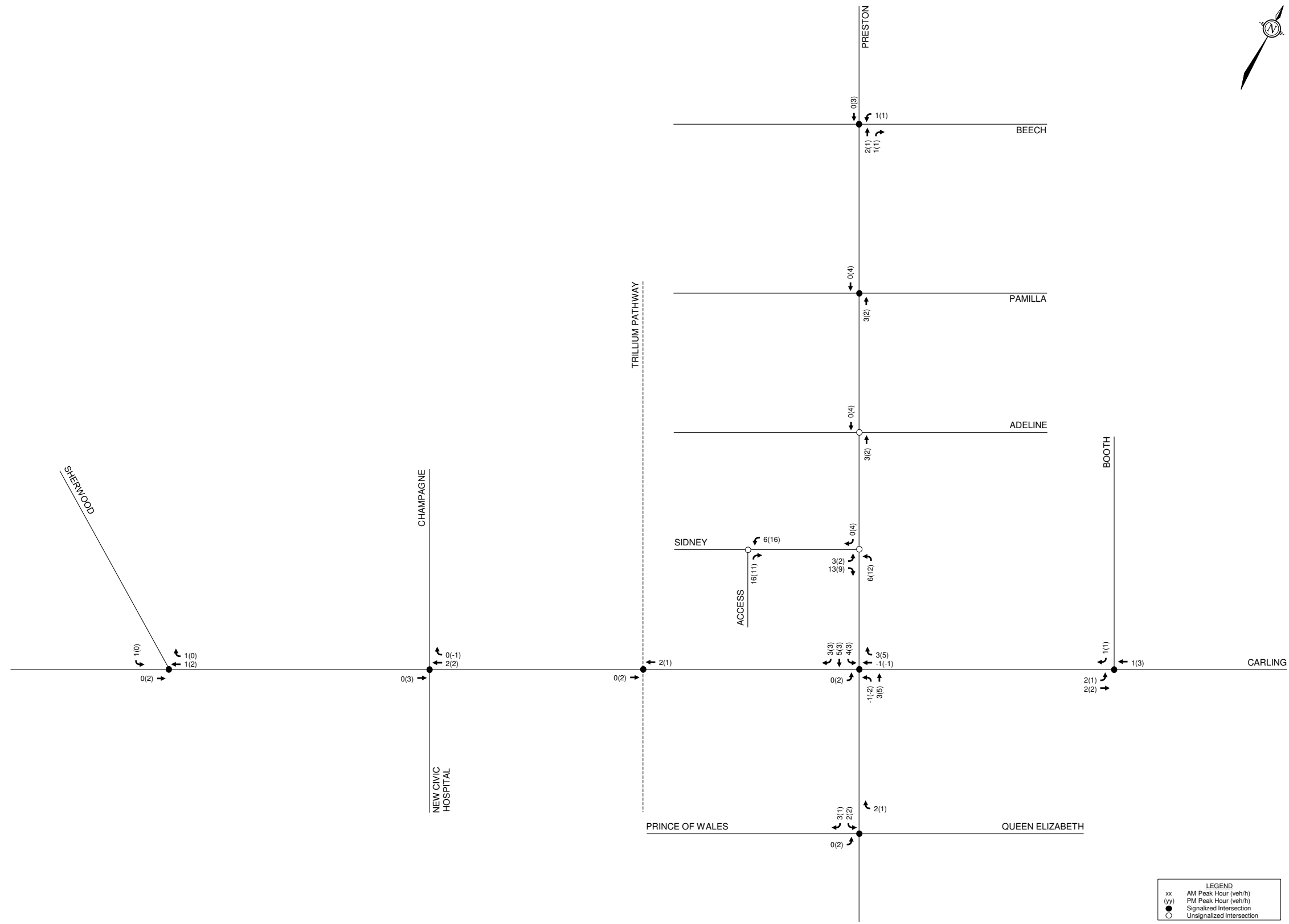
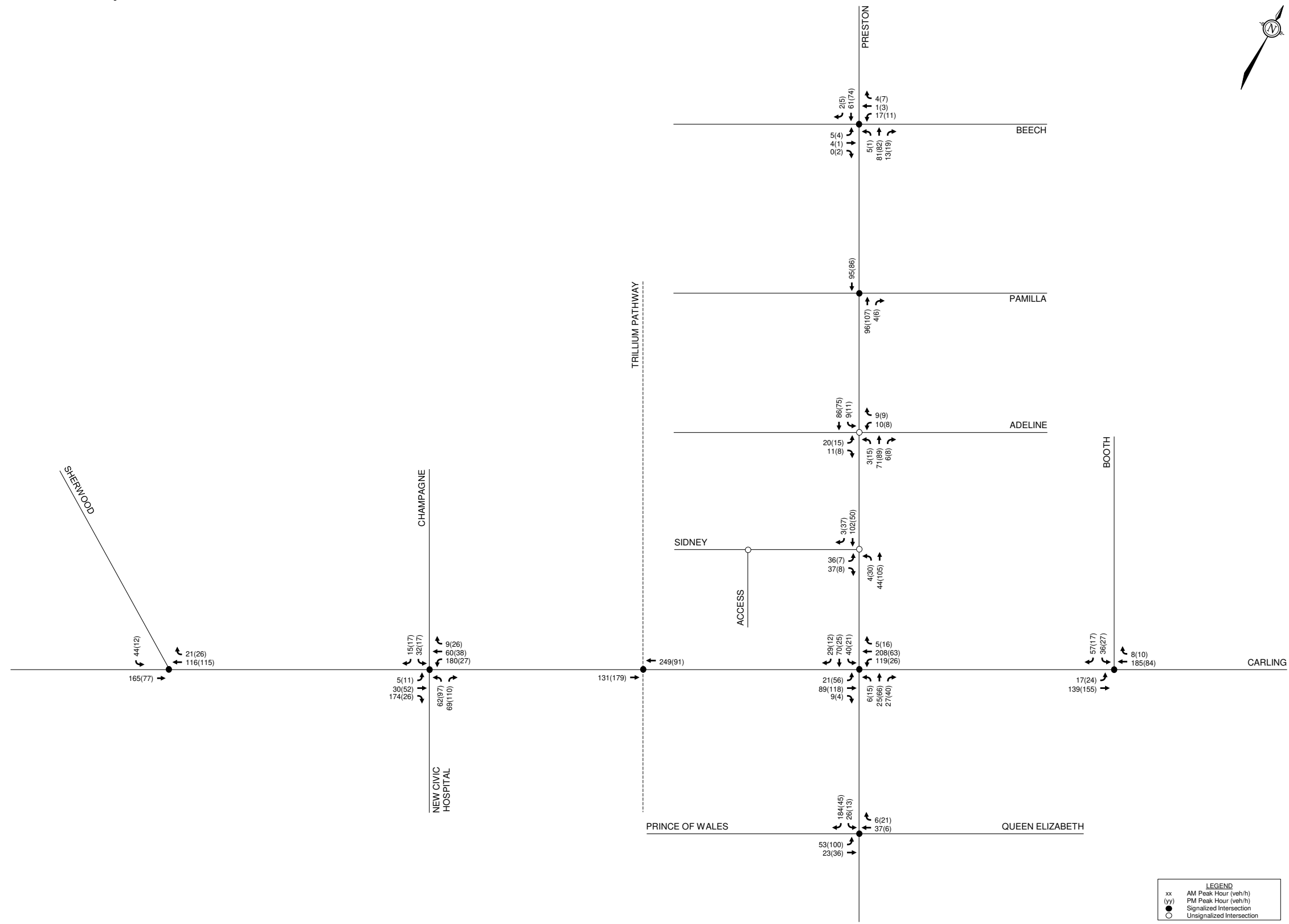




Figure 10: 2028 Other Area Development-Generated Traffic Volumes



LEGEND  
 xx AM Peak Hour (veh/h)  
 yy PM Peak Hour (veh/h)  
 ● Signalized Intersection  
 ○ Unsignalized Intersection

Figure 11: 2033 Other Area Development-Generated Traffic Volumes

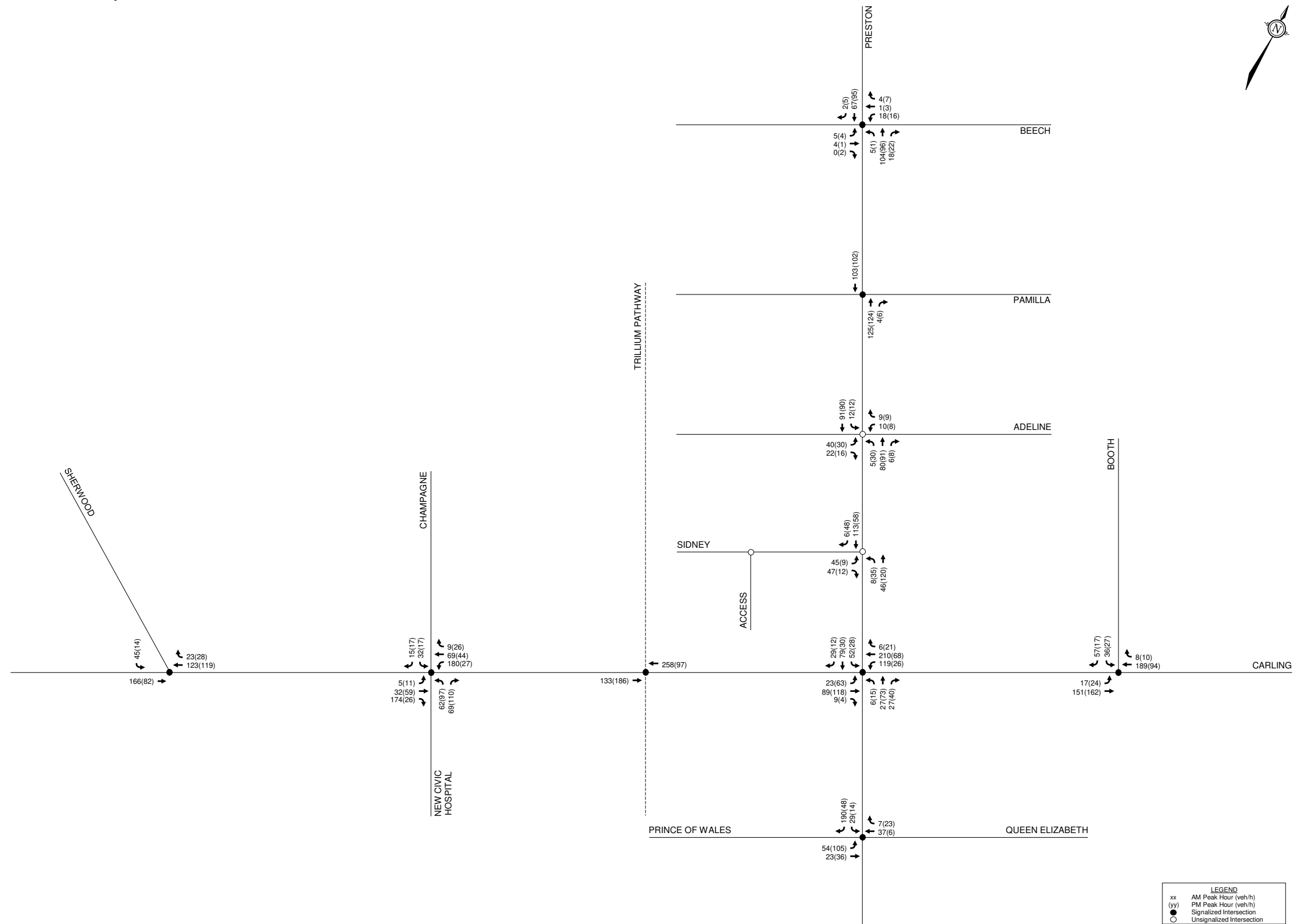


Figure 12: 2028 Background Traffic Volumes

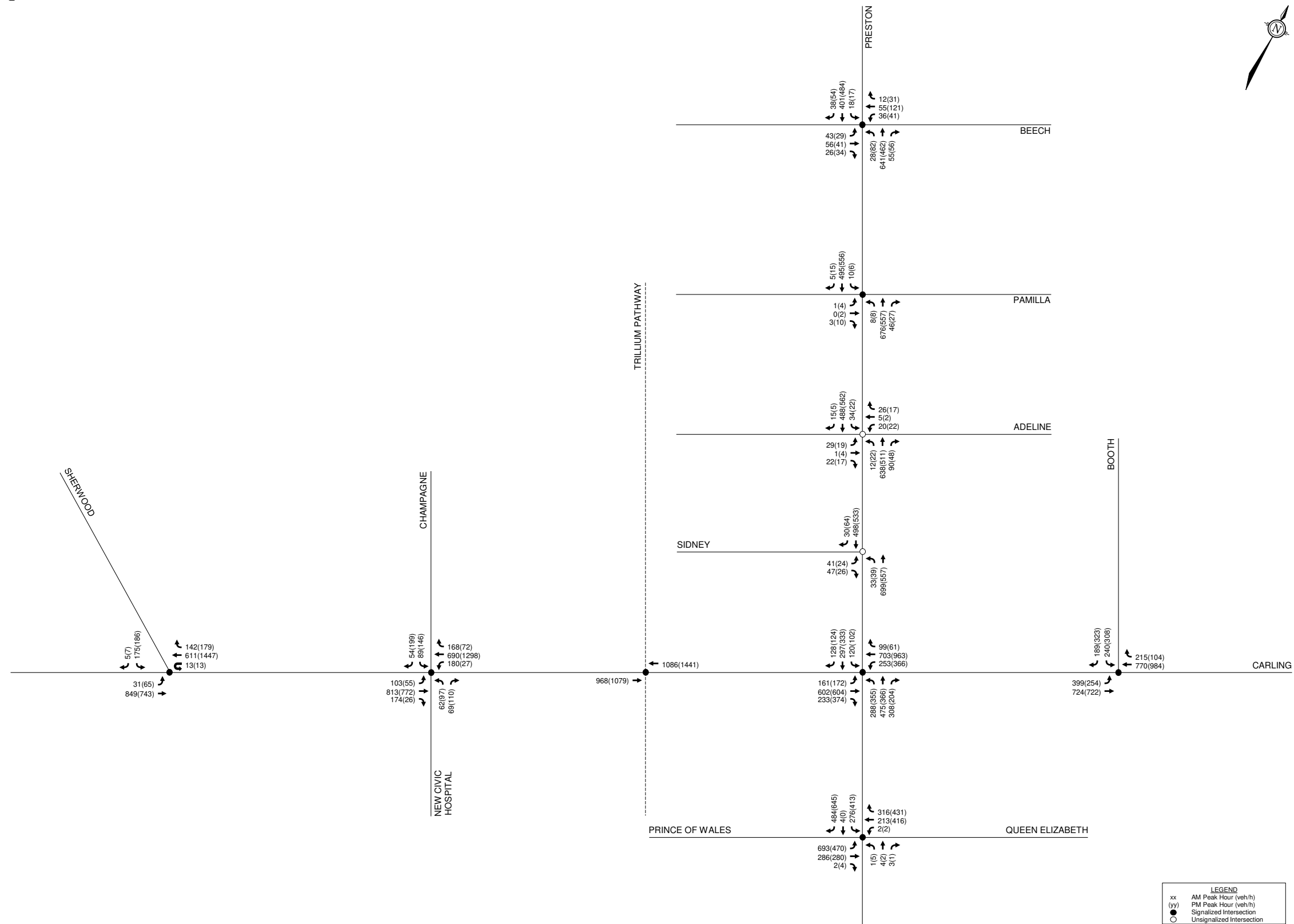


Figure 13: 2033 Background Traffic Volumes

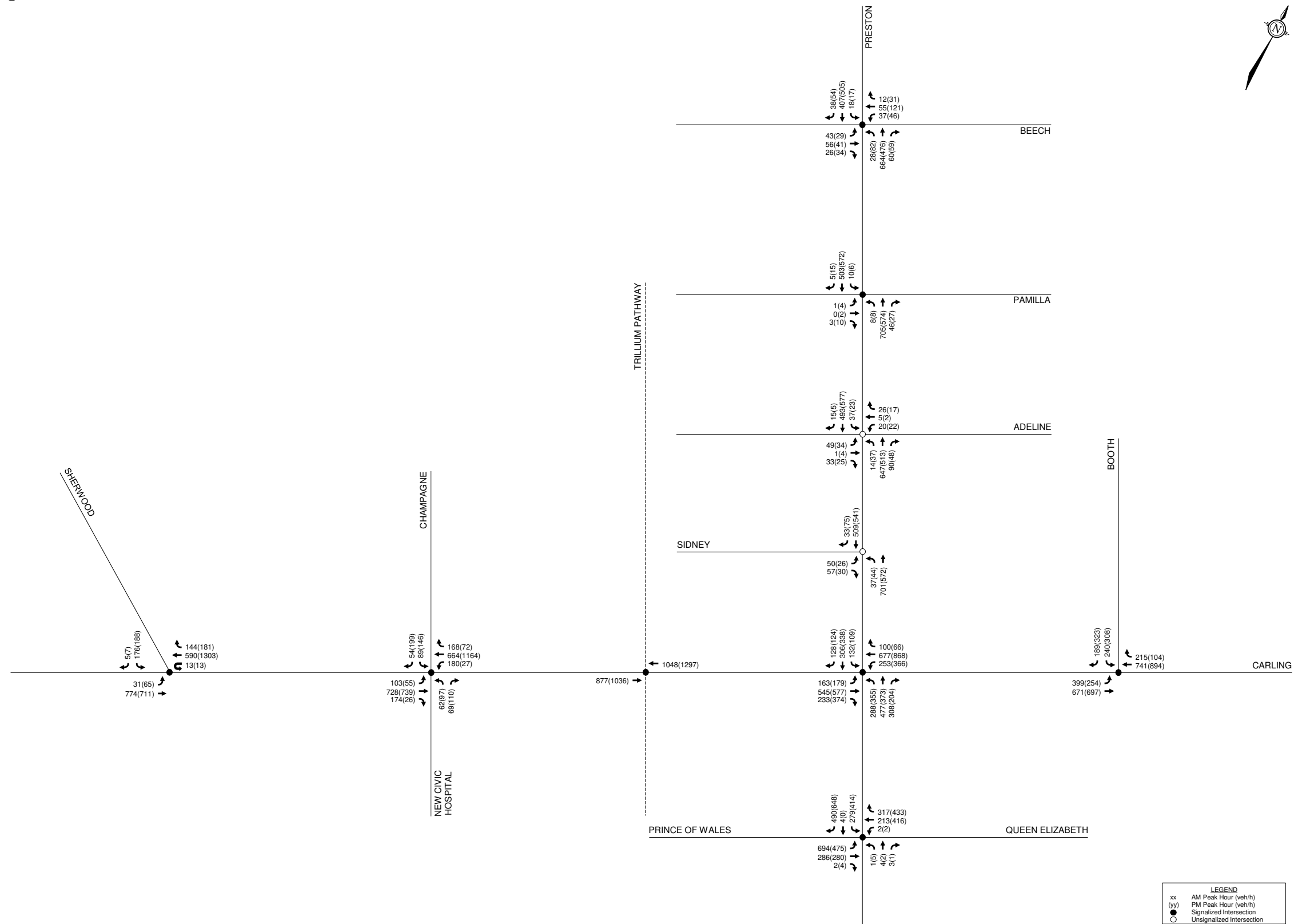


Figure 14: 2028 Total Traffic Volumes

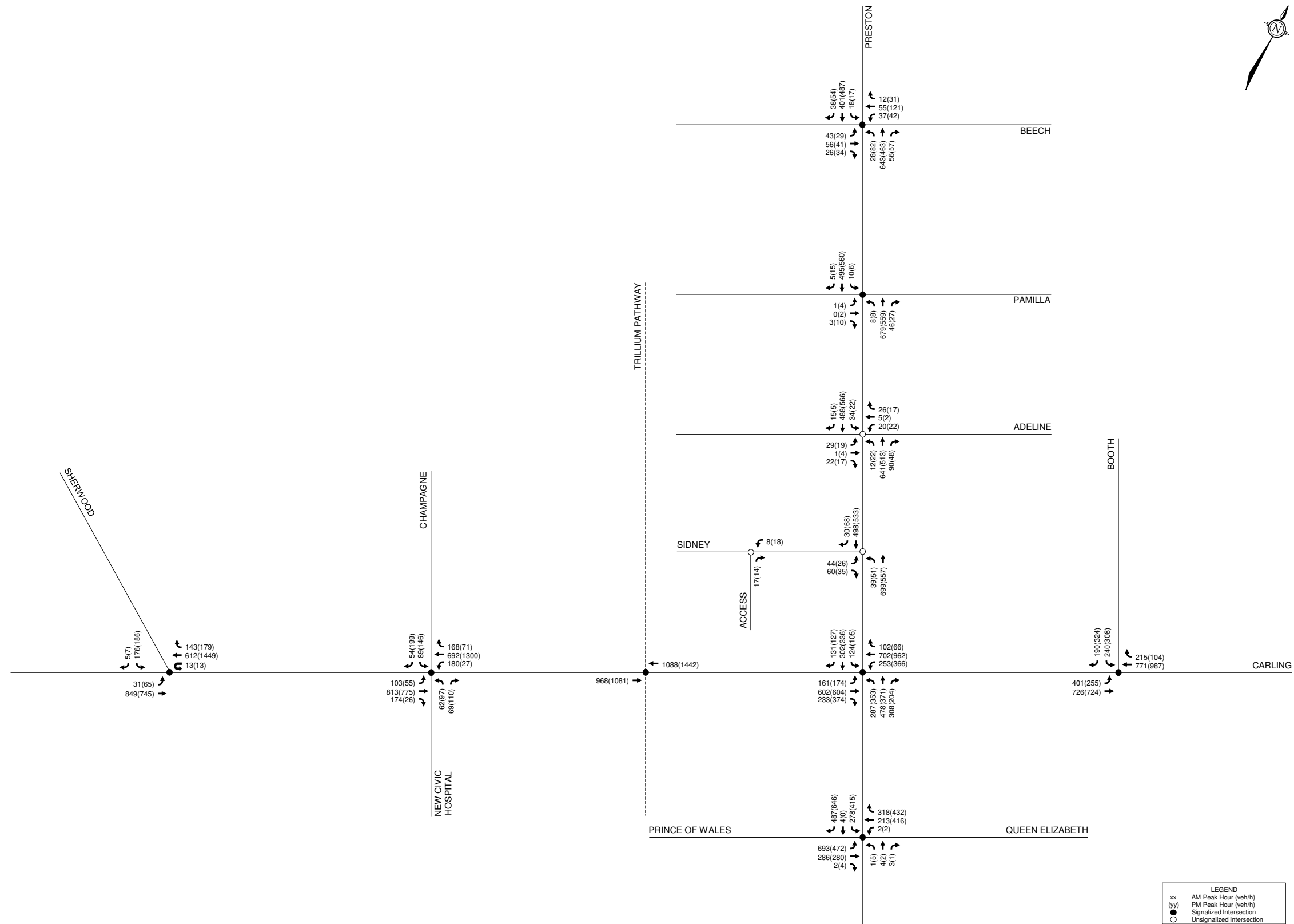
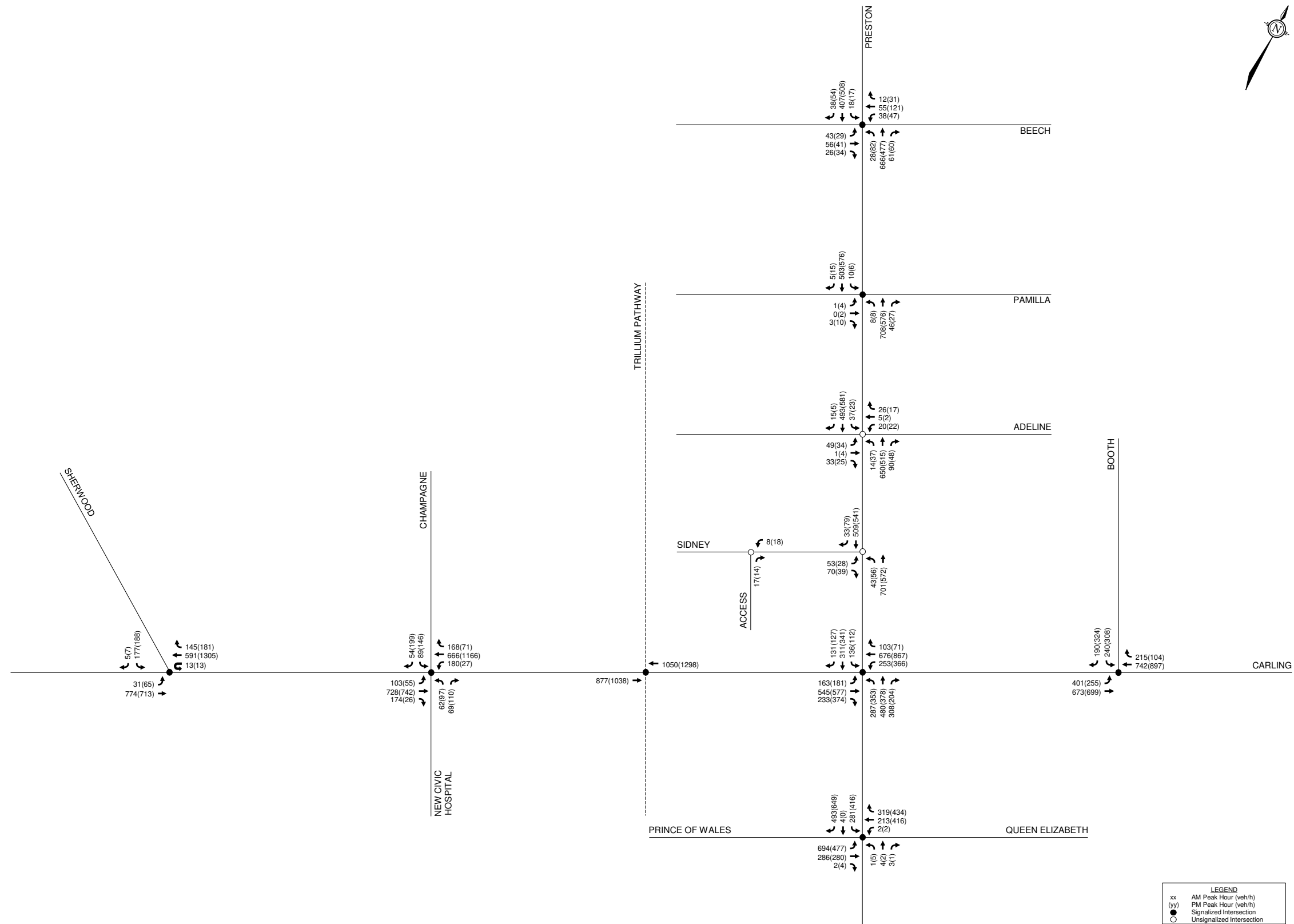


Figure 15: 2033 Total Traffic Volumes



### 3.4 Demand Rationalization

A review of the existing and background intersection operations has been conducted to determine if and when traffic volumes exceed capacity within the study area. The intersection parameters used in the analysis are consistent with the *2017 TIA Guidelines* (Saturated Flow Rate: 1,800 vphpl, Peak Hour Factor: 0.9 in existing conditions and 1.0 in future conditions). Per Exhibit 22 of the *Multi-Modal Level of Service (MMLoS) Guidelines*, the target vehicular level of service (Auto LOS) at all study area intersections is an Auto LOS E, which equates to a vehicle-to-capacity (v/c) ratio of 1.00.

Intersection and lane geometry for all future conditions is consistent with the planned roadway modifications within the study area (for example, lane reductions on Carling Avenue and new lanes at Carling Avenue/Champagne Avenue and Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway are included). Signal timing plans were obtained from the City, and are included in **Appendix H**.

#### 3.4.1 Existing Intersection Operations

Intersection capacity analysis has been conducted for the existing traffic conditions. The results of the analysis are summarized in **Table 14** and **Table 15** for the weekday AM and PM peak hours. Detailed reports are included in **Appendix I**.

**Table 14: Existing Traffic Operations**

Intersection	Period	Critical Movements			Intersection		
		Max v/c or Delay	LOS	Mvmt	v/c	Delay	LOS
Carling Avenue/ Sherwood Drive <sup>(1)</sup>	AM	0.52	A	SBL	0.30	12 sec	A
	PM	0.69	B	SBL	0.63	19 sec	B
Carling Avenue/ Champagne Avenue <sup>(1)</sup>	AM	0.39	A	EBT	0.22	6 sec	A
	PM	0.59	A	WBT	0.58	10 sec	A
Carling Avenue/ Trillium Pathway <sup>(2)</sup>	AM	0.39	A	EBT	0.34	3 sec	A
	PM	0.45	A	WBT	0.45	7 sec	A
Carling Avenue/ Preston Street <sup>(1)</sup>	AM	1.00	E	EBL	0.87	43 sec	D
	PM	<b>1.44</b>	<b>F</b>	<b>NBL</b>	<b>1.08</b>	<b>83 sec</b>	<b>F</b>
		<b>1.03</b>	<b>F</b>	<b>SBT/R</b>			
		<b>1.33</b>	<b>F</b>	<b>WBL</b>			
Carling Avenue/ Booth Street <sup>(1)</sup>	AM	0.84	D	EBL	0.59	25 sec	A
	PM	0.85	D	SBL	0.59	23 sec	A
Preston Street/ Beech Street <sup>(1)</sup>	AM	0.61	B	NBT	0.54	12 sec	A
	PM	0.54	B	WBL/T	0.42	12 sec	A
Preston Street/ Pamilla Street <sup>(1)</sup>	AM	0.47	A	NBT	0.41	4 sec	A
	PM	0.38	A	SBT	0.37	4 sec	A
Preston Street/ Adeline Street <sup>(3)</sup>	AM	23 sec	C	WBL/T/R	-		
	PM	20 sec	C	WBL/T/R			
Preston Street/ Sidney Street <sup>(3)</sup>	AM	15 sec	B	EBL/R	-		
	PM	17 sec	C	EBL/R			
Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway <sup>(1)</sup>	AM	<b>1.16</b>	<b>F</b>	<b>SBL/T</b>	0.84	30 sec	D
	PM	<b>1.21</b>	<b>F</b>	<b>SBL/T</b>	0.98	60 sec	E

- 1. Signalized intersection
- 2. Signalized pathway crossing
- 3. Unsignalized intersection

**Table 15: Existing Queues**

Intersection	Mvmt	Storage/Spacing <sup>(1)</sup>	AM Peak			PM Peak		
			v/c [LOS]	50 <sup>th</sup> % Queue (m)	95 <sup>th</sup> % Queue (m)	v/c [LOS]	50 <sup>th</sup> % Queue (m)	95 <sup>th</sup> % Queue (m)
Carling Avenue/ Preston Street	NBL	75m	0.79 [C]	54	m73	<b>1.44 [F]</b>	~116	#174
	SBT/R	35m	0.70 [B]	64	96	<b>1.03 [F]</b>	~125	#186
	EBL	65m	1.00 [E]	37	#76	0.68 [B]	33	55
	WBL	75m	0.91 [E]	34	#71	<b>1.33 [F]</b>	~125	#182
	WBT	50m	0.65 [B]	21	51	0.81 [D]	100	#134
Carling Avenue/ Booth Street	SBL	--	0.69 [B]	47	64	0.85 [D]	71	98
	EBL	45m	0.84 [D]	75	m#106	0.76 [C]	21	48
Preston Street/ Prince of Wales Drive/Queen Elizabeth Driveway	SBL/T	135m	<b>1.16 [F]</b>	~71	<b>m#118</b>	<b>1.21 [F]</b>	~128	#186
	EBL	55m	0.87 [D]	74	#115	0.87 [D]	68	#113

1. Indicates the storage length for auxiliary lanes or the spacing to the nearest upstream intersection for through lanes  
m: volume for the 95<sup>th</sup> percentile queue is metered by an upstream signal  
#: volume for the 95<sup>th</sup> percentile cycle exceeds capacity  
~: approach is above capacity

From the previous tables, the northbound left turn, southbound through/right turn, and westbound left turn movements at Carling Avenue/Preston Street, and the southbound left turn/through movement at Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway do not meet the target Auto LOS E. All other movements within the study area currently meet the City’s target Auto LOS. A summary of the critical queueing at the study area intersections is provided below.

During the AM peak hour, the average (50<sup>th</sup>-percentile) and maximum (95<sup>th</sup>-percentile) queue lengths of the eastbound left turn movements at Carling Avenue/Booth Street and Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway exceed the storage lengths provided for those movements. Additionally, the maximum queue length of the eastbound left turn movement at Carling Avenue/Preston Street exceeds the storage length provided. Both the average and maximum queue lengths for the southbound through/right turn movement at Carling Avenue/Preston Street extend through the upstream intersection at Preston Street/Sidney Street.

During the PM peak hour, the average and maximum queue lengths of the northbound and westbound left turn movements at Carling Avenue/Preston Street and the eastbound left turn movement at Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway exceed the storage lengths provided for these movements. Further, the maximum queue length of the eastbound left turn movement at Carling Avenue/Booth Street exceed the storage length provided. Both the average and maximum queue lengths of the southbound through/right turn and westbound through movements at Carling Avenue/Preston Street extend through the upstream intersections of Preston Street/Adeline Street and Carling Avenue/Norfolk Avenue, respectively. Additionally, the maximum queue length of the southbound left turn/through movement at Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway extends through the upstream intersection at Carling Street/Preston Street.

The approximate required reduction in volumes to meet the target Auto LOS for each over-capacity movement is included below.

**AM Peak Hour**

- Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway
  - Southbound left turn/through (v/c: 1.13): reduction of 40 vehicles required.



PM Peak Hour

- Carling Avenue/Preston Street
  - Northbound left turn (v/c: 1.44): reduction of 90 vehicles required;
  - Southbound through/right turn (v/c: 1.03): reduction of 20 vehicles required;
  - Westbound left turn (v/c: 1.33): reduction of 90 vehicles required.
- Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway
  - Southbound left turn/through (v/c: 1.21): reduction of 70 vehicles required.

While the Synchro analysis does not identify operational concerns at Preston Street/Sidney Street, it is acknowledged that additional traffic volumes generated by future developments may trigger a restriction of the eastbound movements on Sidney Street to right turns only, due to potential safety and congestion issues. The background future conditions have been analyzed with both scenarios considered (i.e. eastbound left turns permitted, and eastbound left turns prohibited).

**3.4.2 2028 Background Intersection Operations**

Intersection capacity analysis has been conducted for the 2028 background traffic conditions. Signal timing plans within the study area have been optimized to reflect the planned changes in the roadway network. The results of the analysis are summarized in **Table 16** and **Table 17** for the weekday AM and PM peak hours. Detailed reports are included in **Appendix J**.

**Table 16: 2028 Background Traffic Operations**

Intersection	Period	Critical Movements			Intersection		
		Max v/c or Delay	LOS	Mvmt	v/c	Delay	LOS
Carling Avenue/ Sherwood Drive <sup>(1)</sup>	AM	0.55	A	SBL	0.36	12 sec	A
	PM	0.70	B	WBT	0.68	15 sec	B
Carling Avenue/ Champagne Avenue <sup>(1)</sup>	AM	0.45	A	WBL	0.35	7 sec	A
	PM	0.67	B	SBR	0.53	13 sec	A
Carling Avenue/ Trillium Pathway <sup>(2)</sup>	AM	0.41	A	WBT	0.39	4 sec	A
	PM	0.53	A	WBT	0.47	3 sec	A
Carling Avenue/ Preston Street <sup>(1)</sup>	AM	1.01	F	NBL	1.02	53 sec	F
		1.07	F	EBT			
	PM	1.44	F	NBL	1.19	92 sec	F
		1.04	F	SBT/R			
		1.01	F	EBL			
		1.13	F	EBT/R			
1.29	F	WBL					
Carling Avenue/ Booth Street <sup>(1)</sup>	AM	1.09	F	WBT	0.99	49 sec	E
	PM	1.11	F	WBT	1.05	58 sec	F
Preston Street/ Beech Street <sup>(1)</sup>	AM	0.63	A	NBT	0.56	12 sec	A
	PM	0.55	A	WBL/T	0.45	12 sec	A
Preston Street/ Pamilla Street <sup>(1)</sup>	AM	0.49	A	NBT	0.44	4 sec	A
	PM	0.41	A	NBT	0.40	5 sec	A
Preston Street/ Adeline Street <sup>(3)</sup>	AM	29 sec	D	EBL/T/R	-		
	PM	23 sec	C	EBL/T/R			
Preston Street/ Sidney Street <sup>(3)</sup>	AM	20 sec	C	EBL/R	-		
	PM	19 sec	C	EBL/R			
Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway <sup>(1)</sup>	AM	0.63	B	SBL/T	0.58	18 sec	A
	PM	0.97	E	SBL/T	0.77	30 sec	C

1. Signalized intersection

2. Signalized pathway crossing

3. Unsignalized intersection

**Table 17: 2028 Background Queues**

Intersection	Mvmt	Storage/ Spacing <sup>(1)</sup>	AM Peak			PM Peak		
			v/c [LOS]	50 <sup>th</sup> % Queue (m)	95 <sup>th</sup> % Queue (m)	v/c [LOS]	50 <sup>th</sup> % Queue (m)	95 <sup>th</sup> % Queue (m)
Carling Avenue/ Preston Street	NBL	75m	<b>1.01 [F]</b>	~44	#97	<b>1.44 [F]</b>	~105	<b>m#166</b>
	SBL	35m	0.75 [C]	26	#56	0.56 [A]	23	42
	SBT/R	35m	0.96 [E]	96	#156	<b>1.04 [F]</b>	~123	<b>#185</b>
	EBL	65m	0.81 [D]	30	#63	<b>1.01 [F]</b>	~40	<b>#87</b>
	EBT/R	95m	<b>1.07 [F]</b>	~107	<b>#141</b>	<b>1.13 [F]</b>	~144	<b>#175</b>
	WBL	110m	0.95 [E]	54	m#58	<b>1.29 [F]</b>	~117	<b>m#121</b>
Carling Avenue/ Booth Street	WBT	50m	0.77 [C]	91	m90	0.88 [D]	133	m125
	SBL	--	0.70 [B]	50	75	0.88 [D]	74	#114
	EBL	75m	0.97 [E]	~112	m#132	1.00 [E]	~75	m#85
Preston Street/ Prince of Wales Drive/Queen Elizabeth Driveway	WBT	85m	<b>1.09 [F]</b>	~204	<b>#272</b>	<b>1.11 [F]</b>	~286	<b>#358</b>
	SBL/T	135m	0.63 [B]	45	m45	0.97 [E]	90	m64
	EBL	55m	0.62 [B]	48	61	0.60 [A]	34	44

1. Indicates the storage length for auxiliary lanes or the spacing to the nearest upstream intersection for through lanes

m: volume for the 95<sup>th</sup> percentile queue is metered by an upstream signal

#: volume for the 95<sup>th</sup> percentile cycle exceeds capacity

~: approach is above capacity

In the 2028 background conditions, the northbound left turn, southbound through/right turn, eastbound left turn, eastbound through/right turn, and westbound left turn movements at Carling Avenue/Preston Street, and the westbound through movement at Carling Avenue/Booth Street do not meet the target Auto LOS E during one or both of the peak hours. All other intersections within the study area are projected meet the City’s target. A summary of the critical queueing at the study area intersections is provided below.

During the AM peak hour, the average and maximum queue lengths of the eastbound left turn movement at Carling Avenue/Booth Street exceeds the storage length provided. Additionally, the maximum queue length of the northbound and southbound left turn movements at Carling Avenue/Preston Street and the eastbound left turn movement at Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway exceed the storage lengths provided. Both the average and maximum queue lengths for the southbound through/right turn, eastbound through/right turn, and westbound through movements at Carling Avenue/Preston Street extend through at least one upstream intersection (i.e. at Sidney Street and Adeline Street for the southbound movement, at the Trillium Pathway for the eastbound movement, and at Norfolk Avenue for the westbound movement). Both the average and maximum queue lengths for the westbound through movement at Carling Avenue/Booth Street extend through at least one upstream intersection east of the study area (i.e. at Lebreton Street and Bell Street).

During the PM peak hour, the average and maximum queue lengths of the northbound and westbound left turn movements at Carling Avenue/Preston Street and the eastbound left turn movement at Carling Avenue/Booth Street exceed the storage lengths provided. Additionally, the maximum queue lengths of the southbound left turn and eastbound left turn movements at Carling Avenue/Preston Street exceed the storage lengths provided. Both the average and maximum queue lengths of the southbound through/right turn, eastbound through/right turn, and westbound through movements at Carling Avenue/Preston Street extend through at least one upstream intersection (i.e. at Sidney Street and Adeline Street for the southbound movement, at the Trillium Pathway for the eastbound movement, and at Norfolk Avenue for the westbound movement).

Additionally, both the average and maximum queue lengths for the westbound through movement at Carling Avenue/Booth Street extend through at least three upstream intersections east of the study area (i.e. at Lebreton Street, Bell Street, and Cambridge Street).

The approximate required reduction in volumes to meet the target Auto LOS for each over-capacity movement is included below.

#### AM Peak Hour

- Carling Avenue/Preston Street
  - Northbound left turn (v/c: 1.01): reduction of 10 vehicles required;
  - Eastbound through/right turn (v/c: 1.07): reduction of 50 vehicles required.
- Carling Avenue/Booth Street
  - Westbound through (v/c: 1.09): reduction of 60 vehicles required.

#### PM Peak Hour

- Carling Avenue/Preston Street
  - Northbound left turn (v/c: 1.44): reduction of 100 vehicles required;
  - Southbound through/right turn (v/c: 1.04): reduction of 20 vehicles required;
  - Eastbound left turn (v/c: 1.01): reduction of 10 vehicles required;
  - Eastbound through/right turn (v/c: 1.13): reduction of 100 vehicles required;
  - Westbound left turn (v/c: 1.29): reduction of 90 vehicles required.
- Carling Avenue/Booth Street
  - Westbound through (v/c: 1.11): reduction of 100 vehicles required.

As discussed in the previous section, an alternate scenario has been analyzed where Sidney Street is restricted to eastbound right turns only at Preston Street, due to potential safety and congestion issues. All eastbound left turning volumes generated by the proposed development at 845 Carling Avenue have been reassigned to Preston Street/Adeline Street, and all other eastbound left turning volumes have been reassigned to turn right onto Preston Street, left onto Carling Avenue, and left onto Booth Street. The analysis identifies that this restriction would impact the southbound left turn movement at Carling Avenue/Preston Street and the eastbound left turn movement at Carling Avenue/Booth Street, and these impacts can be summarized as follows:

- Carling Avenue/Preston Street (southbound left turn)
  - AM Peak Hour: v/c ratio increases from 0.75 to 0.95
  - PM Peak Hour: v/c ratio increases from 0.56 to 0.68
- Carling Avenue/Booth Street (eastbound left turn)
  - AM Peak Hour: v/c ratio increases from 0.97 to 1.05
  - PM Peak Hour: v/c ratio increases from 1.00 to 1.09

Therefore, restricting eastbound left turns at Preston Street/Sidney Street could be considered. Detailed reports for this alternate scenario are also included in **Appendix J**.

### 3.4.3 2033 Background Intersection Operations

Intersection capacity analysis has been conducted for the 2033 background traffic conditions. Signal timing plans within the study area have been optimized to reflect the planned changes in the roadway network. The results of the analysis are summarized in **Table 18** and **Table 19** for the weekday AM and PM peak hours. Detailed reports are included in **Appendix J**.

**Table 18: 2033 Background Traffic Operations**

Intersection	Period	Critical Movements			Intersection		
		Max v/c or Delay	LOS	Mvmt	v/c	Delay	LOS
Carling Avenue/ Sherwood Drive <sup>(1)</sup>	AM	0.56	A	SBL	0.35	13 sec	A
	PM	0.63	B	WBT	0.62	15 sec	B
Carling Avenue/ Champagne Avenue <sup>(1)</sup>	AM	0.41	A	WBL	0.31	7 sec	A
	PM	0.64	B	SBR	0.48	13 sec	A
Carling Avenue/ Trillium Pathway <sup>(2)</sup>	AM	0.39	A	WBT	0.36	4 sec	A
	PM	0.47	A	WBT	0.43	3 sec	A
Carling Avenue/ Preston Street <sup>(1)</sup>	AM	<b>1.03</b>	<b>F</b>	<b>NBL</b>	0.99	50 sec	E
	PM	<b>1.45</b>	<b>F</b>	<b>NBL</b>	1.18	92 sec	F
		<b>1.05</b>	<b>F</b>	<b>SBT/R</b>			
		<b>1.05</b>	<b>F</b>	<b>EBL</b>			
		<b>1.09</b>	<b>F</b>	<b>EBT/R</b>			
<b>1.29</b>	<b>F</b>	<b>WBL</b>					
Carling Avenue/ Booth Street <sup>(1)</sup>	AM	<b>1.05</b>	<b>F</b>	<b>WBT</b>	0.97	46 sec	E
	PM	<b>1.01</b>	<b>F</b>	<b>WBT</b>	0.98	46 sec	E
Preston Street/ Beech Street <sup>(1)</sup>	AM	0.66	B	NBT	0.59	12 sec	A
	PM	0.57	A	WBL/T	0.46	12 sec	A
Preston Street/ Pamilla Street <sup>(1)</sup>	AM	0.51	A	NBT	0.45	4 sec	A
	PM	0.43	A	NBT	0.42	5 sec	A
Preston Street/ Adeline Street <sup>(3)</sup>	AM	38 sec	E	EBL/T/R	-		
	PM	28 sec	D	EBL/T/R			
Preston Street/ Sidney Street <sup>(3)</sup>	AM	22 sec	C	EBL/R	-		
	PM	20 sec	C	EBL/R			
Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway <sup>(1)</sup>	AM	0.64	B	SBL/T	0.59	18 sec	A
	PM	0.97	E	SBL/T	0.77	30 sec	C

- 1. Signalized intersection
- 2. Signalized pathway crossing
- 3. Unsignalized intersection

**Table 19: 2033 Background Queues**

Intersection	Mvmt	Storage/Spacing <sup>(1)</sup>	AM Peak			PM Peak		
			v/c [LOS]	50 <sup>th</sup> % Queue (m)	95 <sup>th</sup> % Queue (m)	v/c [LOS]	50 <sup>th</sup> % Queue (m)	95 <sup>th</sup> % Queue (m)
Carling Avenue/ Preston Street	NBL	75m	<b>1.03 [F]</b>	~48	#101	<b>1.45 [F]</b>	~107	<b>m#167</b>
	SBL	35m	0.82 [D]	29	#63	0.60 [A]	25	45
	SBT/R	35m	0.98 [E]	99	#161	<b>1.05 [F]</b>	~126	<b>#187</b>
	EBL	65m	0.81 [D]	30	#64	<b>1.05 [F]</b>	~47	<b>#91</b>
	EBT/R	95m	0.99 [E]	50	#125	<b>1.09 [F]</b>	~134	<b>#167</b>
	WBL	110m	0.95 [E]	54	m#67	<b>1.29 [F]</b>	~117	<b>m#135</b>
	WBT	50m	0.74 [C]	87	m90	0.80 [C]	116	m119
Carling Avenue/ Booth Street	SBL	--	0.70 [B]	50	75	0.88 [D]	74	#114
	EBL	75m	0.97 [E]	~113	m#139	1.00 [E]	~75	m#88
	WBT	85m	<b>1.05 [F]</b>	~190	<b>#257</b>	<b>1.01 [F]</b>	~227	<b>#309</b>
Preston Street/ Prince of Wales Drive/Queen Elizabeth Driveway	SBL/T	135m	0.64 [B]	46	m47	0.97 [E]	91	m64
	EBL	55m	0.62 [B]	48	61	0.61 [B]	34	44

1. Indicates the storage length for auxiliary lanes or the spacing to the nearest upstream intersection for through lanes

m: volume for the 95<sup>th</sup> percentile queue is metered by an upstream signal

#: volume for the 95<sup>th</sup> percentile cycle exceeds capacity

~: approach is above capacity

In the 2033 background conditions, the northbound left turn, southbound through/right turn, eastbound left turn, eastbound through/right turn, and westbound left turn movements at Carling Avenue/Preston Street, and the westbound through movements at Carling Avenue/Booth Street do not meet the target Auto LOS E during one or both of the peak hours. All other intersections within the study area are projected meet the City’s target. The critical queues within the study area are generally consistent with the 2028 background conditions.

The approximate required reduction in volumes to meet the target Auto LOS for each over-capacity movement is included below.

AM Peak Hour

- Carling Avenue/Preston Street
  - Northbound left turn (v/c: 1.03): reduction of 10 vehicles required.
- Carling Avenue/Booth Street
  - Westbound through (v/c: 1.05): reduction of 30 vehicles required.

PM Peak Hour

- Carling Avenue/Preston Street
  - Northbound left turn (v/c: 1.45): reduction of 90 vehicles required;
  - Southbound through/right turn (v/c: 1.05): reduction of 30 vehicles required;
  - Eastbound left turn (v/c: 1.05): reduction of 10 vehicles required;
  - Eastbound through/right turn (v/c: 1.09): reduction of 70 vehicles required;
  - Westbound left turn (v/c: 1.29): reduction of 90 vehicles required.
- Carling Avenue/Booth Street
  - Westbound through (v/c: 1.01): reduction of 10 vehicles required.

As discussed in the previous section, an alternate scenario has been analyzed where Sidney Street is restricted to eastbound right turns only at Preston Street. The analysis identifies that this restriction would impact the southbound left turn movement at Carling Avenue/Preston Street and the eastbound left turn movement at Carling Avenue/Booth Street, and these impacts can be summarized as follows:

- Carling Avenue/Preston Street (southbound left turn)
  - AM Peak Hour: v/c ratio increases from 0.82 to 1.02
  - PM Peak Hour: v/c ratio increases from 0.60 to 0.72
- Carling Avenue/Booth Street (eastbound left turn)
  - AM Peak Hour: v/c ratio increases from 0.97 to 1.05
  - PM Peak Hour: v/c ratio increases from 1.00 to 1.09

Detailed reports for this alternate scenario are also included in **Appendix J**.

Traffic throughout the study area could be displaced or alleviated through a combination of increased use of non-auto modes of transportation, alternate time to travel for drivers using the study area roadways to make use of off-peak capacity, and alternate routes for travel. A further description of each option is provided as follows.

#### Increased Use of Non-Auto Modes

It is assumed that the Carling Avenue Transit Priority Measures project will be completed by the buildout year 2028. These measures will provide more reliable transit between Lincoln Fields Station, Dow's Lake O-Train Station, and Bronson Avenue, connecting western Ottawa with the inner area and downtown core. This is anticipated to increase the transit modal share and decrease the auto modal share, thereby reducing traffic volumes within the study area. As stated in Section 3.2.2, a reduction in east-west traffic volumes on Carling Avenue is assumed starting in 2028 to reflect the implementation of the Carling Avenue Transit Priority Measures.

#### Alternate Travel Times

As congestion increases within the study area, some motorists may alter their travel to occur outside of the peak hours. This shift in travel times may result in a reduction of peak hour traffic volumes.

#### Alternate Routes of Travel

As congestion increases within the study area, some motorists may choose alternate routes of travel outside the study area. Alternative north-south routes outside of the study area include Parkdale Avenue and Bronson Avenue. Alternative east-west routes outside of the study area include Baseline Road, Highway 417, Gladstone Avenue, Somerset Street, Scott Street/Albert Street, and Sir John A. Macdonald Parkway.

## **4.0 ANALYSIS**

### **4.1 Development Design**

#### **4.1.1 Design for Sustainable Modes**

Concrete sidewalks will be provided around the north, south, and east sides of the proposed building, and will connect to existing sidewalks on Sidney Street, Preston Street, and Carling Avenue.

Eight bicycle parking spaces will be provided along the south and east sides of the proposed building (i.e. on Carling Avenue and Preston Street). A total of 192 bicycle parking spaces will be provided on the second floor, with access via a bike elevator near the Sidney Street entrance. In total, 200 bicycle parking spaces are proposed. Further review of the bicycle parking requirements as outlined in the City's *Zoning By-Law* (ZBL) are included in Section 4.2.

OC Transpo stops #2397, #6655, #6657, #7369, #8013, #8014, #8023, and the Dow's Lake O-Train Station are within 400m walking distance of all entrances to the proposed development. These stops provide service to OC Transpo routes 2, 55, 56, and 85.

A review of the City's *Transportation Demand Management (TDM)-Supportive Development Design and Infrastructure Checklist* has been conducted. All required TDM-supportive design and infrastructure measures in the TDM checklist are met. A copy of this checklist is included in **Appendix K**. In addition to the required measures, the proposed development also meets the following 'basic' or 'better' measures as defined in the *TDM-Supportive Development Design and Infrastructure Checklist*.

- Locate the building close to the street, and do not locate parking areas between the street and building entrances;
- Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations;
- Located building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort;
- Provide safe, direct, and attractive walking routes from building entrances to nearby transit stops;
- Provide lighting, landscaping, and benches along walking and cycling routes between building entrances and streets, sidewalks, and trails;
- Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer to encourage other cyclists and ensure adequate capacity in peak cycling season;
- Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met);
- 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).

#### 4.1.2 Circulation and Access

Pick-ups and drop-offs will occur curbside on Sidney Street. Garbage collection will also take place curbside on Sidney Street, as waste bins will be wheeled out to the curb. There is no on-site fire route proposed as part of this development. Therefore, the fire route for the development is considered to consist of Carling Avenue, Preston Street, and Sidney Street.

## 4.2 Parking

The subject site is located in Area B of Schedule 1 and Area Z of Schedule 1A of the City's ZBL. Vehicular and bicycle parking requirements for the proposed development are identified in Sections 101, 102, 103, and 111 of the ZBL, and are summarized in **Table 20**.

**Table 20: Parking Requirements**

Land Use	Rate	Units/GFA	Required
<i>Minimum Vehicle Parking Requirements</i>			
Dwelling, Mixed-Use Building	0.1 per dwelling unit after the first 12 units, up to a maximum of 30 spaces (visitors only)	396 units	30
Retail Store	No spaces required (Area Z)	337 m <sup>2</sup>	0
<b>Minimum Required</b>			<b>30</b>
<b>Total Parking Proposed</b>			<b>196</b>
<i>Maximum Vehicle Parking Requirements</i>			
Dwelling, Mixed-Use Building	1.75 per dwelling unit (combined total of resident and visitor parking)	396 units	693
Retail Store	3.6 per 100 m <sup>2</sup> GFA	337 m <sup>2</sup>	12
<b>Maximum Permitted</b>			<b>705</b>
<b>Total Parking Proposed</b>			<b>196</b>
<i>Minimum Bicycle Parking Requirements</i>			
Dwelling, Mixed-Use Building	0.5 per dwelling unit	396 units	198
Retail Store	1.0 per 250 m <sup>2</sup> GFA	337 m <sup>2</sup>	1
<b>Minimum Required</b>			<b>199</b>
<b>Total Bicycle Parking Proposed</b>			<b>200</b>

Based on the previous table, the proposed number of vehicle and bicycle parking spaces meet all requirements of the ZBL. Of the 196 parking spaces, six will be allocated as accessible parking spaces.

Section 111(12) of the ZBL identifies that, where the number of bicycle parking spaces required for a single residential building exceeds 50 spaces, a minimum of 25% of the required total must be located within a building or structure, a secure area, or bicycle lockers. The proposed development will include eight exterior bicycle parking spaces and 192 interior bicycle parking spaces. Therefore, this requirement is met.

### 4.3 Boundary Streets

This section provides a review of the boundary streets Carling Avenue, Preston Street, and Sidney Street, using complete streets principles. The *Multi-Modal Level of Service (MMLOS) Guidelines*, produced by IBI Group in October 2015, were used to evaluate the levels of service for each alternative mode of transportation on Preston Street and Sidney Street. Per the *2017 TIA Guidelines*, an MMLOS review is not required for any streets where a complete streets concept has been developed. This applies to Carling Avenue, based on the functional design shown in **Figure 4**. Given the width between the proposed building and the curblines of Carling Avenue, it is anticipated that the sidewalks and segregated cycling facilities shown in the functional design can be accommodated. The segregated cycling facilities will provide a boulevard for pedestrians.

Due to the subject site's proximity to Dow's Lake O-Train Station, Preston Street and Sidney Street have been evaluated against the targets outlined for the 'Within 600m of a Rapid Transit Station' policy area, based on existing conditions.

A detailed MMLOS review of the boundary streets is included in **Appendix L**. A summary of the results of the segment MMLOS analysis for Preston Street and Sidney Street are provided in **Table 21**.



**Table 21: Segment MMLOS Summary**

Segment	PLOS		BLOS		TLOS		TkLOS	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target
Preston Street	E	A	F	B	F	-	B	D
Sidney Street	A	A	A	D	-	-	-	-

The results of the segment MMLOS analysis can be summarized as follows:

- Sidney Street meets the target pedestrian level of service (PLOS), while Preston Street does not;
- Sidney Street meets the target bicycle level of service (BLOS), while Preston Street does not;
- Preston Street achieves a transit level of service (TLOS) F, but does not have a TLOS target;
- Preston Street meets the target truck level of service (TkLOS).

Preston Street currently achieves a PLOS E. The best possible score is a PLOS C without changing the operating speed of the roadway (i.e. roadways with a curb lane AADT greater than 3,000 vpd and no on-street parking can only achieve a PLOS A if the operating speed is 30 km/h). To achieve a PLOS C, sidewalks with a minimum width of 2.0m and minimum boulevard width of 2.0m are required. This is identified for the City’s consideration. Along the site’s frontage, a sidewalk width greater than 4m is proposed. Considering 2m of this width to be boulevard width, the best possible PLOS C is achieved.

Sidewalk crowding has also been considered when determining the PLOS. Per Table 1 of the *Addendum to the MMLOS Guidelines*, a minimum sidewalk width of 3.0m is required to achieve the target PLOS A when the number of peak hour pedestrians is approximately 250 pedestrians. Based on the existing pedestrian volumes shown in **Figure 3**, the sidewalk at the northwest corner of Carling Avenue/Preston Street serves approximately 105 pedestrians during the AM peak hour and 115 pedestrians during the PM peak hour. Upon buildout of the proposed development, as well as other area developments, it is anticipated that the pedestrian volumes at this corner could increase closer to 250 pedestrians during the peak hours. The target PLOS A is anticipated to be met by the proposed development from a crowding perspective, as the sidewalk widths along the site’s frontages to Carling Avenue and Preston Street are anticipated to be 3.0m or wider, and will be significantly wider at the northwest corner of Carling Avenue/Preston Street.

A sidewalk of approximately 2m width is proposed along the site’s frontage to Sidney Street. This will maintain the PLOS of Sidney Street at the target PLOS A.

Preston Street currently achieves a BLOS D. Based on Exhibit 11 of the MMLOS Guidelines, the target BLOS B can be achieved by reducing the operating speed to 40 km/h, or a combination of curbside bike lanes with a minimum width of 1.5m and an operating speed of 50 km/h. In areas with on-street parking, a 4.25m-wide bike plus parking lane would also achieve the target BLOS B. This is identified for the City’s consideration.

#### 4.4 Access Design

The proposed development includes one two-way access to Sidney Street, at the northwest corner of the site. The existing depressed curbs to the subject site will be removed as part of the proposed development, and full-height curb and sidewalks will be reinstated per City standards. Curbs will be depressed and continuous across the proposed access to Sidney Street. The design of the proposed access has been evaluated using the provisions of the City's ZBL and *Private Approach By-Law* (PABL).

Section 25(a) of the PABL identifies that, for sites with 35m to 45m of frontage, a maximum of two private approaches (one-way or two-way) are permitted. The proposed private approach meets this requirement.

Section 25(c) of the PABL identifies a maximum width requirement of 9.0m for any two-way private approach, as measured at the street line. Since the private approach is approximately 6.0m in width, this requirement is met.

Section 25(m)(ii) of the PABL identifies that, for a property that abuts an arterial roadway or is within 46m of one, there is a minimum distance requirement between a private approach and the nearest intersecting street line, based on the land use and the number of parking spaces provided. For apartment buildings with 300 or more parking spaces, a minimum distance of 45m is required. The subject site does not have adequate frontage onto Carling Avenue, Preston Street, or Sidney Street to meet this requirement. Per Section 25(n) of the PABL, relief from the above requirement is permissible if the private approaches are constructed on the roadway carrying the least traffic and are located as far from the intersecting street as possible. Since the private approaches are proposed on Sidney Street, and are located as far from Preston Street as possible, it is therefore requested that the requirements of Section 25(m)(ii) be waived.

Section 25(p) of the PABL identifies a minimum separation requirement of 3m between a private approach and the nearest property line, as measured at the street line. As the proposed approach is approximately 2.7m from the western property line, this requirement is not met. Section 25(p) of the PABL also states that the 3m minimum can be reduced to as little as 0.3m, provided the proposed approach is located a safe distance from an access to the adjacent property, has adequate sight lines, and does not create a traffic hazard. As the proposed access is located at the terminus of Sidney Street, it is not anticipated to create a traffic hazard. Therefore, it is requested that the requirement of Section 25(p) be waived.

Section 25(u) of the PABL identifies a requirement that any private approach serving a parking area with more than 50 parking spaces shall not have a grade exceeding 2% for the first 9m inside the property line. Measuring from the property line, the grade of the proposed approach is 6% for 6m and 15% for the remaining 3m. Although the grade exceeds 2% for a distance of 9m within the property, the section of the ramp with a grade of 6% is long enough to allow outbound drivers to see pedestrians walking along Sidney Street. Therefore, a waiver of the PABL is requested.

Section 107(1)(a) of the ZBL identifies that for any driveway providing access to a residential parking garage, a minimum driveway width of 6.0m and maximum driveway width of 6.7m is allowed for a double traffic lane leading to 20 or more spaces. As the width of the proposed access is 6.0m in width, this requirement is met.

Section 107(1)(c) of the ZBL identifies that any drive aisles serving parking spaces within a parking garage must have a minimum width of 6.0m. As the width of all drive aisles within the parking garage have a width of 6.0m, this requirement is met.

The proposed access will be stop-controlled, with free flow on Sidney Street. It is anticipated that the proposed access will operate at an Auto LOS A in both peak hours. Detailed Synchro analysis of total traffic conditions is included in Sections 4.8.2 and 4.8.3.

## **4.5 Transportation Demand Management**

### **4.5.1 Context for TDM**

A breakdown of the proposed development's 396 dwellings into type can be summarized as follows:

- 25 bachelor/studio dwellings;
- 197 one-bedroom dwellings;
- 149 two-bedroom dwellings;
- 25 three-bedroom dwellings.

The proposed development also includes opportunities for ground-floor retail, located along the Carling Avenue frontage. The tenants for these retail areas are not yet known, but are assumed to be small trip generators with few employees, given the size. Therefore, the TDM measures checklist has not been reviewed for the retail use, as it is not required.

### **4.5.2 Need and Opportunity**

The subject site is located in the Preston-Carling District Secondary Plan, and is designated as 'Mixed Use Centre' in Schedule B of the City's Official Plan. As first shown in **Table 3**, the mode shares for the proposed uses are somewhat consistent with the mode share targets for a Transit-Oriented Development, with a lower transit share and higher non-auto share being applied. For both the proposed retail and residential uses, a 15% driver share was assumed during both the AM and PM peak hours.

The Ottawa Inner Area includes retail driver shares of 39% in the AM peak and 22% in the PM peak, and residential driver shares of 26% in the AM peak and 25% in the PM peak. Comparing to the mode share targets for a TOD site, failure to meet the 15% driver share target would equate an addition of approximately 24 vehicle trips during the AM peak hour and 26 vehicles during the PM peak hour.

As the planned transit lanes on Carling Avenue will often take the place of a general travel lane for all vehicles, it is anticipated that vehicular congestion will increase, and a failure to meet the proposed mode share targets may marginally increase congestion. However, the proposed development is located in close proximity to multiple bus stops as well as an LRT station, and connects to existing pedestrian and cycling networks. Further, the development is located in close proximity to many amenities, including commercial and retail areas, parks, recreation centres, and multi-use pathways.

### 4.5.3 TDM Program

A review of the City's *TDM Measures Checklist* has been conducted by the proponent, who has committed to providing the following TDM measures. A copy of the completed measures checklist is included in **Appendix K**.

- Display local area maps with walking/cycling access routes and key destinations at major entrances;
- Display relevant transit schedules and route maps at entrances;
- Unbundle parking cost from monthly rent;
- Provide a multimodal travel option information package to new residents.

### 4.6 Neighbourhood Traffic Management

The *2017 TIA Guidelines* identify two-way peak hour traffic volume thresholds for considering when a Neighbourhood Traffic Management (NTM) plan should be developed, when a site relies on local or collector roadways for access. For a local roadway, the NTM two-way volume threshold is 120 vph. This threshold is anticipated to be exceeded in all background and total traffic conditions (2028 and 2033). The proposed development relies on Sidney Street, a local roadway, as the only road to provide direct vehicular access. No neighbourhood traffic management measures are required, as Sidney Street is a dead-end street that only provides access to four different lots (7 Sidney Street, 490 Preston Street, 829 Carling Avenue, and 845 Carling Avenue).

### 4.7 Transit

Based on the trip generation presented in Section 3.1.1.4, the proposed development is anticipated to generate an additional 58 transit trips during the AM peak hour (including 43 boarding and 15 alighting), and an additional 51 transit trips during the PM peak hour (including 21 boarding and 30 alighting). The area is well-served with bus and light rail transit, and is served by OC Transpo Routes 2, 55, 56, and 85. Implementation of the Carling Avenue Transit Priority Measures and the extension of the Trillium Line are anticipated to be in place prior to buildout of the proposed development (i.e. OC Route 2 will return to rail service rather than bus replacement service).

The assumed distribution of vehicle trips to/from the proposed development were outlined in Section 3.1.2, and can be summarized as follows:

#### Proposed Retail Distribution

- 25% to/from the north;
- 25% to/from the south;
- 20% to/from the east;
- 30% to/from the west.

#### Proposed Residential Distribution

- 20% to/from the north;
- 30% to/from the south;
- 30% to/from the east;
- 20% to/from the west.

For the purposes of this review, the assumed transit distribution includes 25% for all four cardinal directions, with any trips originating from or destined to Prince of Wales Drive/Queen Elizabeth Driveway being redistributed to the south via OC Route 2. Per discussions with City staff, transit trips to/from the north are equally split between OC Routes 2, 56, and 85, transit trips to/from the south are solely assigned to OC Route 2, transit trips to/from the east are equally split between OC Routes 2 (transferring at Bayview Station to Route 1), 55, and 56, and transit trips to/from the west are equally split between OC Routes 2 (transferring at Bayview Station to Route 1), 55, and 85.

Winter 2020 (January 5 to March 7) transit utilization data within the study area was obtained from OC Transpo, and is included in **Appendix C**. This period is considered the most recent ‘normal’ ridership period, before ridership was impacted by the ongoing COVID-19 pandemic. Average peak period (6:00am to 9:00am and 3:00pm to 6:00pm) boarding, alighting, and bus load at departure information was obtained for stops #2397, #6655, #6657, #7369, #8013, #8014, and #8023. Ridership projections for the Dow’s Lake O-Train Station are confidential at the time of writing this report, and therefore, capacity analysis has only been conducted for the bus routes (OC Routes 55, 56, and 85).

Existing and projected boarding and alighting information is summarized in **Table 22**. Any zero (0) values in the table indicate a measured average boarding or alighting value of zero, rather than an absence of data. Peak period boarding and alighting data have been divided by three and rounded up to convert to peak hour boardings and alightings.

**Table 22: Existing and Projected Transit Utilization**

Stop	Location	Route (Dir)	Boarding (tph) <sup>(1)</sup>			Alighting (tph) <sup>(1)</sup>			
			Existing	Site	Total	Existing	Site	Total	
<b>AM Peak Hour</b>									
#3061	Dow’s Lake Station	2	NB	-	11	-	-	4	-
			SB	-	11	-	-	4	-
#2397	Preston/Carling	85	WB	2	1	3	8	0	8
#6655	Preston/Adeline	85	WB	0	1	1	2	0	2
#6657	Preston/Carling	85	EB	9	2	11	11	1	12
#7369	Carling/ O-Train Station	55	EB	3	2	5	8	1	9
		56	EB	2	2	4	2	1	3
		85	EB	3	2	5	24	1	25
#8013	Carling/Norfolk	55	WB	5	2	7	8	1	9
		56	WB	0	2	2	5	1	6
#8014	Carling/ O-Train Station	55	WB	12	2	14	2	1	3
		56	WB	3	2	5	2	0	2
		85	WB	10	1	11	4	0	4
#8023	Carling/Preston	55	EB	1	1	2	7	0	7
		56	EB	1	1	2	1	0	1
<b>PM Peak Hour</b>									
#3061	Dow’s Lake Station	2	NB	-	5	-	-	8	-
			SB	-	5	-	-	8	-
#2397	Preston/Carling	85	WB	7	1	8	2	1	3
#6655	Preston/Adeline	85	WB	1	1	2	3	1	4
#6657	Preston/Carling	85	EB	7	1	8	3	1	4
#7369	Carling/ O-Train Station	55	EB	2	1	3	11	1	12
		56	EB	1	1	2	4	1	5
		85	EB	3	1	4	17	1	18
#8013	Carling/Norfolk	55	WB	16	1	17	1	1	2
		56	WB	2	1	3	1	1	2
#8014	Carling/ O-Train Station	55	WB	10	1	11	2	1	3
		56	WB	4	1	5	2	1	3
		85	WB	29	1	30	8	1	9
#8023	Carling/Preston	55	EB	2	0	2	3	1	4
		56	EB	2	0	2	1	2	3

OC Routes 55, 56, and 85 are served by multiple bus stops within the study area, and therefore the average bus load at departure for stops further downstream account for site-generated transit trips boarding at the stops further downstream, and vice versa. The order of bus stops in the study area can be summarized as follows:

**OC Route 55**

- to Elmvale: #7369, #8023
- to Westgate: #8013, #8014

**OC Route 56**

- to King Edward: #7369, #8023
- to Tunney's Pasture: #8013, #8014

**OC Route 85**

- to Gatineau: #7369, #6657
- to Bayshore: #6655, #2397, #8014

A discussion of the site-generated impacts to each route during the weekday peak hours is included below.

Route 2 (to Bayview)

The proposed development is estimated to generate a net addition of 11 AM boarding trips, four AM alighting trips, five PM boarding trips, and eight PM alighting trips. As Route 2 runs on approximately 10-minute intervals, this equates to two AM boarding trips, one AM alighting trips, one PM boarding trip, and two PM alighting trips per train during the peak hours.

Route 2 (to Limebank/Airport)

The proposed development is estimated to generate a net addition of 11 AM boarding trips, four AM alighting trips, five PM boarding trips, and eight PM alighting trips. As Route 2 runs on approximately 10-minute intervals, this equates to two AM boarding trips, one AM alighting trips, one PM boarding trip, and two PM alighting trips per train during the peak hours.

Route 55 (to Elmvale)

At stops #7389 and #8023, the proposed development is estimated to generate a net addition of zero to two boarding or alighting trips at each stop during the AM and PM peak hours. As Route 55 runs on approximately 15-minute intervals, this equates to zero to one boarding or alighting trips per bus during the peak hours. Therefore, these additional transit trips are not anticipated to require more frequent service at these stops.

Route 55 (to Westgate)

At stops #8013 and #8014, the proposed development is estimated to generate a net addition of one to two boarding or alighting trips at each stop during the AM and PM peak hours. As Route 55 runs on approximately 15-minute intervals, this equates to zero to one boarding or alighting trips per bus during the peak hours. Therefore, these additional transit trips are not anticipated to require more frequent service at these stops.

Route 56 (to King Edward)

At stops #7369 and #8023, the proposed development is estimated to generate a net addition of one to two boarding or alighting trips at each stop during the AM and PM peak hours. As Route 56 runs on approximately 30-minute intervals, this equates to one to two boarding or alighting trips per bus during the peak hours. Therefore, these additional transit trips are not anticipated to require more frequent service at these stops.

Route 56 (to Tunney’s Pasture)

At stops #8013 and #8014, the proposed development is estimated to generate a net addition of one to two boarding or alighting trips at each stop during the AM and PM peak hours. As Route 56 runs on approximately 30-minute intervals, this equates to zero to one boarding or alighting trips per bus during the peak hours. Therefore, these additional transit trips are not anticipated to require more frequent service at these stops.

Route 85 (to Gatineau)

At stops #6657 and #7369, the proposed development is estimated to generate a net addition of one to two boarding or alighting trips at each stop during the AM and PM peak hours. As Route 85 runs on approximately 15-minute intervals, this equates to zero to one boarding or alighting trips per bus during the peak hours. Therefore, these additional transit trips are not anticipated to require more frequent service at these stops.

Route 85 (to Bayshore)

At stops #2397, #6655, and #8014, the proposed development is estimated to generate a net addition of zero to one boarding or alighting trips at each stop during the AM and PM peak hours. As Route 85 runs on approximately 15-minute intervals, this equates to zero to one boarding or alighting trips per bus during the peak hours. Therefore, these additional transit trips are not anticipated to require more frequent service at these stops.

**4.8 Intersection Design**

**4.8.1 Intersection MMLOS Review**

This section provides an MMLOS review of the signalized study area intersections, using complete streets principles. All intersections have been evaluated using the MMLOS targets for intersections within 600m of a rapid transit station, and are based on existing conditions.

The full intersection MMLOS analysis is included in **Appendix L**. A summary of the results is shown in **Table 23**.

**Table 23: Intersection MMLOS Summary**

Intersection	PLOS		BLOS		TLOS		TkLOS		Auto LOS	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target
Carling Avenue/ Sherwood Drive	F	A	F	B	C	C	D	D	B	E
Carling Avenue/ Champagne Avenue	F	A	F	C	C	C	F	D	A	E
Carling Avenue/ Trillium Pathway <sup>(1)</sup>	F	A	A	B	B	C	-	-	A	E
Carling Avenue/ Preston Street	F	A	F	B	F	C	D	D	F	E
Carling Avenue/ Booth Street	F	A	F	C	F	C	F	D	A	E
Preston Street/ Beech Street	D	A	F	B	B	-	F	D	A	E
Preston Street/ Pamilla Street	D	A	D	B	B	-	F	D	A	E
Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway	F	A	F	B	-	-	F	D	E	E

Intersection	PLOS		BLOS		TLOS		TkLOS		Auto LOS	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target
Preston Street/ Adeline Street <sup>(2)</sup>	-	-	-	-	-	-	-	-	C	E
Preston Street/ Sidney Street <sup>(2)</sup>	-	-	-	-	-	-	-	-	C	E

1. Signalized intersection with MUP, not evaluated for TkLOS

2. Unsignalized intersection, evaluated for Auto LOS only

The results of the intersection MMLOS analysis can be summarized as follows:

- All study intersections do not meet the target PLOS;
- All study intersections do not meet the target BLOS, except for Carling Avenue/Trillium Pathway;
- All study intersections with targets meet the target TLOS, except for Carling Avenue/Preston Street and Carling Avenue/Booth Street;
- All study intersections do not meet the target TkLOS, except for Carling Avenue/Sherwood Drive and Carling Avenue/Preston Street;
- All study area intersections meet the target Auto LOS, except for Carling Avenue/Preston Street.

The following includes further discussion for each intersection.

Carling Avenue/Sherwood Drive

The intersection does not meet the target PLOS A or BLOS B.

All approaches do not meet the target PLOS A, and have a cross-section equivalent to five lanes crossed or more. There is limited opportunity in improving the PLOS at each approach without reducing the number of travel lanes. Based on Exhibit 5 of the 2017 Addendum to the MMLOS Guidelines, any approach with a cross-section equivalent to four or more lanes crossed cannot achieve a PLOS A. Based on the functional design for the Carling Avenue Transit Priority Measures (shown in **Figure 4**), the future intersection will include shortened crossing distances at all approaches and a median refuge at the east approach.

The west approach does not meet the target BLOS B, based on left turn characteristics. Based on the functional design for the Carling Avenue Transit Priority Measures, segregated cycling facilities and a protected intersection design are planned, which will allow all left turns for cyclists to take place off-road. This would improve the intersection to a BLOS A.

Carling Avenue/Champagne Avenue

The intersection does not meet the target PLOS A, BLOS C, or TkLOS D.

All approaches do not meet the target PLOS A, and have a cross-section equivalent to four lanes crossed or more. There is limited opportunity in improving the PLOS at each approach without reducing the number of travel lanes. Based on the functional design for the Carling Avenue Transit Priority Measures, the future intersection will include shortened crossing distances at all approaches, a median refuge at the east approach, and zebra-striped crosswalks at the east and west approaches. No other modifications are identified.



The north and west approaches do not meet the target BLOS B, based on left turn characteristics, and the east approach does not meet the target based on right turn characteristics. Based on the functional design for the Carling Avenue Transit Priority Measures, segregated cycling facilities and a protected intersection design are planned, which will allow all left turns for cyclists to take place off-road. This would improve the intersection to a BLOS A.

The east approach does not meet the target TkLOS D. Increasing the curb radius for westbound right turns is required to meet the target. As Champagne Avenue is a local roadway and not a truck route, no modifications are recommended.

#### *Carling Avenue/Trillium Pathway*

The intersection does not meet the target PLOS A.

The east and west approaches do not meet the target PLOS A, as these approaches have a cross-section equivalent to nine lanes. There is limited opportunity in improving the PLOS without reducing the number of travel lanes on Carling Avenue. Based on the functional design for the Carling Avenue Transit Priority Measures, the future crossing will include a median refuge at the east approach. No other modifications are recommended.

#### *Carling Avenue/Preston Street*

The intersection does not meet the target PLOS A, BLOS B, TLOS C, or Auto LOS E.

All approaches do not meet the target PLOS A, and have a cross-section equivalent to four lanes crossed or more. There is limited opportunity in improving the PLOS at each approach without reducing the number of travel lanes. Based on the functional design for the Carling Avenue Transit Priority Measures, the future intersection will include zebra-striped crosswalks at all approaches and reduced crossing distances at the north and south approaches. No other modifications are recommended.

All approaches do not meet the target BLOS B, based on left turn characteristics. Based on the functional design for the Carling Avenue Transit Priority Measures, segregated cycling facilities are planned at the east and west approaches, and two-stage left-turn bike boxes are planned for eastbound and westbound cyclists. This will improve these approaches to a BLOS A. Two-stage left-turn bike boxes could be considered for northbound and southbound cyclists as well, and is identified for the City's consideration.

The north, east, and west approaches do not meet the target TLOS C during the AM and PM peak hours. As Preston Street is not designated within the City's RTTP networks, no recommendations are identified for the north approach. Comparing the delays of the north approach in the existing, 2033 background, and 2033 total conditions, the TLOS of the north approach is anticipated to remain at a TLOS F. It is anticipated that the transit priority measures proposed on Carling Avenue will allow the east and west approaches to operate at the target TLOS C or better (i.e. delays for buses will be 20 seconds or less for buses at these approaches).

The Auto LOS of the overall intersection does not meet the target Auto LOS E during the PM peak hour. As discussed, the northbound left turn, southbound through/right turn, and westbound left turn movements individually do not meet the target Auto LOS E. Further discussion of the existing operations at this intersection are included in Section 3.4.1.

Carling Avenue/Booth Street

The intersection does not meet the target PLOS A, BLOS C, TLOS C, or TkLOS D.

All approaches do not meet the target PLOS A, and have a cross-section equivalent to four lanes crossed or more. There is limited opportunity in improving the PLOS at each approach without reducing the number of travel lanes. Based on the functional design for the Carling Avenue Transit Priority Measures, the future intersection will include shortened crossing distances at all approaches, and zebra-striped crosswalks at the east and west approaches. No other modifications are recommended.

All approaches do not meet the target BLOS C, based on both left and right turn characteristics. Based on the functional design for the Carling Avenue Transit Priority Measures, segregated cycling facilities and a protected intersection design are planned, which will allow all left turns for cyclists to take place off-road. This would improve the intersection to a BLOS A.

The north and east approaches do not meet the target TLOS C during the AM and PM peak hours, and the west approach does not meet the target TLOS C during the AM peak hour only. As Booth Street is not designated within the City's RTTP networks, no recommendations are identified for the north approach. The TLOS of the north approach is anticipated to remain at a TLOS F in future conditions. It is anticipated that the transit priority measures proposed on Carling Avenue will allow the east and west approaches to operate at the target TLOS C or better (i.e. delays for buses will be 20 seconds or less for buses at these approaches).

The east approach does not meet the target TkLOS D. Based on the functional design for the Carling Avenue Transit Priority Measures, the receiving lane for this movement will be a wider lane, and may accommodate trucks turning right from the east approach. Therefore, no further modifications are recommended.

Preston Street/Beech Street

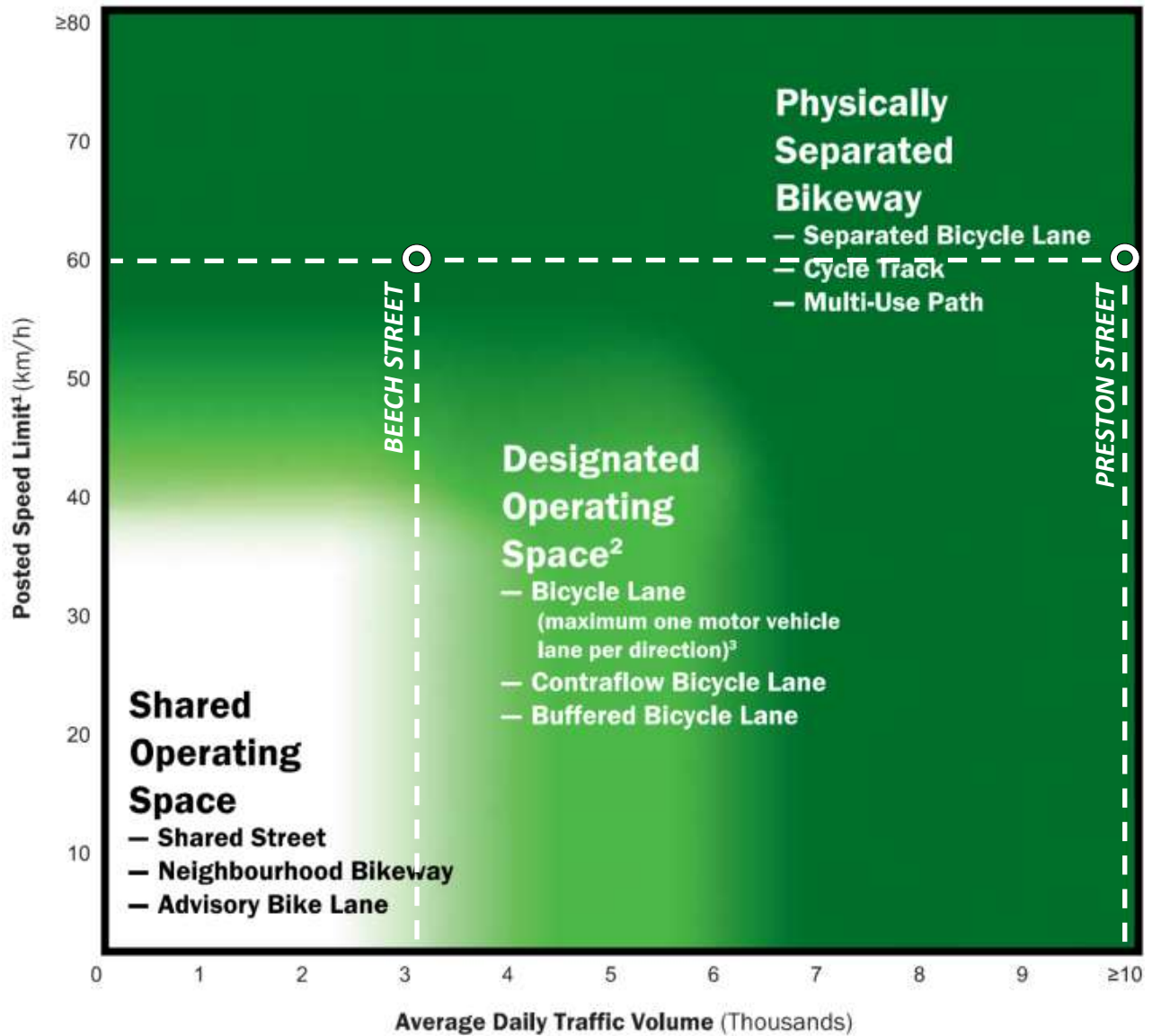
The intersection does not meet the target PLOS A, BLOS B, or TkLOS D.

All approaches do not meet the target PLOS A, and have a cross-section equivalent to three or four lanes crossed. There is limited opportunity in improving the PLOS at each approach to the target, without the removal of auxiliary turn lanes.

The north, south, and east approaches do not meet the target BLOS B based on left turn characteristics, and the east approach does not meet the target BLOS B based on right turn characteristics. A review of the Desirable Cycling Facility Pre-Selection Nomograph included in *Ontario Traffic Manual (OTM) – Book 18* identifies that designated bike lanes are appropriate on Beech Street, while a physically separated bikeway is appropriate for Preston Street. This is identified for the City's consideration. The pre-selection tool is included in **Figure 16**. Alternatively, a reduction of the operating speed to 40 km/h on Preston Street and Beech Street on all approaches would improve the BLOS to the target BLOS B based on left turn characteristics.

All approaches do not meet the target TkLOS D. Increasing the curb radii are required to meet the target. As Beech Street is a local roadway and not a truck route, no modifications are recommended.

Figure 16: Desirable Cycling Facility Pre-Selection Nomograph



Preston Street/Pamilla Street

The intersection does not meet the target PLOS A, BLOS B, or TkLOS D.

The north, south, and west approaches do not meet the target PLOS A. There is limited opportunity in improving the PLOS at these approaches as the number of travel lanes cannot be reduced. The north and south approaches meet the City’s vehicle/pedestrian conflict threshold for zebra-striped crosswalks (greater than 400,000 vehicle/pedestrian conflicts over an eight-hour period). Therefore, these crosswalks could be textured similar to the crosswalks at the east and west approaches, or similar to the crosswalks at Preston Street/Beech Street. Curb bulbouts could be considered to reduce crossing distance.

The north and south approaches do not meet the target BLOS B based on left turn characteristics. As stated for the previous intersection, designated bike lanes or a reduction in the operating speed to 40 km/h on Preston Street could be considered.

All approaches do not meet the target TkLOS D. Increasing the curb radii are required to meet the target TkLOS D. As Pamilla Street is a local roadway and not a truck route, no modifications are recommended.

Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway

The intersection does not meet the target PLOS A, BLOS B, or TkLOS D.

All approaches do not meet the target PLOS A, and have a cross-section equivalent to four lanes crossed or more. There is limited opportunity in improving the PLOS at each approach to the target, without the removal of auxiliary turn lanes. Based on Exhibit 5 of the 2017 Addendum to the MMLOS Guidelines, any approach with a cross-section of four or more lanes crossed cannot achieve a PLOS A. The north, east, and west approaches meet the City’s vehicle/pedestrian conflict threshold for zebra-striped crosswalks, and could increase the level of comfort for pedestrians. This is identified for the City’s consideration.

The north and west approaches do not meet the target BLOS B based on left turn characteristics, and the north approach does not meet the target BLOS B based on right turn characteristics. Based on Exhibit 12 of the MMLOS Guidelines, the target BLOS can be achieved by implementing two-stage left-turn bike boxes for southbound and westbound cyclists. As discussed previously, curbside bike lanes on Preston Street are also identified as appropriate per the OTM Pre-Selection Tool. These improvements are identified for the City’s consideration.

The south and west approaches do not meet the target TkLOS D. As these approaches involve heavy vehicles turning right into or out of the Dow’s Lake Pavilion, no modifications are recommended.

**4.8.2 2028 Total Intersection Operations**

Intersection capacity analysis has been conducted for the 2028 total traffic conditions. Signal timings within the study area reflect the optimized conditions first described in Section 3.4.2. The results of the analysis are summarized in **Table 23** and **Table 24** for the weekday AM and PM peak hours. Detailed reports are included in **Appendix M**.

**Table 24: 2028 Total Traffic Operations**

Intersection	Period	Critical Movements			Intersection		
		Max v/c or Delay	LOS	Mvmt	v/c	Delay	LOS
Carling Avenue/ Sherwood Drive <sup>(1)</sup>	AM	0.56	A	SBL	0.36	12 sec	A
	PM	0.70	B	WBT	0.68	15 sec	B
Carling Avenue/ Champagne Avenue <sup>(1)</sup>	AM	0.45	A	WBL	0.35	7 sec	A
	PM	0.67	B	SBR	0.53	13 sec	A
Carling Avenue/ Trillium Pathway <sup>(2)</sup>	AM	0.41	A	WBT	0.39	4 sec	A
	PM	0.53	A	WBT	0.47	3 sec	A

Intersection	Period	Critical Movements			Intersection		
		Max v/c or Delay	LOS	Mvmt	v/c	Delay	LOS
Carling Avenue/ Preston Street <sup>(1)</sup>	AM	1.02	F	NBL	1.02	53 sec	F
		1.07	F	EBT/R			
	PM	1.45	F	NBL	1.19	92 sec	F
		1.05	F	SBT/R			
		1.02	F	EBL			
		1.13	F	EBT/R			
		1.29	F	WBL			
Carling Avenue/ Booth Street <sup>(1)</sup>	AM	1.09	F	WBT	0.99	49 sec	E
	PM	1.01	F	EBL	1.05	58 sec	F
1.11		F	WBT				
Preston Street/ Beech Street <sup>(1)</sup>	AM	0.64	B	NBT	0.56	12 sec	A
	PM	0.55	A	WBL/T	0.45	12 sec	A
Preston Street/ Pamilla Street <sup>(1)</sup>	AM	0.50	A	NBT	0.44	4 sec	A
	PM	0.42	A	NBT	0.40	5 sec	A
Preston Street/ Adeline Street <sup>(3)</sup>	AM	29 sec	D	EBL/T/R	-		
	PM	24 sec	C	WBL/T/R			
Preston Street/ Sidney Street <sup>(3)</sup>	AM	21 sec	C	EBL/R	-		
	PM	20 sec	C	EBL/R			
Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway <sup>(1)</sup>	AM	0.64	B	SBL/T	0.58	18 sec	D
	PM	0.97	E	SBL/T	0.77	30 sec	C
Sidney Street/ Site Access <sup>(3)</sup>	AM	9 sec	A	NBR	-		
	PM	9 sec	A	NBR			

- 1. Signalized intersection
- 2. Signalized pathway crossing
- 3. Unsignalized intersection

**Table 25: 2028 Total Queues**

Intersection	Mvmt	Storage/ Spacing <sup>(1)</sup>	AM Peak			PM Peak		
			v/c [LOS]	50 <sup>th</sup> % Queue (m)	95 <sup>th</sup> % Queue (m)	v/c [LOS]	50 <sup>th</sup> % Queue (m)	95 <sup>th</sup> % Queue (m)
Carling Avenue/ Preston Street	NBL	75m	1.02 [F]	~48	#100	1.45 [F]	~107	m#166
	SBL	35m	0.78 [C]	27	#58	0.58 [A]	23	43
	SBT/R	35m	0.98 [E]	98	#160	1.05 [F]	~126	#188
	EBL	65m	0.81 [D]	30	#63	1.02 [F]	~41	#89
	EBT/R	95m	1.07 [F]	~107	#141	1.13 [F]	~144	#175
	WBL	110m	0.95 [E]	54	m58	1.29 [F]	~117	m#120
Carling Avenue/ Booth Street	WBT	50m	0.77 [C]	91	m90	0.88 [D]	133	m124
	SBL	--	0.70 [B]	50	75	0.88 [D]	74	#114
	EBL	75m	0.98 [E]	~113	m#133	1.01 [F]	~76	m#85
Preston Street/ Prince of Wales Drive/Queen Elizabeth Driveway	WBT	85m	1.09 [F]	~204	#272	1.12 [F]	~287	#360
	SBL/T	135m	0.64 [B]	45	m45	0.97 [E]	93	m64
	EBL	55m	0.62 [B]	48	61	0.61 [B]	34	44

- 1. Indicates the storage length for auxiliary lanes or the spacing to the nearest upstream intersection for through lanes
- m: volume for the 95<sup>th</sup> percentile queue is metered by an upstream signal
- #: volume for the 95<sup>th</sup> percentile cycle exceeds capacity
- ~: approach is above capacity

Comparing the previous tables and the 2028 background conditions, traffic generated by the proposed development is anticipated to have marginal operational effects within the study area. The discussion of over-capacity movements and queue lengths are generally consistent with those described in Section 3.4.2.

### 4.8.3 2033 Total Intersection Operations

Intersection capacity analysis has been conducted for the 2033 total traffic conditions. Signal timings within the study area reflect the optimized conditions first described in Section 3.4.2. The results of the analysis are summarized in **Table 25** and **Table 26** for the weekday AM and PM peak hours. Detailed reports are included in **Appendix M**.

**Table 26: 2033 Total Traffic Operations**

Intersection	Period	Critical Movements			Intersection		
		Max v/c or Delay	LOS	Mvmt	v/c	Delay	LOS
Carling Avenue/ Sherwood Drive <sup>(1)</sup>	AM	0.56	A	SBL	0.35	13 sec	A
	PM	0.63	B	WBT	0.62	15 sec	B
Carling Avenue/ Champagne Avenue <sup>(1)</sup>	AM	0.41	A	WBL	0.31	7 sec	A
	PM	0.64	B	SBR	0.48	13 sec	A
Carling Avenue/ Trillium Pathway <sup>(2)</sup>	AM	0.39	A	WBT	0.36	4 sec	A
	PM	0.47	A	WBT	0.43	3 sec	A
Carling Avenue/ Preston Street <sup>(1)</sup>	AM	<b>1.05</b>	<b>F</b>	<b>NBL</b>	0.99	50 sec	E
	PM	<b>1.46</b>	<b>F</b>	<b>NBL</b>	<b>1.18</b>	<b>92 sec</b>	<b>F</b>
		<b>1.07</b>	<b>F</b>	<b>SBT/R</b>			
		<b>1.06</b>	<b>F</b>	<b>EBL</b>			
		<b>1.09</b>	<b>F</b>	<b>EBT/R</b>			
<b>1.29</b>	<b>F</b>	<b>WBL</b>					
Carling Avenue/ Booth Street <sup>(1)</sup>	AM	<b>1.05</b>	<b>F</b>	<b>WBT</b>	0.97	46 sec	E
	PM	<b>1.01</b>	<b>F</b>	<b>EBL</b>	0.98	46 sec	E
		<b>1.01</b>	<b>F</b>	<b>WBT</b>			
Preston Street/ Beech Street <sup>(1)</sup>	AM	0.66	B	NBT	0.59	12 sec	A
	PM	0.58	A	WBL/T	0.46	12 sec	A
Preston Street/ Pamilla Street <sup>(1)</sup>	AM	0.51	A	NBT	0.45	4 sec	A
	PM	0.43	A	NBT	0.42	5 sec	A
Preston Street/ Adeline Street <sup>(3)</sup>	AM	38 sec	E	EBL/T/R	-		
	PM	28 sec	D	EBL/T/R			
Preston Street/ Sidney Street <sup>(3)</sup>	AM	23 sec	C	EBL/R	-		
	PM	21 sec	C	EBL/R			
Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway <sup>(1)</sup>	AM	0.64	B	SBL/T	0.59	18 sec	A
	PM	0.98	E	SBL/T	0.77	30 sec	C
Sidney Street/ Site Access <sup>(3)</sup>	AM	9 sec	A	NBR	-		
	PM	9 sec	A	NBR			

- 1. Signalized intersection
- 2. Signalized pathway crossing
- 3. Unsignalized intersection

**Table 27: 2033 Total Queues**

Intersection	Mvmt	Storage/Spacing <sup>(1)</sup>	AM Peak			PM Peak		
			v/c [LOS]	50 <sup>th</sup> % Queue (m)	95 <sup>th</sup> % Queue (m)	v/c [LOS]	50 <sup>th</sup> % Queue (m)	95 <sup>th</sup> % Queue (m)
Carling Avenue/ Preston Street	NBL	75m	<b>1.05 [F]</b>	~51	<b>#103</b>	<b>1.46 [F]</b>	~107	<b>m#167</b>
	SBL	35m	0.85 [D]	30	#65	0.62 [B]	25	46
	SBT/R	35m	1.00 [E]	102	#165	<b>1.07 [F]</b>	~129	<b>#191</b>
	EBL	65m	0.81 [D]	30	#64	<b>1.06 [F]</b>	~48	<b>#92</b>
	EBT/R	95m	0.99 [E]	50	#125	<b>1.09 [F]</b>	~134	<b>#167</b>
	WBL	110m	0.95 [E]	54	m#64	<b>1.29 [F]</b>	~117	<b>m#134</b>
	WBT	50m	0.74 [C]	87	m89	0.80 [C]	115	m119
Carling Avenue/ Booth Street	SBL	--	0.70 [B]	50	75	0.88 [D]	74	#114
	EBL	75m	0.98 [E]	~114	m#139	<b>1.01 [F]</b>	~76	<b>m#89</b>
	WBT	85m	<b>1.05 [F]</b>	~190	<b>#258</b>	<b>1.01 [F]</b>	~230	<b>#311</b>
Preston Street/ Prince of Wales Drive/Queen Elizabeth Driveway	SBL/T	135m	0.64 [B]	46	m47	0.98 [E]	94	m65
	EBL	55m	0.62 [B]	48	61	0.61 [B]	34	45

1. Indicates the storage length for auxiliary lanes or the spacing to the nearest upstream intersection for through lanes  
m: volume for the 95<sup>th</sup> percentile queue is metered by an upstream signal  
#: volume for the 95<sup>th</sup> percentile cycle exceeds capacity  
~: approach is above capacity

Comparing the previous tables and the 2033 background conditions, traffic generated by the proposed development is anticipated to have marginal operational effects within the study area. The discussion of over-capacity movements and queue lengths are consistent with those described in Section 3.4.3.

Based on the southbound queues at Carling Avenue/Preston Street, it is anticipated that northbound left turns and eastbound left/right turns at Preston Street/Sidney Street will rely on courtesy from queued drivers on Preston Street to complete their turns during the peak hours. As there are two northbound lanes approaching Sidney Street, northbound through vehicles can use the curbside lane to bypass a northbound left turning vehicle. This is consistent with the existing intersection operations.

Based on the net site-generated traffic volumes shown in **Figure 9**, the proposed development will add:

- Six to twelve northbound left turning vehicles (equivalent to one vehicle every five to ten minutes during the peak hours);
- Two to three eastbound left turning vehicles (equivalent to one vehicle every 20 to 30 minutes during the peak hours), and;
- Nine to thirteen eastbound right turning vehicles (equivalent to one vehicle every four to seven minutes during the peak hours).

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

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

### Forecasting

- The proposed development is estimated to generate a net additional 140 person trips (including 17 vehicle trips) during the AM peak hour and 112 person trips (including 16 vehicle trips) during the PM peak hour.

### Development Design

- Concrete sidewalks will be provided around the north, south, and east sides of the proposed building, and will connect to existing sidewalks on Sidney Street, Preston Street, and Carling Avenue. The proposed development will include eight exterior bicycle parking spaces and 192 interior bicycle parking spaces.
- OC Transpo stops #2397, #6655, #6657, #7369, #8013, #8014, #8023, and the Dow's Lake O-Train Station are within 400m walking distance of all entrances to the proposed development.
- All required Transportation Demand Management (TDM)-supportive design and infrastructure measures in the TDM checklist are met.

### Parking

- The proposed development includes 196 vehicle parking spaces, meeting the minimum number of required parking spaces and maximum number of permitted parking spaces, as outlined in the City's *Zoning By-Law* (ZBL).
- The proposed development includes 200 bicycle parking spaces, meeting the minimum number of required spaces as outlined in the City's ZBL. Section 111 outlines a requirement to provide at least 25% of bicycle spaces within a secure area or structure, which is also met by the proposed development.

### Boundary Streets

- Sidney Street meets the target pedestrian level of service (PLOS) A and the target bicycle level of service (BLOS) D.
- Preston Street does not meet the target PLOS A or BLOS B, meets the target truck level of service (TkLOS) D, and achieves a transit level of service (TLOS) F, but has no target.
- The best possible PLOS for Preston Street is a PLOS C, which would require sidewalks with a minimum width of 2.0m and a minimum boulevard width of 2.0m. This is identified for the City's consideration. Along the site's frontage, a sidewalk width greater than 4m is proposed. Considering 2m of this width to be boulevard width, the best possible PLOS C will be achieved. The target PLOS A is anticipated to be met by the proposed development from a crowding perspective, as the sidewalk widths along the site's frontages to Carling Avenue and Preston Street are anticipated to be 3.0m or wider, and will be significantly wider at the northwest corner of Carling Avenue/Preston Street.



- The target BLOS B for Preston Street can be achieved by reducing the operating speed to 40 km/h, or a combination of curbside bike lanes with a minimum width of 1.5m and an operating speed of 50 km/h. In areas with on-street parking, a 4.25m-wide bike plus parking lane would also achieve the target BLOS B. This is identified for the City's consideration.
- A sidewalk of approximately 2m width is proposed along the site's frontage to Sidney Street. This will maintain the PLOS of Sidney Street at the target PLOS A.

#### Access Design

- The existing depressed curbs to the subject site will be removed as part of the proposed development, and full-height curb and sidewalks will be reinstated per City standards. Curbs will be depressed and continuous across the proposed access to Sidney Street.
- The proposed access meets the requirements of Sections 25(a) and 25(c) of the *Private Approach By-Law*, and Section 107(1) of the ZBL. It is requested that the requirements of Sections 25(m)(ii), 25(p), and 25(u) of the *Private Approach By-Law* be waived, as the access is proposed as far from Preston Street as possible, will maintain proper sightlines, and will not create a traffic hazard.
- The proposed access will be stop-controlled, with free flow on Sidney Street. It is anticipated that the proposed access will operate acceptably during both peak hours.

#### Transportation Demand Management

- The proponent has committed to providing the following TDM measures:
  - Display local area maps with walking/cycling access routes and key destinations at major entrances;
  - Display relevant transit schedules and route maps at entrances;
  - Unbundle parking cost from monthly rent;
  - Provide a multimodal travel option information package to new residents.

#### Neighbourhood Traffic Management

- The proposed development relies on the local roadway Sidney Street for direct vehicular access. No neighbourhood traffic management measures are required, as Sidney Street is a short, dead-end roadway that only provides access to four different lots (7 Sidney Street, 490 Preston Street, 829 Carling Avenue, and 845 Carling Avenue).

#### Transit

- The proposed development is anticipated to generate an additional 58 transit trips during the AM peak hour (including 43 boarding and 15 alighting), and an additional 51 transit trips during the PM peak hour (including 21 boarding and 30 alighting). It is anticipated that the proposed development will not require more frequent service at the Dow's Lake O-Train Station and surrounding bus stops.

Intersection MMLOS

- The results of the intersection MMLOS analysis can be summarized as follows:
  - All study area intersections do not meet the target PLOS;
  - All study area intersections do not meet the target BLOS, except for Carling Avenue/Trillium Pathway;
  - All study area intersections with targets meet the target TLOS, except for Carling Avenue/Preston Street and Carling Avenue/Booth Street;
  - All study area intersections do not meet the target TkLOS, except for Carling Avenue/ Sherwood Drive and Carling Avenue/Preston Street;
  - All study area intersections meet the target vehicular level of service (Auto LOS), except for Carling Avenue/Preston Street.
  
- Pedestrian Level of Service
  - All approaches at Carling Avenue/Sherwood Drive, Carling Avenue/Champagne Avenue, Carling Avenue/Preston Street, and Carling Avenue/Booth Street, and the east and west approach at Carling Avenue/Trillium Pathway, do not meet the target PLOS A. The functional design for the Carling Avenue Transit Priority Measures outlines various measures to improve the level of comfort for pedestrians, but the target PLOS A will not be achieved at any approach.
  
  - All approaches of Preston Street/Beech Street do not meet the target PLOS A. There is limited opportunity in improving the PLOS without the removal of auxiliary turn lanes.
  
  - The north, south, and west approaches of Preston Street/Pamilla Street do not meet the target PLOS A. The north and south approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks. Therefore, textured crosswalks similar to the east and west approaches at this intersection could be considered. Curb bulbouts could be considered to reduce crossing distance.
  
  - All approaches of Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway do not meet the target PLOS A. The north, east, and west approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks. This is identified for the City's consideration.
  
- Bicycle Level of Service
  - The west approach of Carling Avenue/Sherwood Drive, the north and west approaches of Carling Avenue/Champagne Avenue, and all approaches of Carling Avenue/Booth Street do not meet the target BLOS. The functional design for the Carling Avenue Transit Priority Measures identify segregated cycling facilities and protected intersections at these locations, which will allow all left turns for cyclists to take place off-road, and improve these approaches to a BLOS A.
  
  - All approaches of Carling Avenue/Preston Street does not meet the target BLOS B. The functional design for the Carling Avenue Transit Priority Measures identify segregated cycling facilities and two-stage left-turn bike boxes for eastbound and westbound cyclists, which would improve these approaches to a BLOS A. Two-stage bike boxes could be considered for northbound/southbound cyclists as well, and is identified for the City's consideration.

- The north, south, and east approaches of Preston Street/Beech Street do not meet the target BLOS B. The *Ontario Traffic Manual – Book 18* identifies that designated bike lanes are appropriate on Beech Street, while a physically separated bikeway is appropriate for Preston Street. This is identified for the City's consideration. Alternatively, a reduction of the speed limit to 40 km/h on both roadways would improve the BLOS to the target.
- The north and south approaches of Preston Street/Pamilla Street do not meet the target BLOS B. Designated bike lanes or a reduction in the operating speed to 40 km/h on Preston Street could be considered.
- The north and west approaches of Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway do not meet the target BLOS B. The target BLOS can be achieved for these approaches with the implementation of two-stage left-turn bike boxes. This is identified for the City's consideration.
- Transit Level of Service
  - The north, east, and west approaches at Carling Avenue/Preston Street, and the north and east approaches at Carling Avenue/Booth Street, do not meet the target TLOS C during the AM and PM peak hours. The transit priority measures on Carling Avenue are anticipated to allow the east and west approaches to operate at a TLOS C or better. The north approaches at both intersections are anticipated to continue operating below the target TLOS in future conditions.
- Truck Level of Service
  - The east approach of Carling Avenue/Champagne Avenue does not meet the target TkLOS D. As Champagne Avenue is a local roadway and not a truck route, no modifications are recommended.
  - The east approach of Carling Avenue/Booth Street does not meet the target TkLOS D. Based on the functional design for the Carling Avenue Transit Priority Measures, the receiving lane for this movement will be a wider lane, and may accommodate trucks turning right from the east approach. Therefore, no further modifications are recommended.
  - All approaches of Preston Street/Beech Street and Preston Street/Pamilla Street do not meet the target TkLOS D. While the target TkLOS could be met by increase the curb radii, Beech Street and Pamilla Street are local roadways and not truck routes. Therefore, no modifications are recommended.
  - The south and west approaches of Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway do not meet the target TkLOS D. As these approaches involve heavy vehicles turning right into or out of the Dow's Lake Pavilion, no modifications are recommended.

#### Existing Intersection Operations

- At Carling Avenue/Preston Street, the northbound left turn, southbound through/right turn, and westbound left turn movements do not meet the target Auto LOS E during the PM peak hour.

- At Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway, the southbound left turn/through movement does not meet the target Auto LOS E during the AM and PM peak hours.
- During the AM and PM peak hours, southbound queueing at Carling Avenue/Preston Street extends through the upstream intersection at Preston Street/Sidney Street. While the Synchro analysis does not identify operational concerns at Preston Street/Sidney Street, it is acknowledged that additional traffic volumes generated by future developments may trigger a restriction of the eastbound movements on Sidney Street to right turns only, due to potential safety and congestion issues.

#### Background Intersection Operations

- Traffic throughout the study area could be displaced or alleviated through a combination of increased use of non-auto modes of transportation, alternate times of travel for drivers, and alternate routes of travel. It is assumed that the Carling Avenue Transit Priority Measures project will increase the transit modal share and decrease the auto modal share by the buildout year 2028.
- As congestion increases within the study area, some motorists may alter their travel times to occur outside of the peak hours and alter their routes to other roadways within proximity of the study area.
- At Carling Avenue/Preston Street, a reduction of 10 northbound left turning vehicles during the AM peak hour, and 90 northbound left turning vehicles, 30 southbound through/right turning vehicles, 10 eastbound left turning vehicles, 70 eastbound through/right turning vehicles, and 90 westbound left turning vehicles during the PM peak hour would be required to meet the target Auto LOS E in the 2033 background conditions.
- At Carling Avenue/Booth Street, a reduction of 30 westbound through vehicles during the AM peak hour, and 10 westbound through vehicles during the PM peak hour would be required to meet the target Auto LOS E in the 2033 background conditions.
- Restriction of the eastbound left turn at Preston Street/Sidney Street would impact the southbound left turn movement at Carling Avenue/Preston Street and the eastbound left turn movement at Carling Avenue/Booth Street. The Auto LOS for both movements will downgrade to an Auto LOS F during the AM peak hour.

#### Total Intersection Operations

- Traffic generated by the proposed development is anticipated to have marginal operational effects for most movements at the study area intersections.
- It is anticipated that northbound left turns and eastbound left/right turns at Preston Street/Sidney Street will rely on courtesy from queued drivers on Preston Street to complete their turns during the peak hours. As there are two northbound lanes approaching Sidney Street, northbound through vehicles can use the curbside lane to bypass a northbound left turning vehicle. This is consistent with the existing intersection operations.

- The proposed development will add:
  - Six to twelve northbound left turning vehicles (equivalent to one vehicle every five to ten minutes during the peak hours);
  - Two to three eastbound left turning vehicles (equivalent to one vehicle every 20 to 30 minutes during the peak hours), and;
  - Nine to thirteen eastbound right turning vehicles (equivalent to one vehicle every four to seven minutes during the peak hours).

Based on the foregoing, the proposed development can be recommended from a transportation perspective.

**NOVATECH**

Prepared by:

Reviewed by:



Joshua Audia, P.Eng.  
Project Engineer | Transportation



Brad Byvelds, P.Eng.  
Project Manager | Transportation

## **APPENDIX A**

---

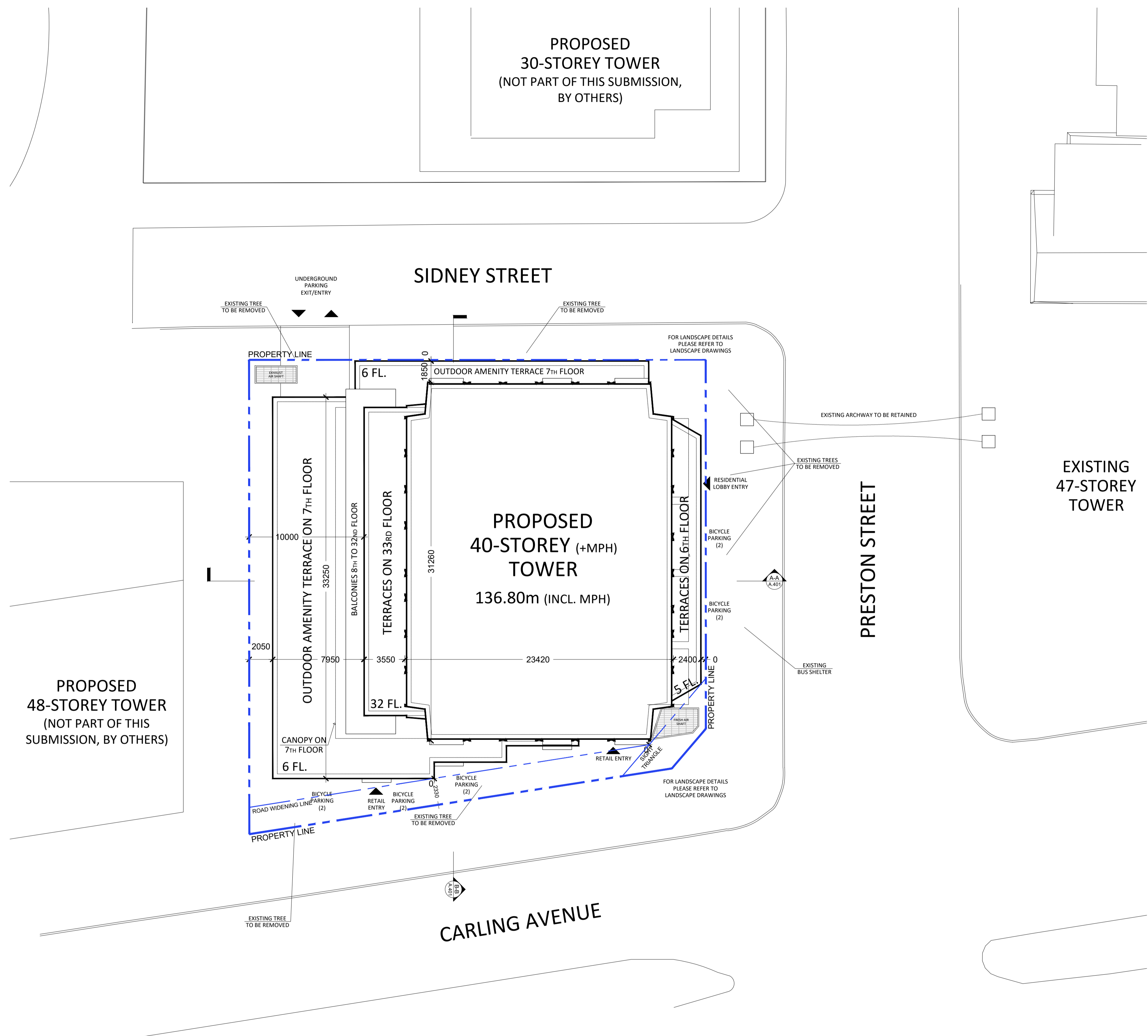
Proposed Site Plan

DEVELOPMENT AREA SUMMARY		
SITE AREA (INCL. ROAD WIDENING)	1,519 m <sup>2</sup>	16,350 ft <sup>2</sup>
SITE AREA (EXCL. ROAD WIDENING)	1,417 m <sup>2</sup>	15,253 ft <sup>2</sup>
FSI (LOT AREA INCL. ROAD WIDENING)	15.35	

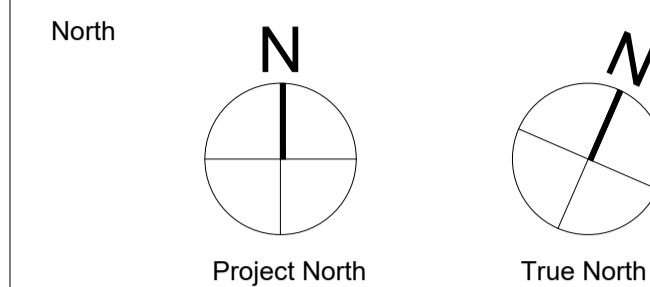
DEVELOPMENT GFA SUMMARY		
TOTAL RESID. GFA	22,983.0 m <sup>2</sup>	247,394 ft <sup>2</sup>
TOTAL RETAIL GFA	337.0 m <sup>2</sup>	3,628 ft <sup>2</sup>
TOTAL GFA	23,320.0 m <sup>2</sup>	251,022 ft <sup>2</sup>

RESIDENTIAL UNIT BREAKDOWN				
B./ST.	1BR	2BR	3BR	TOTAL
25	197	149	25	396
6.3%	49.8%	37.6%	6.3%	-

ZONING TABLE			
PROVISION	REQUIRED	PROVIDED	COMPLIANCE
MIN. LOT AREA	NO MINIMUM	1,519 m <sup>2</sup>	✓
MIN. LOT WIDTH	NO MINIMUM	32.16 m	✓
MIN. FRONT YARD SETBACK	MIXED-USE BLDG: 0m	0 m	✓
MIN. CORNER SIDE YARD SETBACK	MIXED-USE BLDG: 0m	0 m	✓
MIN. REAR YARD	MIXED-USE BLDG NOT ABUTTING A RESIDENTIAL ZONE: 0m	0 m	✓
BUILDING HEIGHT	MAX. 30m AND NO HIGHER THAN 9 STOREYS	136.80m (INCL. MPH; 40 ST.)	✗
AMENITY AREA	MIN. 6m <sup>2</sup> /DU; 50% MUST BE COMMUNAL; 396x6x=2,376m <sup>2</sup> TOTAL AND 1,198m <sup>2</sup> COMM.	COMMUNAL: 1,199 m <sup>2</sup>	✓
MINIMUM RESID. VEHICLE PARKING	AREA Z: NO PARKING REQ'D.	166 SPACES	✓
MAXIMUM RESID. VEHICLE PARKING	1.75 SPACES / DU 396 x 1.75 = 693	166 SPACES	✓
MINIMUM VISITOR PARKING	0.1 SPACES / DU AFTER FIRST 12 DU, MAX. 30 SPACES REQUIRED	30 SPACES	✓
MIN. COMMERCIAL VEHICLE PARKING	AREA Z: NO PARKING REQ'D.	0 SPACES	✓
MIN. RESIDENTIAL BICYCLE PARKING	MIN. RESID. BICYCLE PARK. 0.5 SPACES / DU 396 x 0.5 = 198 SPACES	198 SPACES	✓
MIN. COMMERCIAL BICYCLE PARKING	1 / 250m <sup>2</sup> GFA 335m <sup>2</sup> = 1.34 (2 ROUNDED)	2 SPACES	✓
DRIVEWAY WIDTH	TWO-WAY FOR RESID.: 6.0m	6.0 m	✓
AISLE WIDTH	90-DEGREE PARKING SPACES: 6.0m	6.0 m	✓
PARKING SPACE SIZE	MAX. 40% OF RESID. SPACES CAN BE SMALL SIZE (2.4m x 4.6m) 196 x 40% = 79 SPACES	SMALL SIZE PARK.: 25	✓



- General Notes:
- These Contract Documents are the property of the Architect. The Architect bears no responsibility for the interpretations of these documents by the contractor. Upon written application the Architect will provide written/ graphic clarification or supplementary information regarding the intent of the Contract Documents. The Architect will review Shop Drawings submitted by the Contractor for design conformance only.
  - Drawings are not to be scaled for construction. Contractor to verify all existing conditions and dimensions required to perform the Work and report any discrepancies with the Contract Documents to the Architect before commencing work.
  - Positions of exposed or finished mechanical or electrical devices, fittings, and fixtures are indicated on the Architectural drawings. The locations shown on the Architectural drawings govern over the Mechanical and Electrical drawings. Those items not clearly located will be located as directed by the Architect.



PROJECT TEAM

CLIENT	CLARIDGE HOMES
ARCHITECT	HARIRI PONTARINI ARCHITECTS
LANDSCAPE	JAMES B. LENNOX + ASSOCIATES
PLANNING	FOTENN PLANNING + DESIGN
STRUCTURAL	GOODEVE STRUCTURAL INC.
CIVIL/TRAFFIC	NOVATECH GROUP
GEOTECH	PATERSON GROUP INC.
WIND	GRADIENT WIND ENGINEERING
SURVEYOR	ANNIS O'SULLIVAN, VOLLEBEKK LTD.

Rev.	Issue / Description	Date
3	RE-ISSUED FOR OPA, ZBA, AND SPA (DRAFT)	MAR 24, 2023
2	RE-ISSUED FOR OPA, ZBA, AND SPA (DRAFT)	NOV 08, 2022
1	ISSUED FOR OPA, ZBA, AND SPA	MAY 10, 2021

Architect of Record:  
**HARIRI PONTARINI ARCHITECTS**  
 235 Carlaw Avenue  
 Suite 301  
 Toronto, Canada M4M 2S1  
 TEL 416 929 4901  
 FAX 416 929 8924  
 info@hp-arch.com  
 hariripontarini.com

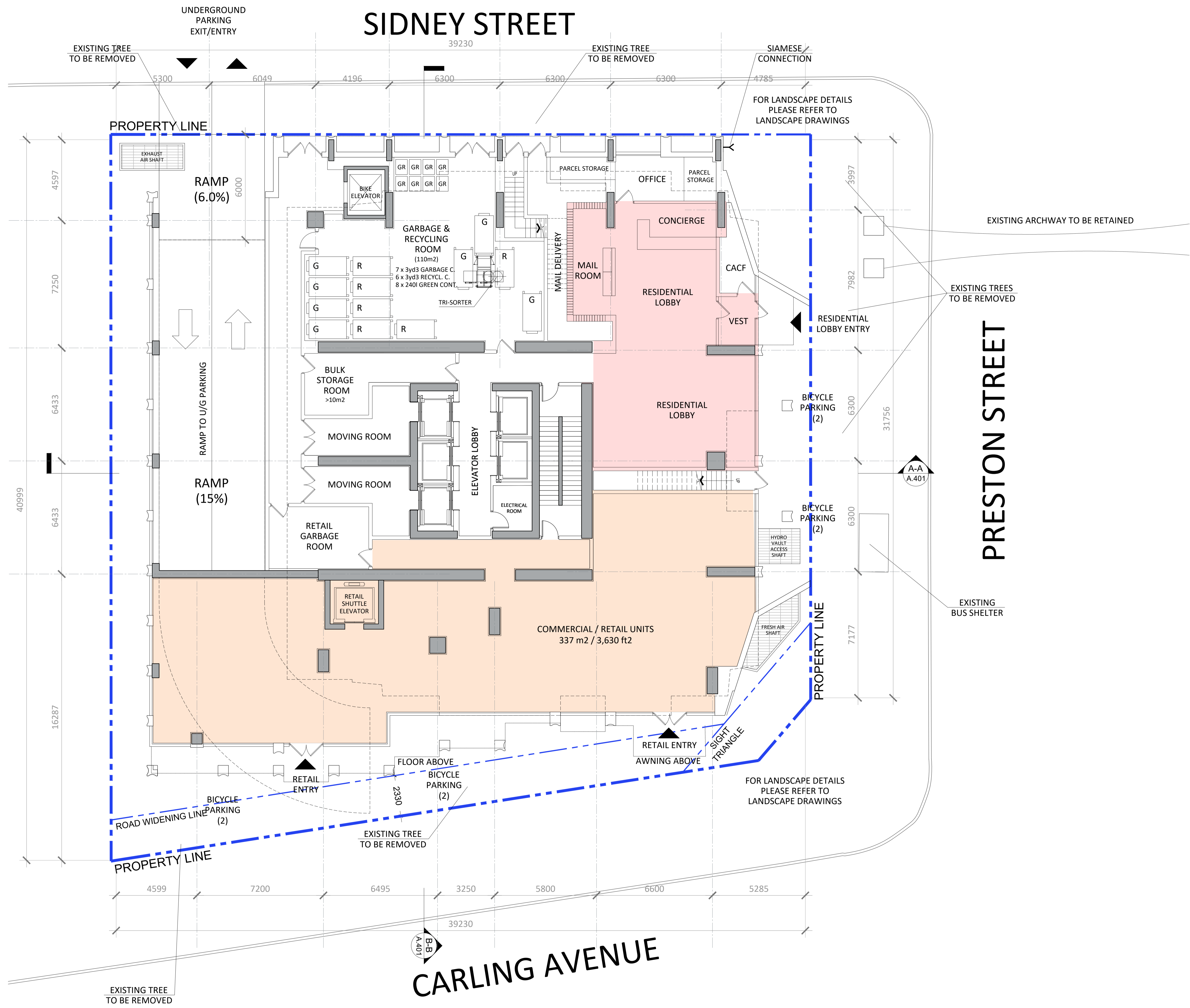
Project Title:  
**829 CARLING AVENUE**  
 MIXED-USE DEVELOPMENT  
 OTTAWA, ON

**SITE PLAN**

Project number: 2030  
 Scale: 1 : 200  
 Date: MARCH 24, 2023  
 Drawn by: HPA

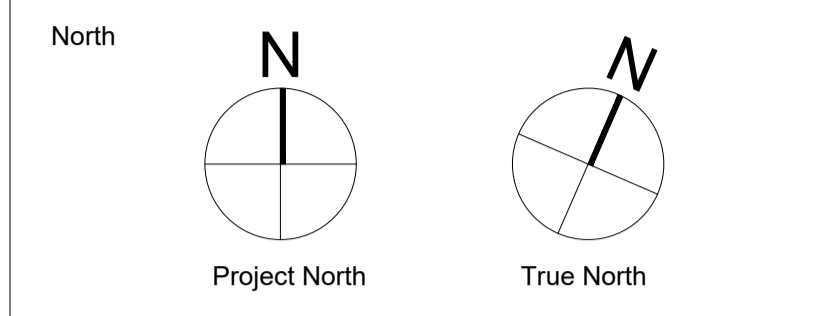
Drawing No.: Revision:

**A.102**



General Notes:

- These Contract Documents are the property of the Architect. The Architect bears no responsibility for the interpretations of these documents by the contractor. Upon written application the Architect will provide written/graphic clarification or supplementary information regarding the intent of the Contract Documents. The Architect will review Shop Drawings submitted by the Contractor for design conformance only.
- Drawings are not to be scaled for construction. Contractor to verify all existing conditions and dimensions required to perform the Work and report any discrepancies with the Contract Documents to the Architect before commencing work.
- Positions of exposed or finished mechanical or electrical devices, fittings, and fixtures are indicated on the Architectural drawings. The locations shown on the Architectural drawings govern over the Mechanical and Electrical drawings. Those items not clearly located will be located as directed by the Architect.



PROJECT TEAM

CLIENT	CLARIDGE HOMES
ARCHITECT	HARIRI PONTARINI ARCHITECTS
LANDSCAPE	JAMES B. LENNOX + ASSOCIATES
PLANNING	FOTENN PLANNING + DESIGN
STRUCTURAL	GOODEVE STRUCTURAL INC.
CIVIL/TRAFFIC	NOVATECH GROUP
GEOTECH	PATERSON GROUP INC.
WIND	GRADIENT WIND ENGINEERING
SURVEYOR	ANNIS O'SULLIVAN, VOLLEBEKK LTD.

Rev.	Issue / Description	Date
3	RE-ISSUED FOR OPA, ZBA, AND SPA (DRAFT)	MAR 24, 2023
2	RE-ISSUED FOR OPA, ZBA, AND SPA (DRAFT)	NOV 08, 2022
1	ISSUED FOR OPA, ZBA, AND SPA	MAY 10, 2021

Architect of Record:  
**HARIRI PONTARINI ARCHITECTS**  
 235 Carlaw Avenue  
 Suite 301  
 Toronto, Canada M4M 2S1  
 TEL 416 929 4901  
 FAX 416 929 8924  
 info@hp-arch.com  
 hariripontarini.com



Project Title:  
**829 CARLING AVENUE**  
 MIXED-USE DEVELOPMENT  
 OTTAWA, ON

**GROUND FLOOR PLAN**

Project number: 2030  
 Scale: 1 : 100  
 Date: MARCH 24, 2023  
 Drawn by: HPA

Drawing No.: A.301  
 Revision:



## **APPENDIX B**

---

TIA Screening Form

## City of Ottawa 2017 TIA Guidelines Screening Form

### 1. Description of Proposed Development

Municipal Address	<b>829 Carling Avenue</b>
Description of Location	<b>Located directly north of Carling Avenue, south of Sidney Street, and west of Preston Street</b>
Land Use Classification	<b>Residential apartments, ground floor retail</b>
Development Size (units)	<b>396 dwellings</b>
Development Size (m <sup>2</sup> )	<b>337 m<sup>2</sup> (3,628 ft<sup>2</sup>) GFA retail</b>
Number of Accesses and Locations	<b>One proposed access to Sidney Street</b>
Phase of Development	<b>1</b>
Buildout Year	<b>2028</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
<b><i>Townhomes or apartments</i></b>	<b><i>90 units</i></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 limiting sight lines at a proposed driveway?		✓
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/suburban conditions)?	✓	
Is the proposed driveway within auxiliary lanes of an intersection?		✓
Does the proposed driveway make use of an existing median break that serves an existing site?		✓
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		✓
Does the development include a drive-thru facility?		✓

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

### 5. Summary

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

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

## **APPENDIX C**

---

OC Transpo Route Maps

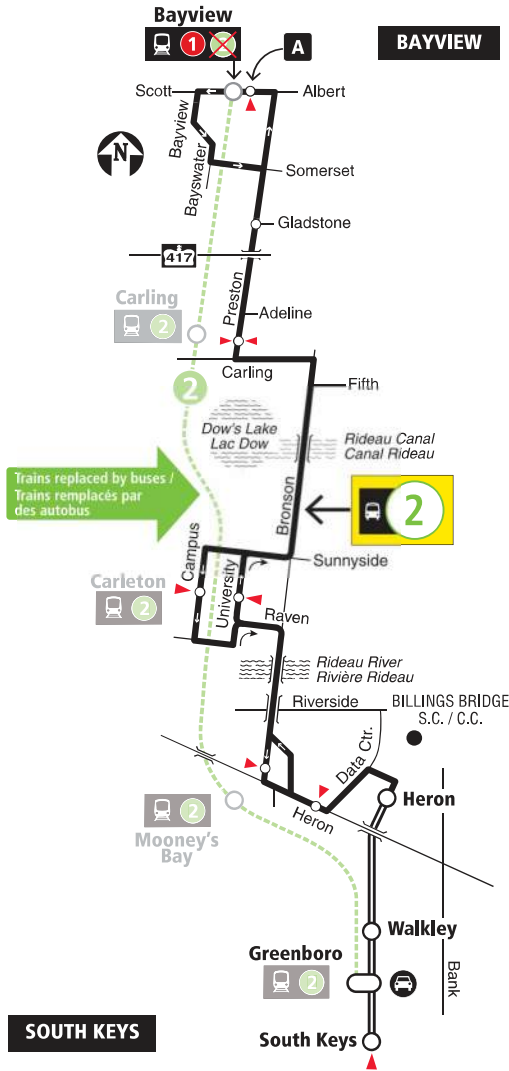


★ Subject Site

# 2 BAYVIEW SOUTH KEYS

Bus service during  
O-Train Line 2 expansion

Service d'autobus durant le  
prolongement de la Ligne 2 de l'O-Train



2020.09



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

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

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

Customer Service

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

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

Security / Sécurité..... 613-741-2478

**Effective Fall 2020**

**En vigueur automne 2020**



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

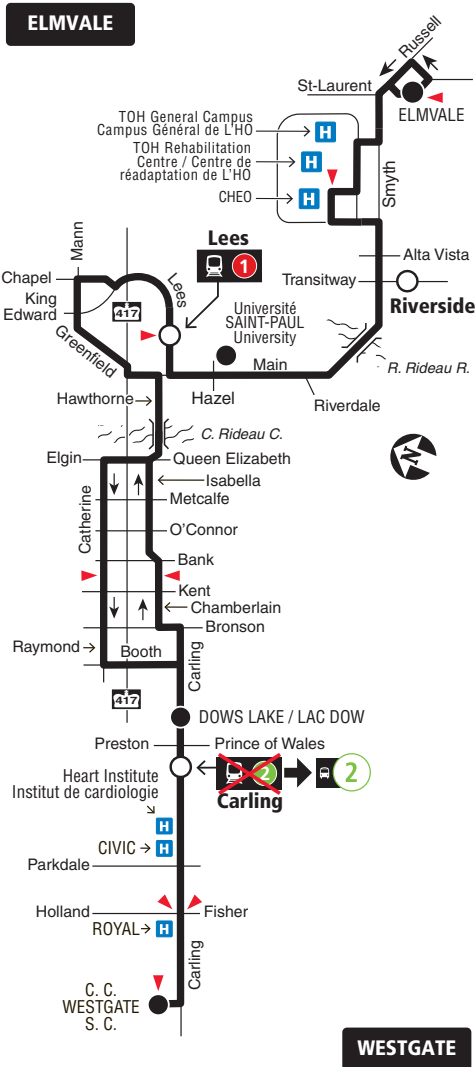


# 55

## ELMVALE WESTGATE


Local

7 days a week / 7 jours par semaine



○ Stations  
▲ Timepoint / Heures de passage

2021.06

 **Schedule / Horaire ..... 613-560-1000**  
**Text / Texto\* ..... 560560**  
*plus your four digit bus stop number / plus votre numéro d'arrêt à quatre chiffres*  
\*Standard message rates may apply / Les tarifs réguliers de messagerie texte peuvent s'appliquer

Customer Service  
 Service à la clientèle ..... 613-741-4390  
 Lost and Found / Objets perdus ..... 613-563-4011  
 Security / Sécurité ..... 613-741-2478

**Effective June 20, 2021**  
**En vigueur 20 juin 2021**

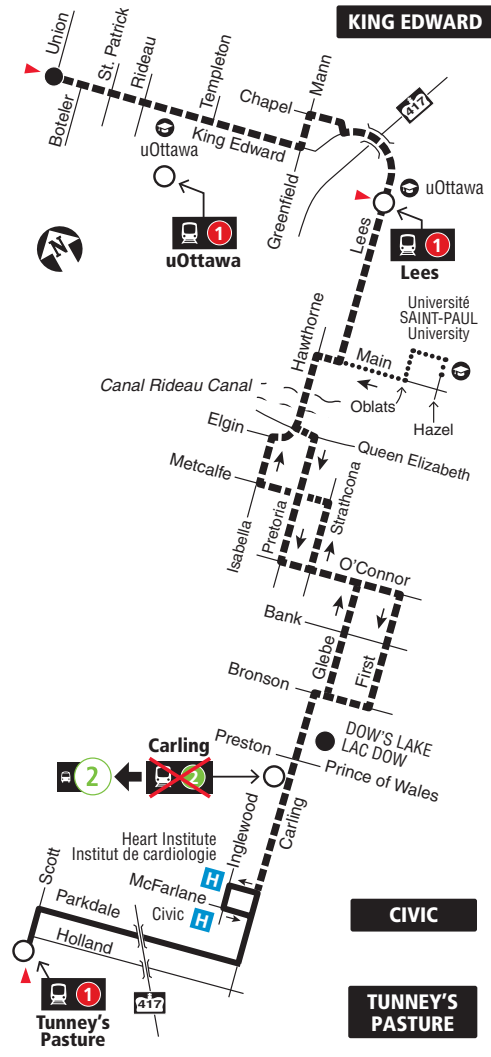


# 56

## CIVIC KING EDWARD TUNNEY'S PASTURE

Local

7 days a week / 7 jours par semaine



- Station
- 7 days a week / 7 jours par semaine
- Monday to Friday only (Peak periods)  
Lundi au vendredi seulement (Périodes de pointe)
- Some trips / Quelques trajets
- Timepoint / Heures de passage

2021.06

**Schedule / Horaire ..... 613-560-1000**  
**Text / Texto\* ..... 560560**  
*plus your four digit bus stop number / plus votre numéro d'arrêt à quatre chiffres*  
\*Standard message rates may apply / Les tarifs réguliers de messagerie texte peuvent s'appliquer

- Customer Service / Service à la clientèle ..... **613-741-4390**
- Lost and Found / Objets perdus ..... **613-563-4011**
- Security / Sécurité ..... **613-741-2478**

**Effective June 20, 2021  
En vigueur 20 juin 2021**





# 85

## GATINEAU BAYSHORE

*Fréquent*

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

All day service  
Service toute la journée



2020.04

 **Schedule / Horaire..... 613-560-1000**  
**Text / Texto ..... 560560**  
*plus your four digit bus stop number / plus votre numéro d'arrêt à quatre chiffres*

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

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

**Effective May 3, 2020**  
**En vigueur 3 mai 2020**

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

## Joshua Audia

---

**Subject:** FW: 829 Carling Avenue - Request for Transit Data

---

**From:** Rathwell, Graham <[graham.rathwell@ottawa.ca](mailto:graham.rathwell@ottawa.ca)>  
**Sent:** Friday, January 28, 2022 10:31 AM  
**To:** Joshua Audia <[j.audia@novatech-eng.com](mailto:j.audia@novatech-eng.com)>  
**Subject:** RE: 829 Carling Avenue - Request for Transit Data

Hi Josh, apologies for the delay.

We have been discussing internally what exactly we would want to see from a Line 2 capacity analysis. Given that the development would be completed after Line 2 is reopened, one factor to consider is that pre-closure ridership data would need to be compared to the higher capacity available with the new Line 2 trains. However, we don't believe this would be a useful comparison because the nature of Line 2 is also changing: the line is expected to draw new ridership due to new stations along the existing alignment plus new stations along the extended southern alignment.

Ridership projections were made to account for these differences as part of the Stage 2 South planning process. Unfortunately, we are currently unable to share these as they are held as confidential information by the Stage 2 office. Without this information I don't think it makes sense to ask you for a Line 2 capacity analysis.

Here is what I would like to see: distribute the site-generated transit trips among the bus stops and the O-Train station. Match them to the appropriate stops, routes, and directions based on the destinations that they serve. The trip distribution values from Section 3.1.2 of the TIA can be used as a guide, or a different distribution can be presented with some justification. As long as it seems reasonable, for example:

- Trips to the north split between Route 56 WB, Route 85 NB, and Line 2 NB
- Trips to the south assigned to Line 2 SB
- Trips to the east split between Route 55 EB, Route 56 EB, and Line 2 NB (with assumed connection to Line 1 at Bayview Station to continue east).
- Trips to the west split between Route 55 WB, Route 85 WB, and Line 2 NB (with assumed connection to Line 1 at Bayview Station to continue west).

Then, add the new transit trips to the bus stop data below and comment on any capacity concerns for bus routes. For Line 2, please just report the number of new transit trips by direction and time period (AM vs PM peak period) - no comments regarding capacity are needed.

Please let me know if there are any questions.

**From:** Rathwell, Graham  
**Sent:** January 19, 2022 4:02 PM  
**To:** Joshua Audia <[j.audia@novatech-eng.com](mailto:j.audia@novatech-eng.com)>  
**Subject:** RE: 829 Carling Avenue - Request for Transit Data

Hi Josh,

The requested bus stop data is shown in the table below. Data for Line 2 at Carling Station is taking a bit longer to prepare but I expect to be able to share it next week. The below data were sampled from the period of January 5 to March 16 2020, which is the last 'normal' ridership period before pandemic-related impacts began. Note that cells with a zero (0) value indicate a measured average value of zero, based on available APC data, rather than an absence of data.

Stop No.	Location	Route (Direction)		AM (6:00-9:00)			PM (15:00-18:00)			24-HR		
				Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure
#2397	Preston / Carling	85	WB	5	24	22	21	6	20	43	42	15
#6655	Preston / Adeline	85	WB	0	5	23	1	7	20	2	18	15
#6657	Preston / Carling	85	EB	27	32	22	20	7	19	68	64	15
#7369	Carling / O-Train Station	55	EB	9	22	29	4	32	15	19	106	16
		56	EB	4	4	6	2	11	11	9	19	8
		85	EB	8	70	22	9	51	18	35	235	15
#8013	Carling / Norfolk	55	WB	13	24	20	48	3	22	76	40	16
		56	WB	0	14	10	4	1	16	3	17	10
#8014	Carling / O-Train Station	55	WB	35	6	23	30	5	28	103	17	18
		56	WB	8	5	11	12	5	16	24	12	11
		85	WB	29	10	23	86	24	27	257	69	18
#8023	Carling / Preston	55	EB	2	21	27	6	9	14	18	39	16
		56	EB	1	1	7	5	2	12	6	6	9

Please let me know if there are any questions. I will follow-up with the Carling Station Line 2 data as soon as it is ready.

Thank you,

**Graham Rathwell**

Transit Planner, Network Service Design  
Service Planning Branch  
Transit Services Department

## **APPENDIX D**

---

Traffic Count Data



# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

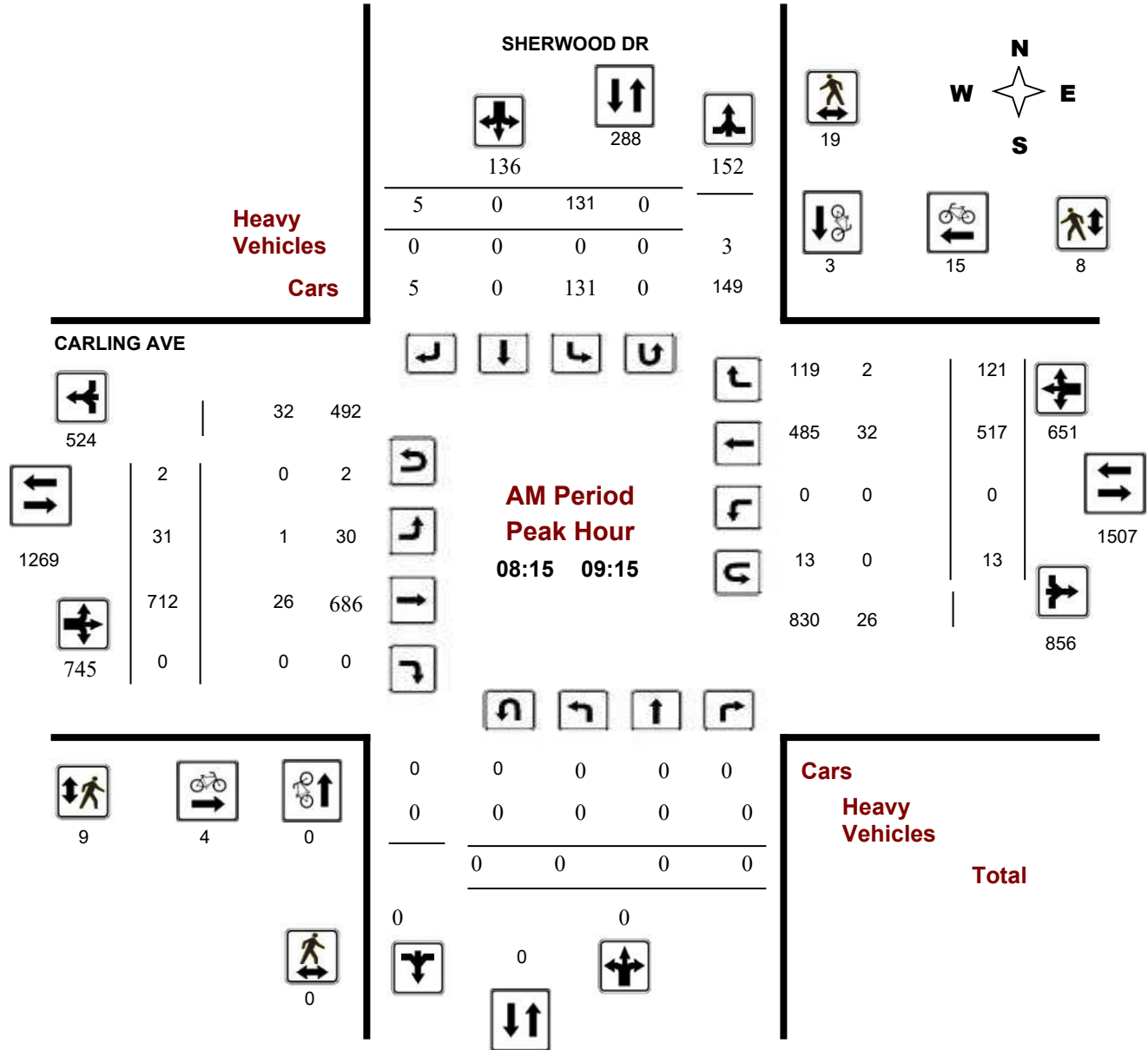
### CARLING AVE @ SHERWOOD DR

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

**Start Time:** 07:00

**WO No:** 36249

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

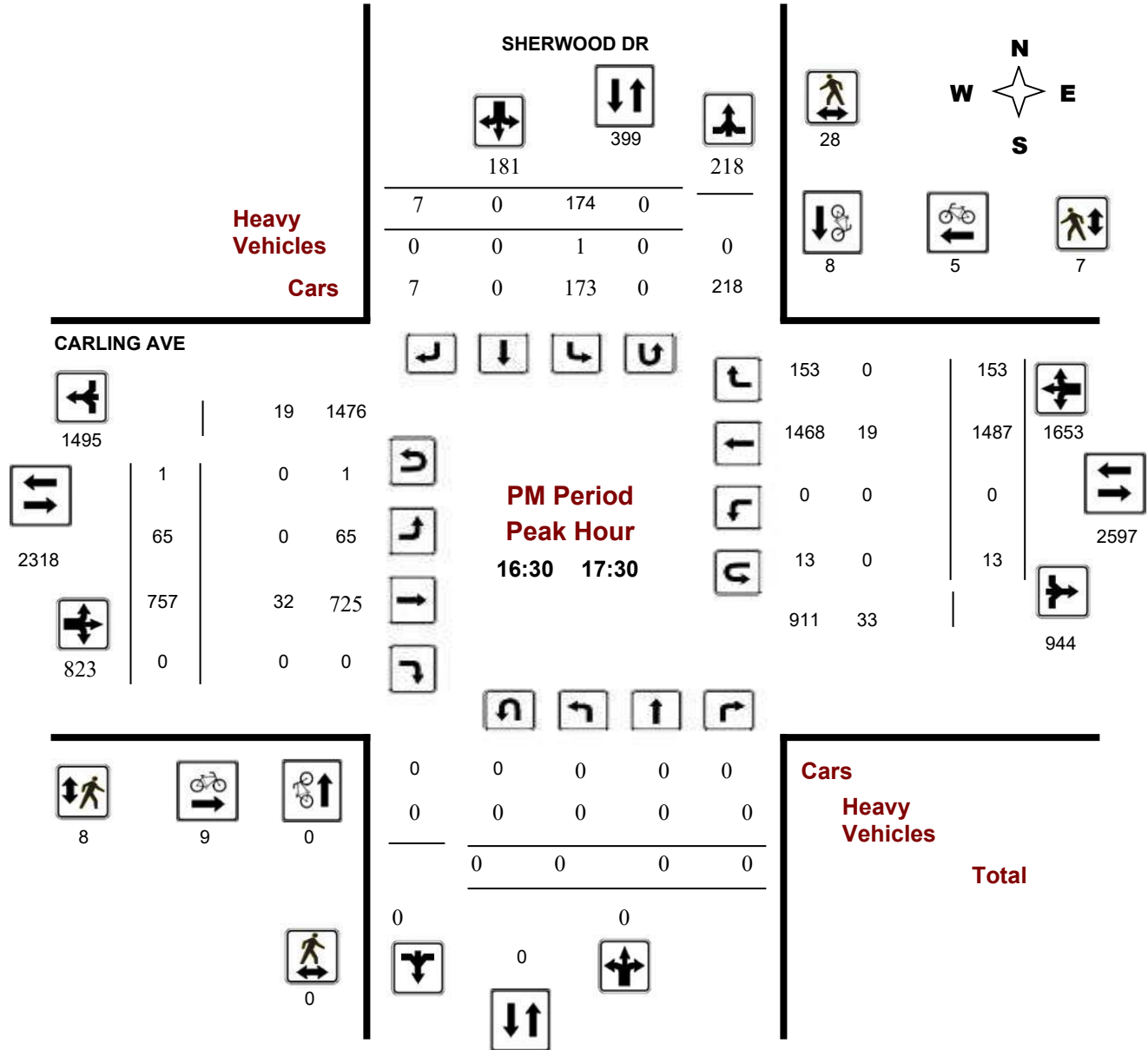
### CARLING AVE @ SHERWOOD DR

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

**Start Time:** 07:00

**WO No:** 36249

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

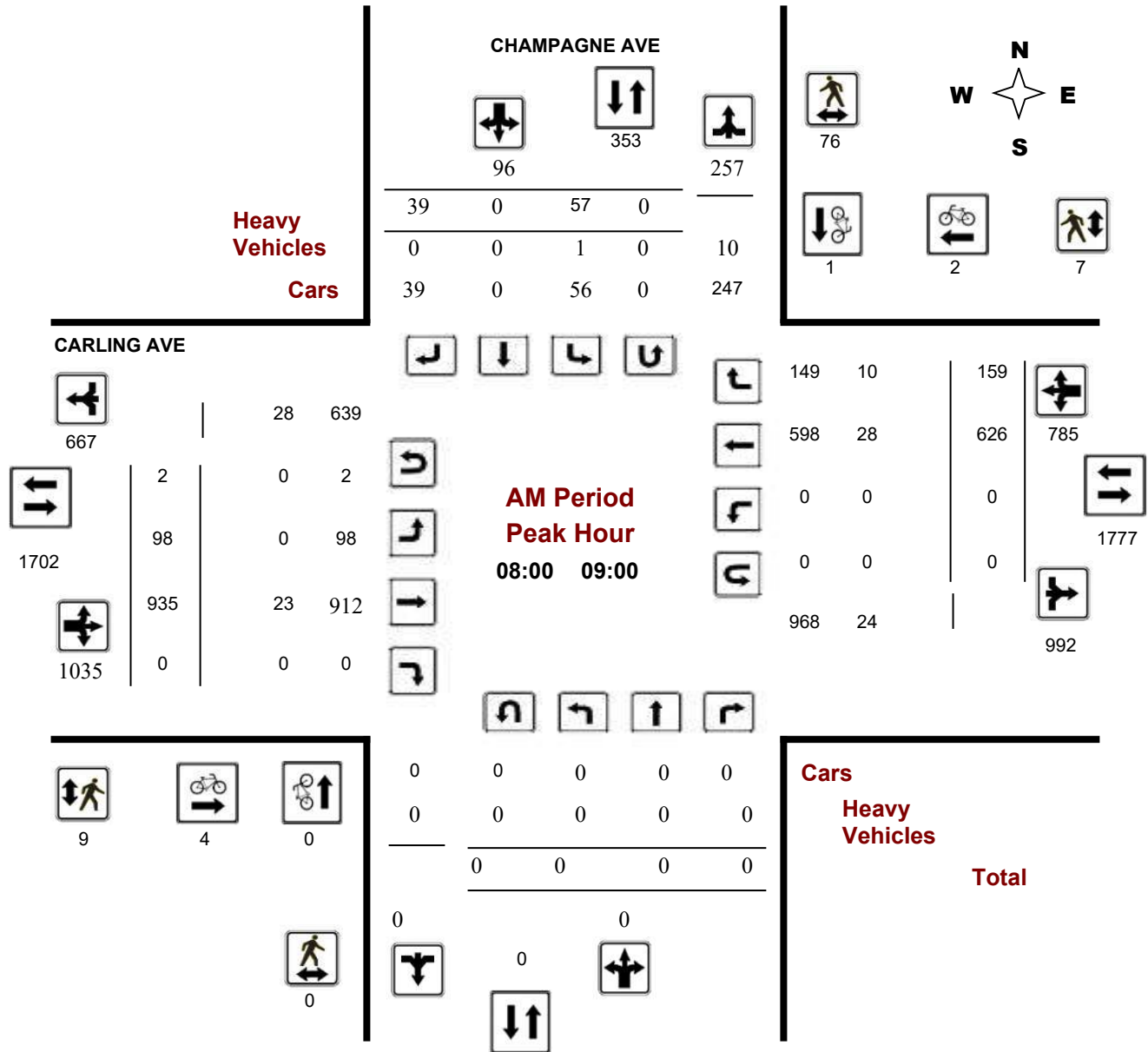
### CARLING AVE @ CHAMPAGNE AVE

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

**Start Time:** 07:00

**WO No:** 35697

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

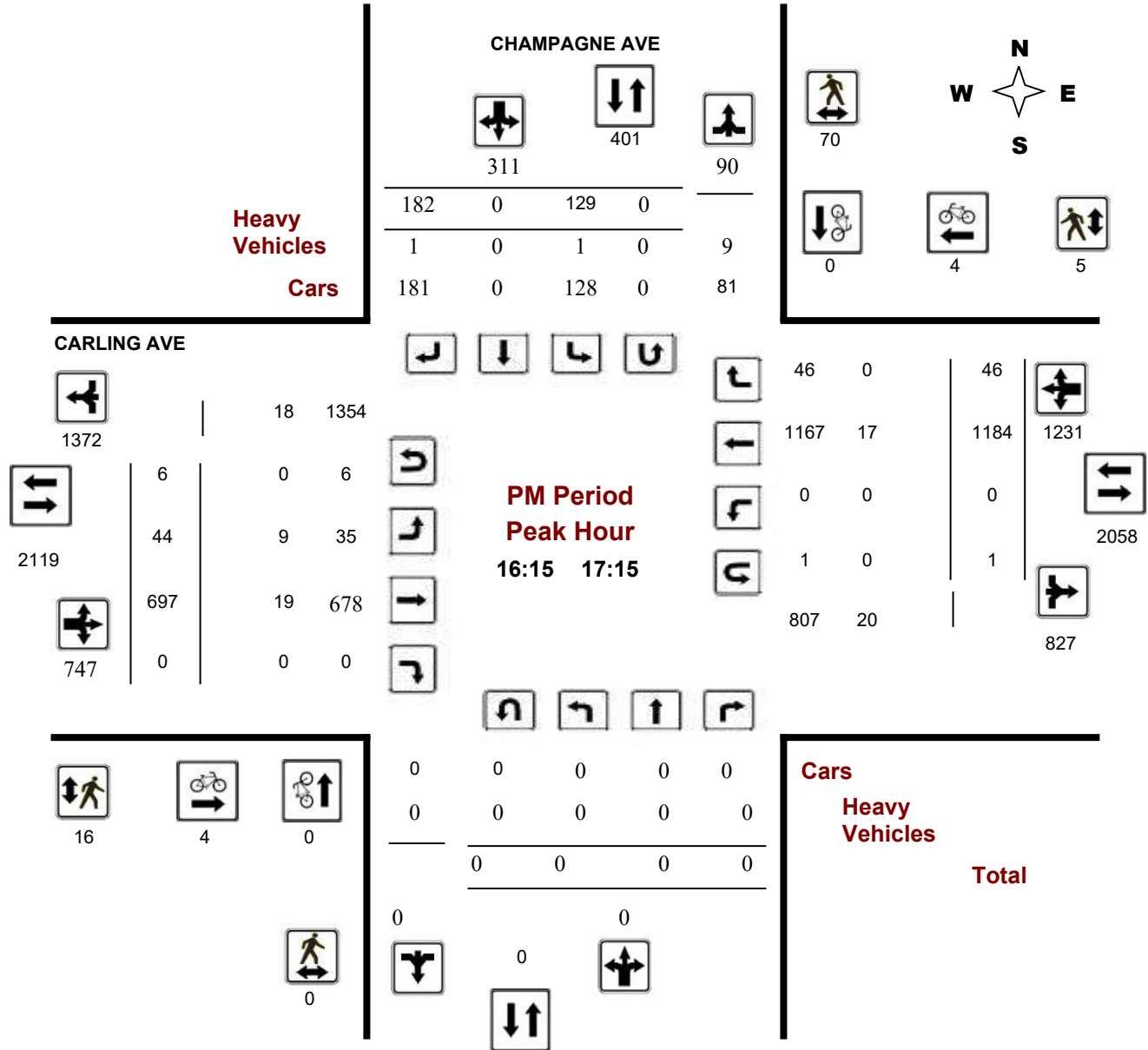
### CARLING AVE @ CHAMPAGNE AVE

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

**Start Time:** 07:00

**WO No:** 35697

**Device:** Miovision



**Comments**





# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

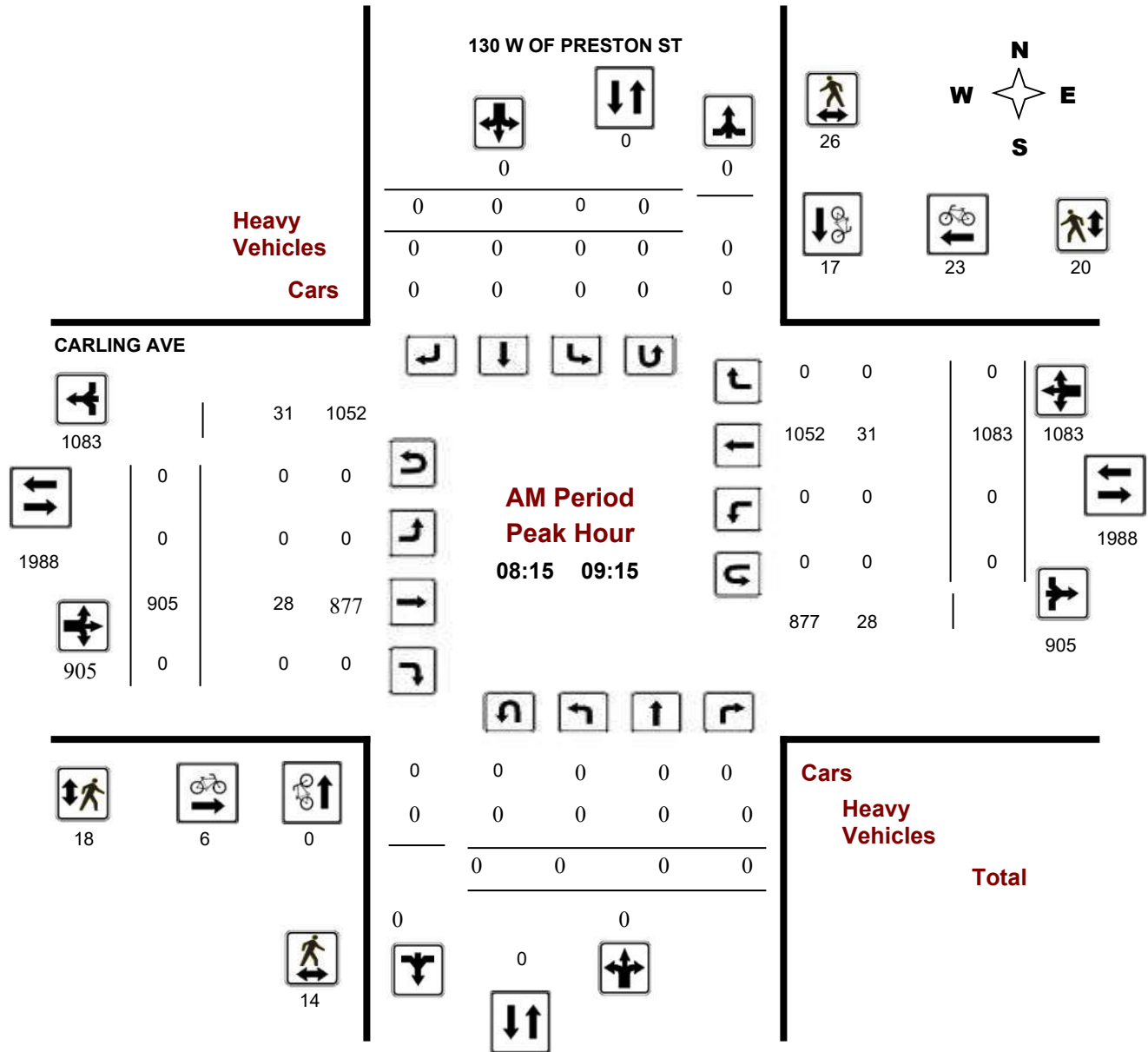
### 130 W OF PRESTON ST @ CARLING AVE

**Survey Date:** Wednesday, July 13, 2016

**Start Time:** 07:00

**WO No:** 36033

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

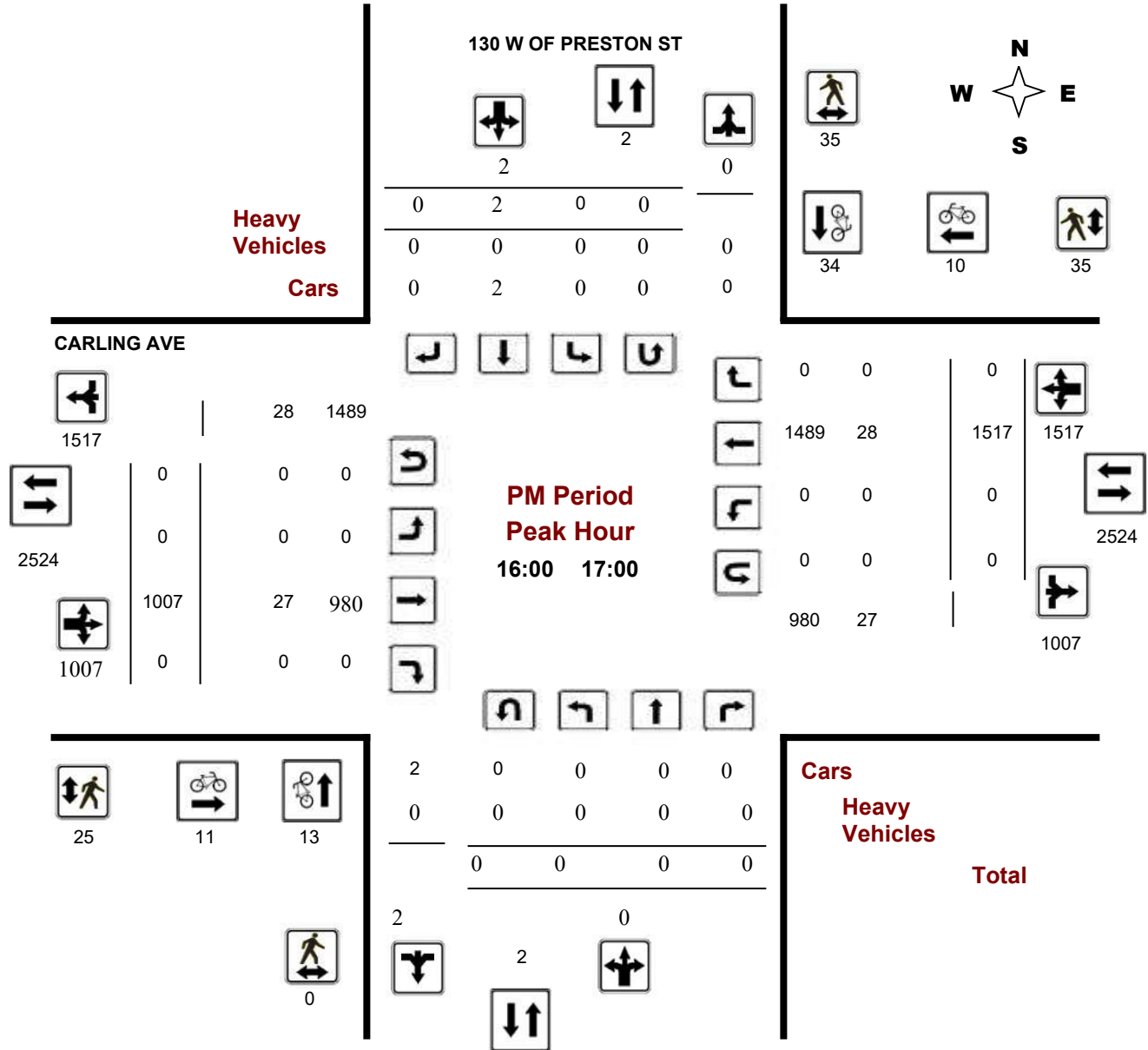
### 130 W OF PRESTON ST @ CARLING AVE

**Survey Date:** Wednesday, July 13, 2016

**Start Time:** 07:00

**WO No:** 36033

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

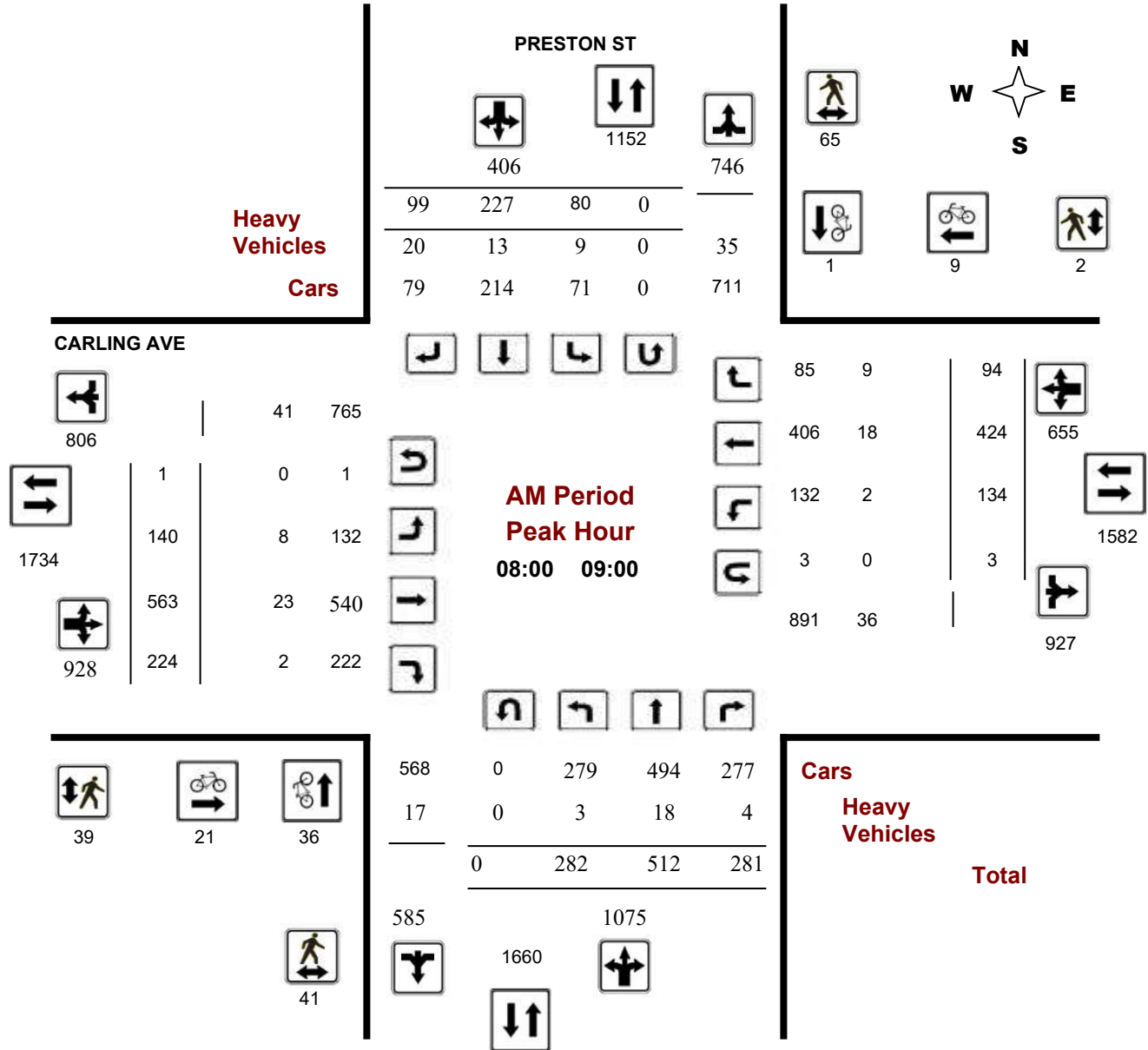
### CARLING AVE @ PRESTON ST

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

**Start Time:** 07:00

**WO No:** 37131

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

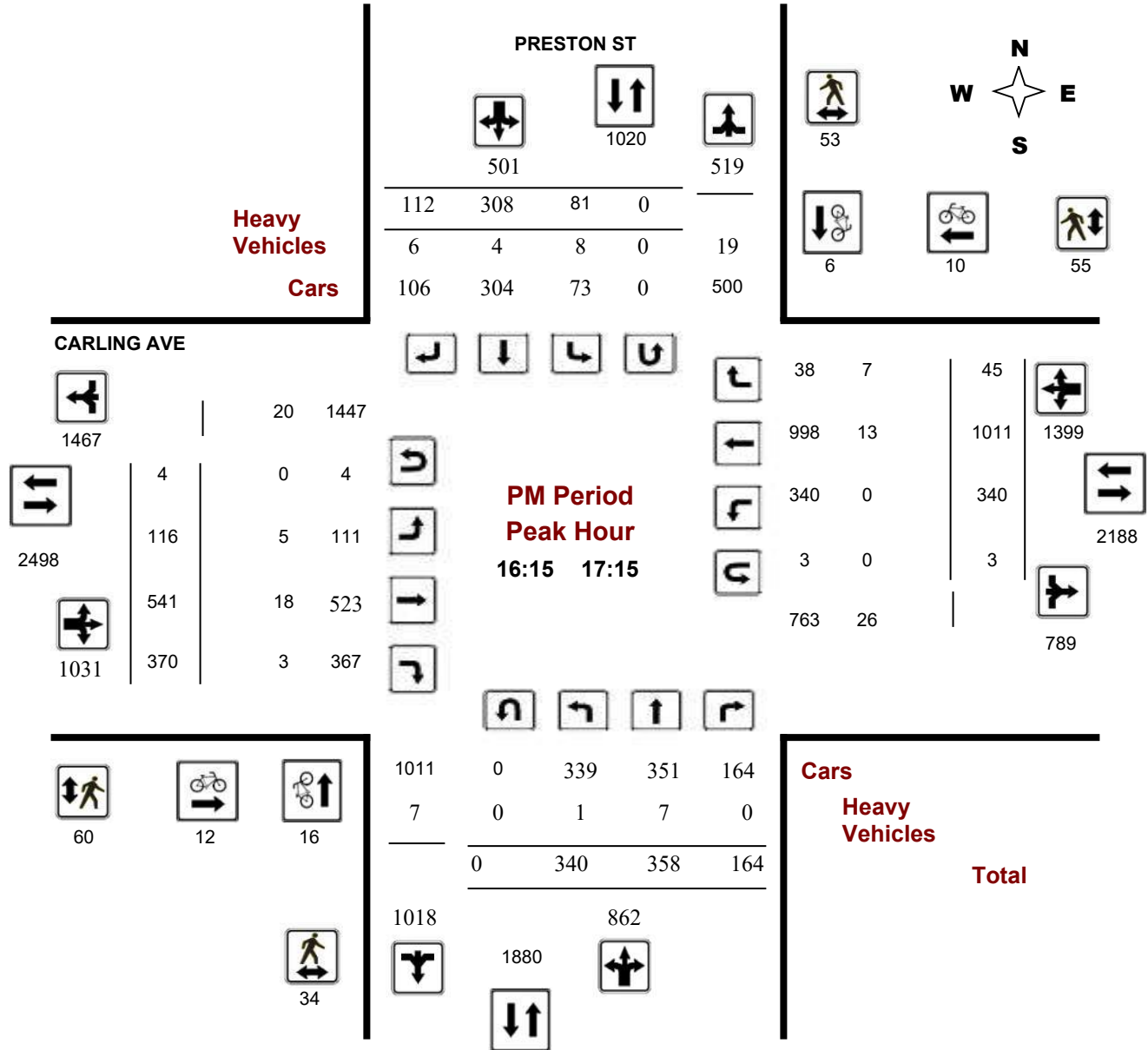
### CARLING AVE @ PRESTON ST

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

**Start Time:** 07:00

**WO No:** 37131

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

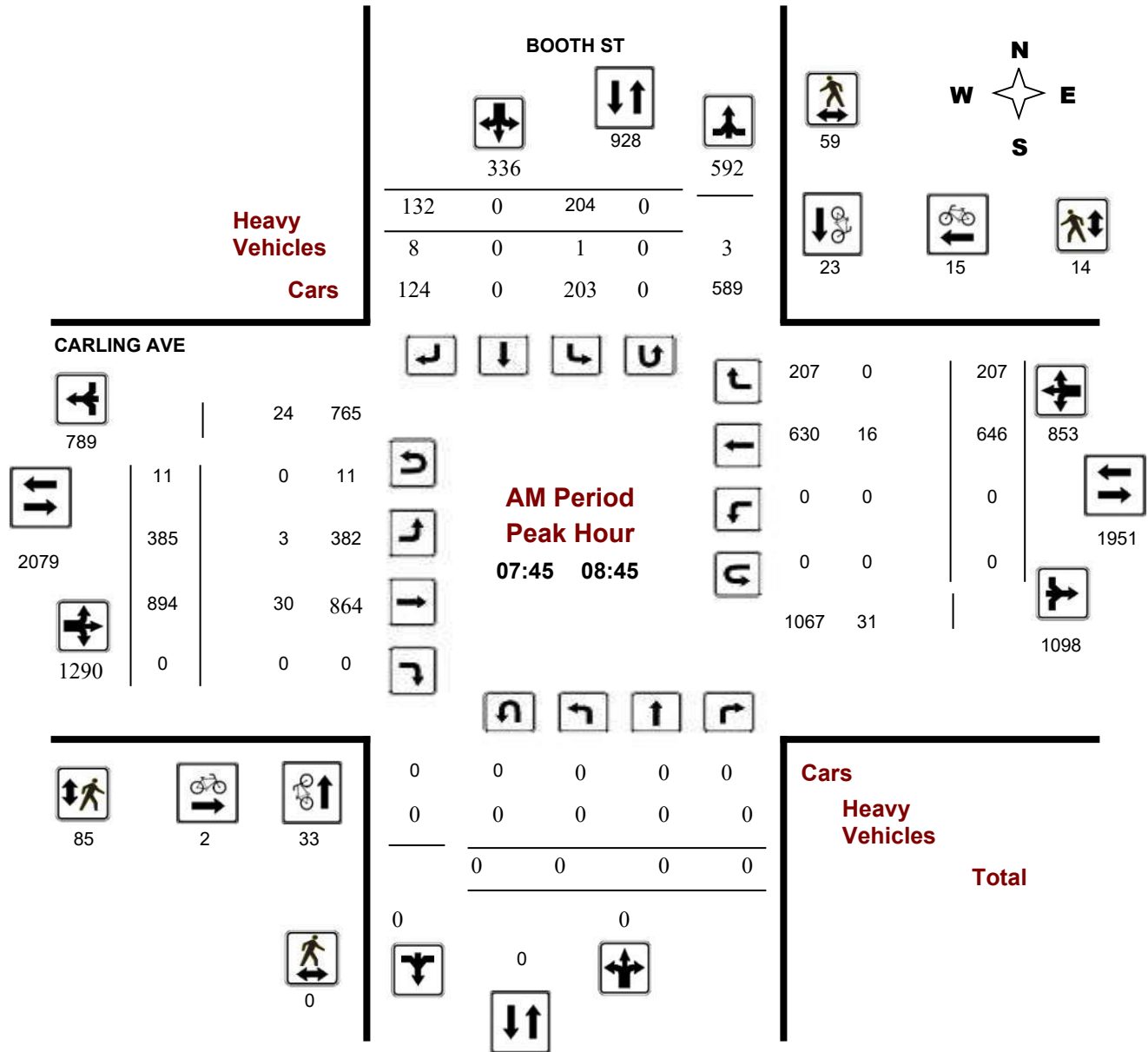
### BOOTH ST @ CARLING AVE

**Survey Date:** Thursday, September 12, 2019

**Start Time:** 07:00

**WO No:** 38761

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

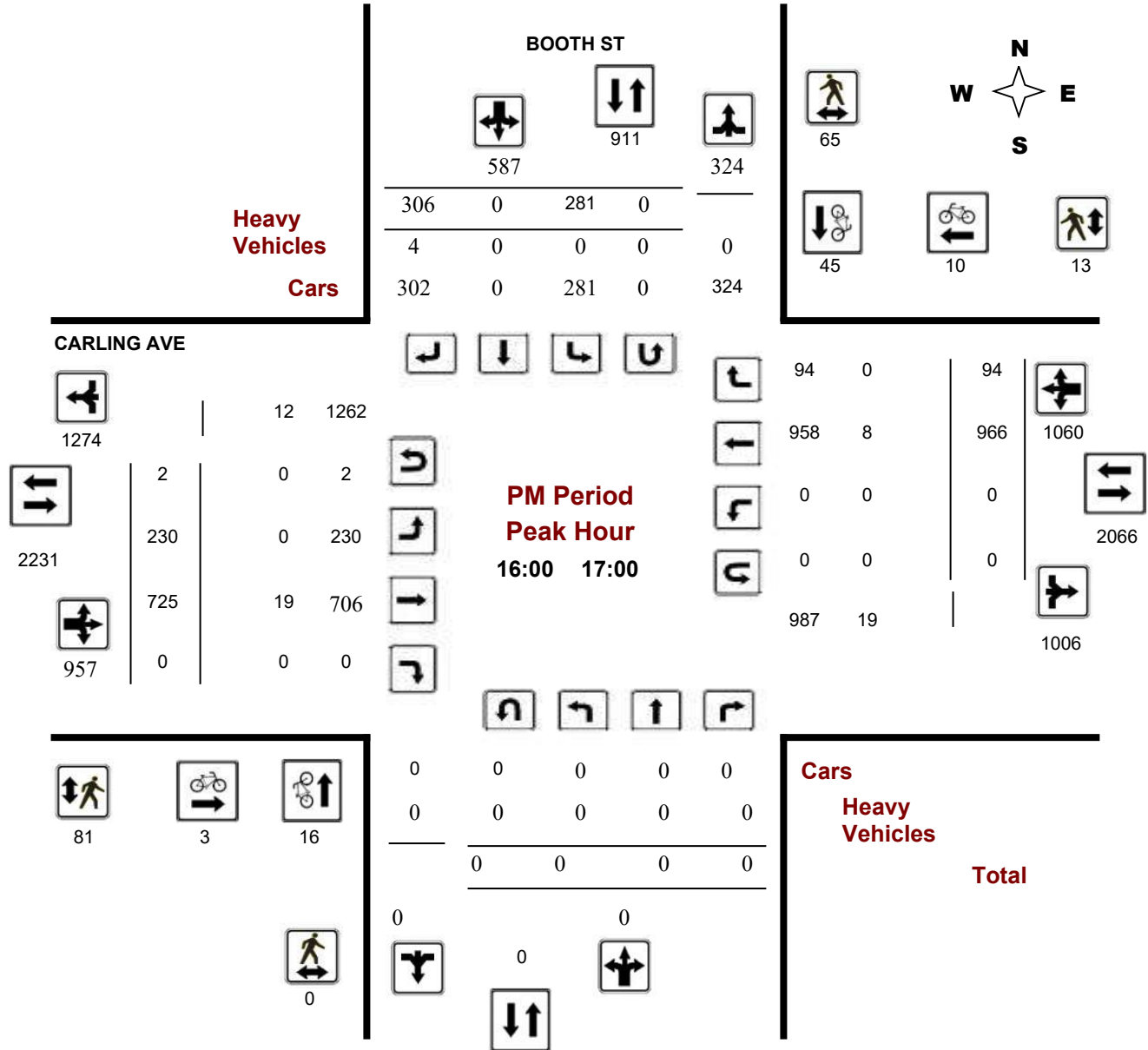
### BOOTH ST @ CARLING AVE

**Survey Date:** Thursday, September 12, 2019

**Start Time:** 07:00

**WO No:** 38761

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

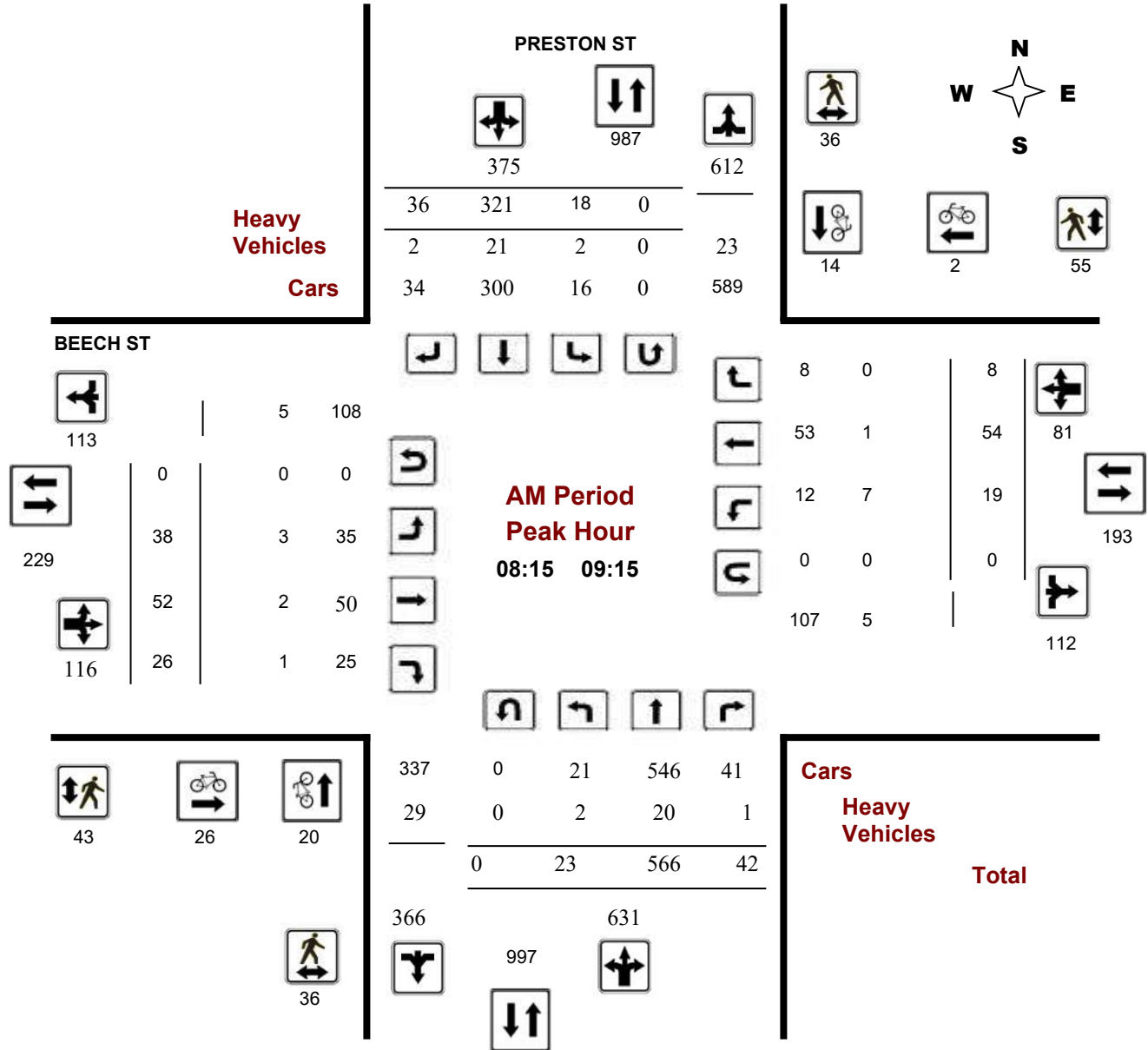
### BEECH ST @ PRESTON ST

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

**Start Time:** 07:00

**WO No:** 36281

**Device:** Miovision



**Comments**



# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

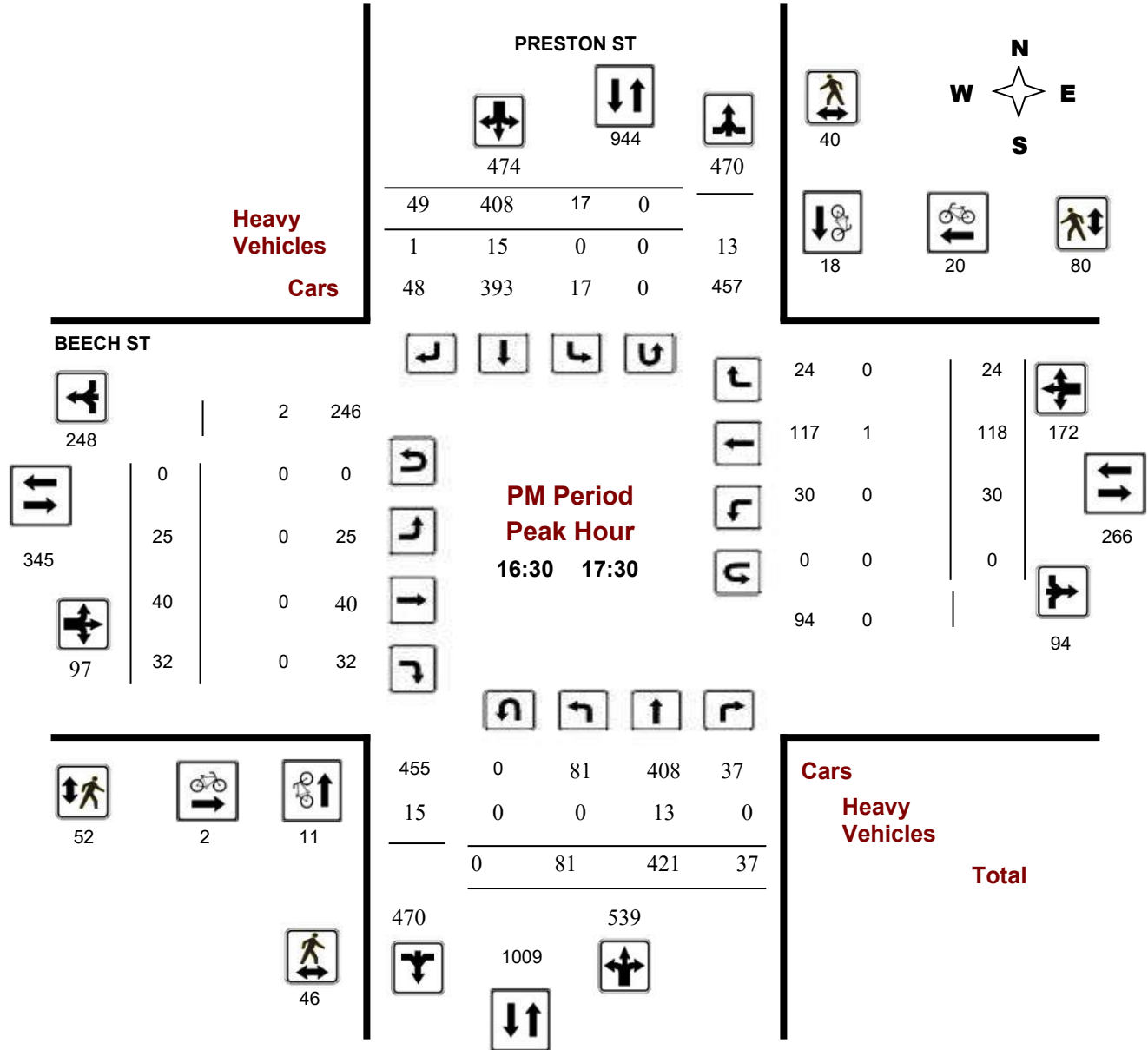
### BEECH ST @ PRESTON ST

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

**Start Time:** 07:00

**WO No:** 36281

**Device:** Miovision







# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

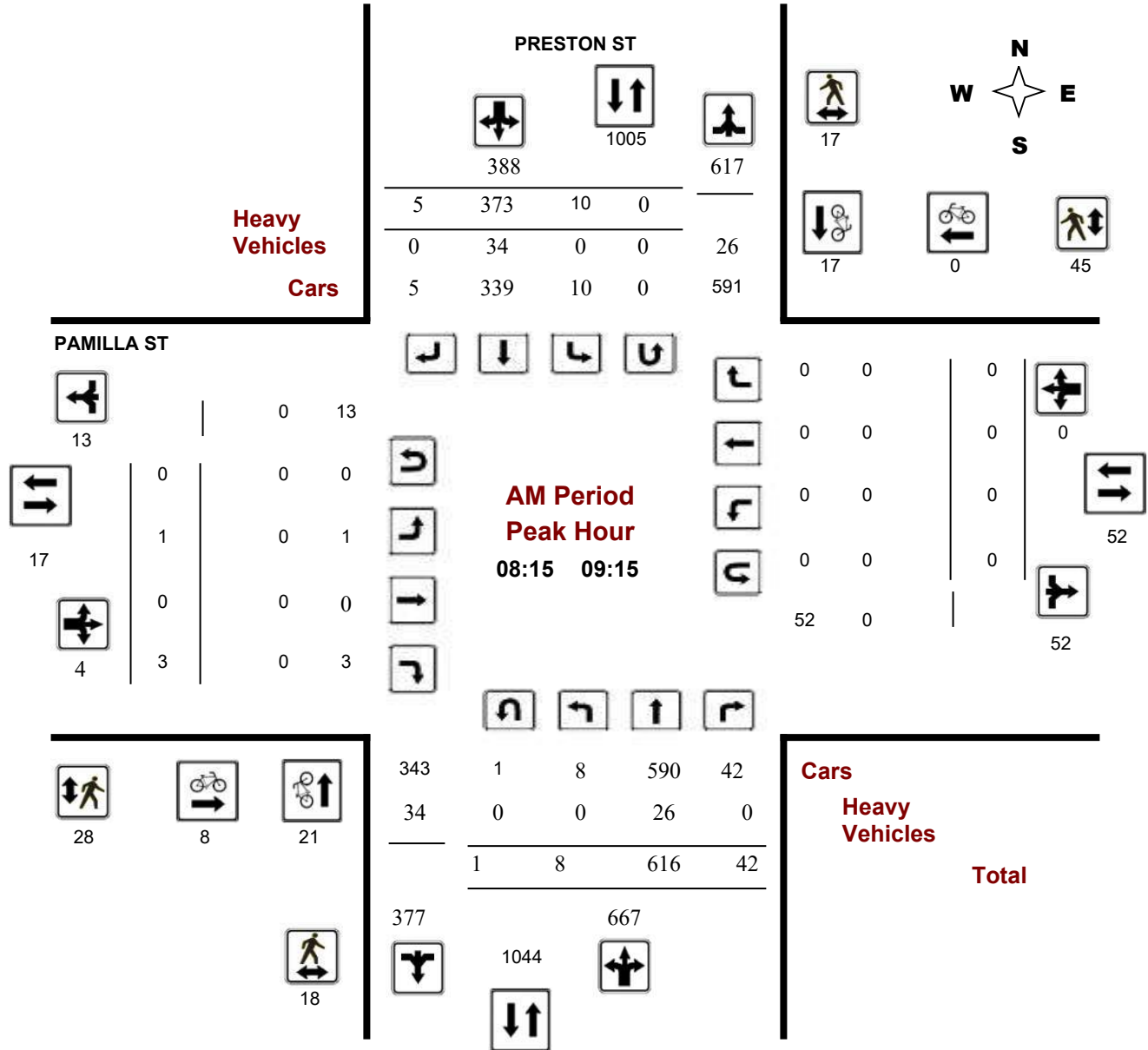
### PAMILLA ST @ PRESTON ST

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

**Start Time:** 07:00

**WO No:** 36279

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

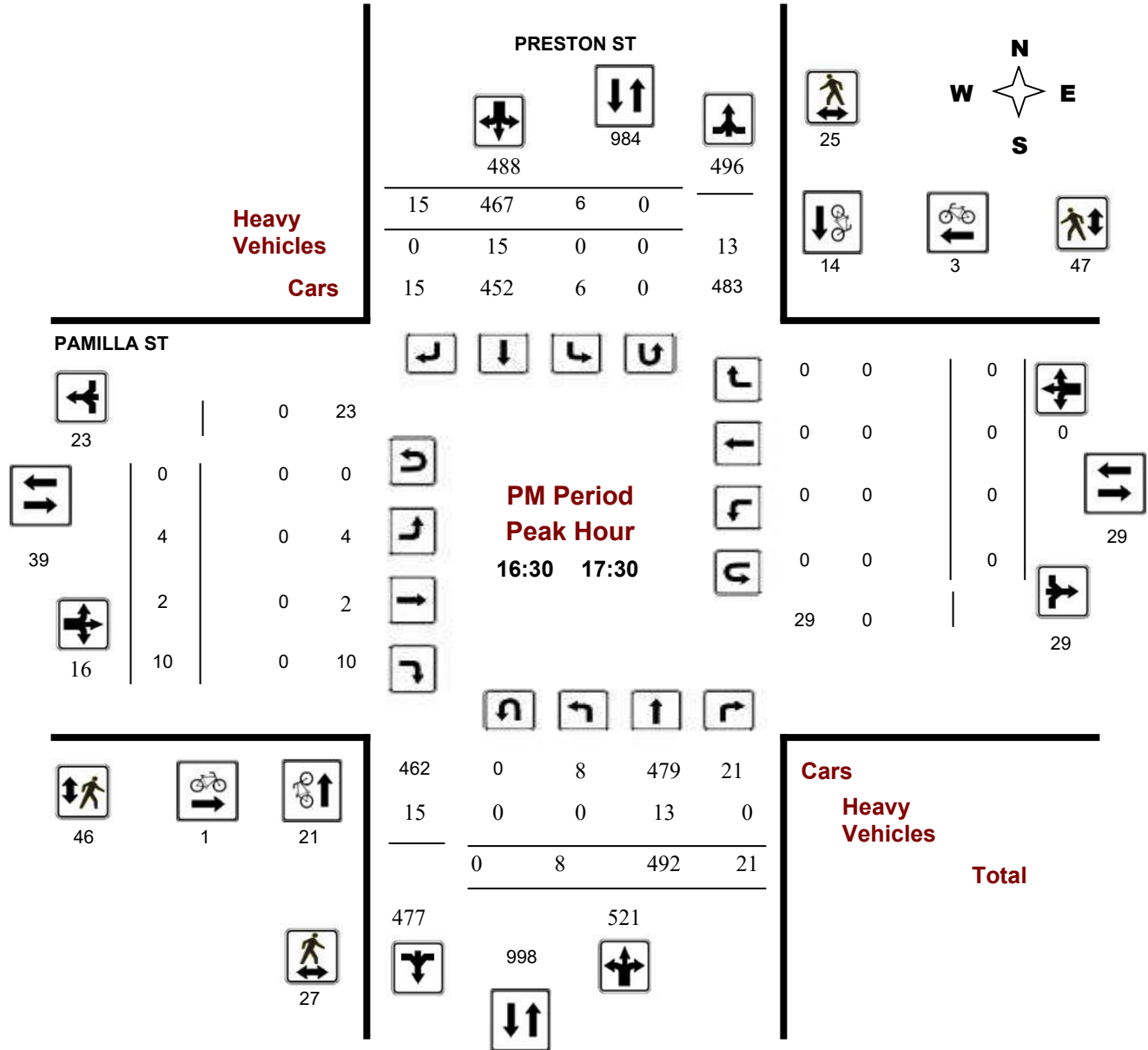
### PAMILLA ST @ PRESTON ST

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

**Start Time:** 07:00

**WO No:** 36279

**Device:** Miovision



**Recorded Traffic Volumes**



Street 1 Preston Street

Street 2 Adeline Stret

Road Conditions wet

Date March 8, 2012

Day Name Thursday

Start Time 07:30

Number of Hours 4

TIME	NORTHBOUND APPROACH ON PRESTON			SOUTHBOUND APPROACH ON PRESTON			EASTBOUND APPROACH ON ADELINE			WESTBOUND APPROACH ON ADELINE		
	LT	ST	RT	LT	ST	RT	LT	ST	RT	LT	ST	RT
0730-0745	1	N/A	13	4	N/A	1	0	0	0	1	0	3
0745-0800	4	N/A	12	2	N/A	3	0	1	0	3	2	4
0800-0815	3	N/A	12	8	N/A	5	1	1	6	3	0	2
0815-0830	0	N/A	18	2	N/A	4	3	0	2	3	0	4
0830-0845	4	N/A	24	13	N/A	3	4	0	2	3	3	6
0845-0900	2 9	N/A X	30 84	2 25	N/A X	3 15	1 9	0 1	1 11	1 10	2 5	5 17
0900-0915	0	N/A	19	2	N/A	4	1	0	3	3	1	3
0915-0930	1	N/A	12	2	N/A	4	2	0	4	3	1	4
<b>SUB TOTAL</b>	<b>15</b>	<b>0</b>	<b>140</b>	<b>35</b>	<b>0</b>	<b>27</b>	<b>12</b>	<b>2</b>	<b>18</b>	<b>20</b>	<b>9</b>	<b>31</b>
1530-1545	2	N/A	5	3	N/A	1	1	1	2	1	0	3
1545-1600	1	N/A	7	2	N/A	1	1	0	4	1	0	3
1600-1615	0	N/A	8	1	N/A	1	0	0	2	5	0	2
1615-1630	3	N/A	8	1	N/A	1	0	2	4	3	0	1
1630-1645	4	N/A	12	4	N/A	1	2	1	2	3	0	2
1645-1700	0 7	N/A X	12 40	5 11	N/A X	2 5	2 4	1 4	1 9	3 14	2 2	3 8
1700-1715	0	N/A	0	0	N/A	0	0	0	0	0	0	0
1715-1730	0	N/A	0	0	N/A	0	0	0	0	0	0	0
<b>SUB TOTAL</b>	<b>10</b>	<b>0</b>	<b>52</b>	<b>16</b>	<b>0</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>15</b>	<b>16</b>	<b>2</b>	<b>14</b>
<b>TOTAL</b>	<b>25</b>	<b>0</b>	<b>192</b>	<b>51</b>	<b>0</b>	<b>34</b>	<b>18</b>	<b>7</b>	<b>33</b>	<b>36</b>	<b>11</b>	<b>45</b>

AM PEAK

PM PEAK

# DIRECTIONAL TRAFFIC FLOW

Intersection: Peston at Sidney

DATE: Day: 2 Month: March Year: 2011 Day of Week: Wednesday

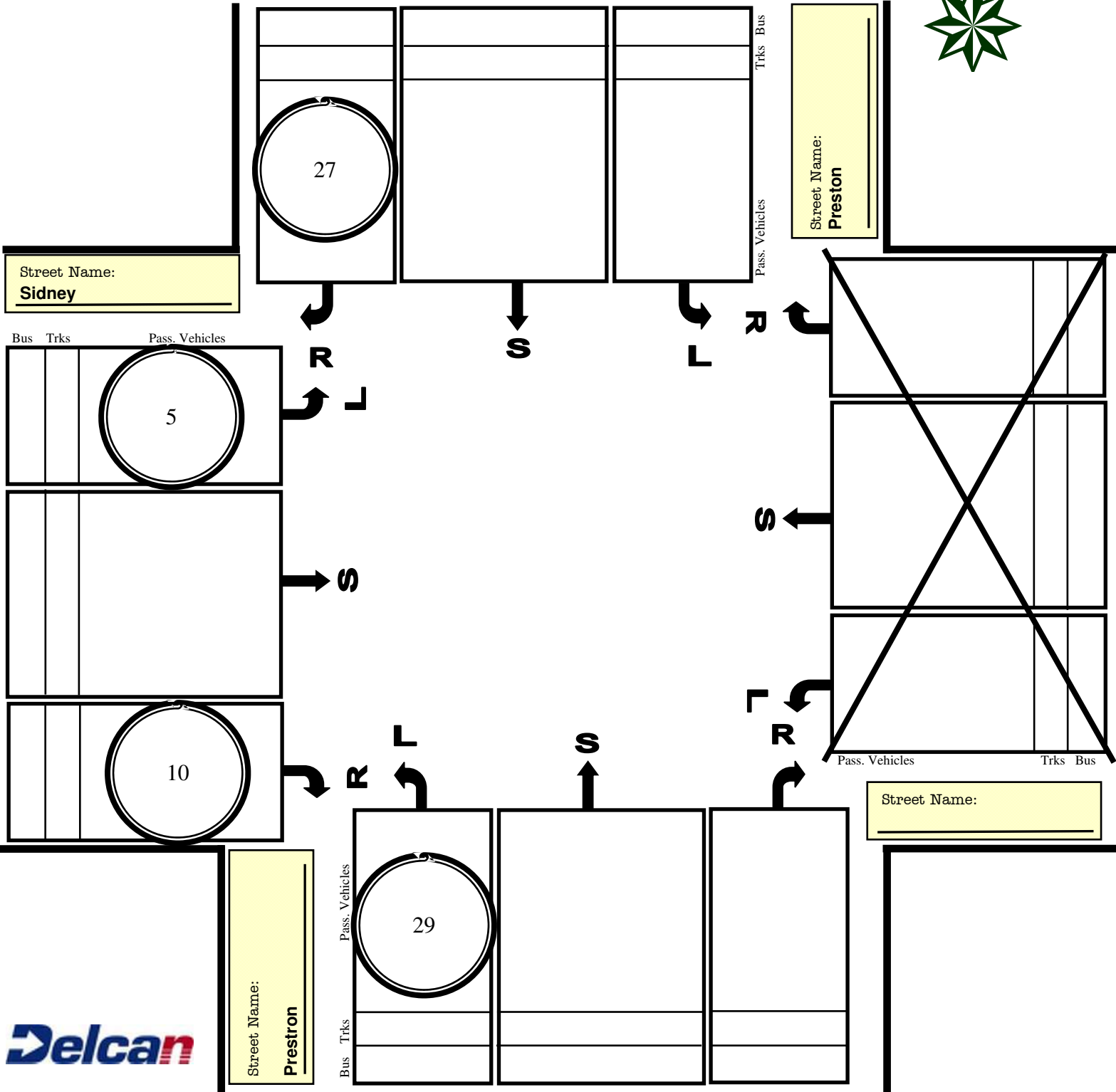
Observer: Kyle Delaney Weather: Cloudy

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

TIME PERIOD: From: 7 : 30 To: 8 : 30

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

N



# DIRECTIONAL TRAFFIC FLOW

Intersection: Peston at Sidney

DATE: Day: 1 Month: March Year: 2011 Day of Week: Tuesday

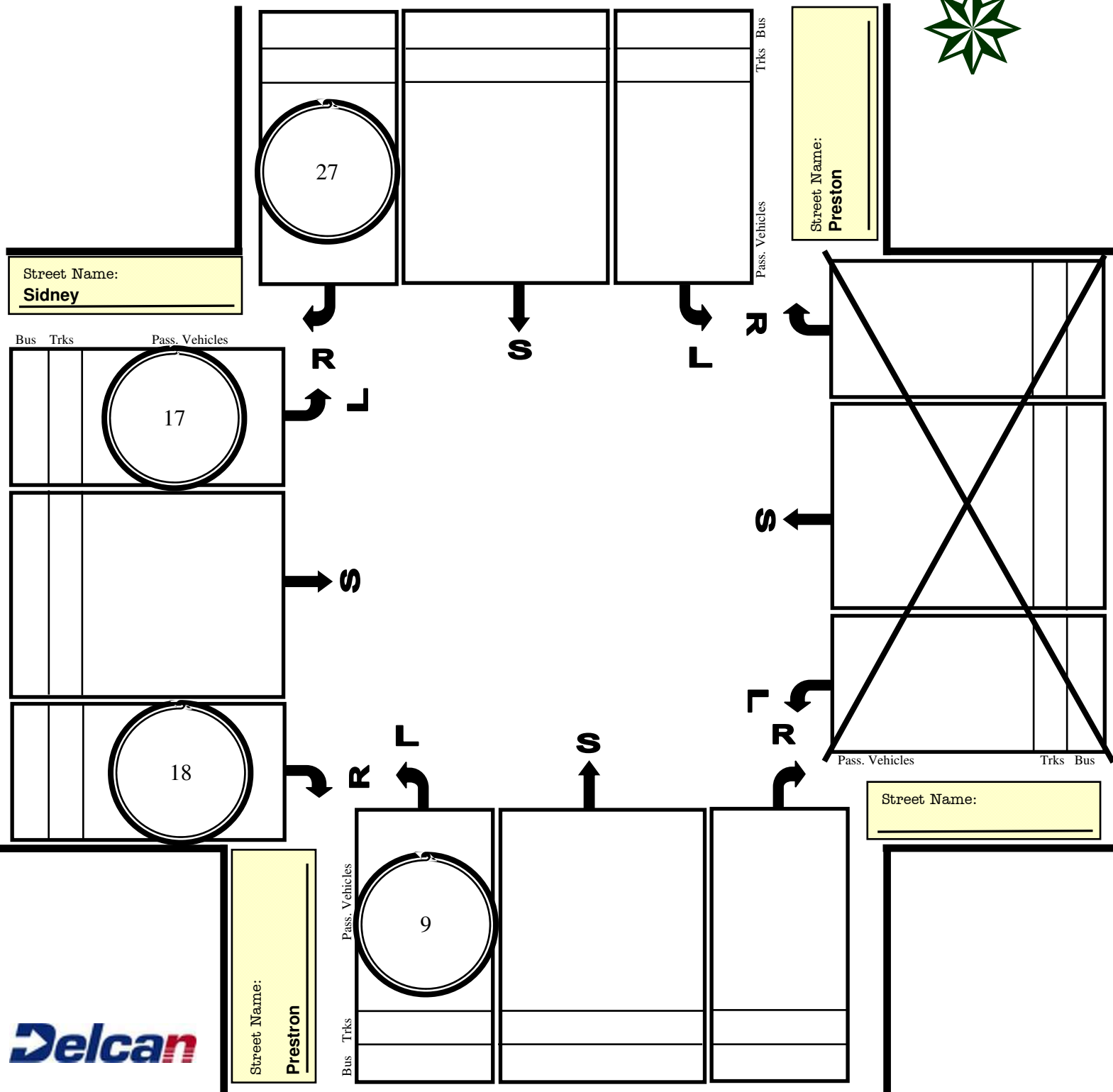
Observer: Kyle Delaney Weather: Clear

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





# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

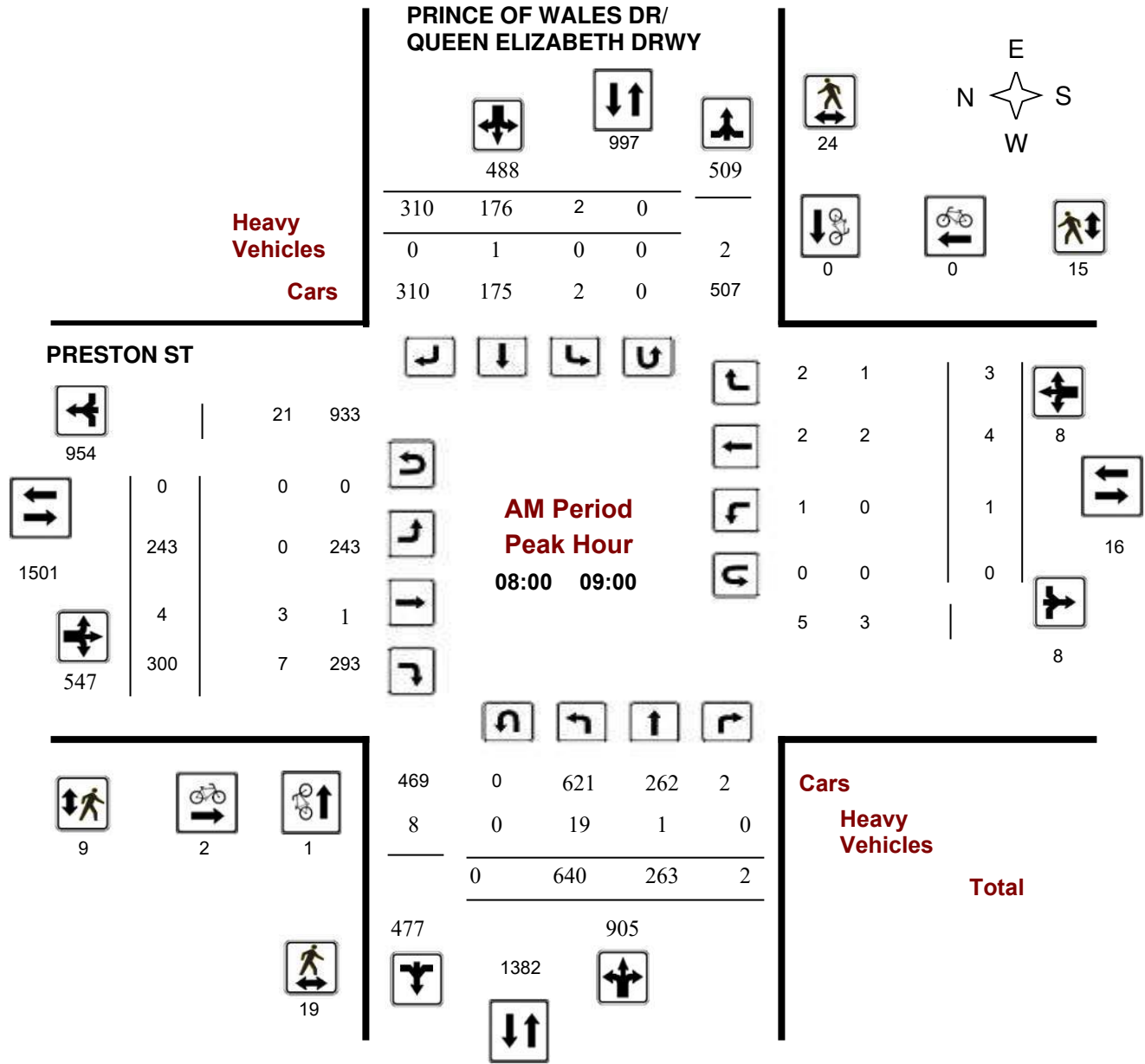
### PRESTON ST @ PRINCE OF WALES DR/QUEEN ELIZABETH

**Survey Date:** Wednesday, January 10, 2018

**Start Time:** 07:00

**WO No:** 37407

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

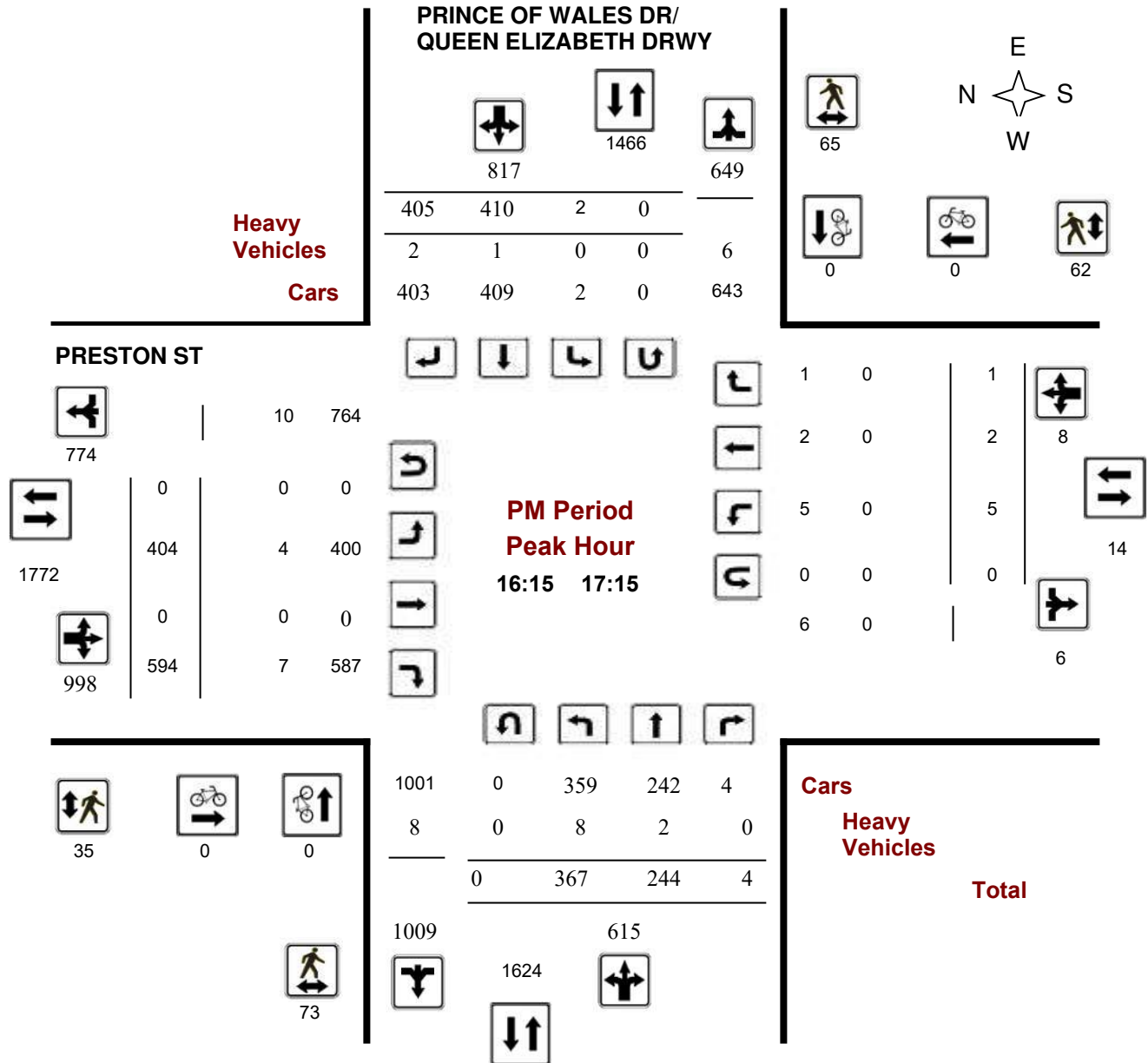
### PRESTON ST @ PRINCE OF WALES DR/QUEEN ELIZABET

**Survey Date:** Wednesday, January 10, 2018

**Start Time:** 07:00

**WO No:** 37407

**Device:** Miovision



**Comments**

## **APPENDIX E**

---

### Collision Records





# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** 130 W OF PRESTON ST @ CARLING AVE

**Traffic Control:** Traffic signal

**Total Collisions:** 4

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Apr-12, Thu,10:02	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Passenger van	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2018-May-21, Mon,18:31	Clear	Angle	Non-fatal injury	Dry	North	Going ahead	Bicycle	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Cyclist	
2019-May-07, Tue,11:42	Clear	Angle	Non-fatal injury	Dry	West	Slowing or stopping	Automobile, station wagon	Cyclist	0
					North	Going ahead	Bicycle	Other motor vehicle	
2019-May-16, Thu,18:02	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Cyclist	0
					North	Going ahead	Bicycle	Other	
					North	Going ahead	Bicycle	Other motor vehicle	

**Location:** BEECH ST @ PRESTON ST

**Traffic Control:** Traffic signal

**Total Collisions:** 7

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2015-Jan-26, Mon,12:42	Clear	Other	P.D. only	Dry	North	Reversing	Automobile, station wagon	Other motor vehicle	0
					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	0
					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	0
					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	0
					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	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** BEECH ST @ PRESTON ST

**Traffic Control:** Traffic signal

**Total Collisions:** 7

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2019-Mar-28, Thu,16:20	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Oct-24, Thu,20:49	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	

**Location:** BOOTH ST @ CARLING AVE

**Traffic Control:** Traffic signal

**Total Collisions:** 20

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2015-Apr-02, Thu,16:29	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Pick-up truck	Other motor vehicle	
2015-May-06, Wed,10:23	Clear	Rear end	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2015-Jun-30, Tue,16:26	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Jul-23, Thu,10:34	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Truck and trailer	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Oct-27, Thu,16:41	Snow	Turning movement	P.D. only	Wet	East	Turning left	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Jan-10, Tue,17:30	Snow	Turning movement	P.D. only	Loose snow	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Jan-18, Thu,17:27	Snow	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jun-07, Thu,16:17	Clear	Turning movement	P.D. only	Dry	East	Turning left	Passenger van	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** BOOTH ST @ CARLING AVE

**Traffic Control:** Traffic signal

**Total Collisions:** 20

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Jun-21, Thu,15:48	Clear	Rear end	Non-fatal injury	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jul-13, Fri,15:32	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Cyclist	0
					North	Going ahead	Bicycle	Other motor vehicle	
2018-Sep-19, Wed,10:51	Clear	Sideswipe	P.D. only	Dry	South	Unknown	Automobile, station wagon	Other motor vehicle	0
					South	Unknown	Automobile, station wagon	Other motor vehicle	
2018-Sep-28, Fri,16:30	Clear	Rear end	P.D. only	Dry	West	Going ahead	School bus	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Oct-18, Thu,07:03	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Jan-24, Thu,14:20	Clear	Sideswipe	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Feb-14, Thu,12:33	Clear	Turning movement	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2019-May-22, Wed,06:15	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-Jun-15, Sat,17:53	Rain	Turning movement	P.D. only	Wet	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Jun-18, Tue,22:00	Clear	Turning movement	P.D. only	Dry	West	Making "U" turn	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Dec-01, Sun,10:44	Clear	Angle	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** BOOTH ST @ CARLING AVE

**Traffic Control:** Traffic signal

**Total Collisions:** 20

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2019-Dec-17, Tue,17:46	Clear	Rear end	P.D. only	Dry	East	Unknown	Unknown	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

**Location:** CARLING AVE @ CHAMPAGNE AVE

**Traffic Control:** Traffic signal

**Total Collisions:** 11

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	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	0
					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	0
					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	0
					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	0
					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	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jan-15, Mon,16:15	Clear	Sideswipe	P.D. only	Packed snow	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Pick-up truck	Other motor vehicle	
2018-Nov-24, Sat,13:45	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-May-15, Wed,08:30	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** CARLING AVE @ CHAMPAGNE AVE

**Traffic Control:** Traffic signal

**Total Collisions:** 11

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Sep-03, Tue,21:10	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Bus (other)	Other motor vehicle	0
					West	Going ahead	Motorcycle	Other motor vehicle	
2019-Dec-04, Wed,16:28	Snow	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Dec-28, Sat,14:25	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Passenger van	Other motor vehicle	

**Location:** CARLING AVE @ PRESTON ST

**Traffic Control:** Traffic signal

**Total Collisions:** 56

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jan-16, Fri,15:45	Clear	Rear end	Non-fatal injury	Loose snow	West	Turning right	Passenger van	Other motor vehicle	0
					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	0
					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	0
					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	0
					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	0
					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	0
2015-Jun-06, Sat,21:44	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Bicycle	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Cyclist	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** CARLING AVE @ PRESTON ST

**Traffic Control:** Traffic signal

**Total Collisions:** 56

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2015-Jun-23, Tue,23:02	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Intercity bus	Other motor vehicle	0
					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	0
					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	0
					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	0
					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	0
					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	0
					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	0
					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	0
					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	0
					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	0
					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	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** CARLING AVE @ PRESTON ST

**Traffic Control:** Traffic signal

**Total Collisions:** 56

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2017-Feb-10, Fri,13:45	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Mar-06, Mon,16:53	Snow	Angle	P.D. only	Ice	South	Overtaking	Automobile, station wagon	Other motor vehicle	0
					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	0
					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	0
					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	0
					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	0
					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	0
					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)	0
2017-Nov-29, Wed,07:36	Clear	Sideswipe	P.D. only	Wet	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					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
2018-Jan-12, Fri,10:50	Rain	Turning movement	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Jan-15, Mon,08:54	Clear	Rear end	Non-fatal injury	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** CARLING AVE @ PRESTON ST

**Traffic Control:** Traffic signal

**Total Collisions:** 56

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Jan-26, Fri,16:00	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Feb-06, Tue,20:44	Clear	Rear end	Non-fatal injury	Slush	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Mar-01, Thu,14:30	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Mar-17, Sat,15:00	Clear	Angle	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Mar-21, Wed,18:00	Clear	Sideswipe	P.D. only	Dry	South	Overtaking	Automobile, station wagon	Other motor vehicle	0
					South	Overtaking	Automobile, station wagon	Other motor vehicle	
2018-Apr-12, Thu,17:12	Rain	Rear end	P.D. only	Wet	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jun-07, Thu,16:51	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2018-Jun-14, Thu,06:57	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2018-Sep-05, Wed,16:47	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Cyclist	0
					North	Going ahead	Bicycle	Other motor vehicle	
2018-Sep-21, Fri,20:22	Clear	Angle	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Dec-05, Wed,14:47	Snow	Sideswipe	P.D. only	Slush	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	





# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** CARLING AVE @ PRESTON ST

**Traffic Control:** Traffic signal

**Total Collisions:** 56

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2019-Jan-12, Sat,15:14	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Passenger van	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Mar-27, Wed,08:20	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Apr-15, Mon,15:30	Clear	Sideswipe	P.D. only	Wet	South	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Jun-03, Mon,10:40	Rain	Other	P.D. only	Wet	South	Reversing	Pick-up truck	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Jun-04, Tue,08:55	Clear	Rear end	P.D. only	Dry	East	Going ahead	Delivery van	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-Jun-28, Fri,15:07	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Jul-16, Tue,20:45	Clear	Sideswipe	P.D. only	Dry	North	Merging	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Jul-28, Sun,17:30	Clear	Turning movement	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Jul-30, Tue,15:06	Clear	Angle	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Sep-03, Tue,16:00	Clear	Rear end	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Oct-25, Fri,09:03	Clear	Other	Non-fatal injury	Dry	East	Turning right	Unknown	Cyclist	0
					West	Going ahead	Bicycle	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** CARLING AVE @ PRESTON ST

**Traffic Control:** Traffic signal

**Total Collisions:** 56

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2019-Nov-25, Mon,17:30	Rain	Rear end	Non-fatal injury	Wet	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Nov-29, Fri,16:19	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Truck - open	Other motor vehicle	
2019-Dec-04, Wed,09:20	Snow	Rear end	P.D. only	Ice	East	Turning left	Automobile, station wagon	Skidding/sliding	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Dec-06, Fri,16:09	Clear	SMV other	Non-fatal injury	Wet	North	Turning left	Automobile, station wagon	Pedestrian	1

**Location:** CARLING AVE @ SHERWOOD DR

**Traffic Control:** Traffic signal

**Total Collisions:** 8

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2015-Feb-28, Sat,10:25	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					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	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-Jan-22, Tue,12:30	Clear	Rear end	P.D. only	Packed snow	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Apr-09, Tue,16:57	Snow	Rear end	P.D. only	Loose snow	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-May-24, Fri,09:30	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Oct-31, Thu,16:19	Rain	Rear end	Non-fatal injury	Wet	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** CARLING AVE @ SHERWOOD DR

**Traffic Control:** Traffic signal

**Total Collisions:** 8

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2019-Nov-16, Sat,06:45	Clear	Turning movement	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Dec-04, Wed,09:27	Snow	Other	P.D. only	Wet	East	Slowing or stopping	Automobile, station wagon	Curb	0
					East	Slowing or stopping	Pick-up truck	Other motor vehicle	

**Location:** PAMILLA ST @ PRESTON ST

**Traffic Control:** Traffic signal

**Total Collisions:** 7

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2015-May-13, Wed,15:06	Clear	Turning movement	P.D. only	Dry	North	Pulling away from shoulder or curb	Pick-up truck	Other motor vehicle	0
					North	Turning right	Pick-up truck	Other motor vehicle	
2016-Dec-31, Sat,22:11	Snow	Approaching	P.D. only	Loose snow	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Feb-25, Sat,15:11	Rain	Angle	P.D. only	Wet	South	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Nov-20, Mon,14:15	Clear	SMV other	Non-fatal injury	Dry	North	Going ahead	Unknown	Pedestrian	1
2017-Nov-22, Wed,10:17	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jun-26, Tue,16:30	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-Jan-28, Mon,15:35	Clear	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** PRESTON ST @ PRINCE OF WALES DR/QUEEN ELIZABET

**Traffic Control:** Traffic signal

**Total Collisions:** 26

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Feb-26, Thu,09:52	Clear	Rear end	P.D. only	Dry	East	Turning left	Delivery van	Other motor vehicle	0
					East	Turning left	Truck and trailer	Other motor vehicle	
2015-Apr-13, Mon,15:31	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-May-08, Fri,16:17	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Jun-09, Tue,19:25	Rain	Other	P.D. only	Wet	East	Reversing	Pick-up truck	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2015-Oct-28, Wed,23:24	Rain	Angle	P.D. only	Wet	South	Turning right	Unknown	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2015-Nov-12, Thu,13:36	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Nov-20, Fri,19:20	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Mar-26, Sat,18:13	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Passenger van	Other motor vehicle	
2017-Feb-23, Thu,18:13	Clear	Rear end	P.D. only	Wet	West	Turning right	Unknown	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Other motor vehicle	
2017-Apr-08, Sat,14:47	Clear	Rear end	P.D. only	Dry	South	Turning right	Unknown	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2017-Aug-03, Thu,11:25	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Bicycle	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** PRESTON ST @ PRINCE OF WALES DR/QUEEN ELIZABET

**Traffic Control:** Traffic signal

**Total Collisions:** 26

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-Aug-04, Fri,13:07	Clear	Angle	P.D. only	Dry	East	Going ahead	Bicycle	Other motor vehicle	0
					South	Going ahead	Motorcycle	Cyclist	
2017-Sep-12, Tue,09:20	Clear	Turning movement	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2017-Oct-02, Mon,12:45	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Nov-03, Fri,15:22	Clear	Angle	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
2017-Dec-21, Thu,16:00	Clear	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Feb-01, Thu,11:00	Clear	Sideswipe	P.D. only	Dry	North	Unknown	Bicycle	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Cyclist	
2018-Apr-09, Mon,09:23	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Bicycle	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Cyclist	
2018-Dec-21, Fri,21:16	Rain	Turning movement	P.D. only	Wet	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-May-16, Thu,17:55	Clear	Sideswipe	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Jul-02, Tue,18:27	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Jul-04, Thu,11:15	Clear	Rear end	P.D. only	Dry	South	Turning right	Pick-up truck	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2019-Aug-26, Mon,07:45	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** PRESTON ST @ PRINCE OF WALES DR/QUEEN ELIZABET

**Traffic Control:** Traffic signal

**Total Collisions:** 26

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Oct-17, Thu,18:58	Rain	Turning movement	P.D. only	Wet	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Oct-26, Sat,15:52	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Pick-up truck	Other motor vehicle	
2019-Nov-14, Thu,09:50	Snow	Sideswipe	P.D. only	Loose snow	East	Overtaking	Unknown	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

**Location:** PRESTON ST @ SIDNEY ST

**Traffic Control:** Stop sign

**Total Collisions:** 9

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jan-16, Fri,16:00	Snow	Angle	P.D. only	Slush	East	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2015-May-15, Fri,21:59	Clear	Angle	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Feb-18, Thu,13:49	Snow	Sideswipe	P.D. only	Slush	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Truck - closed	Other motor vehicle	
2017-Jan-23, Mon,11:14	Clear	Angle	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Delivery van	Other motor vehicle	
2017-Jun-23, Fri,16:43	Clear	Angle	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Jan-16, Tue,08:10	Snow	Turning movement	P.D. only	Loose snow	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Mar-07, Wed,15:27	Clear	Angle	P.D. only	Wet	East	Unknown	Automobile, station wagon	Other motor vehicle	0
					South	Unknown	Automobile, station wagon	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** PRESTON ST @ SIDNEY ST

**Traffic Control:** Stop sign

**Total Collisions:** 9

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2019-Jun-28, Fri,16:40	Rain	Rear end	P.D. only	Wet	South	Unknown	Unknown	Other motor vehicle	0
					South	Turning right	Pick-up truck	Other motor vehicle	
2019-Sep-09, Mon,13:30	Clear	Angle	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Passenger van	Other motor vehicle	

<b>Intersection</b>	<b>Date</b>	<b>Time</b>	<b>Environment</b>	<b>Road Surface</b>	<b>Control</b>	<b>Collision Location</b>	<b>Light</b>	<b>Classification</b>	<b>Impact Type</b>
ADELINE ST @ PRESTON ST	2/17/2016	9:52	01 - Clear	01 - Dry	02 - Stop sign	02 - Intersection related	01 - Daylight	03 - P.D. only	03 - Rear end
ADELINE ST @ PRESTON ST	2/18/2017	12:46	01 - Clear	04 - Slush	02 - Stop sign	03 - At intersection	01 - Daylight	03 - P.D. only	06 - SMV
ADELINE ST @ PRESTON ST	2/12/2017	18:40	03 - Snow	03 - Loose snow	02 - Stop sign	03 - At intersection	07 - Dark	03 - P.D. only	02 - Angle
ADELINE ST @ PRESTON ST	2/8/2017	11:20	01 - Clear	04 - Slush	02 - Stop sign	02 - Intersection related	01 - Daylight	03 - P.D. only	06 - SMV



## **APPENDIX F**

---

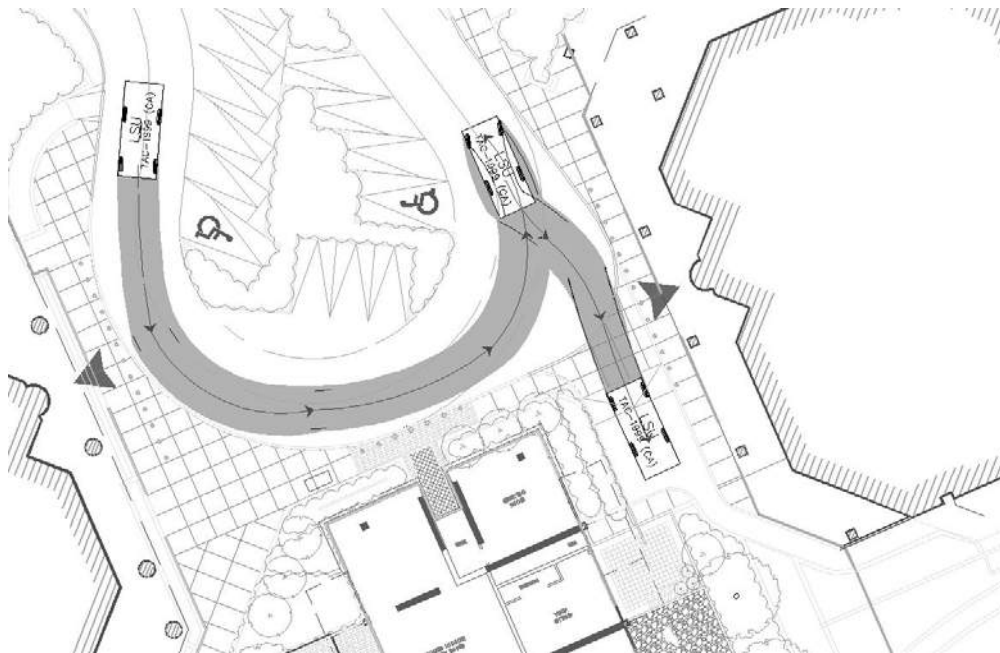
Other Area Developments

## **OTHER AREA DEVELOPMENTS**

---

17 Aberdeen Street

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%

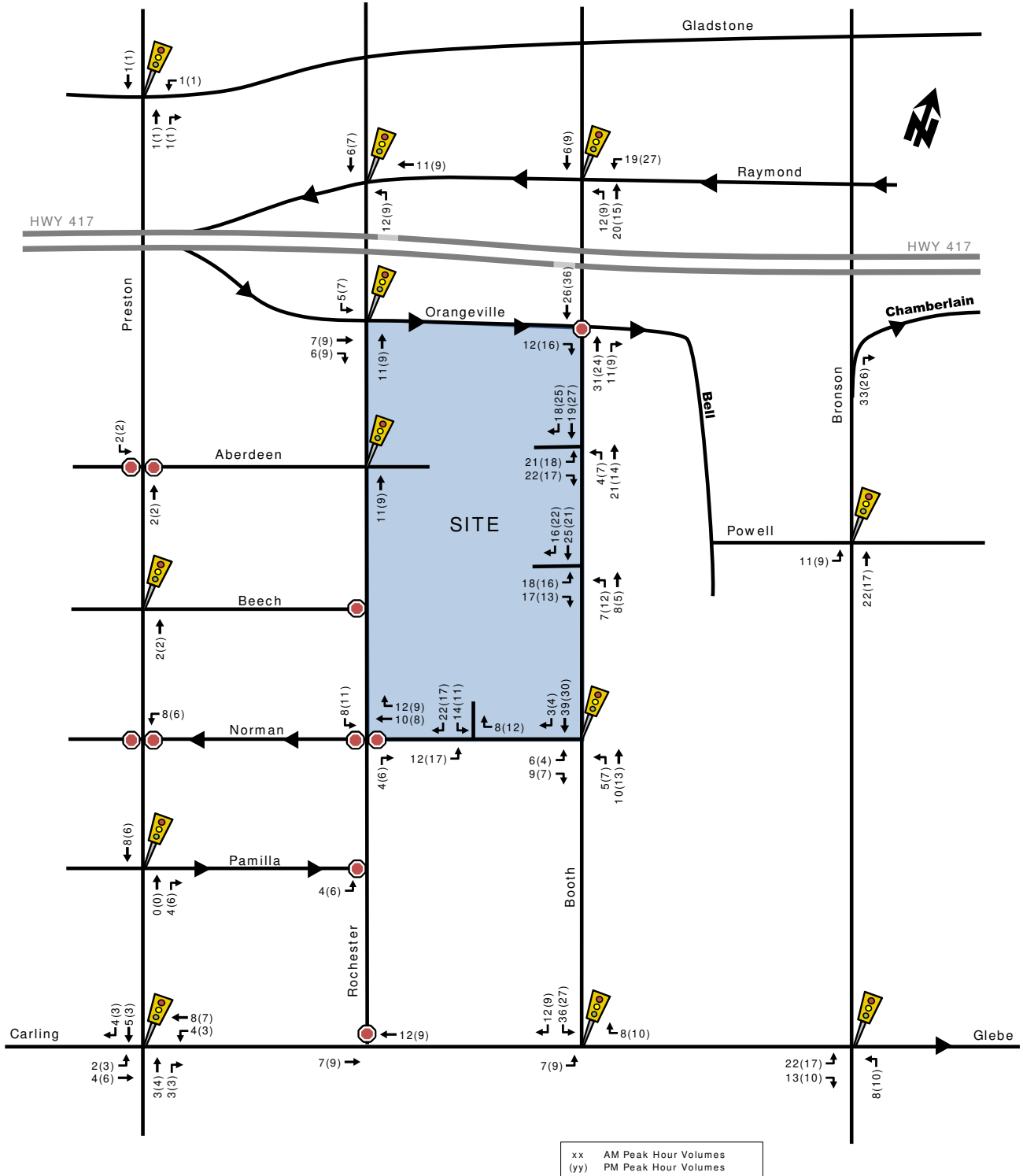
The local adjustment factors above therefore indicate that the development will generate approximately 39 vehicles per hour and 49 vehicles per hour during the weekday morning and afternoon peak hours, respectively. It is important to note that these are two-way trips (in and out) and will be distributed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

## **OTHER AREA DEVELOPMENTS**

---

552 Booth Street

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



### 3.2. BACKGROUND NETWORK TRAVEL DEMANDS

#### 3.2.1. TRANSPORTATION NETWORK PLANS

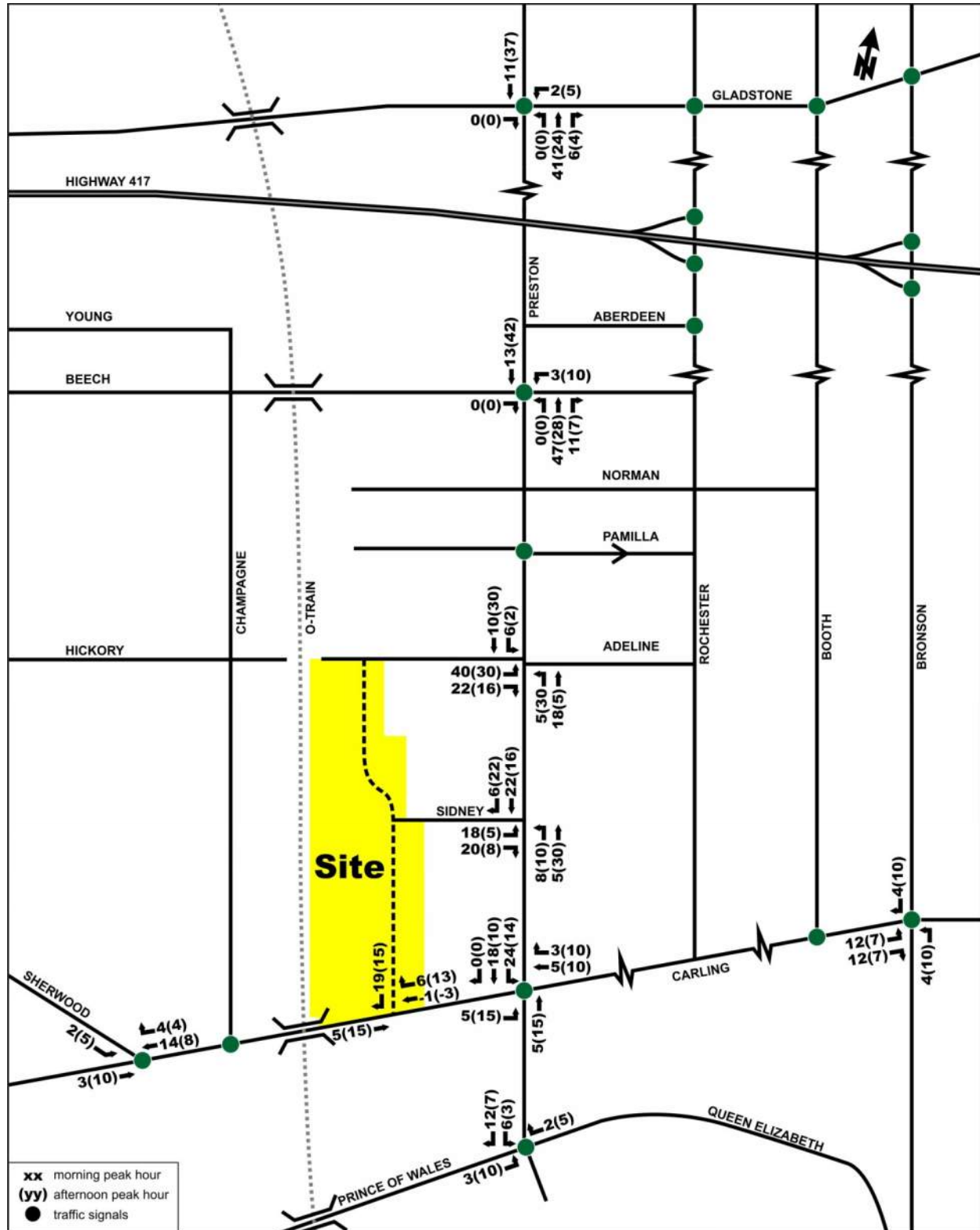
Refer to Section 2.1.2 Planned Conditions.

## **OTHER AREA DEVELOPMENTS**

---

845 Carling Avenue

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





## **OTHER AREA DEVELOPMENTS**

---

90 Champagne Avenue

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**.

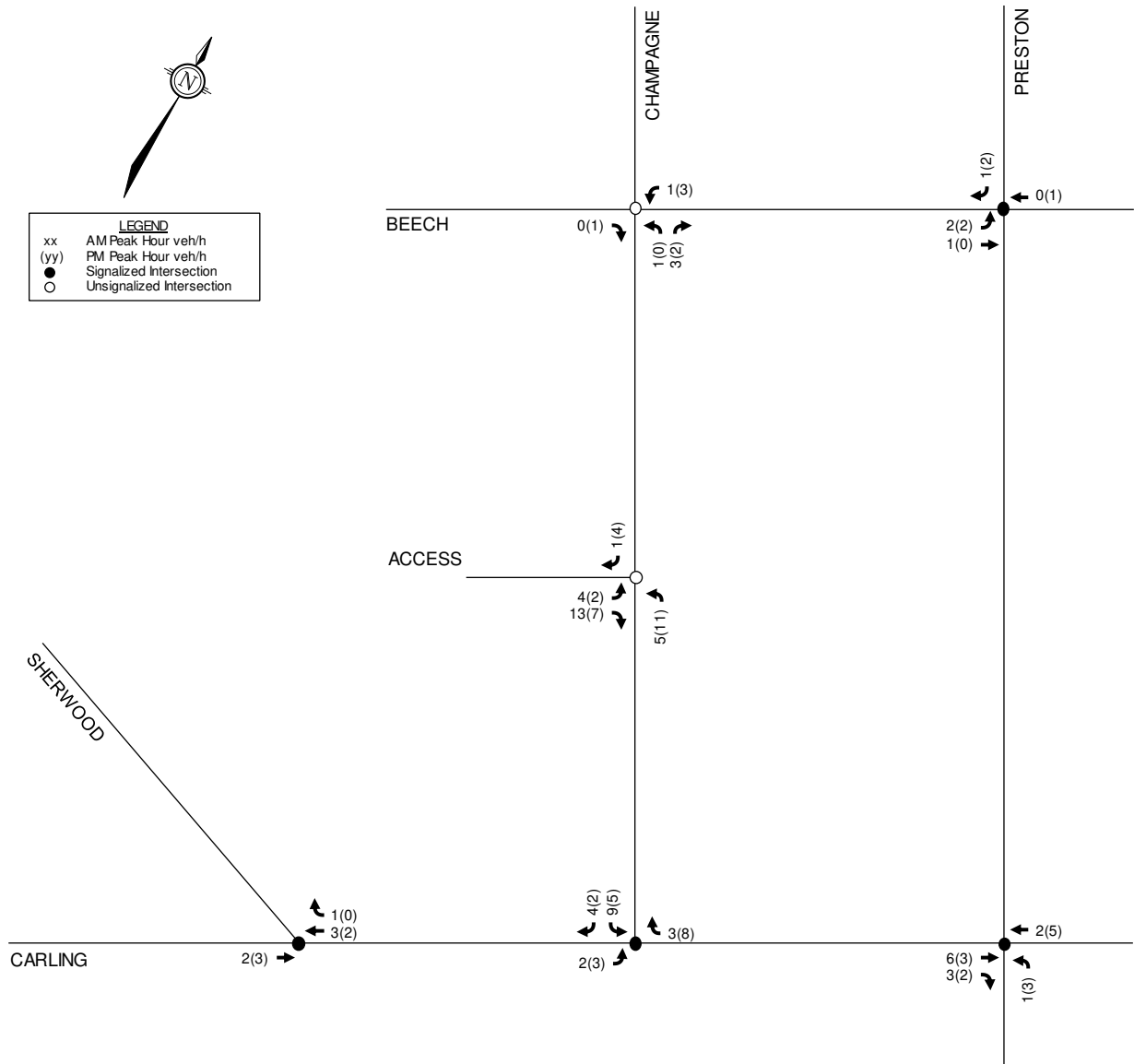
## **5.2 Background Traffic**

### **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 6: Site Generated Traffic Volumes



## **OTHER AREA DEVELOPMENTS**

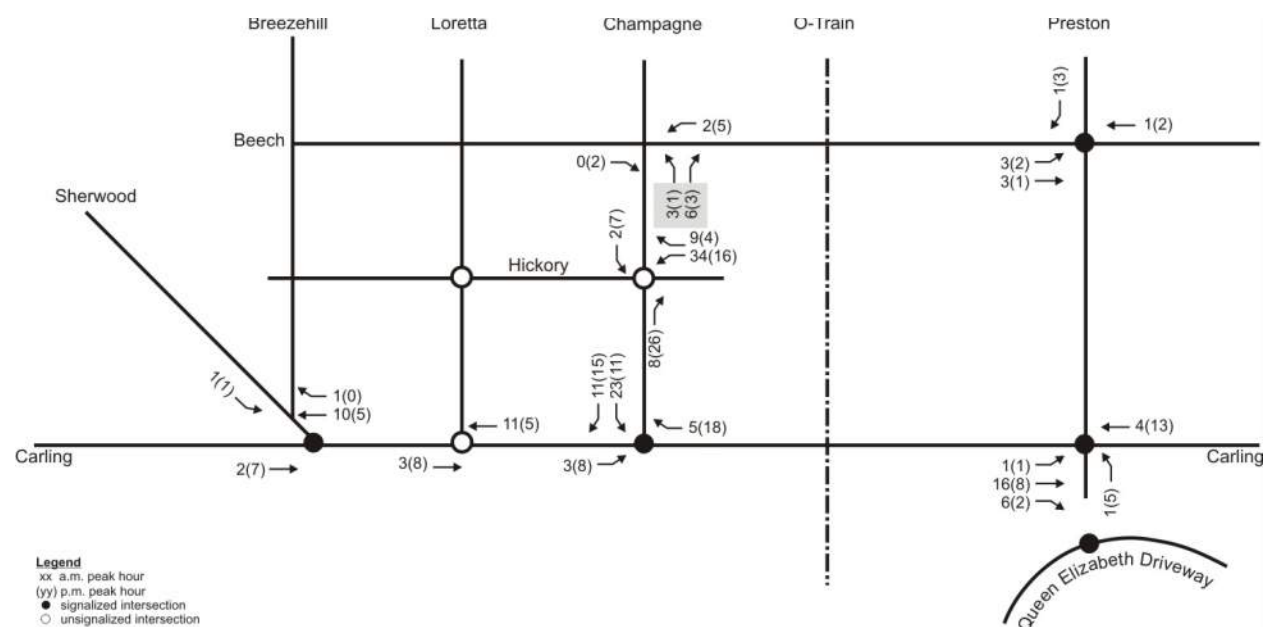
---

101-105 Champagne Avenue

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.

## **OTHER AREA DEVELOPMENTS**

---

93-105 Norman Street

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.

## **OTHER AREA DEVELOPMENTS**

---

500 Preston Street



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

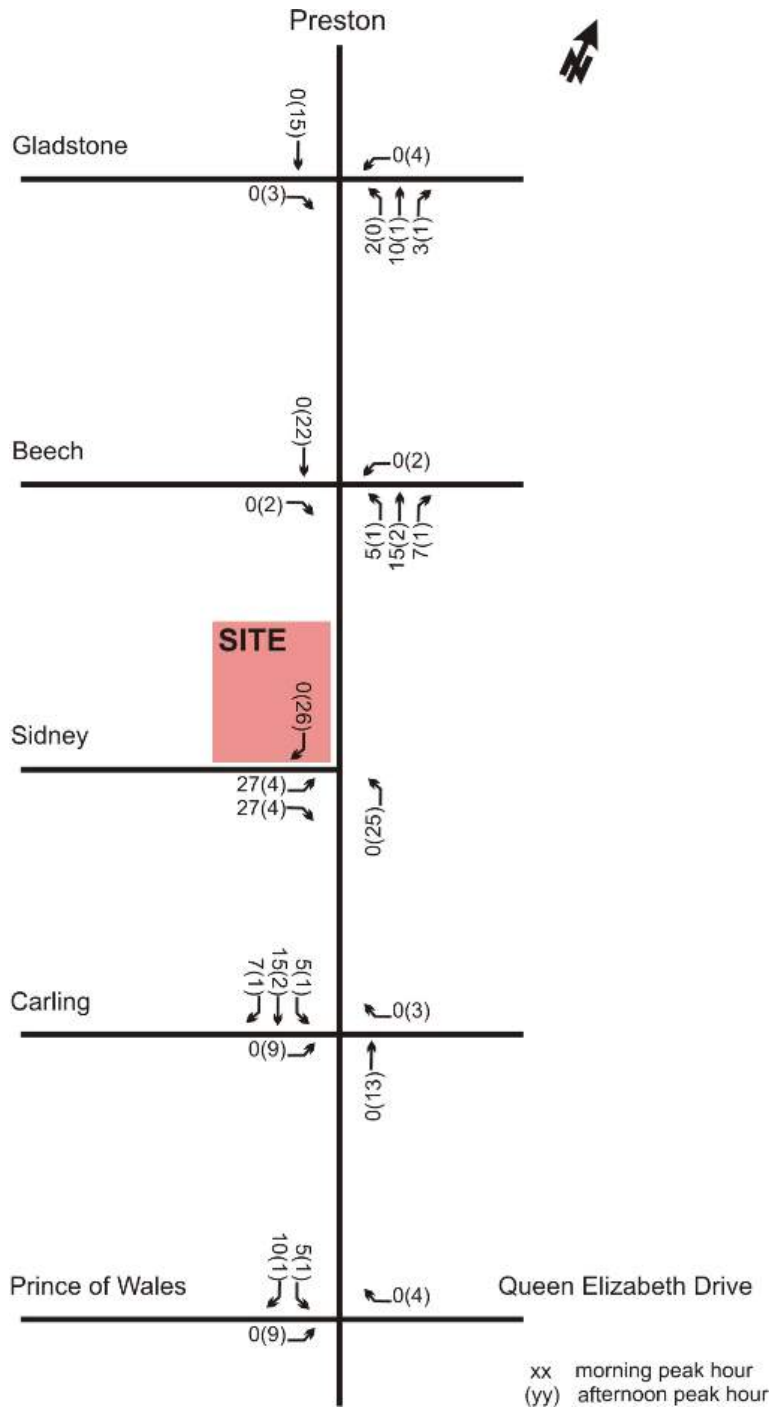


TABLE 5: High Rise Condo Trip Generation (Net Increase)

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
Total 'New' Auto Trips		3	12	15	6	4	10

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
Total 'New' Auto Trips		8	3	11	5	11	16

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
Total 'New' Auto Trips	11	15	26	11	15	26

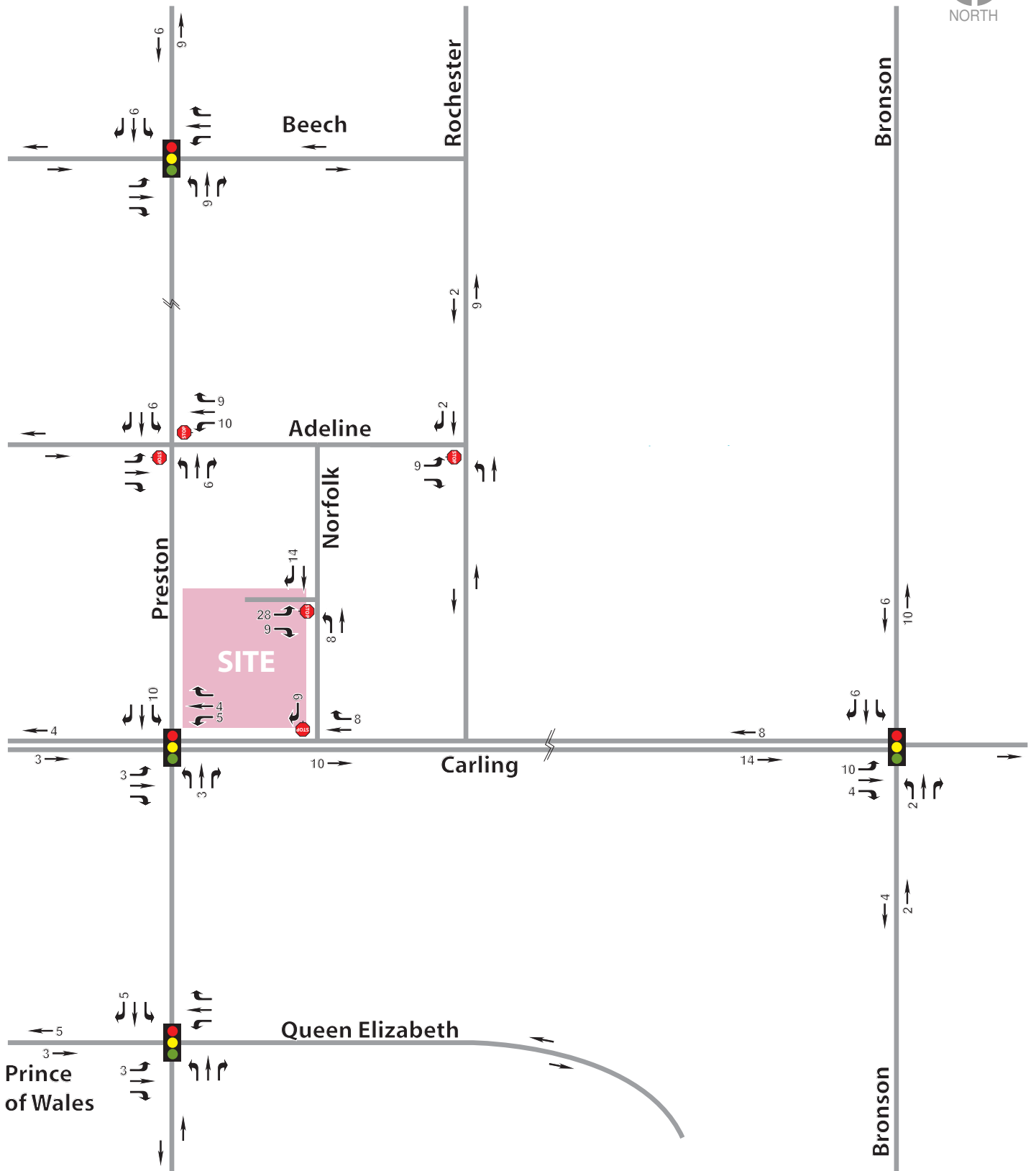
As summarized in Table 7, the net traffic increase associated with the proposed Site Plan changes is estimated at 26 vph during both peak periods, or less than one new vehicle every two minutes during peak hours.

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

## **OTHER AREA DEVELOPMENTS**

---

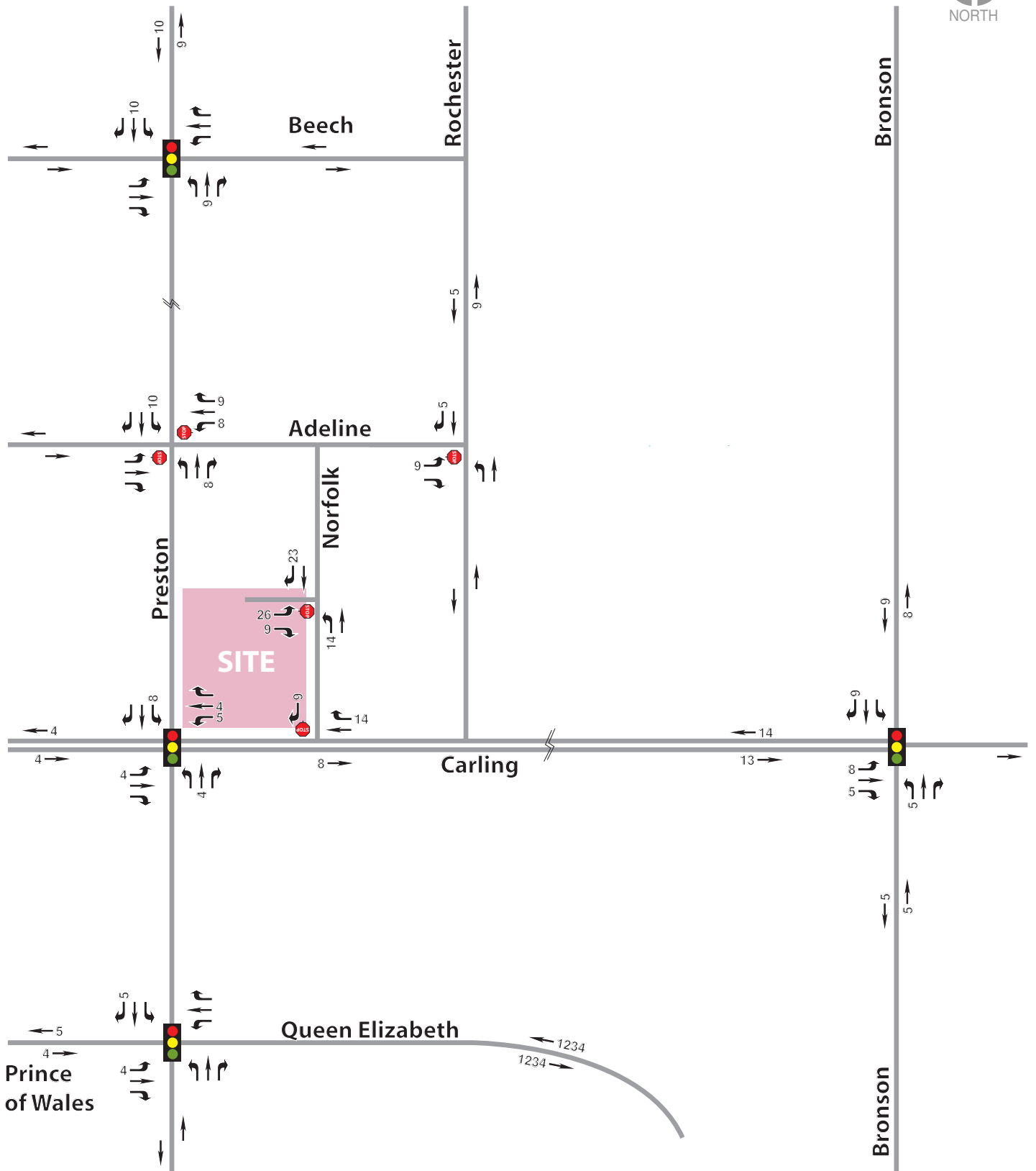
505 Preston Street



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.

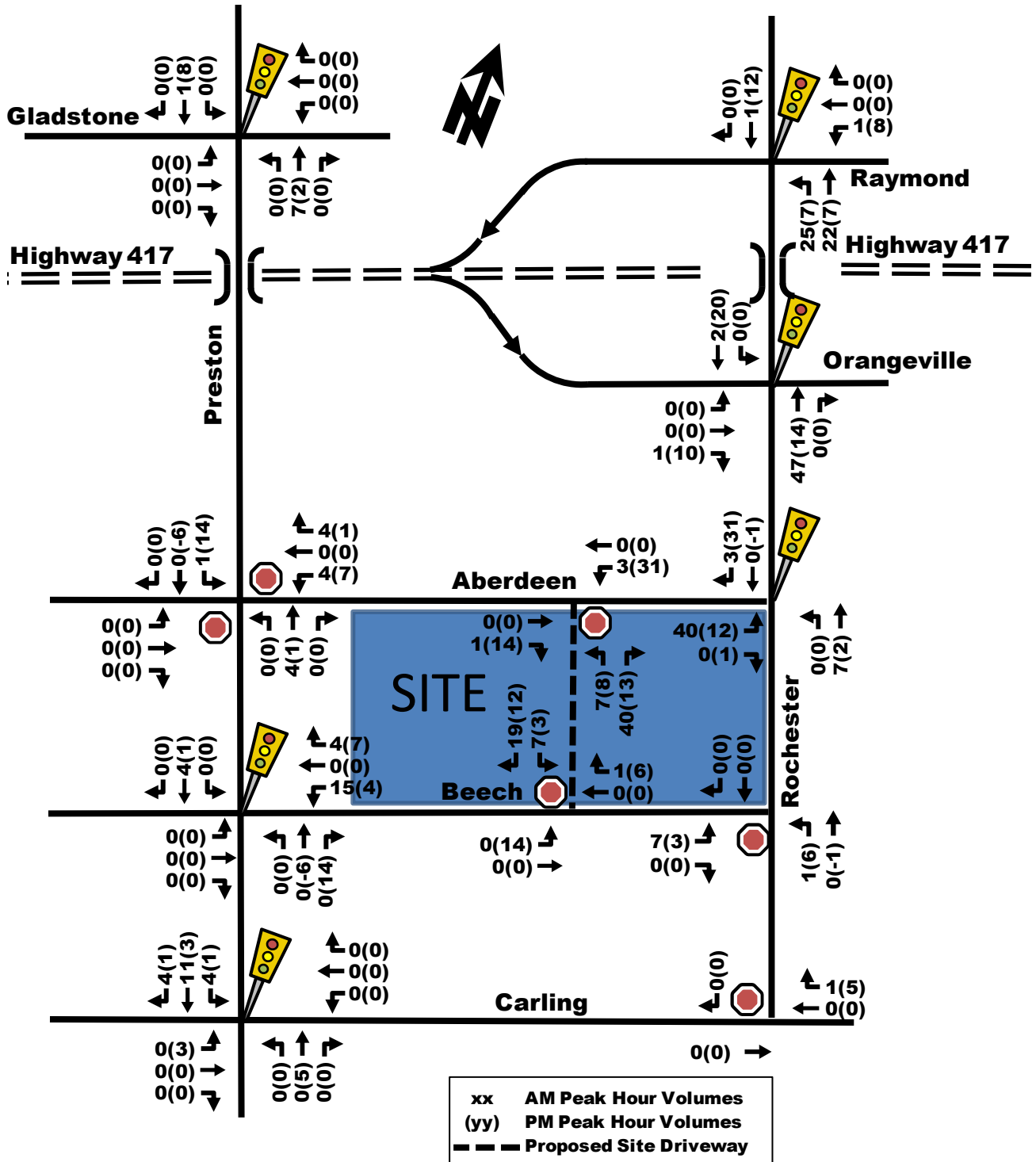
The update to trip generation values for each of the developments listed above suggests a net increase of 31 trips in the weekday morning peak hour and 34 trips in the weekday afternoon

## **OTHER AREA DEVELOPMENTS**

---

450 Rochester Street

Figure 11: Site-Generated Traffic at Full Buildout (Phase 1 & 2)



Note: values in negative reflect changes in routes based on pass-by trips or net change between trips generated and reduction in public parking lot.



## **OTHER AREA DEVELOPMENTS**

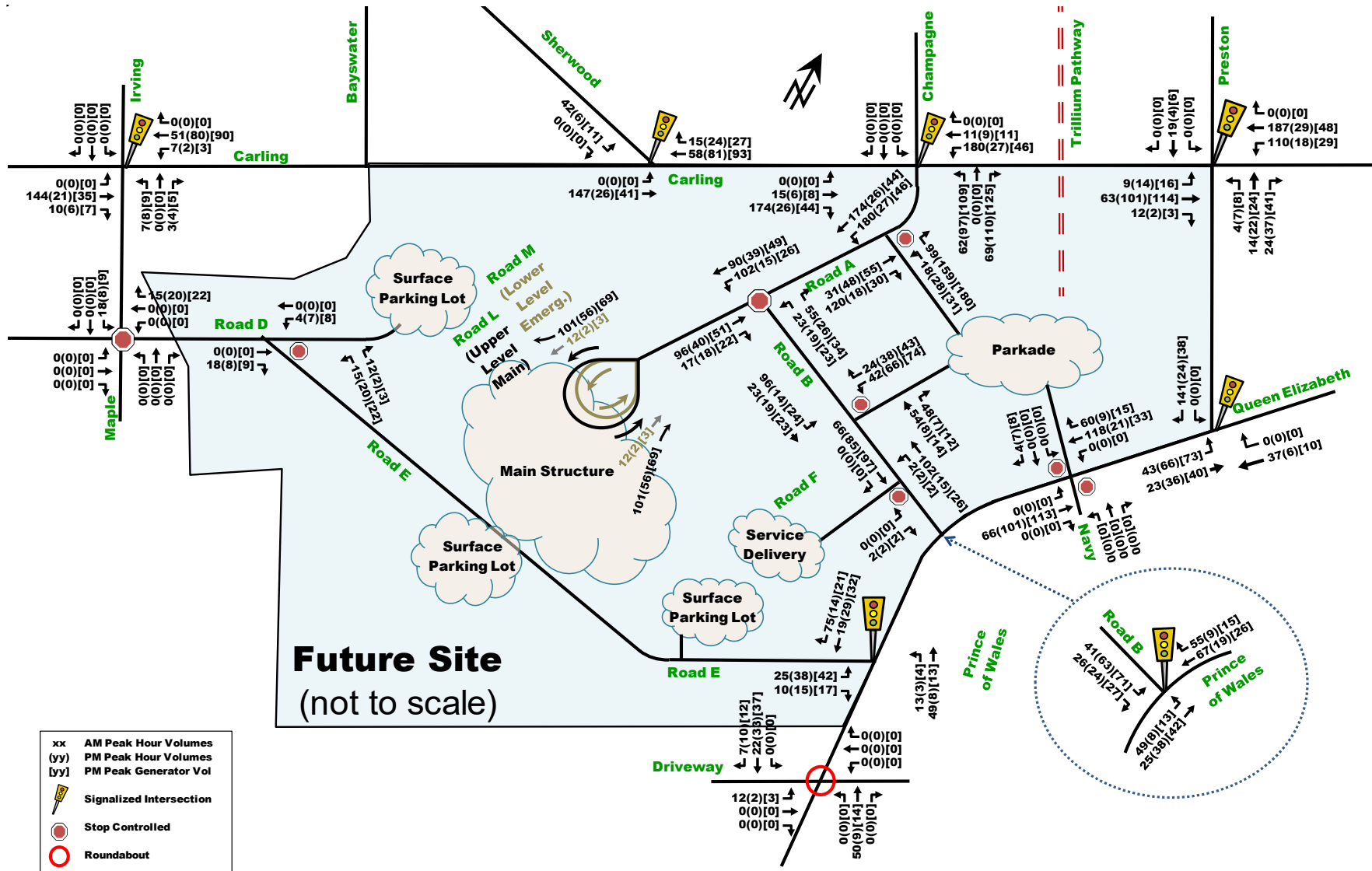
---

Ottawa Civic Hospital Expansion (930 Carling Avenue)

Figure 5: Future Active Transportation Network Map



Figure 3: 2028 Opening Day Site Generated Volumes (Streets Adjacent to NCD)



## **APPENDIX G**

---

Strategic Long-Range Model and Intersection Growth Rate Figures

# TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

## AM Peak Hour Total Traffic Volume

### Carling Preston Area

2011 Model - Basecase

N/A

User Initials: TIMW

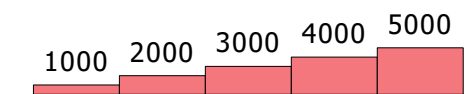
Plot Prepared: Feb 2, 2020

EMME Scenario: 21711

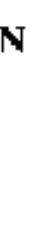
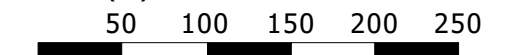


## Legend

AM Peak Hour Total Traffic Volume



Distance (m)



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

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

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

# TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

## AM Peak Hour Total Traffic Volume

### Carling Preston Area

2031 Model - Basecase

N/A

User Initials: TIMW

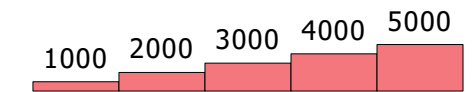
Plot Prepared: Feb 2, 2020

EMME Scenario: 21711

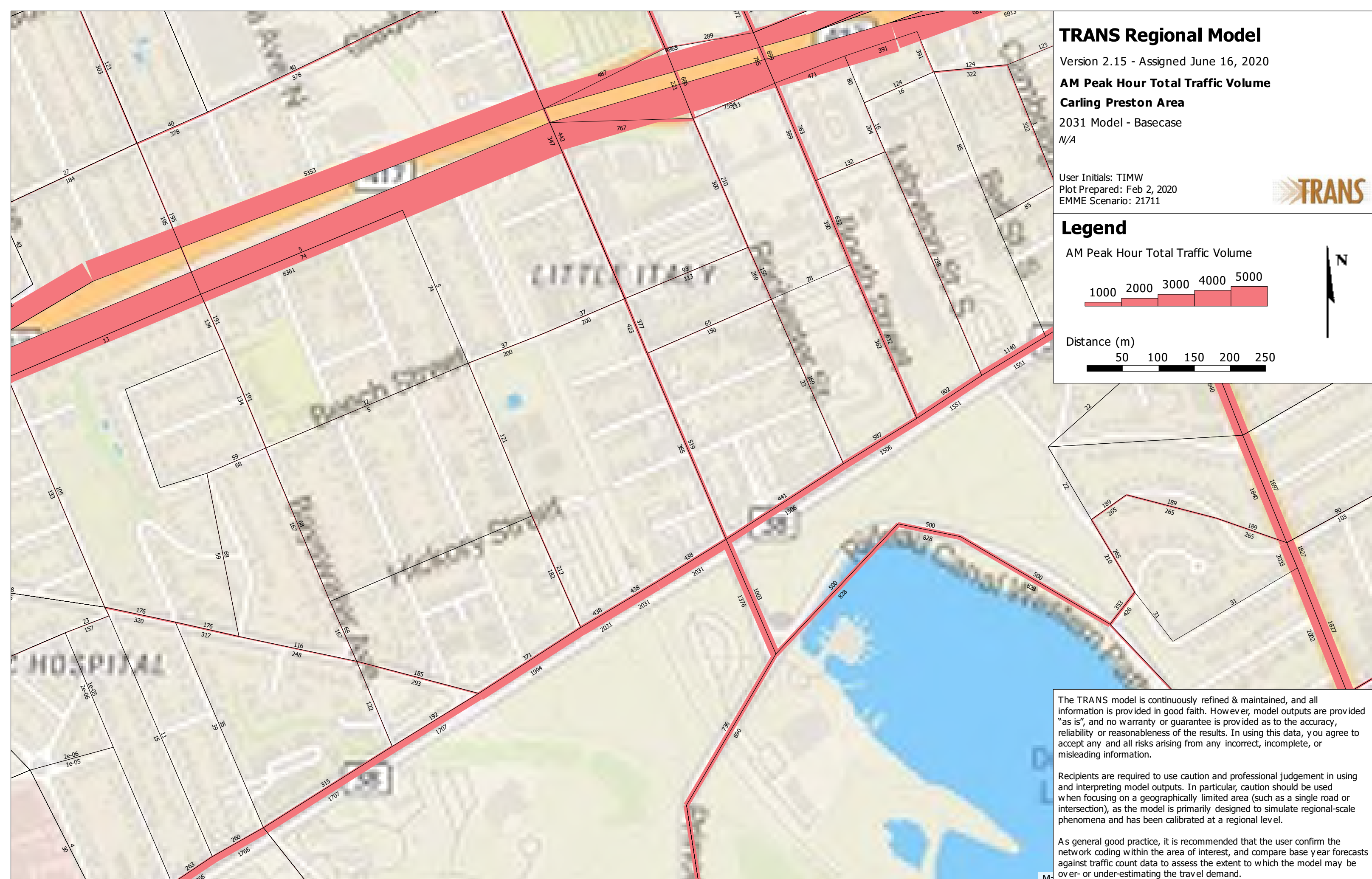
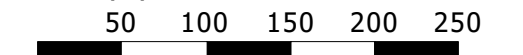


## Legend

AM Peak Hour Total Traffic Volume



Distance (m)



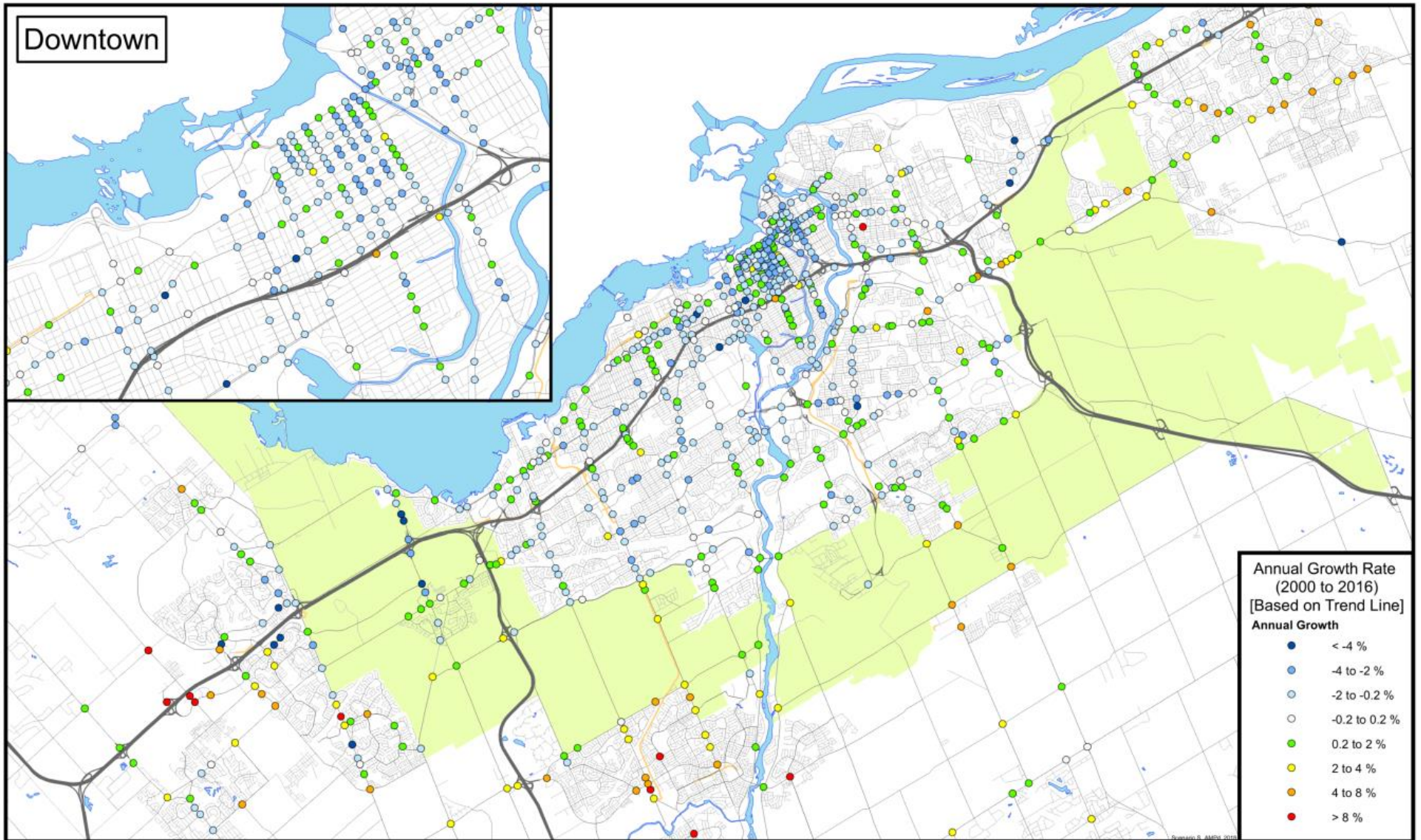
The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and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

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

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

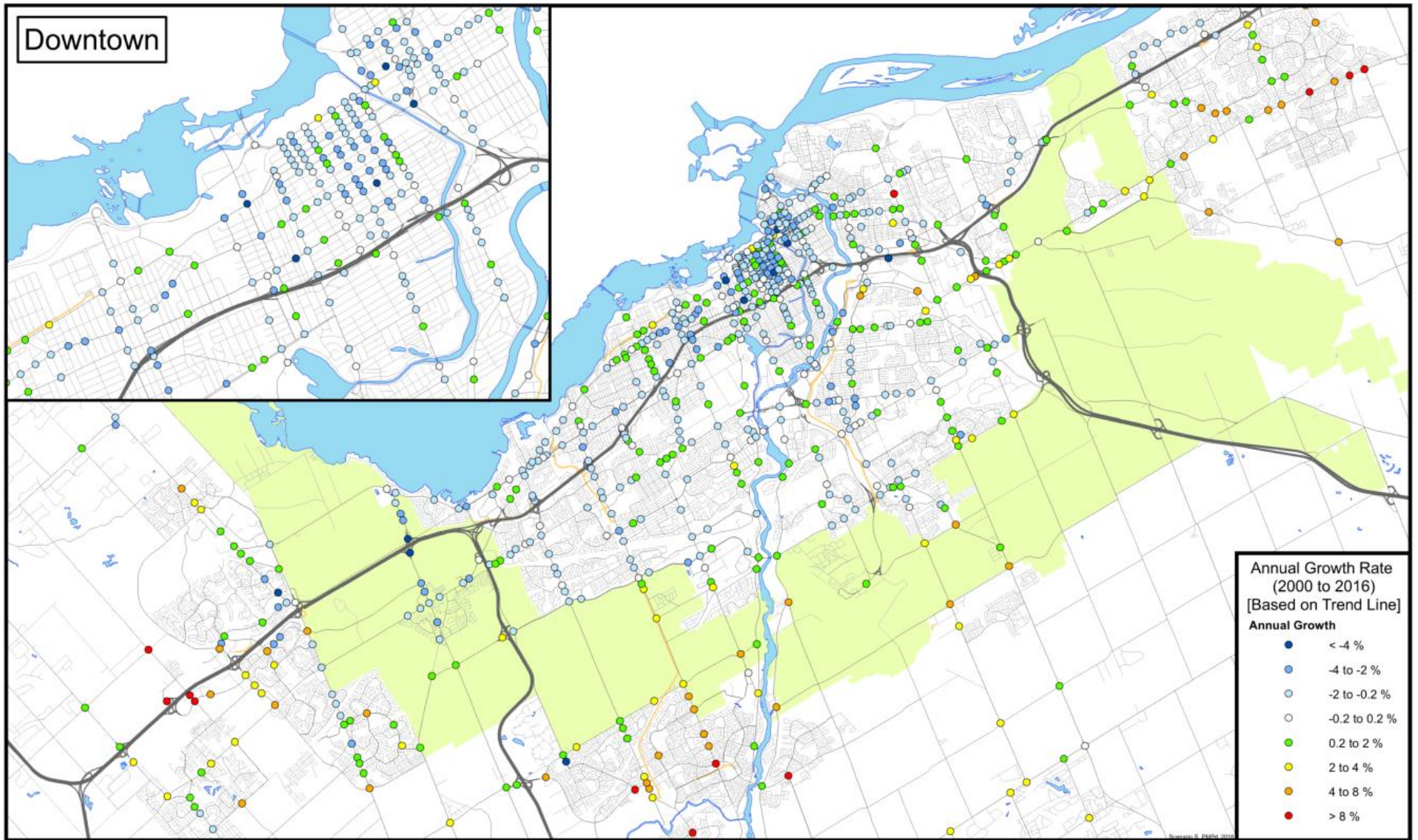
# INTERSECTION TRAFFIC GROWTH RATE, AM PEAK PERIOD

Total Vehicular Volume Entering the Intersection, 2000 to 2016



# INTERSECTION TRAFFIC GROWTH RATE, PM PEAK PERIOD

Total Vehicular Volume Entering the Intersection, 2000 to 2016





## **APPENDIX H**

---

### Signal Timing Plans

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

## Traffic Signal Operations Unit

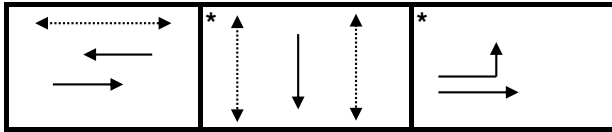
<b>Intersection:</b>	Main: Carling	Side: Sherwood
<b>Controller:</b>	ATC 3	<b>TSD:</b> 5135
<b>Author:</b>	Matthew Anderson	<b>Date:</b> 04-Mar-2021

### Existing Timing Plans†

	Plan				Ped Minimum Time		
	AM Peak 1	Off Peak 2	Night 9	PM Peak 13	Walk	DW	A+R
<b>Cycle</b>	120	130	Free	140			
<b>Offset</b>	112	41	X	24			
EB Thru	79	89	105.4	99	-	-	3.7+2.7
WB Thru	66	73	105.4	84	12	15	3.7+2.7
SB Thru	41	41	33.1	41	26	7	3.3+3.8
EB Left (fp)	13	16	20.2	15	-	-	3.7+1.5

### Phasing Sequence‡

Plan: All



**Notes:**

- 1) In plan 9, if the NS pedestrian phases are actuated, the SB green will be extended to match.

### Schedule

Weekday		Saturday		Sunday	
Time	Plan	Time	Plan	Time	Plan
0:15	9	0:15	9	0:10	9
6:30	1	7:00	2	7:30	2
9:30	2	22:30	9	22:30	9
15:00	13				
18:30	2				
22:35	9				

### 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 \$59.96 (\$53.06 + HST)

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

## Traffic Signal Operations Unit

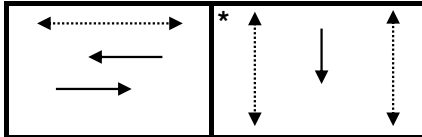
<b>Intersection:</b>	<i>Main:</i> Carling	<i>Side:</i> Champagne
<b>Controller:</b>	<b>MS 3200</b>	<b>TSD: 5341</b>
<b>Author:</b>	Matthew Anderson	<b>Date:</b> 04-Mar-2021

## Existing Timing Plans†

	Plan				Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 13	Night 4	Walk	DW	A+R
<b>Cycle</b>	120	65	70	70			
<b>Offset</b>	106	19	11	X			
EB Thru	82	27	32	32	-	-	3.7+1.6
WB Thru	82	27	32	32	10	10	3.7+1.6
SB Thru	38	38	38	38	7	25	3.3+2.6

## Phasing Sequence‡

Plan: All



## 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	7:30	2
9:30	2	23:30	4	23:30	4
15:00	13				
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 \$59.96 (\$53.06 + HST)

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

## Traffic Signal Operations Unit

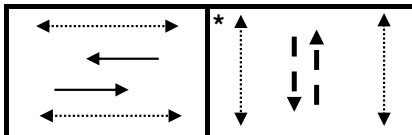
<b>Intersection:</b>	<i>Main:</i> Carling	<i>Side:</i> 130m W of Preston
<b>Controller:</b>	<b>ATC 3</b>	<b>TSD: 6731</b>
<b>Author:</b>	Matthew Anderson	<b>Date:</b> 04-Mar-2021

## Existing Timing Plans†

	Plan				Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 13	Night 4	Walk	DW	A+R
<b>Cycle</b>	120	65	70	70			
<b>Offset</b>	112	0	6	X			
EB Thru	84	30	35	35	15	5	3.7+1.4
WB Thru	84	30	35	35	15	5	3.7+1.4
NB Bike	36	35	35	35	7	22	3.0+3.6
SB Bike	36	35	35	35	7	22	3.0+3.6

## Phasing Sequence‡

Plan: All



## 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	7:30	2
9:30	2	23:30	4	23:30	4
15:00	13				
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

- - - -> Bike signal

Cost is \$59.96 (\$53.06 + HST)

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

## Traffic Signal Operations Unit

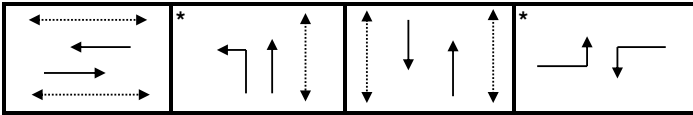
<b>Intersection:</b>	<i>Main:</i> Carling	<i>Side:</i> Preston
<b>Controller:</b>	MS 3200	TSD: 5183
<b>Author:</b>	Matthew Anderson	Date: 04-Mar-2021

### Existing Timing Plans†

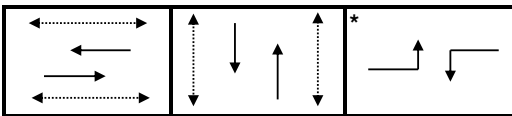
	Plan				Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 13	Night 4	Walk	DW	A+R
<b>Cycle</b>	120	130	140	90			
<b>Offset</b>	116	0	6	6			
EB Thru	35	38	41	32	7	17	3.7+2.3
WB Thru	35	38	41	32	7	17	3.7+2.3
NB Left	20	20	24	-	-	-	3.3+3.6
NB Thru	67	65	69	45	7	30	3.3+3.6
SB Thru	47	45	45	45	7	30	3.3+3.6
EB Left (fp)	18	27	30	13	-	-	3.7+2.5
WB Left (fp)	18	27	30	13	-	-	3.7+2.5

### Phasing Sequence‡

Plan: 1, 2 & 13



Plan: 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	7:30	2
9:30	2	23:30	4	23:30	4
15:00	13				
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 \$59.96 (\$53.06 + HST)

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

## Traffic Signal Operations Unit

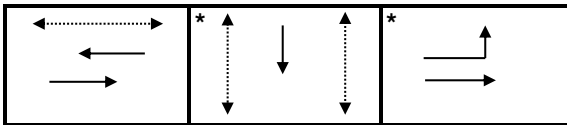
<b>Intersection:</b>	<i>Main:</i> Carling	<i>Side:</i> Booth
<b>Controller:</b>	MS 3200	<b>TSD:</b> 5270
<b>Author:</b>	Matthew Anderson	<b>Date:</b> 04-Mar-2021

### Existing Timing Plans<sup>†</sup>

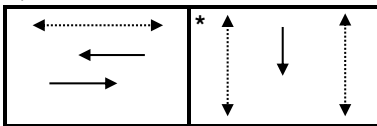
	Plan					Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Weekend 5	Walk	DW	A+R
<b>Cycle</b>	120	120	130	70	90			
<b>Offset</b>	116	85	110	X	X			
EB Thru	81	81	90	31	51	-	-	3.7+2.0
WB Thru	47	81	67	31	51	13	11	3.7+2.0
SB Thru	39	39	40	39	39	7	26	3.3+2.7
EB Left	34	-	23	-	-	-	-	3.7+2.2

### Phasing Sequence<sup>‡</sup>

Plan: 1 & 3



Plan: 2, 4 & 5



### Schedule

Weekday		Saturday		Sunday	
Time	Plan	Time	Plan	Time	Plan
0:15	4	0:15	4	0:15	4
6:30	1	7:00	5	7:00	5
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 \$59.96 (\$53.06 + HST)

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

## Traffic Signal Operations Unit

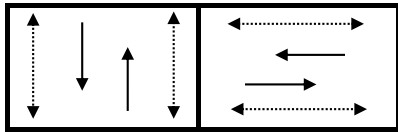
<b>Intersection:</b>	Main: Preston	Side: Beech
<b>Controller:</b>	MS 3200	<b>TSD:</b> 5413
<b>Author:</b>	Matthew Anderson	<b>Date:</b> 04-Mar-2021

### Existing Timing Plans<sup>†</sup>

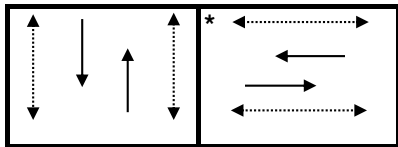
	Plan					AM Peak 11	Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Weekend 5		Walk	DW	A+R
<b>Cycle</b>	80	80	90	70	80	80			
<b>Offset</b>	40	11	43	X	0	40			
NB Thru	57	57	67	47	57	57	18	10	3.3+2.2
SB Thru	57	57	67	47	57	57	18	10	3.3+2.2
EB Thru	23	23	23	23	23	23	7	10	3.3+2.3
WB Thru	23	23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

### Phasing Sequence<sup>‡</sup>

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

#### Weekend

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 \$59.96 (\$53.06 + HST)

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

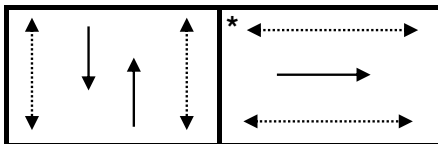
<b>Intersection:</b>	<b>Main:</b> Preston	<b>Side:</b> Pamilla
<b>Controller:</b>	<b>MS-3200</b>	<b>TSD:</b> 6150
<b>Author:</b>	Matthew Anderson	<b>Date:</b> 04-Mar-2021

## Existing Timing Plans†

	Plan					Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Weekend 5	Walk	DW	A+R
<b>Cycle</b>	80	80	90	70	80			
<b>Offset</b>	48	0	27	X	X			
NB Thru	59	59	69	49	59	18	5	3.3+1.8
SB Thru	59	59	69	49	59	18	5	3.3+1.8
EB Thru	21	21	21	21	21	7	8	3.3+2.2

## Phasing Sequence‡

Plan: All



## Schedule

### Weekday

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

### Saturday

Time	Plan
0:15	4
12:00	5
22:00	4

### Sunday

Time	Plan
0:15	4
8:00	5
22:00	4

## Notes

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

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

Asterisk (\*) Indicates actuated phase

(fp): Fully Protected Left Turn

←.....→ Pedestrian signal

Cost is \$59.96 (\$53.06 + HST)



# Traffic Signal Timing

City of Ottawa, Transportation Services Department

## Traffic Signal Operations Unit

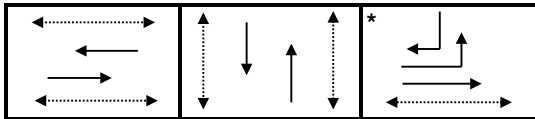
<b>Intersection:</b>	<i>Main:</i> Prince of Wales	<i>Side:</i> Preston
<b>Controller:</b>	<b>ATC 3</b>	<b>TSD: 5199</b>
<b>Author:</b>	Matthew Anderson	<b>Date:</b> 04-Mar-2021

### Existing Timing Plans<sup>†</sup>

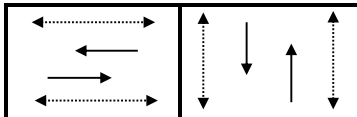
	Plan				Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Walk	DW	A+R
<b>Cycle</b>	120	130	130	75			
<b>Offset</b>	4	0	6	31			
<b>EB Thru</b>	90	88	81	43	7	19	3.7+2.4
<b>WB Thru</b>	52	52	42	43	7	19	3.7+2.4
<b>NB Thru</b>	30	42	49	32	12	12	3.3+2.2
<b>SB Thru</b>	30	42	49	32	12	12	3.3+2.2
<i>EB Left</i>	38	36	39	-	-	-	3.7+2.4
<i>SB Right</i>	38	36	39	-	-	-	3.7+2.4

### Phasing Sequence<sup>‡</sup>

Plan: 1, 2 & 3



Plan: 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	7:30	2
9:30	2	23:30	4	23:30	4
15:00	3				
18:30	2				
23:30	4				

### NOTES

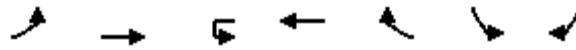
- †: Time for each direction includes amber and all red intervals
- ‡: Start of first phase should be used as reference point for offset
- Asterisk (\*) Indicates actuated phase
- (fp): Fully Protected Left Turn
- ◄.....► Pedestrian signal

Cost is \$59.96 (\$53.06 + HST)

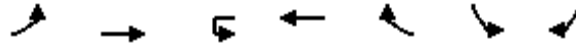
## **APPENDIX I**

---

Existing Synchro Analysis



Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	31	760	13	550	121	131	5
Future Volume (vph)	31	760	13	550	121	131	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	35.0		25.0		0.0	0.0	0.0
Storage Lanes	1		1		0	1	0
Taper Length (m)	25.0		25.0			25.0	
Lane Util. Factor	1.00	0.95	1.00	0.91	0.91	1.00	1.00
Ped Bike Factor	0.98			0.99		0.99	
Fr <sub>t</sub>				0.973		0.995	
Fl <sub>t</sub> Protected	0.950		0.950			0.954	
Satd. Flow (prot)	1642	3283	1674	4399	0	1671	0
Fl <sub>t</sub> Permitted	0.950		0.335			0.954	
Satd. Flow (perm)	1617	3283	590	4399	0	1657	0
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)				57		2	
Link Speed (k/h)		60		60		40	
Link Distance (m)		196.1		162.9		242.3	
Travel Time (s)		11.8		9.8		21.8	
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	0.90
Heavy Vehicles (%)	3%	3%	1%	7%	2%	1%	1%
Adj. Flow (vph)	34	844	14	611	134	146	6
Shared Lane Traffic (%)							
Lane Group Flow (vph)	34	844	14	745	0	152	0
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	Left	Right	L NA	Right
Median Width(m)		7.0		7.0		3.5	
Link Offset(m)		0.0		0.0		0.0	
Crosswalk Width(m)		5.0		10.0		5.0	
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14		14	40	14
Number of Detectors	1	2	1	2		1	
Detector Template	Left	Thru	Left	Thru		Left	
Leading Detector (m)	6.1	30.5	6.1	30.5		6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0		0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0		0.0	
Detector 1 Size(m)	6.1	1.8	6.1	1.8		6.1	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0		0.0	
Detector 2 Position(m)		28.7		28.7			
Detector 2 Size(m)		1.8		1.8			
Detector 2 Type		Cl+Ex		Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)		0.0		0.0			
Turn Type	Prot	NA	Perm	NA		Perm	
Protected Phases	5	2		6			
Permitted Phases			6			4	
Detector Phase	5	2	6	6		4	



Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	10.0		10.0	
Minimum Split (s)	10.2	16.4	33.4	33.4		40.1	
Total Split (s)	13.0	79.0	66.0	66.0		41.0	
Total Split (%)	10.8%	65.8%	55.0%	55.0%		34.2%	
Maximum Green (s)	7.8	72.6	59.6	59.6		33.9	
Yellow Time (s)	3.7	3.7	3.7	3.7		3.3	
All-Red Time (s)	1.5	2.7	2.7	2.7		3.8	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	
Total Lost Time (s)	5.2	6.4	6.4	6.4		7.1	
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max	C-Max		None	
Walk Time (s)			12.0	12.0		26.0	
Flash Dont Walk (s)			15.0	15.0		7.0	
Pedestrian Calls (#/hr)			20	20		20	
Act Effct Green (s)	7.5	85.3	77.1	77.1		21.2	
Actuated g/C Ratio	0.06	0.71	0.64	0.64		0.18	
v/c Ratio	0.33	0.36	0.04	0.26		0.52	
Control Delay	62.2	8.6	8.6	6.6		48.2	
Queue Delay	0.0	0.0	0.0	0.0		0.0	
Total Delay	62.2	8.6	8.6	6.6		48.2	
LOS	E	A	A	A		D	
Approach Delay		10.7		6.6		48.2	
Approach LOS		B		A		D	
Queue Length 50th (m)	7.2	27.5	0.7	11.2		31.4	
Queue Length 95th (m)	16.8	59.2	1.9	10.3		43.2	
Internal Link Dist (m)		172.1		138.9		218.3	
Turn Bay Length (m)	35.0		25.0				
Base Capacity (vph)	112	2334	379	2848		469	
Starvation Cap Reductn	0	0	0	0		0	
Spillback Cap Reductn	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0		0	
Reduced v/c Ratio	0.30	0.36	0.04	0.26		0.32	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 112 (93%), Referenced to phase 2:EBT and 6:WBTU, Start of Green  
 Natural Cycle: 85  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.52  
 Intersection Signal Delay: 12.2  
 Intersection LOS: B  
 Intersection Capacity Utilization 51.7%  
 ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 1: Carling & Sherwood





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	98	870	700	159	57	39
Future Volume (vph)	98	870	700	159	57	39
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0			35.0	20.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				25.0	
Lane Util. Factor	1.00	0.95	0.91	1.00	1.00	1.00
Ped Bike Factor	0.93			0.76	0.99	0.98
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1674	3283	4672	1414	1658	1498
Flt Permitted	0.342				0.950	
Satd. Flow (perm)	559	3283	4672	1069	1645	1464
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				177		43
Link Speed (k/h)		60	60		50	
Link Distance (m)		162.9	117.5		178.4	
Travel Time (s)		9.8	7.1		12.8	
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 (%)	1%	3%	4%	7%	2%	1%
Adj. Flow (vph)	109	967	778	177	63	43
Shared Lane Traffic (%)						
Lane Group Flow (vph)	109	967	778	177	63	43
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Perm	Perm
Protected Phases		2	6			
Permitted Phases	2			6	4	4
Detector Phase	2	2	6	6	4	4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	15.3	15.3	25.3	25.3	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
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)			20	20	20	20
Act Effct Green (s)	89.8	89.8	89.8	89.8	23.2	23.2
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.19	0.19
v/c Ratio	0.26	0.39	0.22	0.21	0.20	0.14
Control Delay	7.2	6.4	2.9	0.6	38.2	10.8
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	7.2	6.5	2.9	0.6	38.2	10.8
LOS	A	A	A	A	D	B
Approach Delay		6.5	2.5		27.1	
Approach LOS		A	A		C	
Queue Length 50th (m)	12.4	65.0	7.7	0.0	10.5	0.0
Queue Length 95th (m)	6.8	22.0	7.0	0.4	21.0	8.1
Internal Link Dist (m)		138.9	93.5		154.4	
Turn Bay Length (m)	45.0			35.0	20.0	
Base Capacity (vph)	418	2458	3498	844	440	423
Starvation Cap Reductn	0	322	0	0	0	0
Spillback Cap Reductn	0	11	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.45	0.22	0.21	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: 0.39  
 Intersection Signal Delay: 5.7  
 Intersection LOS: A  
 Intersection Capacity Utilization 51.8%  
 ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 2: Carling & Champagne



3: Trillium Pathway & Carling  
AM Peak Hour

829 Carling Avenue  
Existing Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑↑							
Traffic Volume (vph)	0	930	0	0	930	0	0	0	0	0	0	0
Future Volume (vph)	0	930	0	0	930	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected												
Satd. Flow (prot)	0	3283	0	0	4718	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3283	0	0	4718	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (k/h)	60				60				50			
Link Distance (m)	117.5				124.7				157.3			
Travel Time (s)	7.1				7.5				11.3			
Confl. Peds. (#/hr)	26		14	14		26	18		20	20		18
Confl. Bikes (#/hr)			6			23						17
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	1033	0	0	1033	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1033	0	0	1033	0	0	0	0	0	0	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)	7.0				7.0				0.0			
Link Offset(m)	0.0				0.0				0.0			
Crosswalk Width(m)	5.0				5.0				5.0			
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	2				2							
Detector Template	Thru				Thru							
Leading Detector (m)	30.5				30.5							
Trailing Detector (m)	0.0				0.0							
Detector 1 Position(m)	0.0				0.0							
Detector 1 Size(m)	1.8				1.8							
Detector 1 Type	CI+Ex				CI+Ex							
Detector 1 Channel												
Detector 1 Extend (s)	0.0				0.0							
Detector 1 Queue (s)	0.0				0.0							
Detector 1 Delay (s)	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	NA				NA							
Protected Phases	2				6							
Permitted Phases												
Detector Phase	2				6							
Switch Phase												
Minimum Initial (s)	10.0				10.0							
Minimum Split (s)	25.1				25.1							

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	35.6



3: Trillium Pathway & Carling  
AM Peak Hour

829 Carling Avenue  
Existing Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)		84.0			84.0							
Total Split (%)		70.0%			70.0%							
Maximum Green (s)		78.9			78.9							
Yellow Time (s)		3.7			3.7							
All-Red Time (s)		1.4			1.4							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		5.1			5.1							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0							
Recall Mode		C-Max			C-Max							
Walk Time (s)		15.0			15.0							
Flash Dont Walk (s)		5.0			5.0							
Pedestrian Calls (#/hr)		20			20							
Act Effct Green (s)		95.6			95.6							
Actuated g/C Ratio		0.80			0.80							
v/c Ratio		0.40			0.27							
Control Delay		2.2			3.1							
Queue Delay		0.0			0.1							
Total Delay		2.2			3.2							
LOS		A			A							
Approach Delay		2.2			3.2							
Approach LOS		A			A							
Queue Length 50th (m)		7.9			9.2							
Queue Length 95th (m)		9.0			17.5							
Internal Link Dist (m)		93.5			100.7			133.3			30.9	
Turn Bay Length (m)												
Base Capacity (vph)		2615			3757							
Starvation Cap Reductn		139			1268							
Spillback Cap Reductn		0			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.42			0.42							

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: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.40  
 Intersection Signal Delay: 2.7  
 Intersection Capacity Utilization 31.4%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service A

Splits and Phases: 3: Trillium Pathway & Carling



Lane Group	Ø4
Total Split (s)	36.0
Total Split (%)	30%
Maximum Green (s)	29.4
Yellow Time (s)	3.0
All-Red Time (s)	3.6
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	22.0
Pedestrian Calls (#/hr)	20
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

4: Preston & Carling  
AM Peak Hour

829 Carling Avenue  
Existing Traffic

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	570	224	134	550	94	282	450	281	80	227	99
Future Volume (vph)	140	570	224	134	550	94	282	450	281	80	227	99
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		40.0	75.0		0.0	75.0		0.0	0.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.96		0.91	0.97	0.98		0.98	0.99		1.00	0.98	
Fr <sub>t</sub>			0.850		0.978			0.942			0.954	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1595	3252	1483	1658	4456	0	1674	3051	0	1510	1517	0
Flt Permitted	0.950			0.950			0.312			0.345		
Satd. Flow (perm)	1538	3252	1350	1616	4456	0	541	3051	0	548	1517	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			199		26			163			20	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		124.7			193.9			164.5			65.2	
Travel Time (s)		7.5			11.6			11.8			4.7	
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%	2%	2%	4%	10%	1%	4%	2%	12%	6%	20%
Adj. Flow (vph)	156	633	249	149	611	104	313	500	312	89	252	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	156	633	249	149	715	0	313	812	0	89	362	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	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	

4: Preston & Carling  
AM Peak Hour

829 Carling Avenue  
Existing Traffic

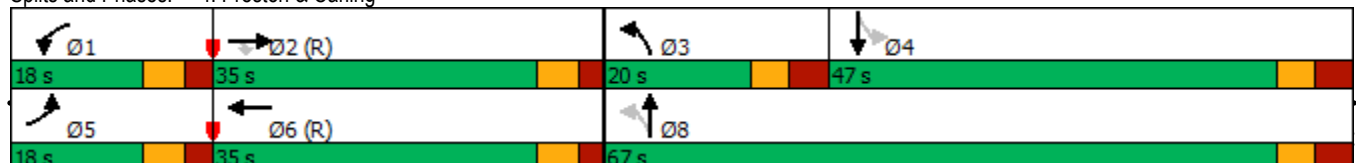


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0	30.0	11.2	30.0		11.9	43.9		43.9	43.9	
Total Split (s)	18.0	35.0	35.0	18.0	35.0		20.0	67.0		47.0	47.0	
Total Split (%)	15.0%	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	
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?												
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	Max		Max	Max	
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)		20	20		20			20		20	20	
Act Effct Green (s)	11.8	29.0	29.0	11.8	29.0		60.1	60.1		40.1	40.1	
Actuated g/C Ratio	0.10	0.24	0.24	0.10	0.24		0.50	0.50		0.33	0.33	
v/c Ratio	1.00	0.81	0.52	0.91	0.65		0.79	0.50		0.49	0.70	
Control Delay	136.7	40.9	8.8	117.5	41.7		42.1	25.2		42.6	41.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	136.7	40.9	8.8	117.5	41.7		42.1	25.2		42.6	41.0	
LOS	F	D	A	F	D		D	C		D	D	
Approach Delay		47.6			54.8			29.9			41.3	
Approach LOS		D			D			C			D	
Queue Length 50th (m)	36.5	27.3	0.5	34.3	21.4		54.2	68.5		15.3	64.3	
Queue Length 95th (m)	#76.3	60.5	16.1	#70.5	51.1		m72.6	m91.3		31.6	96.3	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0		40.0	75.0			75.0					
Base Capacity (vph)	156	785	477	163	1096		394	1609		183	520	
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	1.00	0.81	0.52	0.91	0.65		0.79	0.50		0.49	0.70	

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: 1.00  
 Intersection Signal Delay: 42.8 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Preston & Carling





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	382	650	650	207	204	132
Future Volume (vph)	382	650	650	207	204	132
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0			35.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	40.0				10.0	
Lane Util. Factor	1.00	0.95	0.91	0.91	1.00	1.00
Ped Bike Factor	0.98		0.96		0.98	0.88
Frt			0.964			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1674	3252	4373	0	1674	1427
Flt Permitted	0.215				0.950	
Satd. Flow (perm)	370	3252	4373	0	1649	1258
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			73			147
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	59			59	14	85
Confl. Bikes (#/hr)				15		23
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	4%	3%	1%	1%	6%
Adj. Flow (vph)	424	722	722	230	227	147
Shared Lane Traffic (%)						
Lane Group Flow (vph)	424	722	952	0	227	147
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2				4	4
Detector Phase	5	2	6		4	4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0		10.0	10.0
Minimum Split (s)	10.9	15.7	29.7		39.0	39.0
Total Split (s)	34.0	81.0	47.0		39.0	39.0
Total Split (%)	28.3%	67.5%	39.2%		32.5%	32.5%
Maximum Green (s)	28.1	75.3	41.3		33.0	33.0
Yellow Time (s)	3.7	3.7	3.7		3.3	3.3
All-Red Time (s)	2.2	2.0	2.0		2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7		6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	C-Max	C-Max		None	None
Walk Time (s)			13.0		7.0	7.0
Flash Dont Walk (s)			11.0		26.0	26.0
Pedestrian Calls (#/hr)			20		20	20
Act Effct Green (s)	83.9	84.1	55.7		24.2	24.2
Actuated g/C Ratio	0.70	0.70	0.46		0.20	0.20
v/c Ratio	0.84	0.32	0.46		0.69	0.40
Control Delay	45.7	8.5	23.4		54.0	8.7
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	45.7	8.5	23.4		54.0	8.7
LOS	D	A	C		D	A
Approach Delay		22.3	23.4		36.2	
Approach LOS		C	C		D	
Queue Length 50th (m)	74.9	29.4	46.4		47.2	0.0
Queue Length 95th (m)	m#105.5	49.0	71.3		64.3	14.0
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	45.0					45.0
Base Capacity (vph)	564	2280	2070		453	452
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.75	0.32	0.46		0.50	0.33

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 116 (97%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 24.8  
 Intersection LOS: C  
 Intersection Capacity Utilization 83.4%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carling & Booth





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	560	42	18	340	36
Future Volume (vph)	38	52	26	19	54	8	23	560	42	18	340	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	25.0		0.0	25.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	25.0			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			0.98	0.89	0.97	0.99		0.98	0.99	
Frt		0.970				0.850		0.989			0.986	
Flt Protected		0.984			0.987		0.950			0.950		
Satd. Flow (prot)	0	1557	0	0	1627	1498	1537	1696	0	1537	1643	0
Flt Permitted		0.876			0.904		0.488			0.322		
Satd. Flow (perm)	0	1352	0	0	1465	1339	764	1696	0	508	1643	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				34		10			13	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		101.4			151.8			160.5			163.2	
Travel Time (s)		7.3			10.9			11.6			11.8	
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 (%)	9%	4%	4%	25%	2%	1%	10%	3%	3%	10%	6%	5%
Adj. Flow (vph)	42	58	29	21	60	9	26	622	47	20	378	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	129	0	0	81	9	26	669	0	20	418	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	

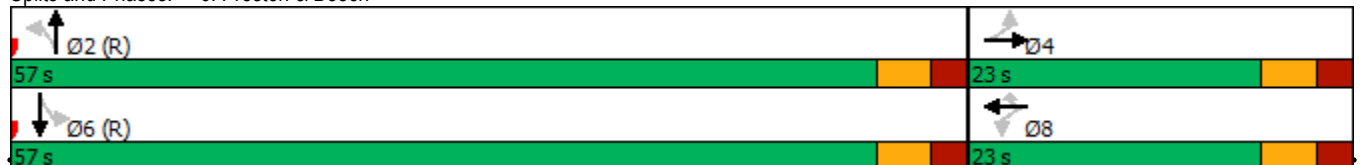


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	22.6	22.6		22.6	22.6	22.6	33.5	33.5		33.5	33.5	
Total Split (s)	23.0	23.0		23.0	23.0	23.0	57.0	57.0		57.0	57.0	
Total Split (%)	28.8%	28.8%		28.8%	28.8%	28.8%	71.3%	71.3%		71.3%	71.3%	
Maximum Green (s)	17.4	17.4		17.4	17.4	17.4	51.5	51.5		51.5	51.5	
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3	2.3	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.6			5.6	5.6	5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Ped	Ped		Ped	Ped	Ped	C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	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	10.0	
Pedestrian Calls (#/hr)	20	20		20	20	20	20	20		20	20	
Act Effct Green (s)		17.1			17.1	17.1	51.8	51.8		51.8	51.8	
Actuated g/C Ratio		0.21			0.21	0.21	0.65	0.65		0.65	0.65	
v/c Ratio		0.43			0.26	0.03	0.05	0.61		0.06	0.39	
Control Delay		28.6			28.8	0.5	5.3	9.1		5.8	7.7	
Queue Delay		0.0			0.0	0.0	0.0	0.1		0.0	0.0	
Total Delay		28.6			28.8	0.5	5.3	9.2		5.8	7.7	
LOS		C			C	A	A	A		A	A	
Approach Delay		28.6			26.0			9.1			7.7	
Approach LOS		C			C			A			A	
Queue Length 50th (m)		13.5			9.5	0.0	1.2	46.6		0.9	23.1	
Queue Length 95th (m)		27.9			20.1	0.5	m2.4	37.9		3.1	38.1	
Internal Link Dist (m)		77.4			127.8			136.5			139.2	
Turn Bay Length (m)							25.0			25.0		
Base Capacity (vph)		307			318	317	494	1101		329	1068	
Starvation Cap Reductn		0			0	0	0	45		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		0.42			0.25	0.03	0.05	0.63		0.06	0.39	

Intersection Summary

Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 40 (50%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.61  
 Intersection Signal Delay: 11.6  
 Intersection LOS: B  
 Intersection Capacity Utilization 76.3%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Preston & Beech







Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Volume (vph)	1	0	3	0	0	0	8	580	42	10	400	5
Future Volume (vph)	1	0	3	0	0	0	8	580	42	10	400	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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		0.93						0.99			1.00	
Flt Protected		0.999						0.991			0.998	
Flt Permitted		0.988						0.999			0.999	
Satd. Flow (prot)	0	1470	0	0	0	0	0	1701	0	0	1617	0
Satd. Flow (perm)	0	1453	0	0	0	0	0	1694	0	0	1591	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29						10			2	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		114.6			152.9			73.8			160.5	
Travel Time (s)		8.3			11.0			5.3			11.6	
Confl. Peds. (#/hr)	17		18	18		17	28		45	45		28
Confl. Bikes (#/hr)			8						21			17
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	3%	1%	1%	10%	1%
Adj. Flow (vph)	1	0	3	0	0	0	9	644	47	11	444	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	0	0	0	700	0	0	461	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		-2.0			-1.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2					1	2		1	2	
Detector Template	Left	Thru					Left	Thru		Left	Thru	
Leading Detector (m)	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	
Detector 1 Position(m)	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	
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			28.7	
Detector 2 Size(m)		1.8						1.8			1.8	
Detector 2 Type		CI+Ex						CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Detector Phase	4	4					2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0					10.0	10.0		10.0	10.0	
Minimum Split (s)	20.5	20.5					28.1	28.1		28.1	28.1	

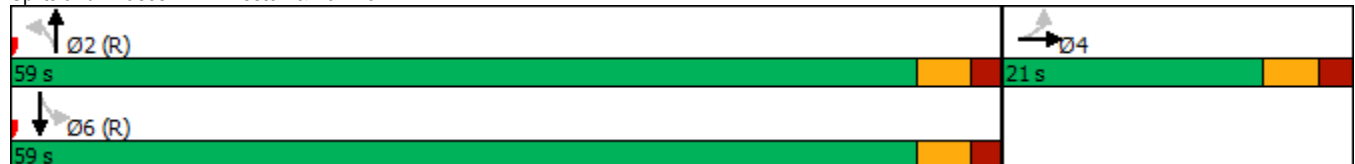


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	21.0	21.0					59.0	59.0		59.0	59.0	
Total Split (%)	26.3%	26.3%					73.8%	73.8%		73.8%	73.8%	
Maximum Green (s)	15.5	15.5					53.9	53.9		53.9	53.9	
Yellow Time (s)	3.3	3.3					3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2					1.8	1.8		1.8	1.8	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)		5.5						5.1			5.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	
Recall Mode	None	None					C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0					18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	8.0	8.0					5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	20	20					20	20		20	20	
Act Effct Green (s)		12.0						69.8			69.8	
Actuated g/C Ratio		0.15						0.87			0.87	
v/c Ratio		0.02						0.47			0.33	
Control Delay		0.0						5.2			1.9	
Queue Delay		0.0						0.0			0.0	
Total Delay		0.0						5.2			1.9	
LOS		A						A			A	
Approach Delay												
Approach LOS												
Queue Length 50th (m)		0.0						0.0			0.0	
Queue Length 95th (m)		0.0						71.1			14.1	
Internal Link Dist (m)		90.6			128.9			49.8			136.5	
Turn Bay Length (m)												
Base Capacity (vph)		304						1478			1387	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.01						0.47			0.33	

Intersection Summary

Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 48 (60%), 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: 3.9 Intersection LOS: A  
 Intersection Capacity Utilization 58.2% ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 7: Preston & Pamilla



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	1	11	10	5	17	9	567	84	25	402	15
Future Volume (vph)	9	1	11	10	5	17	9	567	84	25	402	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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												
Frt		0.930			0.929			0.983			0.995	
Flt Protected		0.979			0.985			0.999			0.997	
Satd. Flow (prot)	0	1589	0	0	1597	0	0	1699	0	0	1686	0
Flt Permitted		0.979			0.985			0.999			0.997	
Satd. Flow (perm)	0	1589	0	0	1597	0	0	1699	0	0	1686	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		113.6			154.3			71.5			73.8	
Travel Time (s)		8.2			11.1			5.1			5.3	
Confl. Peds. (#/hr)							28		45	45		28
Confl. Bikes (#/hr)									21			17
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	5%	2%
Adj. Flow (vph)	10	1	12	11	6	19	10	630	93	28	447	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	23	0	0	36	0	0	733	0	0	492	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		-2.0			-2.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 50.2%	ICU Level of Service A											
Analysis Period (min)	15											



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	10	29	655	396	27
Future Volume (vph)	5	10	29	655	396	27
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.913			0.991		
Flt Protected	0.983			0.998		
Satd. Flow (prot)	1566	0	0	3278	1683	0
Flt Permitted	0.983			0.998		
Satd. Flow (perm)	1566	0	0	3278	1683	0
Link Speed (k/h)	30			50	50	
Link Distance (m)	68.0			65.2	71.5	
Travel Time (s)	8.2			4.7	5.1	
Confl. Peds. (#/hr)				28		28
Confl. Bikes (#/hr)						17
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	5%	2%
Adj. Flow (vph)	6	11	32	728	440	30
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	0	0	760	470	0
Enter Blocked Intersection	No	No	Yes	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			2.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.6%
	ICU Level of Service A
Analysis Period (min)	15

10: Prince of Wales/Queen Elizabeth & Preston  
AM Peak Hour

829 Carling Avenue  
Existing Traffic

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	640	263	2	2	176	310	1	4	3	250	4	300
Future Volume (vph)	640	263	2	2	176	310	1	4	3	250	4	300
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	55.0		0.0	30.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.98		0.98		0.97			0.94	0.93
Frt		0.999				0.850		0.949				0.850
Flt Protected	0.950			0.950				0.994			0.953	
Satd. Flow (prot)	1642	1760	0	1674	1762	1498	0	1211	0	0	1668	1469
Flt Permitted	0.530			0.580				0.969			0.724	
Satd. Flow (perm)	909	1760	0	999	1762	1462	0	1177	0	0	1193	1371
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				344		3				333
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		233.9			203.3			76.1			164.5	
Travel Time (s)		14.0			12.2			5.5			11.8	
Confl. Peds. (#/hr)	9		15	15		9	19		24	24		19
Confl. Bikes (#/hr)			2						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 (%)	3%	1%	1%	1%	1%	1%	1%	50%	25%	1%	50%	3%
Adj. Flow (vph)	711	292	2	2	196	344	1	4	3	278	4	333
Shared Lane Traffic (%)												
Lane Group Flow (vph)	711	294	0	2	196	344	0	8	0	0	282	333
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)		3.5			3.5			0.0			3.5	
Link Offset(m)		2.0			0.0			5.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6		6	8			4		4
Detector Phase	5	2		6	6	6	8	8		4	4	5

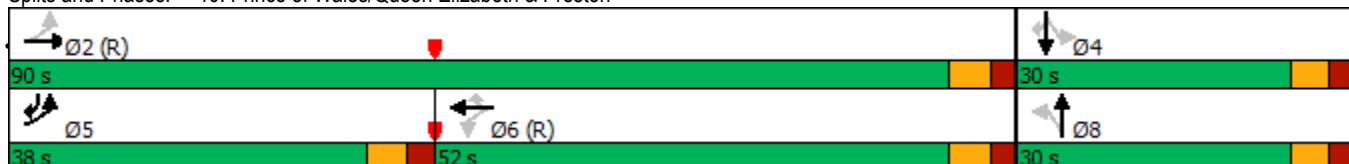


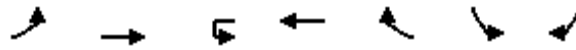
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	5.0
Minimum Split (s)	11.1	32.1		32.1	32.1	32.1	29.5	29.5		29.5	29.5	11.1
Total Split (s)	38.0	90.0		52.0	52.0	52.0	30.0	30.0		30.0	30.0	38.0
Total Split (%)	31.7%	75.0%		43.3%	43.3%	43.3%	25.0%	25.0%		25.0%	25.0%	31.7%
Maximum Green (s)	31.9	83.9		45.9	45.9	45.9	24.5	24.5		24.5	24.5	31.9
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.7
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	2.2	2.2		2.2	2.2	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		5.5			5.5	6.1
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	Max	Max		Max	Max	None
Walk Time (s)		7.0		7.0	7.0	7.0	12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		19.0		19.0	19.0	19.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		20		20	20	20	20	20		20	20	
Act Effct Green (s)	83.9	83.9		47.5	47.5	47.5		24.5			24.5	54.2
Actuated g/C Ratio	0.70	0.70		0.40	0.40	0.40		0.20			0.20	0.45
v/c Ratio	0.87	0.24		0.01	0.28	0.44		0.03			1.16	0.40
Control Delay	22.9	7.1		23.0	26.6	4.5		32.1			142.8	2.7
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	22.9	7.1		23.0	26.6	4.5		32.1			142.8	2.7
LOS	C	A		C	C	A		C			F	A
Approach Delay		18.3			12.5			32.1			67.0	
Approach LOS		B			B			C			E	
Queue Length 50th (m)	73.5	20.6		0.3	29.2	0.0		0.9			~70.8	3.0
Queue Length 95th (m)	#115.3	30.5		1.9	45.9	16.7		4.8			m#112.7	m5.5
Internal Link Dist (m)		209.9			179.3			52.1			140.5	
Turn Bay Length (m)	55.0			30.0		25.0						
Base Capacity (vph)	830	1230		396	697	786		242			243	841
Starvation Cap Reductn	0	0		0	0	0		0			0	0
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.86	0.24		0.01	0.28	0.44		0.03			1.16	0.40

Intersection Summary

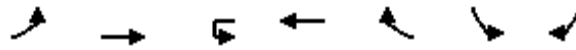
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 4 (3%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.16  
 Intersection Signal Delay: 30.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 95.4%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Prince of Wales/Queen Elizabeth & Preston





Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	65	760	13	1480	153	174	7
Future Volume (vph)	65	760	13	1480	153	174	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	35.0		25.0		0.0	0.0	0.0
Storage Lanes	1		1		0	1	0
Taper Length (m)	25.0		25.0			25.0	
Lane Util. Factor	1.00	0.95	1.00	0.91	0.91	1.00	1.00
Ped Bike Factor	0.99			0.99		0.99	
Fr <sub>t</sub>				0.986		0.995	
Fl <sub>t</sub> Protected	0.950		0.950			0.954	
Satd. Flow (prot)	1674	3252	1674	4660	0	1671	0
Fl <sub>t</sub> Permitted	0.950		0.335			0.954	
Satd. Flow (perm)	1664	3252	590	4660	0	1657	0
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)				20		1	
Link Speed (k/h)		60		60		40	
Link Distance (m)		196.1		162.9		242.3	
Travel Time (s)		11.8		9.8		21.8	
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	0.90
Heavy Vehicles (%)	1%	4%	1%	2%	1%	1%	1%
Adj. Flow (vph)	72	844	14	1644	170	193	8
Shared Lane Traffic (%)							
Lane Group Flow (vph)	72	844	14	1814	0	201	0
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	Left	Right	L NA	Right
Median Width(m)		7.0		7.0		3.5	
Link Offset(m)		0.0		0.0		0.0	
Crosswalk Width(m)		5.0		10.0		5.0	
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14		14	40	14
Number of Detectors	1	2	1	2		1	
Detector Template	Left	Thru	Left	Thru		Left	
Leading Detector (m)	6.1	30.5	6.1	30.5		6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0		0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0		0.0	
Detector 1 Size(m)	6.1	1.8	6.1	1.8		6.1	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0		0.0	
Detector 2 Position(m)		28.7		28.7			
Detector 2 Size(m)		1.8		1.8			
Detector 2 Type		Cl+Ex		Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)		0.0		0.0			
Turn Type	Prot	NA	Perm	NA		Perm	
Protected Phases	5	2		6			
Permitted Phases			6			4	
Detector Phase	5	2	6	6		4	



Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	10.0		10.0	
Minimum Split (s)	10.2	16.4	33.4	33.4		40.1	
Total Split (s)	15.0	99.0	84.0	84.0		41.0	
Total Split (%)	10.7%	70.7%	60.0%	60.0%		29.3%	
Maximum Green (s)	9.8	92.6	77.6	77.6		33.9	
Yellow Time (s)	3.7	3.7	3.7	3.7		3.3	
All-Red Time (s)	1.5	2.7	2.7	2.7		3.8	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	
Total Lost Time (s)	5.2	6.4	6.4	6.4		7.1	
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max	C-Max		None	
Walk Time (s)			12.0	12.0		26.0	
Flash Dont Walk (s)			15.0	15.0		7.0	
Pedestrian Calls (#/hr)			20	20		20	
Act Effct Green (s)	10.0	102.2	87.0	87.0		24.3	
Actuated g/C Ratio	0.07	0.73	0.62	0.62		0.17	
v/c Ratio	0.61	0.36	0.04	0.62		0.70	
Control Delay	84.5	8.2	14.7	16.4		65.8	
Queue Delay	0.0	0.0	0.0	0.4		0.0	
Total Delay	84.5	8.2	14.7	16.8		65.8	
LOS	F	A	B	B		E	
Approach Delay		14.2		16.7		65.8	
Approach LOS		B		B		E	
Queue Length 50th (m)	17.9	34.6	0.6	28.9		49.5	
Queue Length 95th (m)	#33.8	57.9	m2.4	155.1		68.0	
Internal Link Dist (m)		172.1		138.9		218.3	
Turn Bay Length (m)	35.0		25.0				
Base Capacity (vph)	125	2372	366	2903		401	
Starvation Cap Reductn	0	0	0	495		0	
Spillback Cap Reductn	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0		0	
Reduced v/c Ratio	0.58	0.36	0.04	0.75		0.50	

**Intersection Summary**

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 24 (17%), Referenced to phase 2:EBT and 6:WBTU, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 19.3

Intersection LOS: B

Intersection Capacity Utilization 68.4%

ICU Level of Service C

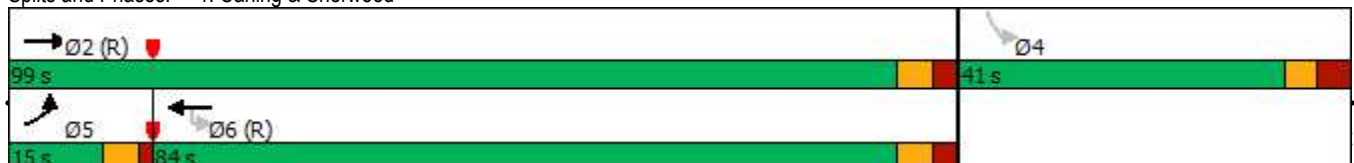
Analysis Period (min) 15

# 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: 1: Carling & Sherwood





2: Carling & Champagne  
PM Peak Hour

829 Carling Avenue  
Existing Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	44	800	1400	46	129	182
Future Volume (vph)	44	800	1400	46	129	182
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0			35.0	20.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				25.0	
Lane Util. Factor	1.00	0.95	0.91	1.00	1.00	1.00
Ped Bike Factor	0.99			0.86	1.00	0.98
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1409	3283	4764	1498	1674	1498
Fl <sub>t</sub> Permitted	0.116				0.950	
Satd. Flow (perm)	171	3283	4764	1283	1669	1464
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				45		2
Link Speed (k/h)		60	60		50	
Link Distance (m)		162.9	117.5		178.4	
Travel Time (s)		9.8	7.1		12.8	
Confl. Peds. (#/hr)	70			70	5	16
Confl. Bikes (#/hr)				4		1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	20%	3%	2%	1%	1%	1%
Adj. Flow (vph)	49	889	1556	51	143	202
Shared Lane Traffic (%)						
Lane Group Flow (vph)	49	889	1556	51	143	202
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Perm	Perm
Protected Phases		2	6			
Permitted Phases	2			6	4	4
Detector Phase	2	2	6	6	4	4

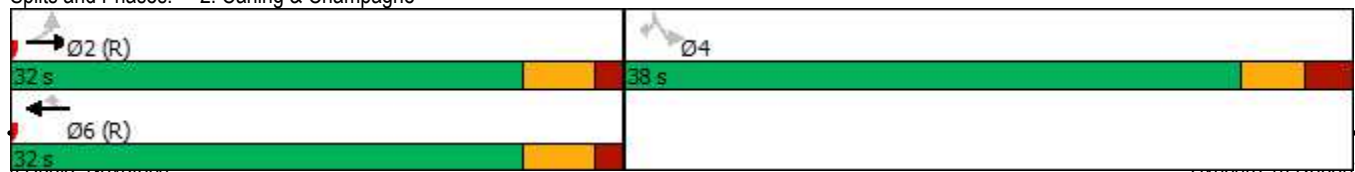


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	15.3	15.3	25.3	25.3	37.9	37.9
Total Split (s)	32.0	32.0	32.0	32.0	38.0	38.0
Total Split (%)	45.7%	45.7%	45.7%	45.7%	54.3%	54.3%
Maximum Green (s)	26.7	26.7	26.7	26.7	32.1	32.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
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)			20	20	20	20
Act Effct Green (s)	38.5	38.5	38.5	38.5	20.3	20.3
Actuated g/C Ratio	0.55	0.55	0.55	0.55	0.29	0.29
v/c Ratio	0.52	0.49	0.59	0.07	0.30	0.48
Control Delay	39.3	9.9	6.4	1.5	18.3	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	39.3	9.9	6.4	1.5	18.3	21.9
LOS	D	A	A	A	B	C
Approach Delay		11.4	6.2		20.4	
Approach LOS		B	A		C	
Queue Length 50th (m)	2.7	25.3	48.6	0.3	14.9	22.0
Queue Length 95th (m)	#24.9	47.2	15.0	0.0	18.8	26.7
Internal Link Dist (m)		138.9	93.5		154.4	
Turn Bay Length (m)	45.0			35.0	20.0	
Base Capacity (vph)	94	1805	2620	725	765	672
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	2	38	0	0	53
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.49	0.60	0.07	0.19	0.33

Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 11 (16%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.59  
 Intersection Signal Delay: 9.6  
 Intersection LOS: A  
 Intersection Capacity Utilization 63.8%  
 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.

Splits and Phases: 2: Carling & Champagne



3: Trillium Pathway & Carling  
PM Peak Hour

829 Carling Avenue  
Existing Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑↑							
Traffic Volume (vph)	0	1000	0	0	1500	0	0	0	0	0	0	0
Future Volume (vph)	0	1000	0	0	1500	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected												
Satd. Flow (prot)	0	3283	0	0	4764	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3283	0	0	4764	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (k/h)	60				60				50			
Link Distance (m)	117.5				124.7				157.3			
Travel Time (s)	7.1				7.5				11.3			
Confl. Peds. (#/hr)	35						35		25		35	
Confl. Bikes (#/hr)			11				10		13		34	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	1111	0	0	1667	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1111	0	0	1667	0	0	0	0	0	0	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)	7.0				7.0				0.0			
Link Offset(m)	0.0				0.0				0.0			
Crosswalk Width(m)	5.0				5.0				5.0			
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14		24		14		24		14	
Number of Detectors	2				2							
Detector Template	Thru				Thru							
Leading Detector (m)	30.5				30.5							
Trailing Detector (m)	0.0				0.0							
Detector 1 Position(m)	0.0				0.0							
Detector 1 Size(m)	1.8				1.8							
Detector 1 Type	CI+Ex				CI+Ex							
Detector 1 Channel												
Detector 1 Extend (s)	0.0				0.0							
Detector 1 Queue (s)	0.0				0.0							
Detector 1 Delay (s)	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	NA				NA							
Protected Phases	2				6							
Permitted Phases												
Detector Phase	2				6							
Switch Phase												
Minimum Initial (s)	10.0				10.0							
Minimum Split (s)	25.1				25.1							

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	35.6

3: Trillium Pathway & Carling  
PM Peak Hour

829 Carling Avenue  
Existing Traffic

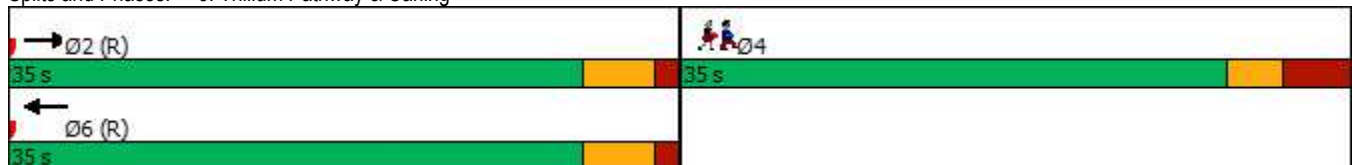


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)		35.0			35.0							
Total Split (%)		50.0%			50.0%							
Maximum Green (s)		29.9			29.9							
Yellow Time (s)		3.7			3.7							
All-Red Time (s)		1.4			1.4							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		5.1			5.1							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0							
Recall Mode		C-Max			C-Max							
Walk Time (s)		15.0			15.0							
Flash Dont Walk (s)		5.0			5.0							
Pedestrian Calls (#/hr)		20			20							
Act Effct Green (s)		54.0			54.0							
Actuated g/C Ratio		0.77			0.77							
v/c Ratio		0.44			0.45							
Control Delay		6.3			7.9							
Queue Delay		0.0			0.0							
Total Delay		6.3			7.9							
LOS		A			A							
Approach Delay		6.3			7.9							
Approach LOS		A			A							
Queue Length 50th (m)		0.1			0.0							
Queue Length 95th (m)		41.4			m78.0							
Internal Link Dist (m)		93.5			100.7			133.3			30.9	
Turn Bay Length (m)												
Base Capacity (vph)		2531			3672							
Starvation Cap Reductn		0			0							
Spillback Cap Reductn		0			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.44			0.45							

Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 6 (9%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.45  
 Intersection Signal Delay: 7.3  
 Intersection LOS: A  
 Intersection Capacity Utilization 34.8%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.


Splits and Phases: 3: Trillium Pathway & Carling



Lane Group	Ø4
Total Split (s)	35.0
Total Split (%)	50%
Maximum Green (s)	28.4
Yellow Time (s)	3.0
All-Red Time (s)	3.6
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	22.0
Pedestrian Calls (#/hr)	20
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
Existing Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	540	370	340	1000	45	340	300	164	81	308	112
Future Volume (vph)	116	540	370	340	1000	45	340	300	164	81	308	112
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		40.0	75.0		0.0	75.0		0.0	0.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.98		0.92	0.97	1.00		0.98	0.97		0.97	0.98	
Frt			0.850		0.994			0.947			0.960	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1610	3283	1483	1674	4705	0	1674	3061	0	1537	1626	0
Flt Permitted	0.950			0.950			0.104			0.462		
Satd. Flow (perm)	1581	3283	1365	1631	4705	0	180	3061	0	725	1626	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			299		5			95				13
Link Speed (k/h)		60			60			50				50
Link Distance (m)		124.7			193.9			164.5				65.2
Travel Time (s)		7.5			11.6			11.8				4.7
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 (%)	5%	3%	2%	1%	2%	6%	1%	2%	1%	10%	2%	5%
Adj. Flow (vph)	129	600	411	378	1111	50	378	333	182	90	342	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	129	600	411	378	1161	0	378	515	0	90	466	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5				3.5
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		5.0			5.0			5.0				5.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	

4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
Existing Traffic

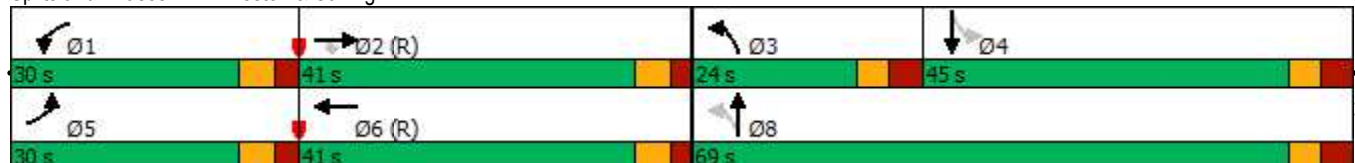


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0	30.0	11.2	30.0		11.9	43.9		43.9	43.9	
Total Split (s)	30.0	41.0	41.0	30.0	41.0		24.0	69.0		45.0	45.0	
Total Split (%)	21.4%	29.3%	29.3%	21.4%	29.3%		17.1%	49.3%		32.1%	32.1%	
Maximum Green (s)	23.8	35.0	35.0	23.8	35.0		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	
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?												
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	Max		Max	Max	
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)		20	20		20			20		20	20	
Act Effct Green (s)	16.5	35.0	35.0	23.8	42.3		62.1	62.1		38.1	38.1	
Actuated g/C Ratio	0.12	0.25	0.25	0.17	0.30		0.44	0.44		0.27	0.27	
v/c Ratio	0.68	0.73	0.73	1.33	0.81		1.44	0.37		0.46	1.03	
Control Delay	79.7	42.2	20.1	215.0	50.9		250.2	21.5		51.3	99.1	
Queue Delay	0.0	0.8	1.4	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	79.7	43.0	21.5	215.0	50.9		250.2	21.5		51.3	99.1	
LOS	E	D	C	F	D		F	C		D	F	
Approach Delay		39.4			91.2			118.3			91.3	
Approach LOS		D			F			F			F	
Queue Length 50th (m)	32.7	63.0	13.5	~124.7	100.1		~115.7	36.4		19.2	~124.5	
Queue Length 95th (m)	54.9	68.5	53.0	#181.9	#134.1		#173.7	49.3		35.9	#186.3	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0		40.0	75.0			75.0					
Base Capacity (vph)	273	820	565	284	1426		262	1410		197	451	
Starvation Cap Reductn	0	57	49	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	0.47	0.79	0.80	1.33	0.81		1.44	0.37		0.46	1.03	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 6 (4%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.44  
 Intersection Signal Delay: 82.8  
 Intersection LOS: F  
 Intersection Capacity Utilization 112.3%  
 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: 4: Preston & Carling





5: Carling & Booth  
PM Peak Hour

829 Carling Avenue  
Existing Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	230	630	1000	94	281	306
Future Volume (vph)	230	630	1000	94	281	306
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0			35.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	40.0				10.0	
Lane Util. Factor	1.00	0.95	0.91	0.91	1.00	1.00
Ped Bike Factor	0.98		0.98		0.98	0.86
Frt			0.987			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1674	3316	4626	0	1674	1483
Flt Permitted	0.161				0.950	
Satd. Flow (perm)	279	3316	4626	0	1649	1279
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			16			262
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	65			65	13	81
Confl. Bikes (#/hr)				10		45
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	2%	2%	1%	1%	2%
Adj. Flow (vph)	256	700	1111	104	312	340
Shared Lane Traffic (%)						
Lane Group Flow (vph)	256	700	1215	0	312	340
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2				4	4
Detector Phase	5	2	6		4	4

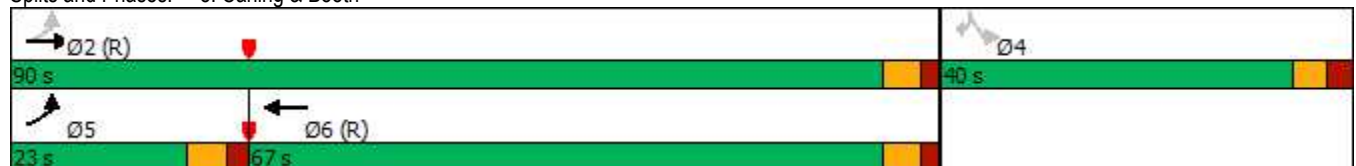


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0		10.0	10.0
Minimum Split (s)	10.9	15.7	29.7		39.0	39.0
Total Split (s)	23.0	90.0	67.0		40.0	40.0
Total Split (%)	17.7%	69.2%	51.5%		30.8%	30.8%
Maximum Green (s)	17.1	84.3	61.3		34.0	34.0
Yellow Time (s)	3.7	3.7	3.7		3.3	3.3
All-Red Time (s)	2.2	2.0	2.0		2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7		6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	C-Max	C-Max		None	None
Walk Time (s)			13.0		7.0	7.0
Flash Dont Walk (s)			11.0		26.0	26.0
Pedestrian Calls (#/hr)			20		20	20
Act Effct Green (s)	89.2	89.4	69.9		28.9	28.9
Actuated g/C Ratio	0.69	0.69	0.54		0.22	0.22
v/c Ratio	0.76	0.31	0.49		0.85	0.70
Control Delay	27.3	9.0	20.6		69.7	19.0
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	27.3	9.0	20.6		69.7	19.0
LOS	C	A	C		E	B
Approach Delay		13.9	20.6		43.2	
Approach LOS		B	C		D	
Queue Length 50th (m)	20.9	32.1	63.5		70.6	15.4
Queue Length 95th (m)	47.9	45.4	85.4		98.4	46.1
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	45.0					45.0
Base Capacity (vph)	374	2281	2496		431	527
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.68	0.31	0.49		0.72	0.65

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 110 (85%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.85  
 Intersection Signal Delay: 23.5  
 Intersection LOS: C  
 Intersection Capacity Utilization 77.9%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 5: Carling & Booth



6: Preston & Beech  
PM Peak Hour

829 Carling 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	380	37	17	410	49
Future Volume (vph)	25	40	32	30	118	24	81	380	37	17	410	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	25.0		0.0	25.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	25.0			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		0.93			0.98	0.84	0.96	0.99		0.94	0.99	
Frt		0.955				0.850		0.987			0.984	
Flt Protected		0.987			0.990		0.950			0.950		
Satd. Flow (prot)	0	1582	0	0	1745	1498	1674	1686	0	1674	1668	0
Flt Permitted		0.883			0.922		0.432			0.463		
Satd. Flow (perm)	0	1386	0	0	1593	1261	733	1686	0	765	1668	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25				30		12			15	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		101.4			151.8			160.5			163.2	
Travel Time (s)		7.3			10.9			11.6			11.8	
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 (%)	1%	1%	1%	1%	1%	1%	1%	3%	1%	1%	4%	2%
Adj. Flow (vph)	28	44	36	33	131	27	90	422	41	19	456	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	108	0	0	164	27	90	463	0	19	510	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	

6: Preston & Beech  
PM Peak Hour

829 Carling Avenue  
Existing Traffic

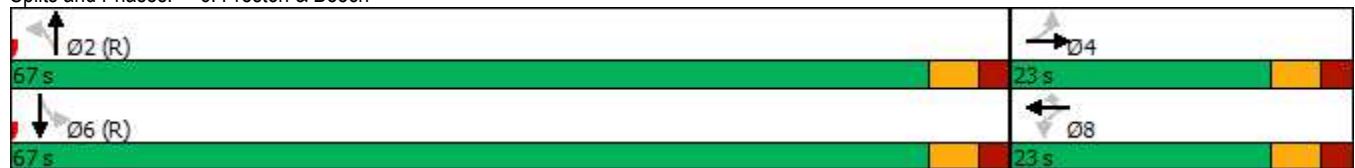


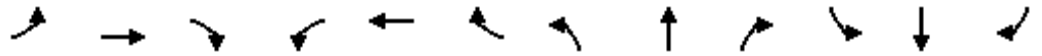
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	22.6	22.6		22.6	22.6	22.6	33.5	33.5		33.5	33.5	
Total Split (s)	23.0	23.0		23.0	23.0	23.0	67.0	67.0		67.0	67.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%	25.6%	74.4%	74.4%		74.4%	74.4%	
Maximum Green (s)	17.4	17.4		17.4	17.4	17.4	61.5	61.5		61.5	61.5	
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3	2.3	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.6			5.6	5.6	5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Ped	Ped		Ped	Ped	Ped	C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	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	10.0	
Pedestrian Calls (#/hr)	20	20		20	20	20	20	20		20	20	
Act Effct Green (s)		17.1			17.1	17.1	61.8	61.8		61.8	61.8	
Actuated g/C Ratio		0.19			0.19	0.19	0.69	0.69		0.69	0.69	
v/c Ratio		0.38			0.54	0.10	0.18	0.40		0.04	0.44	
Control Delay		28.8			40.6	11.4	2.8	4.4		4.8	7.6	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		28.8			40.6	11.4	2.8	4.4		4.8	7.6	
LOS		C			D	B	A	A		A	A	
Approach Delay		28.8			36.4			4.1			7.5	
Approach LOS		C			D			A			A	
Queue Length 50th (m)		11.5			23.8	0.0	3.5	28.8		0.8	30.5	
Queue Length 95th (m)		25.1			41.6	5.8	0.8	2.4		2.8	47.8	
Internal Link Dist (m)		77.4			127.8			136.5			139.2	
Turn Bay Length (m)							25.0			25.0		
Base Capacity (vph)		288			307	267	503	1161		525	1150	
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		0.38			0.53	0.10	0.18	0.40		0.04	0.44	

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 43 (48%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.54  
 Intersection Signal Delay: 11.8  
 Intersection LOS: B  
 Intersection Capacity Utilization 66.2%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 6: Preston & Beech





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	2	10	0	0	0	8	450	21	6	470	15
Future Volume (vph)	4	2	10	0	0	0	8	450	21	6	470	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								0.99			1.00	
Frt		0.913						0.994			0.996	
Flt Protected		0.988						0.999			0.999	
Satd. Flow (prot)	0	1485	0	0	0	0	0	1709	0	0	1715	0
Flt Permitted		0.988						0.992			0.994	
Satd. Flow (perm)	0	1459	0	0	0	0	0	1696	0	0	1705	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11						6			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		114.6			152.9			73.8			160.5	
Travel Time (s)		8.3			11.0			5.3			11.6	
Confl. Peds. (#/hr)	25		27	27		25	46		47	47		46
Confl. Bikes (#/hr)			1			3			21			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 (%)	1%	1%	1%	2%	2%	2%	1%	3%	1%	1%	3%	1%
Adj. Flow (vph)	4	2	11	0	0	0	9	500	23	7	522	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	17	0	0	0	0	0	532	0	0	546	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		-2.0			-1.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2					1	2		1	2	
Detector Template	Left	Thru					Left	Thru		Left	Thru	
Leading Detector (m)	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	
Detector 1 Position(m)	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	
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			28.7	
Detector 2 Size(m)		1.8						1.8			1.8	
Detector 2 Type		CI+Ex						CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Detector Phase	4	4					2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0					10.0	10.0		10.0	10.0	
Minimum Split (s)	20.5	20.5					28.1	28.1		28.1	28.1	

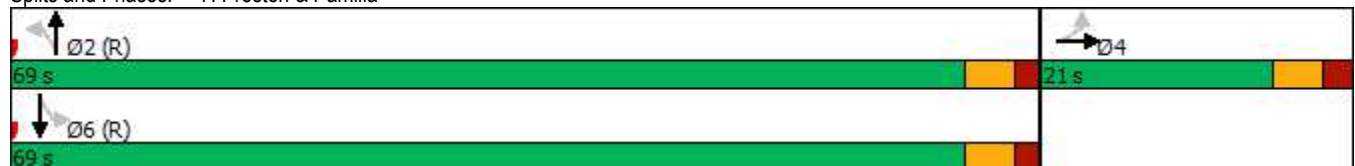


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	21.0	21.0					69.0	69.0		69.0	69.0	
Total Split (%)	23.3%	23.3%					76.7%	76.7%		76.7%	76.7%	
Maximum Green (s)	15.5	15.5					63.9	63.9		63.9	63.9	
Yellow Time (s)	3.3	3.3					3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2					1.8	1.8		1.8	1.8	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.5						5.1			5.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	
Recall Mode	None	None					C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0					18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	8.0	8.0					5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	20	20					20	20		20	20	
Act Effct Green (s)		12.0						75.6			75.6	
Actuated g/C Ratio		0.13						0.84			0.84	
v/c Ratio		0.08						0.37			0.38	
Control Delay		21.6						4.4			3.5	
Queue Delay		0.0						0.0			0.1	
Total Delay		21.6						4.4			3.6	
LOS		C						A			A	
Approach Delay		21.6						4.4			3.6	
Approach LOS		C						A			A	
Queue Length 50th (m)		0.9						21.7			19.1	
Queue Length 95th (m)		6.0						44.5			30.9	
Internal Link Dist (m)		90.6			128.9			49.8			136.5	
Turn Bay Length (m)												
Base Capacity (vph)		260						1426			1433	
Starvation Cap Reductn		0						0			109	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.07						0.37			0.41	

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 27 (30%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.38  
 Intersection Signal Delay: 4.2 Intersection LOS: A  
 Intersection Capacity Utilization 51.2% ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 7: Preston & Pamilla





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	4	4	9	14	2	8	7	422	40	11	487	5
Future Volume (vph)	4	4	9	14	2	8	7	422	40	11	487	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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												
Frt		0.925			0.955			0.989			0.999	
Flt Protected		0.989			0.971			0.999			0.999	
Satd. Flow (prot)	0	1596	0	0	1618	0	0	1709	0	0	1725	0
Flt Permitted		0.989			0.971			0.999			0.999	
Satd. Flow (perm)	0	1596	0	0	1618	0	0	1709	0	0	1725	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		113.6			154.3			71.5			73.8	
Travel Time (s)		8.2			11.1			5.1			5.3	
Confl. Peds. (#/hr)							46		47	47		46
Confl. Bikes (#/hr)									21			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 (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Adj. Flow (vph)	4	4	10	16	2	9	8	469	44	12	541	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	18	0	0	27	0	0	521	0	0	559	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		-2.0			-2.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

**Intersection Summary**

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 43.9% ICU Level of Service A

Analysis Period (min) 15



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	17	18	9	452	483	27
Future Volume (vph)	17	18	9	452	483	27
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.931			0.993		
Flt Protected	0.976			0.999		
Satd. Flow (prot)	1586	0	0	3281	1717	0
Flt Permitted	0.976			0.999		
Satd. Flow (perm)	1586	0	0	3281	1717	0
Link Speed (k/h)	30			50	50	
Link Distance (m)	68.0			65.2	71.5	
Travel Time (s)	8.2			4.7	5.1	
Confl. Peds. (#/hr)				46		47
Confl. Bikes (#/hr)						14
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%
Adj. Flow (vph)	19	20	10	502	537	30
Shared Lane Traffic (%)						
Lane Group Flow (vph)	39	0	0	512	567	0
Enter Blocked Intersection	No	No	Yes	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			2.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

**Intersection Summary**

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 38.8% ICU Level of Service A

Analysis Period (min) 15



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	370	244	4	2	410	410	5	2	1	400	0	600
Future Volume (vph)	370	244	4	2	410	410	5	2	1	400	0	600
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	55.0		0.0	30.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.89		0.94		0.94			0.83	0.79
Frt		0.998				0.850		0.985				0.850
Flt Protected	0.950			0.950				0.968			0.950	
Satd. Flow (prot)	1642	1754	0	1674	1762	1498	0	1644	0	0	1674	1483
Flt Permitted	0.157			0.590				0.821			0.752	
Satd. Flow (perm)	271	1754	0	930	1762	1403	0	1343	0	0	1095	1166
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				175		1				87
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		233.9			203.3			76.1			164.5	
Travel Time (s)		14.0			12.2			5.5			11.8	
Confl. Peds. (#/hr)	35		62	62		35	73		65	65		73
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 (%)	3%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%
Adj. Flow (vph)	411	271	4	2	456	456	6	2	1	444	0	667
Shared Lane Traffic (%)												
Lane Group Flow (vph)	411	275	0	2	456	456	0	9	0	0	444	667
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)		3.5			3.5			0.0			3.5	
Link Offset(m)		2.0			0.0			5.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6		6	8			4		4
Detector Phase	5	2		6	6	6	8	8		4	4	5
Switch Phase												

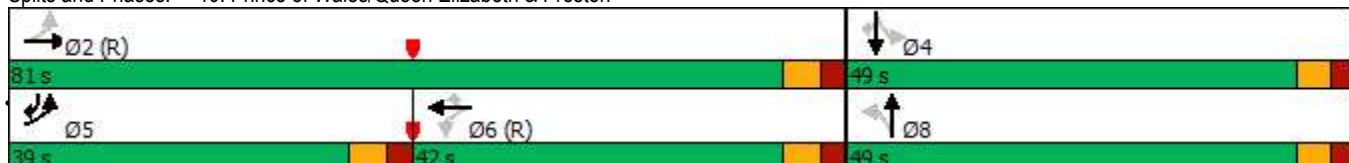


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	5.0
Minimum Split (s)	11.1	32.1		32.1	32.1	32.1	29.5	29.5		29.5	29.5	11.1
Total Split (s)	39.0	81.0		42.0	42.0	42.0	49.0	49.0		49.0	49.0	39.0
Total Split (%)	30.0%	62.3%		32.3%	32.3%	32.3%	37.7%	37.7%		37.7%	37.7%	30.0%
Maximum Green (s)	32.9	74.9		35.9	35.9	35.9	43.5	43.5		43.5	43.5	32.9
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.7
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	2.2	2.2		2.2	2.2	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		5.5			5.5	6.1
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	Max	Max		Max	Max	None
Walk Time (s)		7.0		7.0	7.0	7.0	12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		19.0		19.0	19.0	19.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		20		20	20	20	20	20		20	20	
Act Effct Green (s)	74.9	74.9		38.9	38.9	38.9		43.5			43.5	72.8
Actuated g/C Ratio	0.58	0.58		0.30	0.30	0.30		0.33			0.33	0.56
v/c Ratio	0.87	0.27		0.01	0.87	0.84		0.02			1.21	0.87
Control Delay	46.7	14.7		34.5	61.6	41.8		27.2			156.6	33.4
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	46.7	14.7		34.5	61.6	41.8		27.2			156.6	33.4
LOS	D	B		C	E	D		C			F	C
Approach Delay		33.8			51.7			27.3			82.7	
Approach LOS		C			D			C			F	
Queue Length 50th (m)	67.6	31.1		0.3	105.4	68.4		1.3			~127.8	84.5
Queue Length 95th (m)	#113.1	45.8		2.3	#163.6	#125.3		5.0			#186.2	#128.6
Internal Link Dist (m)		209.9			179.3			52.1			140.5	
Turn Bay Length (m)	55.0			30.0		25.0						
Base Capacity (vph)	503	1010		278	527	542		450			366	796
Starvation Cap Reductn	0	0		0	0	0		0			0	0
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.82	0.27		0.01	0.87	0.84		0.02			1.21	0.84

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 6 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.21  
 Intersection Signal Delay: 59.8  
 Intersection LOS: E  
 Intersection Capacity Utilization 101.8%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Prince of Wales/Queen Elizabeth & Preston



4: Preston & Carling  
AM Peak Hour

829 Carling Avenue  
Existing Traffic (demand rationalization)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	570	224	134	550	94	282	450	281	80	227	99
Future Volume (vph)	140	570	224	134	550	94	282	450	281	80	227	99
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		40.0	75.0		0.0	75.0		0.0	0.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.96		0.91	0.97	0.98		0.98	0.99		1.00	0.98	
Frt			0.850		0.978			0.942			0.954	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1595	3252	1483	1658	4456	0	1674	3051	0	1510	1517	0
Flt Permitted	0.950			0.950			0.312			0.345		
Satd. Flow (perm)	1538	3252	1350	1616	4456	0	541	3051	0	548	1517	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			199		26			163			20	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		124.7			193.9			164.5			65.2	
Travel Time (s)		7.5			11.6			11.8			4.7	
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%	2%	2%	4%	10%	1%	4%	2%	12%	6%	20%
Adj. Flow (vph)	156	633	249	149	611	104	313	500	312	89	252	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	156	633	249	149	715	0	313	812	0	89	362	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	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	

4: Preston & Carling  
AM Peak Hour

829 Carling Avenue  
Existing Traffic (demand rationalization)

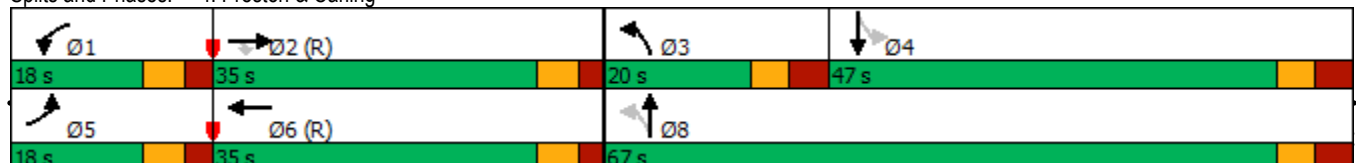


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0	30.0	11.2	30.0		11.9	43.9		43.9	43.9	
Total Split (s)	18.0	35.0	35.0	18.0	35.0		20.0	67.0		47.0	47.0	
Total Split (%)	15.0%	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	
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?												
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	Max		Max	Max	
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)		20	20		20			20		20	20	
Act Effct Green (s)	11.8	29.0	29.0	11.8	29.0		60.1	60.1		40.1	40.1	
Actuated g/C Ratio	0.10	0.24	0.24	0.10	0.24		0.50	0.50		0.33	0.33	
v/c Ratio	1.00	0.81	0.52	0.91	0.65		0.79	0.50		0.49	0.70	
Control Delay	136.7	40.9	8.8	117.5	41.7		42.1	25.2		42.6	41.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	136.7	40.9	8.8	117.5	41.7		42.1	25.2		42.6	41.0	
LOS	F	D	A	F	D		D	C		D	D	
Approach Delay		47.6			54.8			29.9			41.3	
Approach LOS		D			D			C			D	
Queue Length 50th (m)	36.5	27.3	0.5	34.3	21.4		54.2	68.5		15.3	64.3	
Queue Length 95th (m)	#76.3	60.5	16.1	#70.5	51.1		m72.6	m91.3		31.6	96.3	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0		40.0	75.0			75.0					
Base Capacity (vph)	156	785	477	163	1096		394	1609		183	520	
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	1.00	0.81	0.52	0.91	0.65		0.79	0.50		0.49	0.70	

Intersection Summary

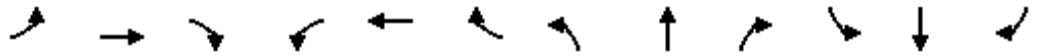
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 116 (97%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 42.8  
 Intersection LOS: D  
 Intersection 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Preston & Carling



10: Prince of Wales/Queen Elizabeth & Preston  
 AM Peak Hour

829 Carling Avenue  
 Existing Traffic (demand rationalization)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	640	263	2	2	176	310	1	4	3	210	4	300
Future Volume (vph)	640	263	2	2	176	310	1	4	3	210	4	300
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	55.0		0.0	30.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.98		0.98		0.97			0.94	0.93
Fr <sub>t</sub>		0.999				0.850		0.949				0.850
Fl <sub>t</sub> Protected	0.950			0.950				0.994			0.953	
Satd. Flow (prot)	1642	1760	0	1674	1762	1498	0	1211	0	0	1666	1469
Fl <sub>t</sub> Permitted	0.530			0.580				0.972			0.724	
Satd. Flow (perm)	909	1760	0	999	1762	1462	0	1180	0	0	1192	1371
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				344		3				333
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		233.9			203.3			76.1			164.5	
Travel Time (s)		14.0			12.2			5.5			11.8	
Confl. Peds. (#/hr)	9		15	15		9	19		24	24		19
Confl. Bikes (#/hr)			2						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 (%)	3%	1%	1%	1%	1%	1%	1%	50%	25%	1%	50%	3%
Adj. Flow (vph)	711	292	2	2	196	344	1	4	3	233	4	333
Shared Lane Traffic (%)												
Lane Group Flow (vph)	711	294	0	2	196	344	0	8	0	0	237	333
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)		3.5			3.5			0.0			3.5	
Link Offset(m)		2.0			0.0			5.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6		6	8			4		4
Detector Phase	5	2		6	6	6	8	8		4	4	5

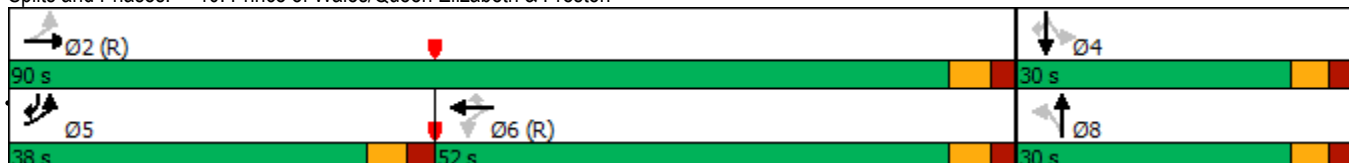


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	5.0
Minimum Split (s)	11.1	32.1		32.1	32.1	32.1	29.5	29.5		29.5	29.5	11.1
Total Split (s)	38.0	90.0		52.0	52.0	52.0	30.0	30.0		30.0	30.0	38.0
Total Split (%)	31.7%	75.0%		43.3%	43.3%	43.3%	25.0%	25.0%		25.0%	25.0%	31.7%
Maximum Green (s)	31.9	83.9		45.9	45.9	45.9	24.5	24.5		24.5	24.5	31.9
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.7
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	2.2	2.2		2.2	2.2	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		5.5			5.5	6.1
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	Max	Max		Max	Max	None
Walk Time (s)		7.0		7.0	7.0	7.0	12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		19.0		19.0	19.0	19.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		20		20	20	20	20	20		20	20	
Act Effct Green (s)	83.9	83.9		47.5	47.5	47.5		24.5			24.5	54.2
Actuated g/C Ratio	0.70	0.70		0.40	0.40	0.40		0.20			0.20	0.45
v/c Ratio	0.87	0.24		0.01	0.28	0.44		0.03			0.98	0.40
Control Delay	22.9	7.1		23.0	26.6	4.5		32.1			91.6	2.7
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	22.9	7.1		23.0	26.6	4.5		32.1			91.6	2.7
LOS	C	A		C	C	A		C			F	A
Approach Delay		18.3			12.5			32.1			39.6	
Approach LOS		B			B			C			D	
Queue Length 50th (m)	73.5	20.6		0.3	29.2	0.0		0.9			45.9	3.0
Queue Length 95th (m)	#115.3	30.5		1.9	45.9	16.7		4.8			m#89.3	m5.5
Internal Link Dist (m)		209.9			179.3			52.1			140.5	
Turn Bay Length (m)	55.0			30.0		25.0						
Base Capacity (vph)	830	1230		396	697	786		243			243	841
Starvation Cap Reductn	0	0		0	0	0		0			0	0
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.86	0.24		0.01	0.28	0.44		0.03			0.98	0.40

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 4 (3%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.98  
 Intersection Signal Delay: 22.6 Intersection LOS: C  
 Intersection Capacity Utilization 93.8% 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Prince of Wales/Queen Elizabeth & Preston



4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
Existing Traffic (demand rationalization)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	540	370	250	1000	45	250	300	164	81	288	112
Future Volume (vph)	116	540	370	250	1000	45	250	300	164	81	288	112
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		40.0	75.0		0.0	75.0		0.0	0.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.98		0.92	0.97	1.00		0.98	0.97		0.97	0.98	
Fr			0.850		0.994			0.947			0.958	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1610	3283	1483	1674	4705	0	1674	3061	0	1537	1620	0
Flt Permitted	0.950			0.950			0.131			0.462		
Satd. Flow (perm)	1581	3283	1365	1631	4705	0	226	3061	0	725	1620	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			299		5			95			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		124.7			193.9			164.5			65.2	
Travel Time (s)		7.5			11.6			11.8			4.7	
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 (%)	5%	3%	2%	1%	2%	6%	1%	2%	1%	10%	2%	5%
Adj. Flow (vph)	129	600	411	278	1111	50	278	333	182	90	320	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	129	600	411	278	1161	0	278	515	0	90	444	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	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	

4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
Existing Traffic (demand rationalization)

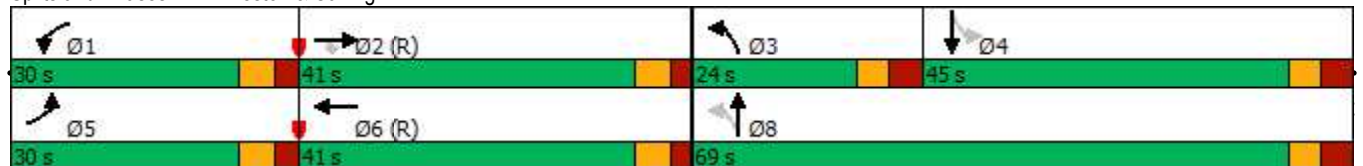


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0	30.0	11.2	30.0		11.9	43.9		43.9	43.9	
Total Split (s)	30.0	41.0	41.0	30.0	41.0		24.0	69.0		45.0	45.0	
Total Split (%)	21.4%	29.3%	29.3%	21.4%	29.3%		17.1%	49.3%		32.1%	32.1%	
Maximum Green (s)	23.8	35.0	35.0	23.8	35.0		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	
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?												
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	Ped		Ped	Ped	
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)		20	20		20			20		20	20	
Act Effct Green (s)	16.5	35.0	35.0	23.8	42.3		62.1	62.1		38.1	38.1	
Actuated g/C Ratio	0.12	0.25	0.25	0.17	0.30		0.44	0.44		0.27	0.27	
v/c Ratio	0.68	0.73	0.73	0.98	0.81		1.00	0.37		0.46	0.98	
Control Delay	79.7	42.2	20.1	105.6	50.9		88.6	21.5		51.3	87.5	
Queue Delay	0.0	0.8	1.4	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	79.7	43.0	21.5	105.6	50.9		88.6	21.5		51.3	87.5	
LOS	E	D	C	F	D		F	C		D	F	
Approach Delay		39.4			61.5			45.0			81.4	
Approach LOS		D			E			D			F	
Queue Length 50th (m)	32.7	63.0	13.5	71.4	100.1		~52.4	36.4		19.2	110.2	
Queue Length 95th (m)	54.9	68.5	53.0	#123.1	#134.1		#106.1	49.3		35.9	#174.0	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0		40.0	75.0			75.0					
Base Capacity (vph)	273	820	565	284	1426		277	1410		197	451	
Starvation Cap Reductn	0	57	49	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	0.47	0.79	0.80	0.98	0.81		1.00	0.37		0.46	0.98	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 6 (4%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 54.4      Intersection LOS: D  
 Intersection Capacity Utilization 101.7%      ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 4: Preston & Carling







Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	370	244	4	2	410	410	5	2	1	330	0	600
Future Volume (vph)	370	244	4	2	410	410	5	2	1	330	0	600
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	55.0		0.0	30.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.89		0.94		0.93			0.83	0.79
Frt		0.998				0.850		0.985				0.850
Flt Protected	0.950			0.950				0.968			0.950	
Satd. Flow (prot)	1642	1754	0	1674	1762	1498	0	1644	0	0	1674	1483
Flt Permitted	0.157			0.590				0.836			0.752	
Satd. Flow (perm)	271	1754	0	930	1762	1403	0	1347	0	0	1095	1166
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				175		1				87
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		233.9			203.3			76.1			164.5	
Travel Time (s)		14.0			12.2			5.5			11.8	
Confl. Peds. (#/hr)	35		62	62		35	73		65	65		73
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 (%)	3%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%
Adj. Flow (vph)	411	271	4	2	456	456	6	2	1	367	0	667
Shared Lane Traffic (%)												
Lane Group Flow (vph)	411	275	0	2	456	456	0	9	0	0	367	667
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)		3.5			3.5			0.0			3.5	
Link Offset(m)		2.0			0.0			5.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6		6	8			4		4
Detector Phase	5	2		6	6	6	8	8		4	4	5
Switch Phase												

10: Prince of Wales/Queen Elizabeth & Preston  
PM Peak Hour

829 Carling Avenue  
Existing Traffic (demand rationalization)

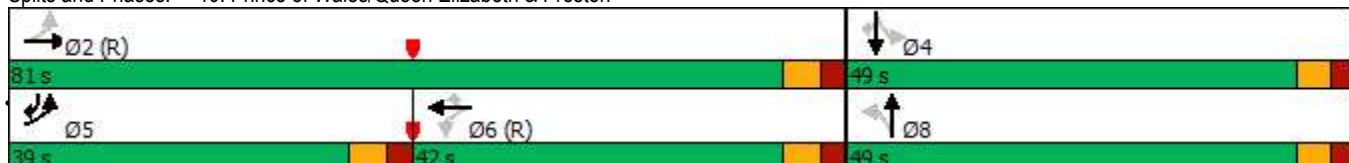


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	5.0
Minimum Split (s)	11.1	32.1		32.1	32.1	32.1	29.5	29.5		29.5	29.5	11.1
Total Split (s)	39.0	81.0		42.0	42.0	42.0	49.0	49.0		49.0	49.0	39.0
Total Split (%)	30.0%	62.3%		32.3%	32.3%	32.3%	37.7%	37.7%		37.7%	37.7%	30.0%
Maximum Green (s)	32.9	74.9		35.9	35.9	35.9	43.5	43.5		43.5	43.5	32.9
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.7
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	2.2	2.2		2.2	2.2	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		5.5			5.5	6.1
Lead/Lag	Lead			Lag			Lag			Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	Max	Max		Max	Max	None
Walk Time (s)		7.0		7.0	7.0	7.0	12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		19.0		19.0	19.0	19.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		20		20	20	20	20	20		20	20	
Act Effct Green (s)	74.9	74.9		38.9	38.9	38.9		43.5			43.5	72.8
Actuated g/C Ratio	0.58	0.58		0.30	0.30	0.30		0.33			0.33	0.56
v/c Ratio	0.87	0.27		0.01	0.87	0.84		0.02			1.00	0.87
Control Delay	46.7	14.7		34.5	61.6	41.8		27.2			91.2	33.4
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	46.7	14.7		34.5	61.6	41.8		27.2			91.2	33.4
LOS	D	B		C	E	D		C			F	C
Approach Delay		33.8			51.7			27.3			53.9	
Approach LOS		C			D			C			D	
Queue Length 50th (m)	67.6	31.1		0.3	105.4	68.4		1.3			~86.7	84.5
Queue Length 95th (m)	#113.1	45.8		2.3	#163.6	#125.3		5.0			#145.5	#128.6
Internal Link Dist (m)		209.9			179.3			52.1			140.5	
Turn Bay Length (m)	55.0			30.0		25.0						
Base Capacity (vph)	503	1010		278	527	542		451			366	796
Starvation Cap Reductn	0	0		0	0	0		0			0	0
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.82	0.27		0.01	0.87	0.84		0.02			1.00	0.84

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 6 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 47.8  
 Intersection LOS: D  
 Intersection Capacity Utilization 101.8%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

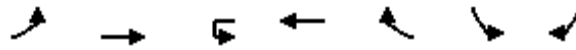
Splits and Phases: 10: Prince of Wales/Queen Elizabeth & Preston



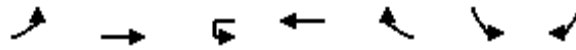
## **APPENDIX J**

---

### Background Synchro Analysis



Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	31	849	13	611	142	175	5
Future Volume (vph)	31	849	13	611	142	175	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0		50.0		110.0	0.0	10.0
Storage Lanes	1		1		1	1	1
Taper Length (m)	25.0		25.0			25.0	
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Ped Bike Factor	0.97				0.90	0.96	0.95
Fr <sub>t</sub>					0.850		0.850
Fl <sub>t</sub> Protected	0.950		0.950			0.950	
Satd. Flow (prot)	1642	3283	1674	3161	1483	1674	1498
Fl <sub>t</sub> Permitted	0.950		0.333			0.950	
Satd. Flow (perm)	1591	3283	587	3161	1328	1615	1425
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					142		3
Link Speed (k/h)		60		60		40	
Link Distance (m)		196.1		162.9		242.3	
Travel Time (s)		11.8		9.8		21.8	
Confl. Peds. (#/hr)	30				30	30	30
Confl. Bikes (#/hr)					17		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	1%	7%	2%	1%	1%
Adj. Flow (vph)	31	849	13	611	142	175	5
Shared Lane Traffic (%)							
Lane Group Flow (vph)	31	849	13	611	142	175	5
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	Left	Right	L NA	R NA
Median Width(m)		7.0		7.0		3.5	
Link Offset(m)		0.0		0.0		0.0	
Crosswalk Width(m)		5.0		10.0		5.0	
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14		14	40	14
Number of Detectors	1	2	1	2	1	1	1
Detector Template	Left	Thru	Left	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	6.1	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	1.8	6.1	6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7		28.7			
Detector 2 Size(m)		1.8		1.8			
Detector 2 Type		Cl+Ex		Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)		0.0		0.0			
Turn Type	Prot	NA	Perm	NA	Perm	Perm	Perm
Protected Phases	5	2		6			
Permitted Phases			6		6	4	4
Detector Phase	5	2	6	6	6	4	4

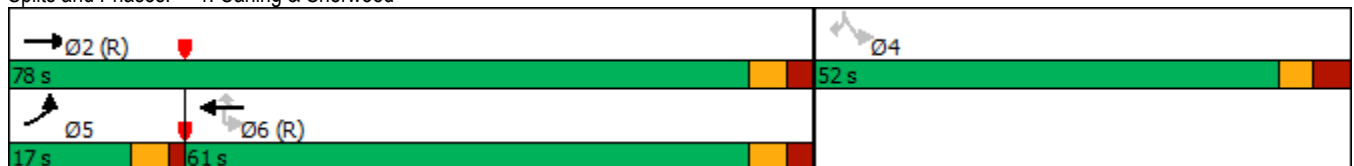


Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.2	33.4	33.4	33.4	33.4	40.1	40.1
Total Split (s)	17.0	78.0	61.0	61.0	61.0	52.0	52.0
Total Split (%)	13.1%	60.0%	46.9%	46.9%	46.9%	40.0%	40.0%
Maximum Green (s)	11.8	71.6	54.6	54.6	54.6	44.9	44.9
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	2.7	2.7	2.7	2.7	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.4	6.4	6.4	6.4	7.1	7.1
Lead/Lag	Lead		Lag	Lag	Lag		
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)		12.0	12.0	12.0	12.0	7.0	7.0
Flash Dont Walk (s)		15.0	15.0	15.0	15.0	26.0	26.0
Pedestrian Calls (#/hr)		20	20	20	20	20	20
Act Effct Green (s)	8.0	90.9	82.3	82.3	82.3	25.6	25.6
Actuated g/C Ratio	0.06	0.70	0.63	0.63	0.63	0.20	0.20
v/c Ratio	0.31	0.37	0.04	0.31	0.16	0.55	0.02
Control Delay	65.6	9.6	5.7	5.0	0.7	52.1	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.6	9.6	5.7	5.0	0.7	52.1	27.4
LOS	E	A	A	A	A	D	C
Approach Delay		11.5		4.2		51.4	
Approach LOS		B		A		D	
Queue Length 50th (m)	7.2	47.4	0.5	11.1	0.0	34.7	0.4
Queue Length 95th (m)	16.3	58.8	1.6	15.3	1.3	55.1	3.4
Internal Link Dist (m)		172.1		138.9		218.3	
Turn Bay Length (m)	40.0		50.0		110.0		10.0
Base Capacity (vph)	149	2295	371	2000	892	557	494
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	0.21	0.37	0.04	0.31	0.16	0.31	0.01

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 107 (82%), Referenced to phase 2:EBT and 6:WBTU, Start of Green  
 Natural Cycle: 85  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.55  
 Intersection Signal Delay: 12.4  
 Intersection LOS: B  
 Intersection Capacity Utilization 59.6%  
 ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 1: Carling & Sherwood



2: Carling & Champagne  
AM Peak Hour

829 Carling Avenue  
2028 Background Traffic

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	813	174	180	690	168	62	0	69	89	0	54
Future Volume (vph)	103	813	174	180	690	168	62	0	69	89	0	54
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	70.0		30.0	60.0		25.0	0.0		0.0	20.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.90		0.95	0.95		0.69	0.96		0.95	0.98		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1674	3283	1483	1658	3252	1414	1658	0	1483	1658	0	1498
Flt Permitted	0.375			0.325			0.950			0.950		
Satd. Flow (perm)	597	3283	1404	542	3252	978	1586	0	1403	1617	0	1443
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			174			168			69			54
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		162.9			117.5			121.7			178.4	
Travel Time (s)		9.8			7.1			8.8			12.8	
Confl. Peds. (#/hr)	90		90	90		90	20		20	20		20
Confl. Bikes (#/hr)			5			4						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 (%)	1%	3%	2%	2%	4%	7%	2%	2%	2%	2%	2%	1%
Adj. Flow (vph)	103	813	174	180	690	168	62	0	69	89	0	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	813	174	180	690	168	62	0	69	89	0	54
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1		1	1		1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left		Right	Left		Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1		6.1	6.1		6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1		6.1	6.1		6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 2 Position(m)		28.7			28.7							
Detector 2 Size(m)		1.8			1.8							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm		Perm	Perm		Perm
Protected Phases		2			6							
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	2	2	2	6	6	6	8		8	4		4

2: Carling & Champagne  
AM Peak Hour

829 Carling Avenue  
2028 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0		5.0	10.0		10.0
Minimum Split (s)	15.3	15.3	15.3	25.3	25.3	25.3	24.0		24.0	37.9		37.9
Total Split (s)	92.0	92.0	92.0	92.0	92.0	92.0	38.0		38.0	38.0		38.0
Total Split (%)	70.8%	70.8%	70.8%	70.8%	70.8%	70.8%	29.2%		29.2%	29.2%		29.2%
Maximum Green (s)	86.7	86.7	86.7	86.7	86.7	86.7	32.0		32.0	32.1		32.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0		3.0	3.3		3.3
All-Red Time (s)	1.6	1.6	1.6	1.6	1.6	1.6	3.0		3.0	2.6		2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	6.0		6.0	5.9		5.9
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None		None	None		None
Walk Time (s)				10.0	10.0	10.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)				10.0	10.0	10.0	11.0		11.0	25.0		25.0
Pedestrian Calls (#/hr)				20	20	20	20		20	20		20
Act Effct Green (s)	95.5	95.5	95.5	95.5	95.5	95.5	23.2		23.2	23.3		23.3
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.73	0.73	0.18		0.18	0.18		0.18
v/c Ratio	0.24	0.34	0.16	0.45	0.29	0.22	0.22		0.23	0.31		0.18
Control Delay	5.9	5.0	0.9	7.5	3.2	2.0	43.8		10.5	46.1		11.2
Queue Delay	0.0	0.1	0.0	0.0	0.2	0.0	0.0		0.0	0.0		0.0
Total Delay	5.9	5.0	0.9	7.5	3.3	2.0	43.8		10.5	46.1		11.2
LOS	A	A	A	A	A	A	D		B	D		B
Approach Delay		4.5			3.9			26.2				32.9
Approach LOS		A			A			C				C
Queue Length 50th (m)	4.6	19.1	1.1	9.4	18.8	2.8	11.6		0.0	16.9		0.0
Queue Length 95th (m)	7.7	22.4	2.6	13.8	22.5	7.9	22.6		10.8	30.5		9.7
Internal Link Dist (m)		138.9			93.5			97.7				154.4
Turn Bay Length (m)	70.0		30.0	60.0		25.0				20.0		
Base Capacity (vph)	438	2412	1077	397	2389	762	390		397	399		396
Starvation Cap Reductn	0	433	0	0	803	0	0		0	0		0
Spillback Cap Reductn	0	0	0	0	0	0	0		0	0		0
Storage Cap Reductn	0	0	0	0	0	0	0		0	0		0
Reduced v/c Ratio	0.24	0.41	0.16	0.45	0.44	0.22	0.16		0.17	0.22		0.14

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 85 (65%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.45  
 Intersection Signal Delay: 7.1  
 Intersection LOS: A  
 Intersection Capacity Utilization 56.3%  
 ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 2: Carling & Champagne



3: Trillium Pathway & Carling  
AM Peak Hour

829 Carling Avenue  
2028 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑							
Traffic Volume (vph)	0	968	0	0	1086	0	0	0	0	0	0	0
Future Volume (vph)	0	968	0	0	1086	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected												
Satd. Flow (prot)	0	3283	0	0	3283	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3283	0	0	3283	0	0	0	0	0	0	0
Right Turn on Red			Yes				Yes				Yes	
Satd. Flow (RTOR)												
Link Speed (k/h)	60				60				50			
Link Distance (m)	117.5				124.7				157.3			
Travel Time (s)	7.1				7.5				11.3			
Confl. Peds. (#/hr)	40		14	14		40	18		20	20		18
Confl. Bikes (#/hr)			7			25						17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	968	0	0	1086	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	968	0	0	1086	0	0	0	0	0	0	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)	7.0				7.0				0.0			
Link Offset(m)	0.0				0.0				0.0			
Crosswalk Width(m)	5.0				5.0				5.0			
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	2				2							
Detector Template	Thru				Thru							
Leading Detector (m)	30.5				30.5							
Trailing Detector (m)	0.0				0.0							
Detector 1 Position(m)	0.0				0.0							
Detector 1 Size(m)	1.8				1.8							
Detector 1 Type	CI+Ex				CI+Ex							
Detector 1 Channel												
Detector 1 Extend (s)	0.0				0.0							
Detector 1 Queue (s)	0.0				0.0							
Detector 1 Delay (s)	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	NA				NA							
Protected Phases	2				6							
Permitted Phases												
Detector Phase	2				6							
Switch Phase												
Minimum Initial (s)	10.0				10.0							
Minimum Split (s)	25.1				25.1							



Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	35.6

3: Trillium Pathway & Carling  
AM Peak Hour

829 Carling Avenue  
2028 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)		94.0			94.0							
Total Split (%)		72.3%			72.3%							
Maximum Green (s)		88.9			88.9							
Yellow Time (s)		3.7			3.7							
All-Red Time (s)		1.4			1.4							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		5.1			5.1							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0							
Recall Mode		C-Max			C-Max							
Walk Time (s)		15.0			15.0							
Flash Dont Walk (s)		5.0			5.0							
Pedestrian Calls (#/hr)		20			20							
Act Effct Green (s)		105.6			105.6							
Actuated g/C Ratio		0.81			0.81							
v/c Ratio		0.36			0.41							
Control Delay		4.5			3.2							
Queue Delay		0.1			0.1							
Total Delay		4.6			3.3							
LOS		A			A							
Approach Delay		4.6			3.3							
Approach LOS		A			A							
Queue Length 50th (m)		34.3			29.5							
Queue Length 95th (m)		42.0			m32.3							
Internal Link Dist (m)		93.5			100.7			133.3			30.9	
Turn Bay Length (m)												
Base Capacity (vph)		2666			2666							
Starvation Cap Reductn		486			470							
Spillback Cap Reductn		181			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.44			0.49							

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 59 (45%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.41  
 Intersection Signal Delay: 3.9 Intersection LOS: A  
 Intersection Capacity Utilization 35.9% ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Trillium Pathway & Carling



Lane Group	Ø4
Total Split (s)	36.0
Total Split (%)	28%
Maximum Green (s)	29.4
Yellow Time (s)	3.0
All-Red Time (s)	3.6
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	22.0
Pedestrian Calls (#/hr)	20
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

4: Preston & Carling  
AM Peak Hour

829 Carling Avenue  
2028 Background Traffic

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	602	233	253	703	99	288	475	308	120	297	128
Future Volume (vph)	161	602	233	253	703	99	288	475	308	120	297	128
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		0.0	110.0		90.0	75.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.94	0.97		0.98		0.84	0.98	0.98		1.00	0.98	
Frt		0.958				0.850		0.941			0.955	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1595	3049	0	1658	3252	1375	1674	3035	0	1510	1506	0
Flt Permitted	0.950			0.950			0.179			0.355		
Satd. Flow (perm)	1507	3049	0	1623	3252	1153	309	3035	0	562	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42				143		148				17
Link Speed (k/h)		60			60			50				50
Link Distance (m)		124.7			193.9			164.5				65.2
Travel Time (s)		7.5			11.6			11.8				4.7
Confl. Peds. (#/hr)	90		41	41		90	60		10	10		60
Confl. Bikes (#/hr)			22			10			36			5
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%	2%	2%	4%	10%	1%	4%	2%	12%	6%	20%
Adj. Flow (vph)	161	602	233	253	703	99	288	475	308	120	297	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	835	0	253	703	99	288	783	0	120	425	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5				3.5
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		5.0			5.0			5.0				5.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8				4
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	3	8		4		4

4: Preston & Carling  
AM Peak Hour

829 Carling Avenue  
2028 Background Traffic

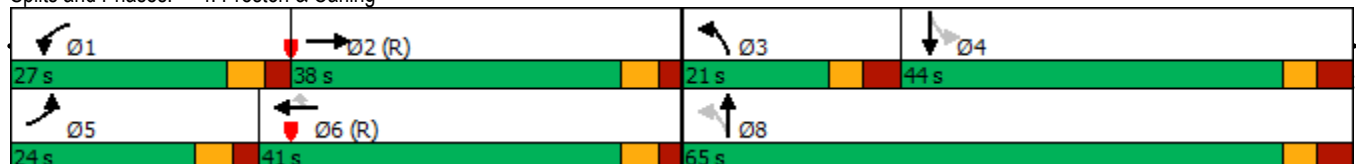


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0		11.2	30.0	30.0	11.9	43.9		43.9	43.9	
Total Split (s)	24.0	38.0		27.0	41.0	41.0	21.0	65.0		44.0	44.0	
Total Split (%)	18.5%	29.2%		20.8%	31.5%	31.5%	16.2%	50.0%		33.8%	33.8%	
Maximum Green (s)	17.8	32.0		20.8	35.0	35.0	14.1	58.1		37.1	37.1	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.3		2.5	2.3	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		6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	Max	
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)		20			20	20		20		20	20	
Act Effct Green (s)	16.3	32.0		20.8	36.5	36.5	58.1	58.1		37.1	37.1	
Actuated g/C Ratio	0.13	0.25		0.16	0.28	0.28	0.45	0.45		0.29	0.29	
v/c Ratio	0.81	1.07		0.95	0.77	0.23	1.01	0.54		0.75	0.96	
Control Delay	88.3	83.1		63.1	41.3	8.8	70.1	8.7		71.4	78.9	
Queue Delay	0.0	2.7		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	88.3	85.7		63.1	41.3	8.8	70.1	8.7		71.4	78.9	
LOS	F	F		E	D	A	E	A		E	E	
Approach Delay		86.1			43.5			25.2			77.3	
Approach LOS		F			D			C			E	
Queue Length 50th (m)	29.8	~107.2		53.6	90.9	5.5	~43.6	51.9		25.8	95.8	
Queue Length 95th (m)	#63.1	#140.8		m#58.3	m90.3	m7.2	#97.1	60.1		#55.8	#155.6	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0			110.0		90.0	75.0					
Base Capacity (vph)	218	782		265	913	426	286	1438		160	441	
Starvation Cap Reductn	0	5		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	0.74	1.07		0.95	0.77	0.23	1.01	0.54		0.75	0.96	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 88 (68%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.07  
 Intersection Signal Delay: 54.7 Intersection LOS: D  
 Intersection Capacity Utilization 110.5% 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Preston & Carling



5: Carling & Booth  
AM Peak Hour

829 Carling Avenue  
2028 Background Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	399	724	770	215	240	189
Future Volume (vph)	399	724	770	215	240	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	75.0			25.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				10.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93			0.78	0.98	0.79
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1674	3252	1728	1498	1674	1427
Fl <sub>t</sub> Permitted	0.950				0.950	
Satd. Flow (perm)	1565	3252	1728	1172	1647	1125
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				60		189
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	70			70	14	85
Confl. Bikes (#/hr)				16		23
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	4%	3%	1%	1%	6%
Adj. Flow (vph)	399	724	770	215	240	189
Shared Lane Traffic (%)						
Lane Group Flow (vph)	399	724	770	215	240	189
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	15.7	29.7	29.7	39.0	39.0
Total Split (s)	32.0	91.0	59.0	59.0	39.0	39.0
Total Split (%)	24.6%	70.0%	45.4%	45.4%	30.0%	30.0%
Maximum Green (s)	26.1	85.3	53.3	53.3	33.0	33.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			13.0	13.0	7.0	7.0
Flash Dont Walk (s)			11.0	11.0	26.0	26.0
Pedestrian Calls (#/hr)			20	20	20	20
Act Effct Green (s)	31.9	91.1	53.3	53.3	27.2	27.2
Actuated g/C Ratio	0.25	0.70	0.41	0.41	0.21	0.21
v/c Ratio	0.97	0.32	1.09	0.42	0.70	0.49
Control Delay	67.3	2.8	97.0	22.1	57.8	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.3	2.8	97.0	22.1	57.8	9.9
LOS	E	A	F	C	E	A
Approach Delay		25.7	80.7		36.7	
Approach LOS		C	F		D	
Queue Length 50th (m)	~112.0	14.5	~203.8	25.3	49.7	0.0
Queue Length 95th (m)	m#131.8	m17.0	#271.9	45.4	75.0	17.8
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	75.0			25.0		45.0
Base Capacity (vph)	411	2279	708	515	418	426
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	0.97	0.32	1.09	0.42	0.57	0.44

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 16 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.09  
 Intersection Signal Delay: 48.9  
 Intersection LOS: D  
 Intersection Capacity Utilization 107.3%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carling & Booth



6: Preston & Beech  
AM Peak Hour

829 Carling Avenue  
2028 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	56	26	36	55	12	28	641	55	18	401	38
Future Volume (vph)	43	56	26	36	55	12	28	641	55	18	401	38
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	25.0		0.0	25.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	25.0			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			0.97	0.89	0.96	0.99		0.98	0.99	
Frt		0.972				0.850		0.988			0.987	
Flt Protected		0.983			0.981		0.950			0.950		
Satd. Flow (prot)	0	1558	0	0	1572	1498	1537	1693	0	1537	1645	0
Flt Permitted		0.865			0.853		0.473			0.306		
Satd. Flow (perm)	0	1336	0	0	1327	1339	738	1693	0	484	1645	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				34		11			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		101.4			151.8			160.5			163.2	
Travel Time (s)		7.3			10.9			11.6			11.8	
Confl. Peds. (#/hr)	36		40	40		36	50		55	55		50
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 (%)	9%	4%	4%	25%	2%	1%	10%	3%	3%	10%	6%	5%
Adj. Flow (vph)	43	56	26	36	55	12	28	641	55	18	401	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	125	0	0	91	12	28	696	0	18	439	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	



6: Preston & Beech  
AM Peak Hour

829 Carling Avenue  
2028 Background Traffic

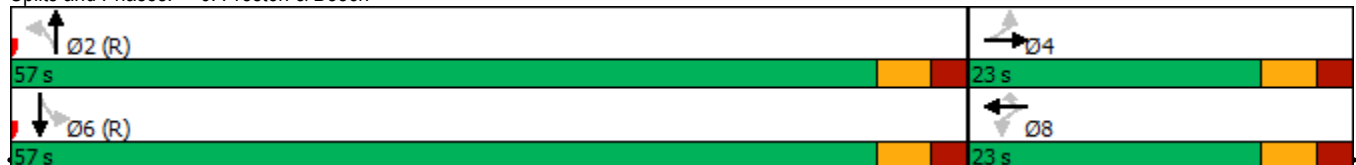


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	22.6	22.6		22.6	22.6	22.6	33.5	33.5		33.5	33.5	
Total Split (s)	23.0	23.0		23.0	23.0	23.0	57.0	57.0		57.0	57.0	
Total Split (%)	28.8%	28.8%		28.8%	28.8%	28.8%	71.3%	71.3%		71.3%	71.3%	
Maximum Green (s)	17.4	17.4		17.4	17.4	17.4	51.5	51.5		51.5	51.5	
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3	2.3	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.6			5.6	5.6	5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Ped	Ped		Ped	Ped	Ped	C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	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	10.0	
Pedestrian Calls (#/hr)	20	20		20	20	20	20	20		20	20	
Act Effct Green (s)		17.1			17.1	17.1	51.8	51.8		51.8	51.8	
Actuated g/C Ratio		0.21			0.21	0.21	0.65	0.65		0.65	0.65	
v/c Ratio		0.42			0.32	0.04	0.06	0.63		0.06	0.41	
Control Delay		28.9			30.3	2.8	5.4	9.5		5.8	8.0	
Queue Delay		0.0			0.0	0.0	0.0	0.1		0.0	0.0	
Total Delay		28.9			30.3	2.8	5.4	9.7		5.8	8.0	
LOS		C			C	A	A	A		A	A	
Approach Delay		28.9			27.1			9.5			7.9	
Approach LOS		C			C			A			A	
Queue Length 50th (m)		13.3			10.9	0.0	1.3	50.0		0.8	24.8	
Queue Length 95th (m)		27.3			22.3	1.2	m2.6	40.2		3.0	40.7	
Internal Link Dist (m)		77.4			127.8			136.5			139.2	
Turn Bay Length (m)							25.0			25.0		
Base Capacity (vph)		302			288	317	477	1100		313	1069	
Starvation Cap Reductn		0			0	0	0	38		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			0.32	0.04	0.06	0.66		0.06	0.41	

Intersection Summary

Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 40 (50%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.63  
 Intersection Signal Delay: 12.0 Intersection LOS: B  
 Intersection Capacity Utilization 81.7% ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Preston & Beech





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	3	0	0	0	8	676	46	10	495	5
Future Volume (vph)	1	0	3	0	0	0	8	676	46	10	495	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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		0.93						0.99			1.00	
Flt Protected		0.999						0.991			0.999	
Satd. Flow (prot)	0	1470	0	0	0	0	0	1702	0	0	1617	0
Flt Permitted		0.988						0.995			0.987	
Satd. Flow (perm)	0	1453	0	0	0	0	0	1694	0	0	1597	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29						9			1	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		114.6			152.9			73.8			160.5	
Travel Time (s)		8.3			11.0			5.3			11.6	
Confl. Peds. (#/hr)	17		18	18		17	35		45	45		35
Confl. Bikes (#/hr)			8						21			17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	3%	1%	1%	10%	1%
Adj. Flow (vph)	1	0	3	0	0	0	8	676	46	10	495	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	0	0	0	730	0	0	510	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		-2.0			-1.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2					1	2		1	2	
Detector Template	Left	Thru					Left	Thru		Left	Thru	
Leading Detector (m)	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	
Detector 1 Position(m)	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	
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			28.7	
Detector 2 Size(m)		1.8						1.8			1.8	
Detector 2 Type		CI+Ex						CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Detector Phase	4	4					2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0					10.0	10.0		10.0	10.0	
Minimum Split (s)	20.5	20.5					28.1	28.1		28.1	28.1	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	21.0	21.0					59.0	59.0		59.0	59.0	
Total Split (%)	26.3%	26.3%					73.8%	73.8%		73.8%	73.8%	
Maximum Green (s)	15.5	15.5					53.9	53.9		53.9	53.9	
Yellow Time (s)	3.3	3.3					3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2					1.8	1.8		1.8	1.8	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.5						5.1			5.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	
Recall Mode	None	None					C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0					18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	8.0	8.0					5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	20	20					20	20		20	20	
Act Effct Green (s)		12.0						69.8			69.8	
Actuated g/C Ratio		0.15						0.87			0.87	
v/c Ratio		0.02						0.49			0.37	
Control Delay		0.0						5.4			2.5	
Queue Delay		0.0						0.0			0.0	
Total Delay		0.0						5.4			2.5	
LOS		A						A			A	
Approach Delay								5.4			2.5	
Approach LOS								A			A	
Queue Length 50th (m)		0.0						0.0			0.0	
Queue Length 95th (m)		0.0						76.8			17.5	
Internal Link Dist (m)		90.6			128.9			49.8			136.5	
Turn Bay Length (m)												
Base Capacity (vph)		304						1478			1393	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.01						0.49			0.37	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 48 (60%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.49

Intersection Signal Delay: 4.2

Intersection LOS: A

Intersection Capacity Utilization 64.1%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 7: Preston & Pamilla



8: Preston & Adeline  
AM Peak Hour

829 Carling Avenue  
2028 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	1	22	20	5	26	12	638	90	34	488	15
Future Volume (vph)	29	1	22	20	5	26	12	638	90	34	488	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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												
Frt		0.943			0.931			0.984			0.996	
Flt Protected		0.973			0.981			0.999			0.997	
Satd. Flow (prot)	0	1601	0	0	1594	0	0	1701	0	0	1688	0
Flt Permitted		0.973			0.981			0.999			0.997	
Satd. Flow (perm)	0	1601	0	0	1594	0	0	1701	0	0	1688	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		113.6			154.3			71.5			73.8	
Travel Time (s)		8.2			11.1			5.1			5.3	
Confl. Peds. (#/hr)							28		45	45		28
Confl. Bikes (#/hr)									21			17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	5%	2%
Adj. Flow (vph)	29	1	22	20	5	26	12	638	90	34	488	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	52	0	0	51	0	0	740	0	0	537	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		-2.0			-2.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 59.9% ICU Level of Service B

Analysis Period (min) 15



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	41	47	33	699	498	30
Future Volume (vph)	41	47	33	699	498	30
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.928			0.992		
Flt Protected	0.977			0.998		
Satd. Flow (prot)	1582	0	0	3278	1684	0
Flt Permitted	0.977			0.998		
Satd. Flow (perm)	1582	0	0	3278	1684	0
Link Speed (k/h)	30			50	50	
Link Distance (m)	68.0			65.2	71.5	
Travel Time (s)	8.2			4.7	5.1	
Confl. Peds. (#/hr)				28		28
Confl. Bikes (#/hr)						17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	5%	2%
Adj. Flow (vph)	41	47	33	699	498	30
Shared Lane Traffic (%)						
Lane Group Flow (vph)	88	0	0	732	528	0
Enter Blocked Intersection	No	No	Yes	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			2.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

**Intersection Summary**

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 58.2% ICU Level of Service B

Analysis Period (min) 15



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	693	286	2	2	213	316	1	4	3	276	4	484
Future Volume (vph)	693	286	2	2	213	316	1	4	3	276	4	484
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	55.0		0.0	30.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	2		0	1		1	0		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.97		0.97		0.96			0.94	0.91
Frt		0.999				0.850		0.949				0.850
Flt Protected	0.950			0.950				0.994			0.953	
Satd. Flow (prot)	3185	1760	0	1674	1762	1498	0	1209	0	0	1668	1469
Flt Permitted	0.459			0.583				0.980			0.724	
Satd. Flow (perm)	1519	1760	0	1002	1762	1460	0	1186	0	0	1187	1340
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						257		3				358
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		233.9			203.3			76.1			164.5	
Travel Time (s)		14.0			12.2			5.5			11.8	
Confl. Peds. (#/hr)	9		15	15		9	25		24	24		25
Confl. Bikes (#/hr)			3						1			2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	1%	1%	1%	1%	1%	50%	25%	1%	50%	3%
Adj. Flow (vph)	693	286	2	2	213	316	1	4	3	276	4	484
Shared Lane Traffic (%)												
Lane Group Flow (vph)	693	288	0	2	213	316	0	8	0	0	280	484
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)		7.0			7.0			0.0			3.5	
Link Offset(m)		2.0			0.0			5.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	1	2		1	2
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6		6	8			4		4
Detector Phase	5	2		6	6	6	8	8		4	4	5

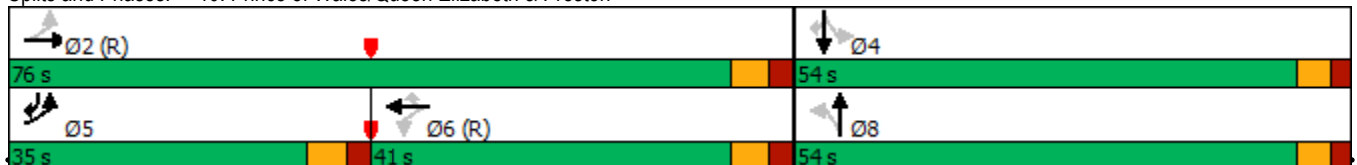


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	5.0
Minimum Split (s)	11.1	32.1		32.1	32.1	32.1	29.5	29.5		29.5	29.5	11.1
Total Split (s)	35.0	76.0		41.0	41.0	41.0	54.0	54.0		54.0	54.0	35.0
Total Split (%)	26.9%	58.5%		31.5%	31.5%	31.5%	41.5%	41.5%		41.5%	41.5%	26.9%
Maximum Green (s)	28.9	69.9		34.9	34.9	34.9	48.5	48.5		48.5	48.5	28.9
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.7
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	2.2	2.2		2.2	2.2	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		5.5			5.5	6.1
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	Max	Max		Max	Max	None
Walk Time (s)		7.0		7.0	7.0	7.0	12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		19.0		19.0	19.0	19.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		20		20	20	20	20	20		20	20	
Act Effct Green (s)	69.9	69.9		39.7	39.7	39.7		48.5			48.5	72.0
Actuated g/C Ratio	0.54	0.54		0.31	0.31	0.31		0.37			0.37	0.55
v/c Ratio	0.62	0.30		0.01	0.40	0.51		0.02			0.63	0.52
Control Delay	20.5	17.7		34.5	39.6	11.5		21.4			28.4	2.2
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	20.5	17.7		34.5	39.6	11.5		21.4			28.4	2.2
LOS	C	B		C	D	B		C			C	A
Approach Delay		19.7			22.9			21.4			11.8	
Approach LOS		B			C			C			B	
Queue Length 50th (m)	48.0	36.2		0.3	39.8	10.1		0.7			45.3	9.8
Queue Length 95th (m)	60.7	53.1		2.3	64.0	36.3		3.9			m45.1	m9.1
Internal Link Dist (m)		209.9			179.3			52.1			140.5	
Turn Bay Length (m)	55.0			30.0		25.0						
Base Capacity (vph)	1187	946		305	537	623		444			442	966
Starvation Cap Reductn	0	0		0	0	0		0			0	21
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.58	0.30		0.01	0.40	0.51		0.02			0.63	0.51

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 7 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.63  
 Intersection Signal Delay: 17.8      Intersection LOS: B  
 Intersection Capacity Utilization 90.4%      ICU Level of Service E  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Prince of Wales/Queen Elizabeth & Preston



4: Preston & Carling  
AM Peak Hour

829 Carling Avenue  
2028 Background Traffic (demand rationalization)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	552	233	253	703	99	278	475	308	120	297	128
Future Volume (vph)	161	552	233	253	703	99	278	475	308	120	297	128
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		0.0	110.0		90.0	75.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.94	0.97		0.98		0.84	0.98	0.98		1.00	0.98	
Fr <sub>t</sub>		0.955				0.850		0.941			0.955	
Fl <sub>t</sub> Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1595	3035	0	1658	3252	1375	1674	3035	0	1510	1506	0
Fl <sub>t</sub> Permitted	0.950			0.950			0.179			0.355		
Satd. Flow (perm)	1507	3035	0	1621	3252	1153	309	3035	0	562	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48				143		148			17	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		124.7			193.9			164.5			65.2	
Travel Time (s)		7.5			11.6			11.8			4.7	
Confl. Peds. (#/hr)	90		41	41		90	60		10	10		60
Confl. Bikes (#/hr)			22			10			36			5
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%	2%	2%	4%	10%	1%	4%	2%	12%	6%	20%
Adj. Flow (vph)	161	552	233	253	703	99	278	475	308	120	297	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	785	0	253	703	99	278	783	0	120	425	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	3	8		4	4	



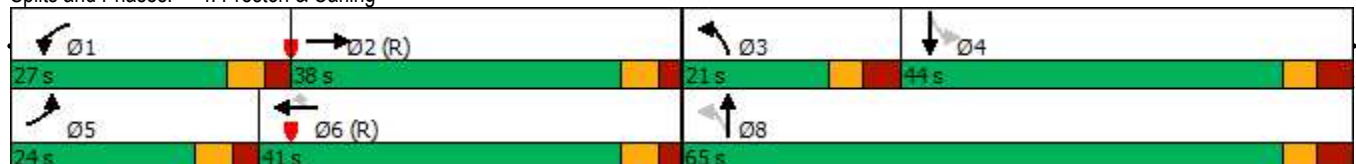


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0		11.2	30.0	30.0	11.9	43.9		43.9	43.9	
Total Split (s)	24.0	38.0		27.0	41.0	41.0	21.0	65.0		44.0	44.0	
Total Split (%)	18.5%	29.2%		20.8%	31.5%	31.5%	16.2%	50.0%		33.8%	33.8%	
Maximum Green (s)	17.8	32.0		20.8	35.0	35.0	14.1	58.1		37.1	37.1	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.3		2.5	2.3	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		6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	Max	
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)		20			20	20		20		20	20	
Act Effct Green (s)	16.3	32.0		20.8	36.5	36.5	58.1	58.1		37.1	37.1	
Actuated g/C Ratio	0.13	0.25		0.16	0.28	0.28	0.45	0.45		0.29	0.29	
v/c Ratio	0.81	1.00		0.95	0.77	0.23	0.97	0.54		0.75	0.96	
Control Delay	88.3	63.7		70.5	43.1	8.4	60.8	8.5		71.4	78.9	
Queue Delay	0.0	5.4		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	88.3	69.1		70.5	43.1	8.4	60.8	8.5		71.4	78.9	
LOS	F	E		E	D	A	E	A		E	E	
Approach Delay		72.4			46.4			22.2			77.3	
Approach LOS		E			D			C			E	
Queue Length 50th (m)	29.5	~48.9		54.1	90.3	4.8	40.5	51.8		25.8	95.8	
Queue Length 95th (m)	#62.9	#126.7		m#72.8	m#96.3	m8.3	#91.0	60.0		#55.8	#155.6	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0			110.0		90.0	75.0					
Base Capacity (vph)	218	783		265	913	426	286	1438		160	441	
Starvation Cap Reductn	0	15		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	0.74	1.02		0.95	0.77	0.23	0.97	0.54		0.75	0.96	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 88 (68%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 50.8  
 Intersection LOS: D  
 Intersection Capacity Utilization 108.5%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Preston & Carling



5: Carling & Booth  
AM Peak Hour

829 Carling Avenue  
2028 Background Traffic (demand rationalization)



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	399	724	710	215	240	189
Future Volume (vph)	399	724	710	215	240	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	75.0			25.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				10.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93			0.78	0.98	0.79
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1674	3252	1728	1498	1674	1427
Fl <sub>t</sub> Permitted	0.950				0.950	
Satd. Flow (perm)	1565	3252	1728	1172	1647	1125
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				65		189
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	70			70	14	85
Confl. Bikes (#/hr)				16		23
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	4%	3%	1%	1%	6%
Adj. Flow (vph)	399	724	710	215	240	189
Shared Lane Traffic (%)						
Lane Group Flow (vph)	399	724	710	215	240	189
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4

5: Carling & Booth  
AM Peak Hour

829 Carling Avenue  
2028 Background Traffic (demand rationalization)

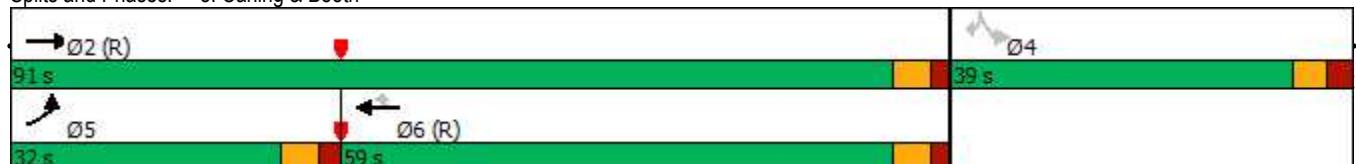


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	15.7	29.7	29.7	39.0	39.0
Total Split (s)	32.0	91.0	59.0	59.0	39.0	39.0
Total Split (%)	24.6%	70.0%	45.4%	45.4%	30.0%	30.0%
Maximum Green (s)	26.1	85.3	53.3	53.3	33.0	33.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			13.0	13.0	7.0	7.0
Flash Dont Walk (s)			11.0	11.0	26.0	26.0
Pedestrian Calls (#/hr)			20	20	20	20
Act Effct Green (s)	31.9	91.1	53.3	53.3	27.2	27.2
Actuated g/C Ratio	0.25	0.70	0.41	0.41	0.21	0.21
v/c Ratio	0.97	0.32	1.00	0.42	0.70	0.49
Control Delay	71.9	3.0	73.0	21.4	57.8	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.9	3.0	73.0	21.4	57.8	9.9
LOS	E	A	E	C	E	A
Approach Delay		27.5	61.0		36.7	
Approach LOS		C	E		D	
Queue Length 50th (m)	~112.6	15.7	~166.4	24.4	49.7	0.0
Queue Length 95th (m)	m#141.4	m19.6	#241.6	44.3	75.0	17.8
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	75.0			25.0		45.0
Base Capacity (vph)	411	2279	708	518	418	426
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	0.97	0.32	1.00	0.42	0.57	0.44

Intersection Summary






















Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 16 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 41.6  
 Intersection LOS: D  
 Intersection Capacity Utilization 104.0%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carling & Booth



4: Preston & Carling  
AM Peak Hour

829 Carling Avenue  
2028 Background Traffic (Sidney restrictions)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	602	233	253	703	99	288	475	308	152	297	128
Future Volume (vph)	161	602	233	253	703	99	288	475	308	152	297	128
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		0.0	110.0		90.0	75.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.94	0.97		0.98		0.84	0.98	0.98		1.00	0.98	
Frt		0.958				0.850		0.941			0.955	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1595	3049	0	1658	3252	1375	1674	3035	0	1510	1506	0
Flt Permitted	0.950			0.950			0.179			0.355		
Satd. Flow (perm)	1507	3049	0	1623	3252	1153	309	3035	0	562	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42				143		148				17
Link Speed (k/h)		60			60			50				50
Link Distance (m)		124.7			193.9			164.5				65.2
Travel Time (s)		7.5			11.6			11.8				4.7
Confl. Peds. (#/hr)	90		41	41		90	60		10	10		60
Confl. Bikes (#/hr)			22			10			36			5
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%	2%	2%	4%	10%	1%	4%	2%	12%	6%	20%
Adj. Flow (vph)	161	602	233	253	703	99	288	475	308	152	297	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	835	0	253	703	99	288	783	0	152	425	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5				3.5
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		5.0			5.0			5.0				5.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	1	2		1	2
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	3	8		4	4	

4: Preston & Carling  
AM Peak Hour

829 Carling Avenue  
2028 Background Traffic (Sidney restrictions)

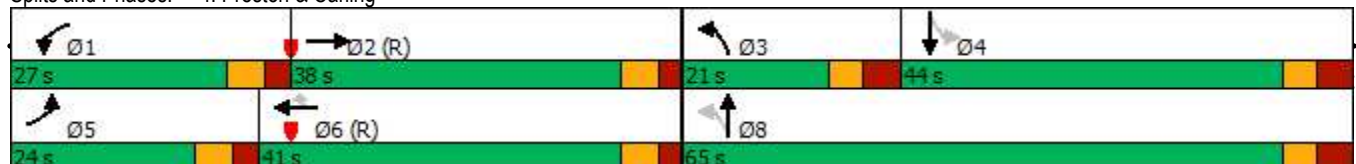


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0		11.2	30.0	30.0	11.9	43.9		43.9	43.9	
Total Split (s)	24.0	38.0		27.0	41.0	41.0	21.0	65.0		44.0	44.0	
Total Split (%)	18.5%	29.2%		20.8%	31.5%	31.5%	16.2%	50.0%		33.8%	33.8%	
Maximum Green (s)	17.8	32.0		20.8	35.0	35.0	14.1	58.1		37.1	37.1	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.3		2.5	2.3	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		6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	Max	
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)		20			20	20		20		20	20	
Act Effct Green (s)	16.3	32.0		20.8	36.5	36.5	58.1	58.1		37.1	37.1	
Actuated g/C Ratio	0.13	0.25		0.16	0.28	0.28	0.45	0.45		0.29	0.29	
v/c Ratio	0.81	1.07		0.95	0.77	0.23	1.01	0.54		0.95	0.96	
Control Delay	88.3	83.1		63.1	41.3	8.8	70.1	8.7		105.6	78.9	
Queue Delay	0.0	2.7		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	88.3	85.7		63.1	41.3	8.8	70.1	8.7		105.6	78.9	
LOS	F	F		E	D	A	E	A		F	E	
Approach Delay		86.1			43.5			25.2			85.9	
Approach LOS		F			D			C			F	
Queue Length 50th (m)	29.8	~107.2		53.6	90.9	5.5	~43.6	51.9		35.2	95.8	
Queue Length 95th (m)	#63.1	#140.8		m#58.3	m90.3	m7.2	#97.1	60.1		#74.9	#155.6	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0			110.0		90.0	75.0					
Base Capacity (vph)	218	782		265	913	426	286	1438		160	441	
Starvation Cap Reductn	0	5		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	0.74	1.07		0.95	0.77	0.23	1.01	0.54		0.95	0.96	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 88 (68%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.07  
 Intersection Signal Delay: 56.3  
 Intersection LOS: E  
 Intersection Capacity Utilization 110.5%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Preston & Carling



5: Carling & Booth  
AM Peak Hour

829 Carling Avenue  
2028 Background Traffic (Sidney restrictions)



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	431	715	770	215	240	189
Future Volume (vph)	431	715	770	215	240	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	75.0			25.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				10.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93			0.78	0.98	0.79
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1674	3252	1728	1498	1674	1427
Fl <sub>t</sub> Permitted	0.950				0.950	
Satd. Flow (perm)	1565	3252	1728	1172	1647	1125
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				60		189
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	70			70	14	85
Confl. Bikes (#/hr)				16		23
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	4%	3%	1%	1%	6%
Adj. Flow (vph)	431	715	770	215	240	189
Shared Lane Traffic (%)						
Lane Group Flow (vph)	431	715	770	215	240	189
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4

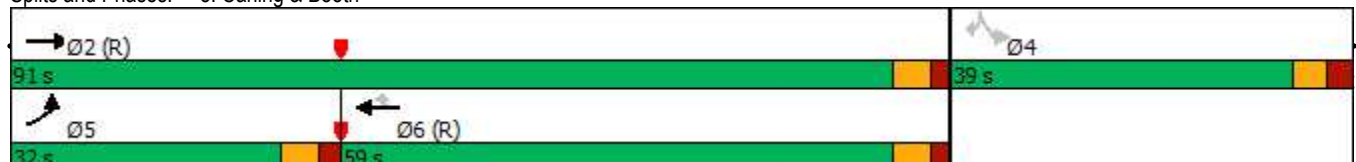


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	15.7	29.7	29.7	39.0	39.0
Total Split (s)	32.0	91.0	59.0	59.0	39.0	39.0
Total Split (%)	24.6%	70.0%	45.4%	45.4%	30.0%	30.0%
Maximum Green (s)	26.1	85.3	53.3	53.3	33.0	33.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			13.0	13.0	7.0	7.0
Flash Dont Walk (s)			11.0	11.0	26.0	26.0
Pedestrian Calls (#/hr)			20	20	20	20
Act Effct Green (s)	31.9	91.1	53.3	53.3	27.2	27.2
Actuated g/C Ratio	0.25	0.70	0.41	0.41	0.21	0.21
v/c Ratio	1.05	0.31	1.09	0.42	0.70	0.49
Control Delay	85.3	2.7	97.0	22.1	57.8	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.3	2.7	97.0	22.1	57.8	9.9
LOS	F	A	F	C	E	A
Approach Delay		33.8	80.7		36.7	
Approach LOS		C	F		D	
Queue Length 50th (m)	~128.2	13.6	~203.8	25.3	49.7	0.0
Queue Length 95th (m)	m#142.6	m15.3	#271.9	45.4	75.0	17.8
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	75.0			25.0		45.0
Base Capacity (vph)	411	2279	708	515	418	426
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	1.05	0.31	1.09	0.42	0.57	0.44

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 16 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.09  
 Intersection Signal Delay: 52.3 Intersection LOS: D  
 Intersection Capacity Utilization 109.2% 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carling & Booth



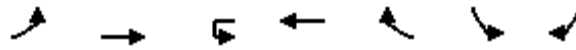


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	79	33	669	498	30
Future Volume (vph)	0	79	33	669	498	30
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt		0.865			0.992	
Flt Protected				0.998		
Satd. Flow (prot)	0	1510	0	3278	1684	0
Flt Permitted				0.998		
Satd. Flow (perm)	0	1510	0	3278	1684	0
Link Speed (k/h)	30			50	50	
Link Distance (m)	68.0			65.2	71.5	
Travel Time (s)	8.2			4.7	5.1	
Confl. Peds. (#/hr)			28			28
Confl. Bikes (#/hr)						17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	5%	2%
Adj. Flow (vph)	0	79	33	669	498	30
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	79	0	702	528	0
Enter Blocked Intersection	No	No	Yes	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			2.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

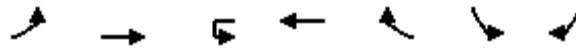
**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.6%
ICU Level of Service	A
Analysis Period (min)	15





Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	65	743	13	1447	179	186	7
Future Volume (vph)	65	743	13	1447	179	186	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0		50.0		110.0	0.0	10.0
Storage Lanes	1		1		1	1	1
Taper Length (m)	25.0		25.0			25.0	
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Ped Bike Factor	0.99				0.91	0.99	0.97
Fr					0.850		0.850
Flt Protected	0.950		0.950			0.950	
Satd. Flow (prot)	1674	3252	1674	3316	1498	1674	1498
Flt Permitted	0.950		0.370			0.950	
Satd. Flow (perm)	1658	3252	652	3316	1357	1659	1454
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					179		3
Link Speed (k/h)		60		60		40	
Link Distance (m)		196.1		162.9		242.3	
Travel Time (s)		11.8		9.8		21.8	
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	1.00
Heavy Vehicles (%)	1%	4%	1%	2%	1%	1%	1%
Adj. Flow (vph)	65	743	13	1447	179	186	7
Shared Lane Traffic (%)							
Lane Group Flow (vph)	65	743	13	1447	179	186	7
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	Left	Right	L NA	R NA
Median Width(m)		7.0		7.0		3.5	
Link Offset(m)		0.0		0.0		0.0	
Crosswalk Width(m)		5.0		10.0		5.0	
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14		14	40	14
Number of Detectors	1	2	1	2	1	1	1
Detector Template	Left	Thru	Left	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	6.1	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	1.8	6.1	6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7		28.7			
Detector 2 Size(m)		1.8		1.8			
Detector 2 Type		Cl+Ex		Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)		0.0		0.0			
Turn Type	Prot	NA	Perm	NA	Perm	Perm	Perm
Protected Phases	5	2		6			
Permitted Phases			6		6	4	4
Detector Phase	5	2	6	6	6	4	4



Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.2	33.4	33.4	33.4	33.4	40.1	40.1
Total Split (s)	17.0	99.0	82.0	82.0	82.0	41.0	41.0
Total Split (%)	12.1%	70.7%	58.6%	58.6%	58.6%	29.3%	29.3%
Maximum Green (s)	11.8	92.6	75.6	75.6	75.6	33.9	33.9
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	2.7	2.7	2.7	2.7	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.4	6.4	6.4	6.4	7.1	7.1
Lead/Lag	Lead		Lag	Lag	Lag		
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)		12.0	12.0	12.0	12.0	7.0	7.0
Flash Dont Walk (s)		15.0	15.0	15.0	15.0	26.0	26.0
Pedestrian Calls (#/hr)		20	20	20	20	20	20
Act Effct Green (s)	10.3	100.4	87.2	87.2	87.2	26.1	26.1
Actuated g/C Ratio	0.07	0.72	0.62	0.62	0.62	0.19	0.19
v/c Ratio	0.53	0.32	0.03	0.70	0.20	0.60	0.03
Control Delay	77.4	8.6	5.8	10.8	1.1	59.1	33.3
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	77.4	8.6	5.8	10.9	1.1	59.1	33.3
LOS	E	A	A	B	A	E	C
Approach Delay		14.1		9.8		58.2	
Approach LOS		B		A		E	
Queue Length 50th (m)	16.2	39.9	0.6	90.4	0.4	41.2	0.8
Queue Length 95th (m)	30.2	49.4	m1.4	137.1	3.3	63.3	4.6
Internal Link Dist (m)		172.1		138.9		218.3	
Turn Bay Length (m)	40.0		50.0		110.0		10.0
Base Capacity (vph)	145	2331	406	2065	912	401	354
Starvation Cap Reductn	0	0	0	78	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	0.45	0.32	0.03	0.73	0.20	0.46	0.02

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 7 (5%), Referenced to phase 2:EBT and 6:WBTU, Start of Green  
 Natural Cycle: 95  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 14.7 Intersection LOS: B  
 Intersection Capacity Utilization 76.7% ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Carling & Sherwood



2: Carling & Champagne  
PM Peak Hour

829 Carling Avenue  
2028 Background Traffic

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	772	26	27	1298	72	97	0	110	146	0	199
Future Volume (vph)	55	772	26	27	1298	72	97	0	110	146	0	199
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	70.0		30.0	60.0		25.0	0.0		0.0	20.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.95	0.96		0.74	0.95		0.94	0.97		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1409	3283	1483	1658	3316	1498	1658	0	1483	1674	0	1498
Flt Permitted	0.179			0.341			0.950			0.950		
Satd. Flow (perm)	266	3283	1415	572	3316	1106	1580	0	1398	1630	0	1440
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			24			34			110			54
Link Speed (k/h)		60			60			50				50
Link Distance (m)		162.9			117.5			121.7				178.4
Travel Time (s)		9.8			7.1			8.8				12.8
Confl. Peds. (#/hr)	70		70	70		70	20		20	20		20
Confl. Bikes (#/hr)			5			4						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 (%)	20%	3%	2%	2%	2%	1%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	55	772	26	27	1298	72	97	0	110	146	0	199
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	772	26	27	1298	72	97	0	110	146	0	199
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5				3.5
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		5.0			5.0			5.0				5.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1		1	1		1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left		Right	Left		Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1		6.1	6.1		6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1		6.1	6.1		6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 2 Position(m)		28.7			28.7							
Detector 2 Size(m)		1.8			1.8							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm		Perm	Perm		Perm
Protected Phases		2			6							
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	2	2	2	6	6	6	8		8	4		4

2: Carling & Champagne  
PM Peak Hour

829 Carling Avenue  
2028 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0		5.0	10.0		10.0
Minimum Split (s)	15.3	15.3	15.3	25.3	25.3	25.3	24.0		24.0	37.9		37.9
Total Split (s)	95.0	95.0	95.0	95.0	95.0	95.0	45.0		45.0	45.0		45.0
Total Split (%)	67.9%	67.9%	67.9%	67.9%	67.9%	67.9%	32.1%		32.1%	32.1%		32.1%
Maximum Green (s)	89.7	89.7	89.7	89.7	89.7	89.7	39.0		39.0	39.1		39.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0		3.0	3.3		3.3
All-Red Time (s)	1.6	1.6	1.6	1.6	1.6	1.6	3.0		3.0	2.6		2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	6.0		6.0	5.9		5.9
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None		None	None		None
Walk Time (s)				10.0	10.0	10.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)				10.0	10.0	10.0	11.0		11.0	25.0		25.0
Pedestrian Calls (#/hr)				20	20	20	20		20	20		20
Act Effct Green (s)	104.1	104.1	104.1	104.1	104.1	104.1	24.6		24.6	24.7		24.7
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.74	0.74	0.18		0.18	0.18		0.18
v/c Ratio	0.28	0.32	0.02	0.06	0.53	0.09	0.35		0.33	0.51		0.67
Control Delay	11.9	7.1	2.4	2.8	3.2	1.8	51.8		10.2	56.6		48.6
Queue Delay	0.0	0.1	0.0	0.0	0.4	0.0	0.0		0.0	0.0		0.0
Total Delay	11.9	7.2	2.4	2.8	3.6	1.8	51.8		10.2	56.6		48.6
LOS	B	A	A	A	A	A	D		B	E		D
Approach Delay		7.4			3.5			29.7				52.0
Approach LOS		A			A			C				D
Queue Length 50th (m)	3.0	21.9	0.3	1.0	25.7	0.7	20.5		0.0	31.8		32.6
Queue Length 95th (m)	17.6	33.4	m1.5	m1.9	28.7	2.1	35.6		14.0	51.0		56.4
Internal Link Dist (m)		138.9			93.5			97.7				154.4
Turn Bay Length (m)	70.0		30.0	60.0		25.0				20.0		
Base Capacity (vph)	197	2441	1058	425	2466	831	440		468	455		441
Starvation Cap Reductn	0	593	0	0	600	0	0		0	0		0
Spillback Cap Reductn	0	0	0	0	116	0	0		0	0		1
Storage Cap Reductn	0	0	0	0	0	0	0		0	0		0
Reduced v/c Ratio	0.28	0.42	0.02	0.06	0.70	0.09	0.22		0.24	0.32		0.45

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 5 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.67  
 Intersection Signal Delay: 12.6 Intersection LOS: B  
 Intersection Capacity Utilization 78.5% ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Carling & Champagne



3: Trillium Pathway & Carling  
PM Peak Hour

829 Carling Avenue  
2028 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑							
Traffic Volume (vph)	0	1079	0	0	1441	0	0	0	0	0	0	0
Future Volume (vph)	0	1079	0	0	1441	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected												
Satd. Flow (prot)	0	3283	0	0	3316	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3283	0	0	3316	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (k/h)	60				60				50			
Link Distance (m)	117.5				124.7				157.3			
Travel Time (s)	7.1				7.5				11.3			
Confl. Peds. (#/hr)	35					35	25			35	35	25
Confl. Bikes (#/hr)			11			10			13			34
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	1079	0	0	1441	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1079	0	0	1441	0	0	0	0	0	0	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)	7.0				7.0				0.0			
Link Offset(m)	0.0				0.0				0.0			
Crosswalk Width(m)	5.0				5.0				5.0			
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24			14	24	14	24	14
Number of Detectors	2				2							
Detector Template	Thru				Thru							
Leading Detector (m)	30.5				30.5							
Trailing Detector (m)	0.0				0.0							
Detector 1 Position(m)	0.0				0.0							
Detector 1 Size(m)	1.8				1.8							
Detector 1 Type	CI+Ex				CI+Ex							
Detector 1 Channel												
Detector 1 Extend (s)	0.0				0.0							
Detector 1 Queue (s)	0.0				0.0							
Detector 1 Delay (s)	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	NA				NA							
Protected Phases	2				6							
Permitted Phases												
Detector Phase	2				6							
Switch Phase												
Minimum Initial (s)	10.0				10.0							
Minimum Split (s)	25.1				25.1							

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	35.6

3: Trillium Pathway & Carling  
PM Peak Hour

829 Carling Avenue  
2028 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)		104.0			104.0							
Total Split (%)		74.3%			74.3%							
Maximum Green (s)		98.9			98.9							
Yellow Time (s)		3.7			3.7							
All-Red Time (s)		1.4			1.4							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		5.1			5.1							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0							
Recall Mode		C-Max			C-Max							
Walk Time (s)		15.0			15.0							
Flash Dont Walk (s)		5.0			5.0							
Pedestrian Calls (#/hr)		20			20							
Act Effct Green (s)		115.6			115.6							
Actuated g/C Ratio		0.83			0.83							
v/c Ratio		0.40			0.53							
Control Delay		4.3			2.3							
Queue Delay		0.1			0.1							
Total Delay		4.5			2.4							
LOS		A			A							
Approach Delay		4.5			2.4							
Approach LOS		A			A							
Queue Length 50th (m)		38.1			28.3							
Queue Length 95th (m)		45.7			m27.7							
Internal Link Dist (m)		93.5			100.7			133.3			30.9	
Turn Bay Length (m)												
Base Capacity (vph)		2710			2737							
Starvation Cap Reductn		588			368							
Spillback Cap Reductn		266			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.51			0.61							

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 108 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.53  
 Intersection Signal Delay: 3.3 Intersection LOS: A  
 Intersection Capacity Utilization 46.3% ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Trillium Pathway & Carling

Ø2 (R) 104 s	Ø4 36 s
Ø5 (R) 104 s	

Lane Group	Ø4
Total Split (s)	36.0
Total Split (%)	26%
Maximum Green (s)	29.4
Yellow Time (s)	3.0
All-Red Time (s)	3.6
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	22.0
Pedestrian Calls (#/hr)	20
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	



4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
2028 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	604	374	366	963	61	355	366	204	102	333	124
Future Volume (vph)	172	604	374	366	963	61	355	366	204	102	333	124
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		0.0	110.0		90.0	75.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.98	0.97		0.98		0.89	0.98	0.97		0.97	0.98	
Frt		0.943				0.850		0.946			0.959	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1610	3014	0	1674	3316	1427	1674	3057	0	1537	1623	0
Flt Permitted	0.950			0.950			0.102			0.438		
Satd. Flow (perm)	1571	3014	0	1649	3316	1272	176	3057	0	689	1623	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		93				132		96			13	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		124.7			193.9			164.5			65.2	
Travel Time (s)		7.5			11.6			11.8			4.7	
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 (%)	5%	3%	2%	1%	2%	6%	1%	2%	1%	10%	2%	5%
Adj. Flow (vph)	172	604	374	366	963	61	355	366	204	102	333	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	172	978	0	366	963	61	355	570	0	102	457	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	3	8		4	4	

4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
2028 Background Traffic

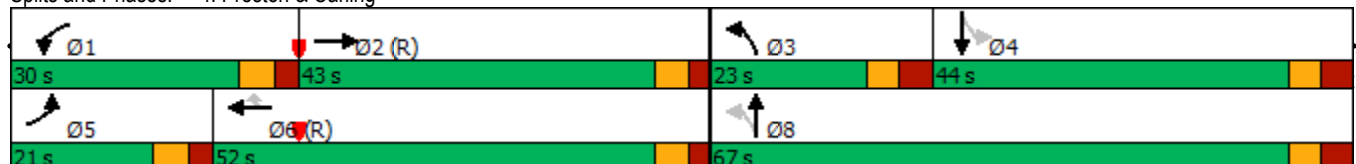


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0		11.2	30.0	30.0	11.9	43.9		43.9	43.9	
Total Split (s)	21.0	43.0		30.0	52.0	52.0	23.0	67.0		44.0	44.0	
Total Split (%)	15.0%	30.7%		21.4%	37.1%	37.1%	16.4%	47.9%		31.4%	31.4%	
Maximum Green (s)	14.8	37.0		23.8	46.0	46.0	16.1	60.1		37.1	37.1	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.3		2.5	2.3	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		6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	Max	
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)		20			20	20		20		20	20	
Act Effct Green (s)	14.8	37.0		23.8	46.0	46.0	60.1	60.1		37.1	37.1	
Actuated g/C Ratio	0.11	0.26		0.17	0.33	0.33	0.43	0.43		0.26	0.26	
v/c Ratio	1.01	1.13		1.29	0.88	0.12	1.44	0.42		0.56	1.04	
Control Delay	139.4	102.9		177.3	40.8	1.6	243.8	6.0		58.0	102.0	
Queue Delay	0.0	0.1		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	139.4	103.0		177.3	40.8	1.6	243.8	6.0		58.0	102.0	
LOS	F	F		F	D	A	F	A		E	F	
Approach Delay		108.5			75.0			97.3			94.0	
Approach LOS		F			E			F			F	
Queue Length 50th (m)	~39.5	~143.5		~117.3	133.3	0.0	~105.3	27.2		22.6	~123.0	
Queue Length 95th (m)	#87.0	#174.9		m#120.7	m125.1	m0.0	m#165.5	34.7		41.5	#184.8	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0			110.0		90.0	75.0					
Base Capacity (vph)	170	864		284	1089	506	247	1367		182	439	
Starvation Cap Reductn	0	17		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	1.01	1.15		1.29	0.88	0.12	1.44	0.42		0.56	1.04	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.44  
 Intersection Signal Delay: 92.3  
 Intersection LOS: F  
 Intersection Capacity Utilization 126.1%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Preston & Carling



5: Carling & Booth  
PM Peak Hour

829 Carling Avenue  
2028 Background Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	254	722	984	104	308	323
Future Volume (vph)	254	722	984	104	308	323
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	75.0			25.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				10.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.95			0.79	0.98	0.75
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1674	3316	1745	1498	1674	1483
Fl <sub>t</sub> Permitted	0.950				0.950	
Satd. Flow (perm)	1593	3316	1745	1181	1647	1117
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				25		262
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	65			65	13	81
Confl. Bikes (#/hr)				10		45
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	2%	1%	1%	2%
Adj. Flow (vph)	254	722	984	104	308	323
Shared Lane Traffic (%)						
Lane Group Flow (vph)	254	722	984	104	308	323
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4

5: Carling & Booth  
PM Peak Hour

829 Carling Avenue  
2028 Background Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	15.7	29.7	29.7	39.0	39.0
Total Split (s)	24.0	101.0	77.0	77.0	39.0	39.0
Total Split (%)	17.1%	72.1%	55.0%	55.0%	27.9%	27.9%
Maximum Green (s)	18.1	95.3	71.3	71.3	33.0	33.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			13.0	13.0	7.0	7.0
Flash Dont Walk (s)			11.0	11.0	26.0	26.0
Pedestrian Calls (#/hr)			20	20	20	20
Act Effct Green (s)	21.2	98.4	71.3	71.3	29.9	29.9
Actuated g/C Ratio	0.15	0.70	0.51	0.51	0.21	0.21
v/c Ratio	1.00	0.31	1.11	0.17	0.88	0.73
Control Delay	86.0	6.6	97.5	14.7	77.9	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.0	6.6	97.5	14.7	77.9	20.9
LOS	F	A	F	B	E	C
Approach Delay		27.3	89.6		48.7	
Approach LOS		C	F		D	
Queue Length 50th (m)	~75.3	49.5	~285.5	10.3	74.4	12.7
Queue Length 95th (m)	m#84.7	m48.6	#358.0	20.3	#113.7	47.1
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	75.0			25.0		45.0
Base Capacity (vph)	253	2330	888	613	388	463
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	1.00	0.31	1.11	0.17	0.79	0.70

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 62 (44%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.11  
 Intersection Signal Delay: 57.5  
 Intersection LOS: E  
 Intersection Capacity Utilization 111.0%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carling & Booth



6: Preston & Beech  
PM Peak Hour

829 Carling Avenue  
2028 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↗	↗	↗	↗	↗	↗
Traffic Volume (vph)	29	41	34	41	121	31	82	462	56	17	484	54
Future Volume (vph)	29	41	34	41	121	31	82	462	56	17	484	54
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	25.0		0.0	25.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	25.0			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		0.93			0.98	0.84	0.97	0.98		0.94	0.99	
Frt		0.956				0.850		0.984			0.985	
Flt Protected		0.986			0.988		0.950			0.950		
Satd. Flow (prot)	0	1584	0	0	1741	1498	1674	1676	0	1674	1670	0
Flt Permitted		0.875			0.906		0.415			0.427		
Satd. Flow (perm)	0	1374	0	0	1557	1261	706	1676	0	710	1670	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24				31		15			14	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		101.4			151.8			160.5			163.2	
Travel Time (s)		7.3			10.9			11.6			11.8	
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 (%)	1%	1%	1%	1%	1%	1%	1%	3%	1%	1%	4%	2%
Adj. Flow (vph)	29	41	34	41	121	31	82	462	56	17	484	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	104	0	0	162	31	82	518	0	17	538	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	22.6	22.6		22.6	22.6	22.6	33.5	33.5		33.5	33.5	
Total Split (s)	23.0	23.0		23.0	23.0	23.0	67.0	67.0		67.0	67.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%	25.6%	74.4%	74.4%		74.4%	74.4%	
Maximum Green (s)	17.4	17.4		17.4	17.4	17.4	61.5	61.5		61.5	61.5	
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3	2.3	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.6			5.6	5.6	5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Ped	Ped		Ped	Ped	Ped	C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	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	10.0	
Pedestrian Calls (#/hr)	20	20		20	20	20	20	20		20	20	
Act Effct Green (s)		17.1			17.1	17.1	61.8	61.8		61.8	61.8	
Actuated g/C Ratio		0.19			0.19	0.19	0.69	0.69		0.69	0.69	
v/c Ratio		0.37			0.55	0.12	0.17	0.45		0.03	0.47	
Control Delay		28.8			40.9	12.2	2.5	4.6		4.8	7.9	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		28.8			40.9	12.2	2.5	4.6		4.8	7.9	
LOS		C			D	B	A	A		A	A	
Approach Delay		28.8			36.2			4.3			7.8	
Approach LOS		C			D			A			A	
Queue Length 50th (m)		11.1			23.6	0.0	2.6	33.7		0.8	33.1	
Queue Length 95th (m)		24.5			41.4	6.6	0.5	1.8		2.6	51.6	
Internal Link Dist (m)		77.4			127.8			136.5			139.2	
Turn Bay Length (m)							25.0			25.0		
Base Capacity (vph)		285			301	268	484	1156		487	1151	
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		0.36			0.54	0.12	0.17	0.45		0.03	0.47	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 43 (48%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.55  
 Intersection Signal Delay: 11.7      Intersection LOS: B  
 Intersection Capacity Utilization 85.9%      ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 6: Preston & Beech





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	2	10	0	0	0	8	557	27	6	556	15
Future Volume (vph)	4	2	10	0	0	0	8	557	27	6	556	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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		0.92						0.99			1.00	
Flt Protected		0.916						0.994			0.996	
Satd. Flow (prot)	0	1494	0	0	0	0	0	1709	0	0	1716	0
Flt Permitted		0.988						0.993			0.995	
Satd. Flow (perm)	0	1466	0	0	0	0	0	1698	0	0	1708	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10						7			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		114.6			152.9			73.8			160.5	
Travel Time (s)		8.3			11.0			5.3			11.6	
Confl. Peds. (#/hr)	25		27	27		25	46		47	47		46
Confl. Bikes (#/hr)			1			3			21			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 (%)	1%	1%	1%	2%	2%	2%	1%	3%	1%	1%	3%	1%
Adj. Flow (vph)	4	2	10	0	0	0	8	557	27	6	556	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	0	0	0	592	0	0	577	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		-2.0			-1.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2					1	2		1	2	
Detector Template	Left	Thru					Left	Thru		Left	Thru	
Leading Detector (m)	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	
Detector 1 Position(m)	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	
Detector 1 Type	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0					0.0	0.0		0.0	0.0	
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			28.7	
Detector 2 Size(m)		1.8						1.8			1.8	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Detector Phase	4	4					2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0					10.0	10.0		10.0	10.0	
Minimum Split (s)	20.5	20.5					28.1	28.1		28.1	28.1	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	21.0	21.0					69.0	69.0		69.0	69.0	
Total Split (%)	23.3%	23.3%					76.7%	76.7%		76.7%	76.7%	
Maximum Green (s)	15.5	15.5					63.9	63.9		63.9	63.9	
Yellow Time (s)	3.3	3.3					3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2					1.8	1.8		1.8	1.8	
Lost Time Adjust (s)			0.0					0.0			0.0	
Total Lost Time (s)		5.5						5.1			5.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	
Recall Mode	None	None					C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0					18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	8.0	8.0					5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	20	20					20	20		20	20	
Act Effct Green (s)		12.0						75.6			75.6	
Actuated g/C Ratio		0.13						0.84			0.84	
v/c Ratio		0.08						0.41			0.40	
Control Delay		21.9						4.7			3.6	
Queue Delay		0.0						0.0			0.0	
Total Delay		21.9						4.7			3.6	
LOS		C						A			A	
Approach Delay		21.9						4.7			3.6	
Approach LOS		C						A			A	
Queue Length 50th (m)		0.9						25.3			20.5	
Queue Length 95th (m)		5.8						52.0			32.2	
Internal Link Dist (m)		90.6			128.9			49.8			136.5	
Turn Bay Length (m)												
Base Capacity (vph)		260						1428			1436	
Starvation Cap Reductn		0						0			86	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.06						0.41			0.43	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 27 (30%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.41

Intersection Signal Delay: 4.4

Intersection LOS: A

Intersection Capacity Utilization 57.7%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 7: Preston & Pamilla





8: Preston & Adeline  
PM Peak Hour

829 Carling Avenue  
2028 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	19	4	17	22	2	17	22	511	48	22	562	5
Future Volume (vph)	19	4	17	22	2	17	22	511	48	22	562	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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												
Frt		0.943			0.944			0.989			0.999	
Flt Protected		0.977			0.974			0.998			0.998	
Satd. Flow (prot)	0	1608	0	0	1605	0	0	1708	0	0	1724	0
Flt Permitted		0.977			0.974			0.998			0.998	
Satd. Flow (perm)	0	1608	0	0	1605	0	0	1708	0	0	1724	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		113.6			154.3			71.5			73.8	
Travel Time (s)		8.2			11.1			5.1			5.3	
Confl. Peds. (#/hr)							46		47	47		46
Confl. Bikes (#/hr)									21			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 (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Adj. Flow (vph)	19	4	17	22	2	17	22	511	48	22	562	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	40	0	0	41	0	0	581	0	0	589	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		-2.0			-2.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 51.0%

ICU Level of Service A

Analysis Period (min) 15



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	24	26	39	557	533	64
Future Volume (vph)	24	26	39	557	533	64
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.930				0.986	
Flt Protected	0.977			0.997		
Satd. Flow (prot)	1586	0	0	3276	1706	0
Flt Permitted	0.977			0.997		
Satd. Flow (perm)	1586	0	0	3276	1706	0
Link Speed (k/h)	30			50	50	
Link Distance (m)	68.0			65.2	71.5	
Travel Time (s)	8.2			4.7	5.1	
Confl. Peds. (#/hr)			46			47
Confl. Bikes (#/hr)						14
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%
Adj. Flow (vph)	24	26	39	557	533	64
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	0	596	597	0
Enter Blocked Intersection	No	No	Yes	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			2.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

**Intersection Summary**

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 57.4% ICU Level of Service B

Analysis Period (min) 15



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	470	280	4	2	416	431	5	2	1	413	0	645
Future Volume (vph)	470	280	4	2	416	431	5	2	1	413	0	645
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	55.0		0.0	30.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	2		0	1		1	0		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.89		0.93		0.93			0.81	0.77
Frt		0.998				0.850		0.983				0.850
Flt Protected	0.950			0.950				0.970			0.950	
Satd. Flow (prot)	3185	1754	0	1674	1762	1498	0	1637	0	0	1674	1483
Flt Permitted	0.225			0.586				0.851			0.752	
Satd. Flow (perm)	754	1754	0	917	1762	1397	0	1373	0	0	1077	1144
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				164		1				88
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		233.9			203.3			76.1			164.5	
Travel Time (s)		14.0			12.2			5.5			11.8	
Confl. Peds. (#/hr)	35		62	62		35	73		65	65		73
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 (%)	3%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%
Adj. Flow (vph)	470	280	4	2	416	431	5	2	1	413	0	645
Shared Lane Traffic (%)												
Lane Group Flow (vph)	470	284	0	2	416	431	0	8	0	0	413	645
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)		7.0			7.0			0.0				3.5
Link Offset(m)		2.0			0.0			5.0				0.0
Crosswalk Width(m)		5.0			10.0			5.0				5.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6		6	8			4		4
Detector Phase	5	2		6	6	6	8	8		4	4	5
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	5.0
Minimum Split (s)	11.1	32.1		32.1	32.1	32.1	29.5	29.5		29.5	29.5	11.1
Total Split (s)	37.0	79.0		42.0	42.0	42.0	61.0	61.0		61.0	61.0	37.0
Total Split (%)	26.4%	56.4%		30.0%	30.0%	30.0%	43.6%	43.6%		43.6%	43.6%	26.4%
Maximum Green (s)	30.9	72.9		35.9	35.9	35.9	55.5	55.5		55.5	55.5	30.9
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.7
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	2.2	2.2		2.2	2.2	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		5.5			5.5	6.1
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	Max	Max		Max	Max	None
Walk Time (s)		7.0		7.0	7.0	7.0	12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		19.0		19.0	19.0	19.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		20		20	20	20	20	20		20	20	
Act Effct Green (s)	72.9	72.9		44.6	44.6	44.6		55.5			55.5	77.1
Actuated g/C Ratio	0.52	0.52		0.32	0.32	0.32		0.40			0.40	0.55
v/c Ratio	0.60	0.31		0.01	0.74	0.78		0.01			0.97	0.89
Control Delay	22.5	20.3		38.0	53.1	37.9		24.4			43.3	11.9
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.1
Total Delay	22.5	20.3		38.0	53.1	37.9		24.4			43.3	12.0
LOS	C	C		D	D	D		C			D	B
Approach Delay		21.7			45.4			24.4			24.2	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	33.8	40.2		0.3	92.5	62.8		1.1			89.9	57.4
Queue Length 95th (m)	44.0	58.1		2.5	#159.3	#128.1		4.4			m63.7	m21.3
Internal Link Dist (m)		209.9			179.3			52.1			140.5	
Turn Bay Length (m)	55.0			30.0		25.0						
Base Capacity (vph)	929	913		292	561	556		544			426	809
Starvation Cap Reductn	0	0		0	0	0		0			0	6
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.51	0.31		0.01	0.74	0.78		0.01			0.97	0.80

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 53 (38%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 30.2  
 Intersection LOS: C  
 Intersection Capacity Utilization 105.1%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Prince of Wales/Queen Elizabeth & Preston



4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
2028 Background Traffic (demand rationalization)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	504	374	276	963	61	255	366	204	102	313	124
Future Volume (vph)	162	504	374	276	963	61	255	366	204	102	313	124
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		0.0	110.0		90.0	75.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.98	0.97		0.98		0.89	0.98	0.97		0.97	0.98	
Frt		0.936				0.850		0.946			0.957	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1610	2982	0	1674	3316	1427	1674	3057	0	1537	1617	0
Flt Permitted	0.950			0.950			0.127			0.438		
Satd. Flow (perm)	1571	2982	0	1645	3316	1272	219	3057	0	689	1617	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		131				132		96			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		124.7			193.9			164.5			65.2	
Travel Time (s)		7.5			11.6			11.8			4.7	
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 (%)	5%	3%	2%	1%	2%	6%	1%	2%	1%	10%	2%	5%
Adj. Flow (vph)	162	504	374	276	963	61	255	366	204	102	313	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	162	878	0	276	963	61	255	570	0	102	437	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	3	8		4	4	

4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
2028 Background Traffic (demand rationalization)

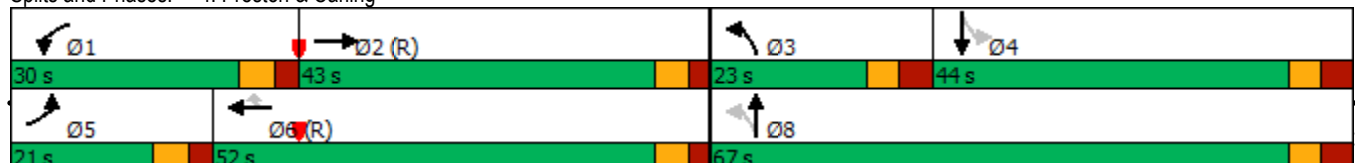


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0		11.2	30.0	30.0	11.9	43.9		43.9	43.9	
Total Split (s)	21.0	43.0		30.0	52.0	52.0	23.0	67.0		44.0	44.0	
Total Split (%)	15.0%	30.7%		21.4%	37.1%	37.1%	16.4%	47.9%		31.4%	31.4%	
Maximum Green (s)	14.8	37.0		23.8	46.0	46.0	16.1	60.1		37.1	37.1	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.3		2.5	2.3	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		6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	Max	
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)		20			20	20		20		20	20	
Act Effct Green (s)	14.8	37.0		23.8	46.0	46.0	60.1	60.1		37.1	37.1	
Actuated g/C Ratio	0.11	0.26		0.17	0.33	0.33	0.43	0.43		0.26	0.26	
v/c Ratio	0.95	0.99		0.97	0.88	0.12	0.98	0.42		0.56	1.00	
Control Delay	126.3	54.8		78.4	43.4	1.6	76.6	5.5		58.0	91.8	
Queue Delay	0.0	17.5		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	126.3	72.3		78.4	43.4	1.6	76.6	5.5		58.0	91.8	
LOS	F	E		E	D	A	E	A		E	F	
Approach Delay		80.7			48.9			27.5			85.4	
Approach LOS		F			D			C			F	
Queue Length 50th (m)	34.8	55.1		67.6	132.9	0.0	44.4	26.7		22.6	109.0	
Queue Length 95th (m)	#80.2	#139.4		m#87.3	m136.2	m0.0	m#93.8	34.3		41.5	#173.0	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0			110.0		90.0	75.0					
Base Capacity (vph)	170	884		284	1089	506	261	1367		182	438	
Starvation Cap Reductn	0	49		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.95	1.05		0.97	0.88	0.12	0.98	0.42		0.56	1.00	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 58.4 Intersection LOS: E  
 Intersection Capacity Utilization 112.2% ICU Level of Service H  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Preston & Carling



5: Carling & Booth  
PM Peak Hour

829 Carling Avenue  
2028 Background Traffic (demand rationalization)



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	254	722	884	104	308	323
Future Volume (vph)	254	722	884	104	308	323
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	75.0			25.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				10.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.95			0.79	0.98	0.75
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1674	3316	1745	1498	1674	1483
Fl <sub>t</sub> Permitted	0.950				0.950	
Satd. Flow (perm)	1593	3316	1745	1181	1647	1117
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				28		262
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	65			65	13	81
Confl. Bikes (#/hr)				10		45
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	2%	1%	1%	2%
Adj. Flow (vph)	254	722	884	104	308	323
Shared Lane Traffic (%)						
Lane Group Flow (vph)	254	722	884	104	308	323
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	15.7	29.7	29.7	39.0	39.0
Total Split (s)	24.0	101.0	77.0	77.0	39.0	39.0
Total Split (%)	17.1%	72.1%	55.0%	55.0%	27.9%	27.9%
Maximum Green (s)	18.1	95.3	71.3	71.3	33.0	33.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			13.0	13.0	7.0	7.0
Flash Dont Walk (s)			11.0	11.0	26.0	26.0
Pedestrian Calls (#/hr)			20	20	20	20
Act Effct Green (s)	21.2	98.4	71.3	71.3	29.9	29.9
Actuated g/C Ratio	0.15	0.70	0.51	0.51	0.21	0.21
v/c Ratio	1.00	0.31	1.00	0.17	0.88	0.73
Control Delay	99.5	6.5	63.4	14.1	77.9	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.5	6.5	63.4	14.1	77.9	20.9
LOS	F	A	E	B	E	C
Approach Delay		30.7	58.2		48.7	
Approach LOS		C	E		D	
Queue Length 50th (m)	~76.2	42.5	218.6	9.9	74.4	12.7
Queue Length 95th (m)	m#100.1	m48.5	#304.1	19.8	#113.7	47.1
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	75.0			25.0		45.0
Base Capacity (vph)	253	2330	888	615	388	463
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	1.00	0.31	1.00	0.17	0.79	0.70

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 62 (44%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 45.5  
 Intersection LOS: D  
 Intersection Capacity Utilization 105.5%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carling & Booth





4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
2028 Background Traffic (Sidney restrictions)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	604	374	366	963	61	355	366	204	123	333	124
Future Volume (vph)	172	604	374	366	963	61	355	366	204	123	333	124
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		0.0	110.0		90.0	75.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.98	0.97		0.98		0.89	0.98	0.97		0.97	0.98	
Frt		0.943				0.850		0.946			0.959	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1610	3014	0	1674	3316	1427	1674	3057	0	1537	1623	0
Flt Permitted	0.950			0.950			0.102			0.438		
Satd. Flow (perm)	1571	3014	0	1649	3316	1272	176	3057	0	689	1623	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		93				132		96			13	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		124.7			193.9			164.5			65.2	
Travel Time (s)		7.5			11.6			11.8			4.7	
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 (%)	5%	3%	2%	1%	2%	6%	1%	2%	1%	10%	2%	5%
Adj. Flow (vph)	172	604	374	366	963	61	355	366	204	123	333	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	172	978	0	366	963	61	355	570	0	123	457	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	3	8		4	4	

4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
2028 Background Traffic (Sidney restrictions)

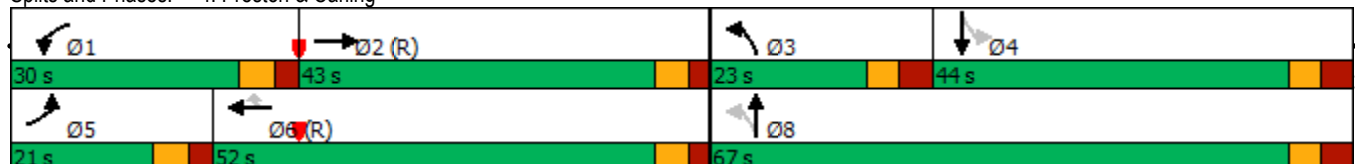


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0		11.2	30.0	30.0	11.9	43.9		43.9	43.9	
Total Split (s)	21.0	43.0		30.0	52.0	52.0	23.0	67.0		44.0	44.0	
Total Split (%)	15.0%	30.7%		21.4%	37.1%	37.1%	16.4%	47.9%		31.4%	31.4%	
Maximum Green (s)	14.8	37.0		23.8	46.0	46.0	16.1	60.1		37.1	37.1	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.3		2.5	2.3	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		6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	Max	
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)		20			20	20		20		20	20	
Act Effct Green (s)	14.8	37.0		23.8	46.0	46.0	60.1	60.1		37.1	37.1	
Actuated g/C Ratio	0.11	0.26		0.17	0.33	0.33	0.43	0.43		0.26	0.26	
v/c Ratio	1.01	1.13		1.29	0.88	0.12	1.44	0.42		0.68	1.04	
Control Delay	139.4	102.9		177.3	40.8	1.6	243.8	6.0		66.1	102.0	
Queue Delay	0.0	0.1		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	139.4	103.0		177.3	40.8	1.6	243.8	6.0		66.1	102.0	
LOS	F	F		F	D	A	F	A		E	F	
Approach Delay		108.5			75.0			97.3			94.4	
Approach LOS		F			E			F			F	
Queue Length 50th (m)	~39.5	~143.5		~117.3	133.3	0.0	~105.3	27.2		28.2	~123.0	
Queue Length 95th (m)	#87.0	#174.9		m#120.7	m125.1	m0.0	m#165.5	34.7		#54.3	#184.8	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0			110.0		90.0	75.0					
Base Capacity (vph)	170	864		284	1089	506	247	1367		182	439	
Starvation Cap Reductn	0	17		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	1.01	1.15		1.29	0.88	0.12	1.44	0.42		0.68	1.04	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.44  
 Intersection Signal Delay: 92.4      Intersection LOS: F  
 Intersection Capacity Utilization 126.1%      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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Preston & Carling



5: Carling & Booth  
PM Peak Hour

829 Carling Avenue  
2028 Background Traffic (Sidney restrictions)



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	275	722	984	104	308	323
Future Volume (vph)	275	722	984	104	308	323
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	75.0			25.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				10.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.95			0.79	0.98	0.75
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1674	3316	1745	1498	1674	1483
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1593	3316	1745	1181	1647	1117
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				25		262
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	65			65	13	81
Confl. Bikes (#/hr)				10		45
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	2%	1%	1%	2%
Adj. Flow (vph)	275	722	984	104	308	323
Shared Lane Traffic (%)						
Lane Group Flow (vph)	275	722	984	104	308	323
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	15.7	29.7	29.7	39.0	39.0
Total Split (s)	24.0	101.0	77.0	77.0	39.0	39.0
Total Split (%)	17.1%	72.1%	55.0%	55.0%	27.9%	27.9%
Maximum Green (s)	18.1	95.3	71.3	71.3	33.0	33.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			13.0	13.0	7.0	7.0
Flash Dont Walk (s)			11.0	11.0	26.0	26.0
Pedestrian Calls (#/hr)			20	20	20	20
Act Effct Green (s)	21.2	98.4	71.3	71.3	29.9	29.9
Actuated g/C Ratio	0.15	0.70	0.51	0.51	0.21	0.21
v/c Ratio	1.09	0.31	1.11	0.17	0.88	0.73
Control Delay	108.0	6.4	97.5	14.7	77.9	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.0	6.4	97.5	14.7	77.9	20.9
LOS	F	A	F	B	E	C
Approach Delay		34.4	89.6		48.7	
Approach LOS		C	F		D	
Queue Length 50th (m)	~86.3	47.5	~285.5	10.3	74.4	12.7
Queue Length 95th (m)	m#96.2	m47.1	#358.0	20.3	#113.7	47.1
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	75.0			25.0		45.0
Base Capacity (vph)	253	2330	888	613	388	463
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	1.09	0.31	1.11	0.17	0.79	0.70

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 62 (44%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.11  
 Intersection Signal Delay: 59.8  
 Intersection LOS: E  
 Intersection Capacity Utilization 112.3%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carling & Booth

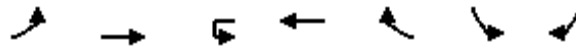




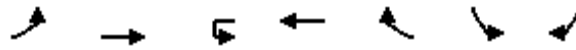
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	47	39	557	533	64
Future Volume (vph)	0	47	39	557	533	64
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt		0.865			0.986	
Flt Protected				0.997		
Satd. Flow (prot)	0	1510	0	3276	1706	0
Flt Permitted				0.997		
Satd. Flow (perm)	0	1510	0	3276	1706	0
Link Speed (k/h)	30			50	50	
Link Distance (m)	68.0			65.2	71.5	
Travel Time (s)	8.2			4.7	5.1	
Confl. Peds. (#/hr)			46			47
Confl. Bikes (#/hr)						14
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%
Adj. Flow (vph)	0	47	39	557	533	64
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	47	0	596	597	0
Enter Blocked Intersection	No	No	Yes	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			2.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization 50.7%	ICU Level of Service A
Analysis Period (min)	15



Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	31	774	13	590	144	176	5
Future Volume (vph)	31	774	13	590	144	176	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0		50.0		110.0	0.0	10.0
Storage Lanes	1		1		1	1	1
Taper Length (m)	25.0		25.0			25.0	
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Ped Bike Factor	0.97				0.90	0.96	0.95
Fr					0.850		0.850
Flt Protected	0.950		0.950			0.950	
Satd. Flow (prot)	1642	3283	1674	3161	1483	1674	1498
Flt Permitted	0.950		0.358			0.950	
Satd. Flow (perm)	1589	3283	631	3161	1328	1615	1425
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					144		3
Link Speed (k/h)		60		60		40	
Link Distance (m)		196.1		162.9		242.3	
Travel Time (s)		11.8		9.8		21.8	
Confl. Peds. (#/hr)	30				30	30	30
Confl. Bikes (#/hr)					17		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	1%	7%	2%	1%	1%
Adj. Flow (vph)	31	774	13	590	144	176	5
Shared Lane Traffic (%)							
Lane Group Flow (vph)	31	774	13	590	144	176	5
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	Left	Right	L NA	R NA
Median Width(m)		7.0		7.0		3.5	
Link Offset(m)		0.0		0.0		0.0	
Crosswalk Width(m)		5.0		10.0		5.0	
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14		14	40	14
Number of Detectors	1	2	1	2	1	1	1
Detector Template	Left	Thru	Left	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	6.1	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	1.8	6.1	6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7		28.7			
Detector 2 Size(m)		1.8		1.8			
Detector 2 Type		Cl+Ex		Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)		0.0		0.0			
Turn Type	Prot	NA	Perm	NA	Perm	Perm	Perm
Protected Phases	5	2		6			
Permitted Phases			6		6	4	4
Detector Phase	5	2	6	6	6	4	4

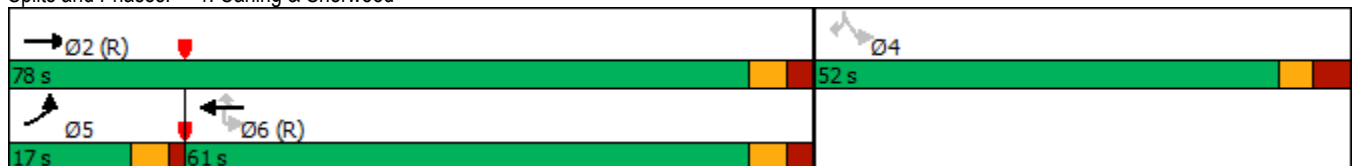


Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.2	33.4	33.4	33.4	33.4	40.1	40.1
Total Split (s)	17.0	78.0	61.0	61.0	61.0	52.0	52.0
Total Split (%)	13.1%	60.0%	46.9%	46.9%	46.9%	40.0%	40.0%
Maximum Green (s)	11.8	71.6	54.6	54.6	54.6	44.9	44.9
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	2.7	2.7	2.7	2.7	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.4	6.4	6.4	6.4	7.1	7.1
Lead/Lag	Lead		Lag	Lag	Lag		
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)		12.0	12.0	12.0	12.0	7.0	7.0
Flash Dont Walk (s)		15.0	15.0	15.0	15.0	26.0	26.0
Pedestrian Calls (#/hr)		20	20	20	20	20	20
Act Effct Green (s)	8.0	90.9	82.3	82.3	82.3	25.6	25.6
Actuated g/C Ratio	0.06	0.70	0.63	0.63	0.63	0.20	0.20
v/c Ratio	0.31	0.34	0.03	0.29	0.16	0.56	0.02
Control Delay	65.6	9.2	5.8	5.1	0.8	52.2	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.6	9.2	5.8	5.1	0.8	52.2	27.4
LOS	E	A	A	A	A	D	C
Approach Delay		11.4		4.3		51.5	
Approach LOS		B		A		D	
Queue Length 50th (m)	7.2	42.0	0.5	11.1	0.0	35.0	0.4
Queue Length 95th (m)	16.3	52.5	1.6	15.3	1.3	55.4	3.4
Internal Link Dist (m)		172.1		138.9		218.3	
Turn Bay Length (m)	40.0		50.0		110.0		10.0
Base Capacity (vph)	149	2295	399	2000	893	557	494
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	0.21	0.34	0.03	0.29	0.16	0.32	0.01

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 107 (82%), Referenced to phase 2:EBT and 6:WBTU, Start of Green  
 Natural Cycle: 85  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.56  
 Intersection Signal Delay: 12.5  
 Intersection LOS: B  
 Intersection Capacity Utilization 59.6%  
 ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 1: Carling & Sherwood



2: Carling & Champagne  
AM Peak Hour

829 Carling Avenue  
2033 Background Traffic

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	728	174	180	664	168	62	0	69	89	0	54
Future Volume (vph)	103	728	174	180	664	168	62	0	69	89	0	54
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	70.0		30.0	60.0		25.0	0.0		0.0	20.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.90		0.95	0.95		0.69	0.96		0.95	0.98		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1674	3283	1483	1658	3252	1414	1658	0	1483	1658	0	1498
Flt Permitted	0.387			0.359			0.950			0.950		
Satd. Flow (perm)	613	3283	1404	593	3252	978	1586	0	1403	1617	0	1443
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			174			168			69			54
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		162.9			117.5			121.7			178.4	
Travel Time (s)		9.8			7.1			8.8			12.8	
Confl. Peds. (#/hr)	90		90	90		90	20		20	20		20
Confl. Bikes (#/hr)			5			4						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 (%)	1%	3%	2%	2%	4%	7%	2%	2%	2%	2%	2%	1%
Adj. Flow (vph)	103	728	174	180	664	168	62	0	69	89	0	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	728	174	180	664	168	62	0	69	89	0	54
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1		1	1		1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left		Right	Left		Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1		6.1	6.1		6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1		6.1	6.1		6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 2 Position(m)		28.7			28.7							
Detector 2 Size(m)		1.8			1.8							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm		Perm	Perm		Perm
Protected Phases		2			6							
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	2	2	2	6	6	6	8		8	4		4



2: Carling & Champagne  
AM Peak Hour

829 Carling Avenue  
2033 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0		5.0	10.0		10.0
Minimum Split (s)	15.3	15.3	15.3	25.3	25.3	25.3	24.0		24.0	37.9		37.9
Total Split (s)	92.0	92.0	92.0	92.0	92.0	92.0	38.0		38.0	38.0		38.0
Total Split (%)	70.8%	70.8%	70.8%	70.8%	70.8%	70.8%	29.2%		29.2%	29.2%		29.2%
Maximum Green (s)	86.7	86.7	86.7	86.7	86.7	86.7	32.0		32.0	32.1		32.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0		3.0	3.3		3.3
All-Red Time (s)	1.6	1.6	1.6	1.6	1.6	1.6	3.0		3.0	2.6		2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	6.0		6.0	5.9		5.9
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None		None	None		None
Walk Time (s)				10.0	10.0	10.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)				10.0	10.0	10.0	11.0		11.0	25.0		25.0
Pedestrian Calls (#/hr)				20	20	20	20		20	20		20
Act Effct Green (s)	95.5	95.5	95.5	95.5	95.5	95.5	23.2		23.2	23.3		23.3
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.73	0.73	0.18		0.18	0.18		0.18
v/c Ratio	0.23	0.30	0.16	0.41	0.28	0.22	0.22		0.23	0.31		0.18
Control Delay	6.2	5.2	1.2	6.3	3.2	2.1	43.8		10.5	46.1		11.2
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0	0.0		0.0	0.0		0.0
Total Delay	6.2	5.2	1.2	6.3	3.3	2.1	43.8		10.5	46.1		11.2
LOS	A	A	A	A	A	A	D		B	D		B
Approach Delay		4.6			3.7			26.2				32.9
Approach LOS		A			A			C				C
Queue Length 50th (m)	4.9	18.3	1.4	9.4	18.1	2.8	11.6		0.0	16.9		0.0
Queue Length 95th (m)	8.2	21.8	3.1	13.9	21.8	8.1	22.6		10.8	30.5		9.7
Internal Link Dist (m)		138.9			93.5			97.7				154.4
Turn Bay Length (m)	70.0		30.0	60.0		25.0				20.0		
Base Capacity (vph)	450	2412	1077	435	2389	762	390		397	399		396
Starvation Cap Reductn	0	0	0	0	827	0	0		0	0		0
Spillback Cap Reductn	0	0	0	0	0	0	0		0	0		0
Storage Cap Reductn	0	0	0	0	0	0	0		0	0		0
Reduced v/c Ratio	0.23	0.30	0.16	0.41	0.43	0.22	0.16		0.17	0.22		0.14

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 85 (65%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.41  
 Intersection Signal Delay: 7.2  
 Intersection LOS: A  
 Intersection Capacity Utilization 55.1%  
 ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 2: Carling & Champagne



3: Trillium Pathway & Carling  
AM Peak Hour

829 Carling Avenue  
2033 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑							
Traffic Volume (vph)	0	877	0	0	1048	0	0	0	0	0	0	0
Future Volume (vph)	0	877	0	0	1048	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected												
Satd. Flow (prot)	0	3283	0	0	3283	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3283	0	0	3283	0	0	0	0	0	0	0
Right Turn on Red			Yes				Yes				Yes	
Satd. Flow (RTOR)												
Link Speed (k/h)	60				60				50			
Link Distance (m)	117.5				124.7				157.3			
Travel Time (s)	7.1				7.5				11.3			
Confl. Peds. (#/hr)	40		14	14		40	18		20	20		18
Confl. Bikes (#/hr)			7			25						17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	877	0	0	1048	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	877	0	0	1048	0	0	0	0	0	0	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)	7.0				7.0				0.0			
Link Offset(m)	0.0				0.0				0.0			
Crosswalk Width(m)	5.0				5.0				5.0			
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	2				2							
Detector Template	Thru				Thru							
Leading Detector (m)	30.5				30.5							
Trailing Detector (m)	0.0				0.0							
Detector 1 Position(m)	0.0				0.0							
Detector 1 Size(m)	1.8				1.8							
Detector 1 Type	CI+Ex				CI+Ex							
Detector 1 Channel												
Detector 1 Extend (s)	0.0				0.0							
Detector 1 Queue (s)	0.0				0.0							
Detector 1 Delay (s)	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	NA				NA							
Protected Phases	2				6							
Permitted Phases												
Detector Phase	2				6							
Switch Phase												
Minimum Initial (s)	10.0				10.0							
Minimum Split (s)	25.1				25.1							

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	35.6

3: Trillium Pathway & Carling  
AM Peak Hour

829 Carling Avenue  
2033 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)		94.0			94.0							
Total Split (%)		72.3%			72.3%							
Maximum Green (s)		88.9			88.9							
Yellow Time (s)		3.7			3.7							
All-Red Time (s)		1.4			1.4							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		5.1			5.1							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0							
Recall Mode		C-Max			C-Max							
Walk Time (s)		15.0			15.0							
Flash Dont Walk (s)		5.0			5.0							
Pedestrian Calls (#/hr)		20			20							
Act Effct Green (s)		105.6			105.6							
Actuated g/C Ratio		0.81			0.81							
v/c Ratio		0.33			0.39							
Control Delay		4.3			3.2							
Queue Delay		0.1			0.1							
Total Delay		4.4			3.3							
LOS		A			A							
Approach Delay		4.4			3.3							
Approach LOS		A			A							
Queue Length 50th (m)		31.3			28.4							
Queue Length 95th (m)		38.8			m31.2							
Internal Link Dist (m)		93.5			100.7			133.3			30.9	
Turn Bay Length (m)												
Base Capacity (vph)		2666			2666							
Starvation Cap Reductn		602			482							
Spillback Cap Reductn		82			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.42			0.48							

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 59 (45%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.39  
 Intersection Signal Delay: 3.8 Intersection LOS: A  
 Intersection Capacity Utilization 34.8% ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.























Splits and Phases: 3: Trillium Pathway & Carling



Lane Group	Ø4
Total Split (s)	36.0
Total Split (%)	28%
Maximum Green (s)	29.4
Yellow Time (s)	3.0
All-Red Time (s)	3.6
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	22.0
Pedestrian Calls (#/hr)	20
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

4: Preston & Carling  
AM Peak Hour

829 Carling Avenue  
2033 Background Traffic

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	163	545	233	253	677	100	288	477	308	132	306	128	
Future Volume (vph)	163	545	233	253	677	100	288	477	308	132	306	128	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Storage Length (m)	65.0		0.0	110.0		90.0	75.0		0.0	0.0		0.0	
Storage Lanes	1		0	1		1	1		0	1		0	
Taper Length (m)	25.0			25.0			25.0			25.0			
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	
Ped Bike Factor	0.94	0.97		0.98		0.84	0.98	0.98		1.00	0.98		
Fr <sub>t</sub>		0.955				0.850		0.941			0.956		
Fl <sub>t</sub> Protected	0.950			0.950			0.950			0.950			
Satd. Flow (prot)	1595	3035	0	1658	3252	1375	1674	3035	0	1510	1510	0	
Fl <sub>t</sub> Permitted	0.950			0.950			0.168			0.355			
Satd. Flow (perm)	1504	3035	0	1620	3252	1153	290	3035	0	562	1510	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		49				143		147			16		
Link Speed (k/h)		60			60			50			50		
Link Distance (m)		124.7			193.9			164.5			65.2		
Travel Time (s)		7.5			11.6			11.8			4.7		
Confl. Peds. (#/hr)	90		41	41		90	60		10	10		60	
Confl. Bikes (#/hr)			22			10			36			5	
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%	2%	2%	4%	10%	1%	4%	2%	12%	6%	20%	
Adj. Flow (vph)	163	545	233	253	677	100	288	477	308	132	306	128	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	163	778	0	253	677	100	288	785	0	132	434	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA	
Median Width(m)		7.0			7.0			3.5			3.5		
Link Offset(m)		0.0			0.0			0.0			0.0		
Crosswalk Width(m)		5.0			5.0			5.0			5.0		
Two way Left Turn Lane													
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	
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	Right	Left	Thru		Left	Thru		
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8		
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		
Detector 1 Channel													
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0		
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0		
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0		
Detector 2 Position(m)		28.7			28.7			28.7			28.7		
Detector 2 Size(m)		1.8			1.8			1.8			1.8		
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex		
Detector 2 Channel													
Detector 2 Extend (s)		0.0			0.0			0.0			0.0		
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		Perm	NA		
Protected Phases	5	2		1	6		3	8			4		
Permitted Phases						6	8			4			
Detector Phase	5	2		1	6	6	3	8		4	4		

4: Preston & Carling  
AM Peak Hour

829 Carling Avenue  
2033 Background Traffic

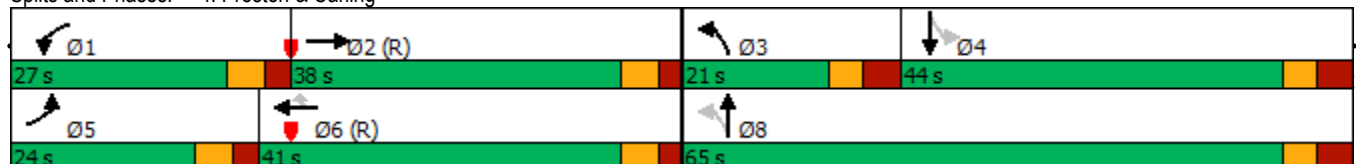


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0		11.2	30.0	30.0	11.9	43.9		43.9	43.9	
Total Split (s)	24.0	38.0		27.0	41.0	41.0	21.0	65.0		44.0	44.0	
Total Split (%)	18.5%	29.2%		20.8%	31.5%	31.5%	16.2%	50.0%		33.8%	33.8%	
Maximum Green (s)	17.8	32.0		20.8	35.0	35.0	14.1	58.1		37.1	37.1	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.3		2.5	2.3	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		6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	Max	
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)		20			20	20		20		20	20	
Act Effct Green (s)	16.4	32.0		20.8	36.4	36.4	58.1	58.1		37.1	37.1	
Actuated g/C Ratio	0.13	0.25		0.16	0.28	0.28	0.45	0.45		0.29	0.29	
v/c Ratio	0.81	0.99		0.95	0.74	0.24	1.03	0.55		0.82	0.98	
Control Delay	88.6	61.5		65.4	41.1	9.0	78.3	8.8		81.5	83.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	88.6	61.5		65.4	41.1	9.0	78.3	8.8		81.5	83.1	
LOS	F	E		E	D	A	E	A		F	F	
Approach Delay		66.2			43.9			27.4			82.8	
Approach LOS		E			D			C			F	
Queue Length 50th (m)	30.1	50.4		53.9	87.2	5.5	~48.1	52.2		29.2	98.8	
Queue Length 95th (m)	#64.3	#125.4		m#67.4	m89.5	m8.0	#100.7	60.4		#62.7	#160.6	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0			110.0		90.0	75.0					
Base Capacity (vph)	218	784		265	911	425	279	1437		160	442	
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	0.75	0.99		0.95	0.74	0.24	1.03	0.55		0.82	0.98	

Intersection Summary

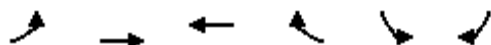
Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 88 (68%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.03  
 Intersection Signal Delay: 50.9  
 Intersection LOS: D  
 Intersection Capacity Utilization 108.9%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Preston & Carling



5: Carling & Booth  
AM Peak Hour

829 Carling Avenue  
2033 Background Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	399	671	741	215	240	189
Future Volume (vph)	399	671	741	215	240	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	75.0			25.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				10.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93			0.78	0.98	0.79
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1674	3252	1728	1498	1674	1427
Fl <sub>t</sub> Permitted	0.950				0.950	
Satd. Flow (perm)	1561	3252	1728	1172	1647	1125
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				62		189
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	70			70	14	85
Confl. Bikes (#/hr)				16		23
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	4%	3%	1%	1%	6%
Adj. Flow (vph)	399	671	741	215	240	189
Shared Lane Traffic (%)						
Lane Group Flow (vph)	399	671	741	215	240	189
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	15.7	29.7	29.7	39.0	39.0
Total Split (s)	32.0	91.0	59.0	59.0	39.0	39.0
Total Split (%)	24.6%	70.0%	45.4%	45.4%	30.0%	30.0%
Maximum Green (s)	26.1	85.3	53.3	53.3	33.0	33.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			13.0	13.0	7.0	7.0
Flash Dont Walk (s)			11.0	11.0	26.0	26.0
Pedestrian Calls (#/hr)			20	20	20	20
Act Effct Green (s)	31.9	91.1	53.3	53.3	27.2	27.2
Actuated g/C Ratio	0.25	0.70	0.41	0.41	0.21	0.21
v/c Ratio	0.97	0.29	1.05	0.42	0.70	0.49
Control Delay	70.5	2.7	84.3	21.8	57.8	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.5	2.7	84.3	21.8	57.8	9.9
LOS	E	A	F	C	E	A
Approach Delay		28.0	70.2		36.7	
Approach LOS		C	E		D	
Queue Length 50th (m)	~113.2	12.0	~189.6	24.9	49.7	0.0
Queue Length 95th (m)	m#139.4	m15.3	#257.2	44.9	75.0	17.8
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	75.0			25.0		45.0
Base Capacity (vph)	411	2279	708	517	418	426
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	0.97	0.29	1.05	0.42	0.57	0.44

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 16 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 46.0  
 Intersection LOS: D  
 Intersection Capacity Utilization 105.7%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carling & Booth



6: Preston & Beech  
AM Peak Hour

829 Carling Avenue  
2033 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↗	↗	↗	↗	↗	↗
Traffic Volume (vph)	43	56	26	37	55	12	28	664	60	18	407	38
Future Volume (vph)	43	56	26	37	55	12	28	664	60	18	407	38
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	25.0		0.0	25.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	25.0			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			0.97	0.89	0.96	0.99		0.98	0.99	
Frt		0.972				0.850		0.988			0.987	
Flt Protected		0.983			0.980		0.950			0.950		
Satd. Flow (prot)	0	1558	0	0	1568	1498	1537	1692	0	1537	1645	0
Flt Permitted		0.865			0.853		0.468			0.289		
Satd. Flow (perm)	0	1336	0	0	1325	1339	730	1692	0	457	1645	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				34		11			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		101.4			151.8			160.5			163.2	
Travel Time (s)		7.3			10.9			11.6			11.8	
Confl. Peds. (#/hr)	36		40	40		36	50		55	55		50
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 (%)	9%	4%	4%	25%	2%	1%	10%	3%	3%	10%	6%	5%
Adj. Flow (vph)	43	56	26	37	55	12	28	664	60	18	407	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	125	0	0	92	12	28	724	0	18	445	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	

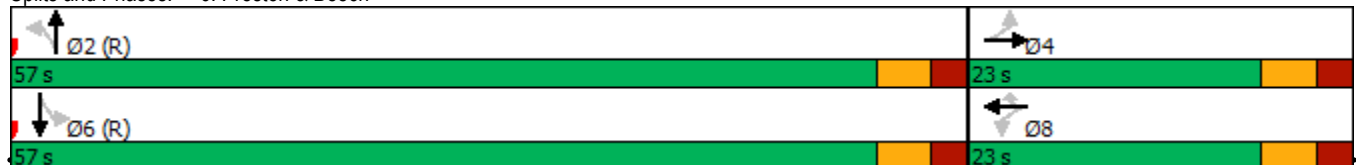


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	22.6	22.6		22.6	22.6	22.6	33.5	33.5		33.5	33.5	
Total Split (s)	23.0	23.0		23.0	23.0	23.0	57.0	57.0		57.0	57.0	
Total Split (%)	28.8%	28.8%		28.8%	28.8%	28.8%	71.3%	71.3%		71.3%	71.3%	
Maximum Green (s)	17.4	17.4		17.4	17.4	17.4	51.5	51.5		51.5	51.5	
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3	2.3	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.6			5.6	5.6	5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Ped	Ped		Ped	Ped	Ped	C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	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	10.0	
Pedestrian Calls (#/hr)	20	20		20	20	20	20	20		20	20	
Act Effct Green (s)		17.1			17.1	17.1	51.8	51.8		51.8	51.8	
Actuated g/C Ratio		0.21			0.21	0.21	0.65	0.65		0.65	0.65	
v/c Ratio		0.42			0.33	0.04	0.06	0.66		0.06	0.42	
Control Delay		28.9			30.4	2.8	5.7	10.1		5.9	8.0	
Queue Delay		0.0			0.0	0.0	0.0	0.1		0.0	0.0	
Total Delay		28.9			30.4	2.8	5.7	10.3		5.9	8.0	
LOS		C			C	A	A	B		A	A	
Approach Delay		28.9			27.2			10.1			8.0	
Approach LOS		C			C			B			A	
Queue Length 50th (m)		13.3			11.0	0.0	1.3	53.4		0.8	25.4	
Queue Length 95th (m)		27.3			22.7	1.2	m2.7	44.8		3.0	41.4	
Internal Link Dist (m)		77.4			127.8			136.5			139.2	
Turn Bay Length (m)							25.0			25.0		
Base Capacity (vph)		302			288	317	472	1099		296	1069	
Starvation Cap Reductn		0			0	0	0	33		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			0.32	0.04	0.06	0.68		0.06	0.42	

Intersection Summary

Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 40 (50%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.66  
 Intersection Signal Delay: 12.3  
 Intersection LOS: B  
 Intersection Capacity Utilization 83.3%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Preston & Beech





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	3	0	0	0	8	705	46	10	503	5
Future Volume (vph)	1	0	3	0	0	0	8	705	46	10	503	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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		0.93						0.99			1.00	
Flt Protected		0.999						0.992			0.999	
Satd. Flow (prot)	0	1470	0	0	0	0	0	1704	0	0	1617	0
Flt Permitted		0.988						0.995			0.987	
Satd. Flow (perm)	0	1453	0	0	0	0	0	1697	0	0	1597	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29						9			1	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		114.6			152.9			73.8			160.5	
Travel Time (s)		8.3			11.0			5.3			11.6	
Confl. Peds. (#/hr)	17		18	18		17	35		45	45		35
Confl. Bikes (#/hr)			8						21			17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	3%	1%	1%	10%	1%
Adj. Flow (vph)	1	0	3	0	0	0	8	705	46	10	503	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	0	0	0	759	0	0	518	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		-2.0			-1.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2					1	2		1	2	
Detector Template	Left	Thru					Left	Thru		Left	Thru	
Leading Detector (m)	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	
Detector 1 Position(m)	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	
Detector 1 Type	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0					0.0	0.0		0.0	0.0	
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			28.7	
Detector 2 Size(m)		1.8						1.8			1.8	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Detector Phase	4	4					2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0					10.0	10.0		10.0	10.0	
Minimum Split (s)	20.5	20.5					28.1	28.1		28.1	28.1	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	21.0	21.0					59.0	59.0		59.0	59.0	
Total Split (%)	26.3%	26.3%					73.8%	73.8%		73.8%	73.8%	
Maximum Green (s)	15.5	15.5					53.9	53.9		53.9	53.9	
Yellow Time (s)	3.3	3.3					3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2					1.8	1.8		1.8	1.8	
Lost Time Adjust (s)			0.0					0.0			0.0	
Total Lost Time (s)		5.5						5.1			5.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	
Recall Mode	None	None					C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0					18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	8.0	8.0					5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	20	20					20	20		20	20	
Act Effct Green (s)		12.0						69.8			69.8	
Actuated g/C Ratio		0.15						0.87			0.87	
v/c Ratio		0.02						0.51			0.37	
Control Delay		0.0						5.7			2.5	
Queue Delay		0.0						0.0			0.0	
Total Delay		0.0						5.7			2.5	
LOS		A						A			A	
Approach Delay								5.7			2.5	
Approach LOS								A			A	
Queue Length 50th (m)		0.0						0.0			0.0	
Queue Length 95th (m)		0.0						82.6			17.7	
Internal Link Dist (m)		90.6			128.9			49.8			136.5	
Turn Bay Length (m)												
Base Capacity (vph)		304						1481			1393	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.01						0.51			0.37	

Intersection Summary

Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 48 (60%), 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: 4.4 Intersection LOS: A  
 Intersection Capacity Utilization 65.7% ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 7: Preston & Pamilla



8: Preston & Adeline  
AM Peak Hour

829 Carling Avenue  
2033 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	49	1	33	20	5	26	14	647	90	37	493	15
Future Volume (vph)	49	1	33	20	5	26	14	647	90	37	493	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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												
Frt		0.946			0.931			0.984			0.996	
Flt Protected		0.971			0.981			0.999			0.997	
Satd. Flow (prot)	0	1603	0	0	1594	0	0	1701	0	0	1688	0
Flt Permitted		0.971			0.981			0.999			0.997	
Satd. Flow (perm)	0	1603	0	0	1594	0	0	1701	0	0	1688	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		113.6			154.3			71.5			73.8	
Travel Time (s)		8.2			11.1			5.1			5.3	
Confl. Peds. (#/hr)							28		45	45		28
Confl. Bikes (#/hr)									21			17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	5%	2%
Adj. Flow (vph)	49	1	33	20	5	26	14	647	90	37	493	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	83	0	0	51	0	0	751	0	0	545	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		-2.0			-2.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 64.2%

ICU Level of Service C

Analysis Period (min) 15



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	50	57	37	701	509	33
Future Volume (vph)	50	57	37	701	509	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.928			0.992		
Flt Protected	0.977			0.997		
Satd. Flow (prot)	1582	0	0	3275	1685	0
Flt Permitted	0.977			0.997		
Satd. Flow (perm)	1582	0	0	3275	1685	0
Link Speed (k/h)	30			50	50	
Link Distance (m)	68.0			65.2	71.5	
Travel Time (s)	8.2			4.7	5.1	
Confl. Peds. (#/hr)				28		28
Confl. Bikes (#/hr)						17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	5%	2%
Adj. Flow (vph)	50	57	37	701	509	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	107	0	0	738	542	0
Enter Blocked Intersection	No	No	Yes	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			2.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	62.7%
	ICU Level of Service B
Analysis Period (min)	15



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	694	286	2	2	213	317	1	4	3	279	4	490
Future Volume (vph)	694	286	2	2	213	317	1	4	3	279	4	490
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	55.0		0.0	30.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	2		0	1		1	0		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.97		0.97		0.96			0.94	0.91
Frt		0.999				0.850		0.949				0.850
Flt Protected	0.950			0.950				0.994			0.953	
Satd. Flow (prot)	3185	1760	0	1674	1762	1498	0	1209	0	0	1668	1469
Flt Permitted	0.459			0.583				0.979			0.724	
Satd. Flow (perm)	1519	1760	0	1002	1762	1460	0	1185	0	0	1187	1340
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						258		3				358
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		233.9			203.3			76.1			164.5	
Travel Time (s)		14.0			12.2			5.5			11.8	
Confl. Peds. (#/hr)	9		15	15		9	25		24	24		25
Confl. Bikes (#/hr)			3						1			2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	1%	1%	1%	1%	1%	50%	25%	1%	50%	3%
Adj. Flow (vph)	694	286	2	2	213	317	1	4	3	279	4	490
Shared Lane Traffic (%)												
Lane Group Flow (vph)	694	288	0	2	213	317	0	8	0	0	283	490
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)		7.0			7.0			0.0			3.5	
Link Offset(m)		2.0			0.0			5.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6		6	8			4		4
Detector Phase	5	2		6	6	6	8	8		4	4	5



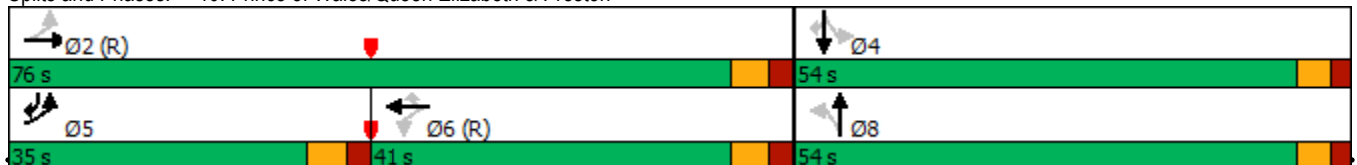


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	5.0
Minimum Split (s)	11.1	32.1		32.1	32.1	32.1	29.5	29.5		29.5	29.5	11.1
Total Split (s)	35.0	76.0		41.0	41.0	41.0	54.0	54.0		54.0	54.0	35.0
Total Split (%)	26.9%	58.5%		31.5%	31.5%	31.5%	41.5%	41.5%		41.5%	41.5%	26.9%
Maximum Green (s)	28.9	69.9		34.9	34.9	34.9	48.5	48.5		48.5	48.5	28.9
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.7
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	2.2	2.2		2.2	2.2	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		5.5			5.5	6.1
Lead/Lag	Lead			Lag			Lag			Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	Max	Max		Max	Max	None
Walk Time (s)		7.0		7.0	7.0	7.0	12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		19.0		19.0	19.0	19.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		20		20	20	20	20	20		20	20	
Act Effct Green (s)	69.9	69.9		39.7	39.7	39.7		48.5			48.5	72.0
Actuated g/C Ratio	0.54	0.54		0.31	0.31	0.31		0.37			0.37	0.55
v/c Ratio	0.62	0.30		0.01	0.40	0.51		0.02			0.64	0.53
Control Delay	20.5	17.7		34.5	39.6	11.5		21.4			28.5	2.4
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	20.5	17.7		34.5	39.6	11.5		21.4			28.5	2.4
LOS	C	B		C	D	B		C			C	A
Approach Delay		19.7			22.8			21.4			12.0	
Approach LOS		B			C			C			B	
Queue Length 50th (m)	48.1	36.2		0.3	39.8	10.1		0.7			45.6	10.1
Queue Length 95th (m)	60.8	53.1		2.3	64.0	36.4		3.9			m46.5	m10.3
Internal Link Dist (m)		209.9			179.3			52.1			140.5	
Turn Bay Length (m)	55.0			30.0		25.0						
Base Capacity (vph)	1187	946		305	537	624		443			442	966
Starvation Cap Reductn	0	0		0	0	0		0			0	21
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.58	0.30		0.01	0.40	0.51		0.02			0.64	0.52

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 7 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.64  
 Intersection Signal Delay: 17.8      Intersection LOS: B  
 Intersection Capacity Utilization 90.8%      ICU Level of Service E  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Prince of Wales/Queen Elizabeth & Preston



4: Preston & Carling  
AM Peak Hour

829 Carling Avenue  
2033 Background Traffic (demand rationalization)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	545	233	253	677	100	278	477	308	132	306	128
Future Volume (vph)	163	545	233	253	677	100	278	477	308	132	306	128
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		0.0	110.0		90.0	75.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.94	0.97		0.98		0.84	0.98	0.98		1.00	0.98	
Frt		0.955				0.850		0.941			0.956	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1595	3035	0	1658	3252	1375	1674	3035	0	1510	1510	0
Flt Permitted	0.950			0.950			0.168			0.355		
Satd. Flow (perm)	1504	3035	0	1620	3252	1153	290	3035	0	562	1510	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		49				143		147			16	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		124.7			193.9			164.5			65.2	
Travel Time (s)		7.5			11.6			11.8			4.7	
Confl. Peds. (#/hr)	90		41	41		90	60		10	10		60
Confl. Bikes (#/hr)			22			10			36			5
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%	2%	2%	4%	10%	1%	4%	2%	12%	6%	20%
Adj. Flow (vph)	163	545	233	253	677	100	278	477	308	132	306	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	163	778	0	253	677	100	278	785	0	132	434	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	3	8		4	4	

4: Preston & Carling  
AM Peak Hour

829 Carling Avenue  
2033 Background Traffic (demand rationalization)

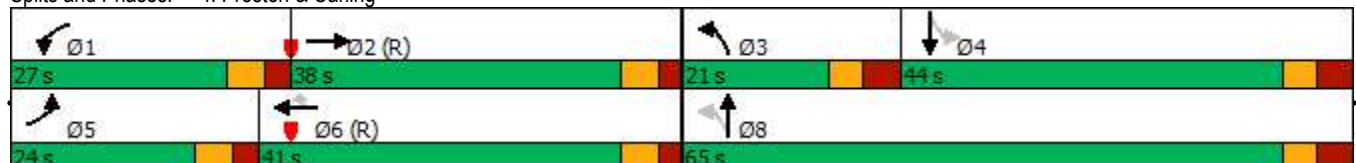


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0		11.2	30.0	30.0	11.9	43.9		43.9	43.9	
Total Split (s)	24.0	38.0		27.0	41.0	41.0	21.0	65.0		44.0	44.0	
Total Split (%)	18.5%	29.2%		20.8%	31.5%	31.5%	16.2%	50.0%		33.8%	33.8%	
Maximum Green (s)	17.8	32.0		20.8	35.0	35.0	14.1	58.1		37.1	37.1	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.3		2.5	2.3	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		6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	Max	
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)		20			20	20		20		20	20	
Act Effct Green (s)	16.4	32.0		20.8	36.4	36.4	58.1	58.1		37.1	37.1	
Actuated g/C Ratio	0.13	0.25		0.16	0.28	0.28	0.45	0.45		0.29	0.29	
v/c Ratio	0.81	0.99		0.95	0.74	0.24	1.00	0.55		0.82	0.98	
Control Delay	88.6	61.5		69.1	41.9	8.7	68.4	8.6		81.5	83.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	88.6	61.5		69.1	41.9	8.7	68.4	8.6		81.5	83.1	
LOS	F	E		E	D	A	E	A		F	F	
Approach Delay		66.2			45.4			24.3			82.8	
Approach LOS		E			D			C			F	
Queue Length 50th (m)	30.1	50.4		54.1	86.8	5.1	42.2	52.1		29.2	98.8	
Queue Length 95th (m)	#64.3	#125.4		m#72.1	m#92.3	m8.5	#94.2	60.3		#62.7	#160.6	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0			110.0		90.0	75.0					
Base Capacity (vph)	218	784		265	911	425	279	1437		160	442	
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	0.75	0.99		0.95	0.74	0.24	1.00	0.55		0.82	0.98	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 88 (68%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 50.5 Intersection LOS: D  
 Intersection Capacity Utilization 108.4% ICU Level of Service G  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Preston & Carling



5: Carling & Booth  
AM Peak Hour

829 Carling Avenue  
2033 Background Traffic (demand rationalization)



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	399	671	711	215	240	189
Future Volume (vph)	399	671	711	215	240	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	75.0			25.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				10.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93			0.78	0.98	0.79
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1674	3252	1728	1498	1674	1427
Fl <sub>t</sub> Permitted	0.950				0.950	
Satd. Flow (perm)	1561	3252	1728	1172	1647	1125
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				65		189
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	70			70	14	85
Confl. Bikes (#/hr)				16		23
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	4%	3%	1%	1%	6%
Adj. Flow (vph)	399	671	711	215	240	189
Shared Lane Traffic (%)						
Lane Group Flow (vph)	399	671	711	215	240	189
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4

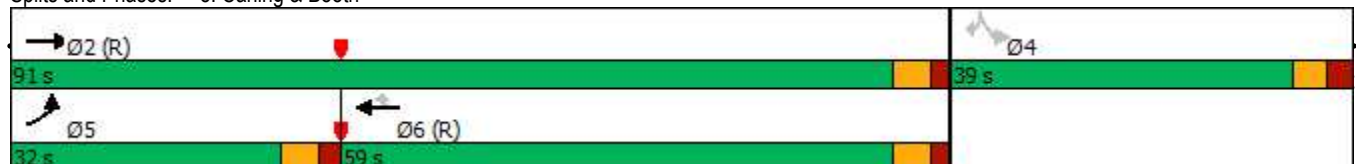


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	15.7	29.7	29.7	39.0	39.0
Total Split (s)	32.0	91.0	59.0	59.0	39.0	39.0
Total Split (%)	24.6%	70.0%	45.4%	45.4%	30.0%	30.0%
Maximum Green (s)	26.1	85.3	53.3	53.3	33.0	33.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			13.0	13.0	7.0	7.0
Flash Dont Walk (s)			11.0	11.0	26.0	26.0
Pedestrian Calls (#/hr)			20	20	20	20
Act Effct Green (s)	31.9	91.1	53.3	53.3	27.2	27.2
Actuated g/C Ratio	0.25	0.70	0.41	0.41	0.21	0.21
v/c Ratio	0.97	0.29	1.00	0.42	0.70	0.49
Control Delay	70.5	2.7	73.3	21.4	57.8	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.5	2.7	73.3	21.4	57.8	9.9
LOS	E	A	E	C	E	A
Approach Delay		28.0	61.3		36.7	
Approach LOS		C	E		D	
Queue Length 50th (m)	~113.2	12.0	~167.1	24.4	49.7	0.0
Queue Length 95th (m)	m#139.3	m15.3	#242.0	44.3	75.0	17.8
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	75.0			25.0		45.0
Base Capacity (vph)	411	2279	708	518	418	426
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	0.97	0.29	1.00	0.42	0.57	0.44

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 16 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 42.2 Intersection LOS: D  
 Intersection Capacity Utilization 104.0% ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carling & Booth



4: Preston & Carling  
AM Peak Hour

829 Carling Avenue  
2033 Background Traffic (Sidney restrictions)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	545	233	253	677	100	288	477	308	164	306	128
Future Volume (vph)	163	545	233	253	677	100	288	477	308	164	306	128
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		0.0	110.0		90.0	75.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.94	0.97		0.98		0.84	0.98	0.98		1.00	0.98	
Frt		0.955				0.850		0.941			0.956	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1595	3035	0	1658	3252	1375	1674	3035	0	1510	1510	0
Flt Permitted	0.950			0.950			0.168			0.355		
Satd. Flow (perm)	1504	3035	0	1620	3252	1153	290	3035	0	562	1510	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		49				143		147			16	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		124.7			193.9			164.5			65.2	
Travel Time (s)		7.5			11.6			11.8			4.7	
Confl. Peds. (#/hr)	90		41	41		90	60		10	10		60
Confl. Bikes (#/hr)			22			10			36			5
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%	2%	2%	4%	10%	1%	4%	2%	12%	6%	20%
Adj. Flow (vph)	163	545	233	253	677	100	288	477	308	164	306	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	163	778	0	253	677	100	288	785	0	164	434	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	3	8		4	4	

4: Preston & Carling  
AM Peak Hour

829 Carling Avenue  
2033 Background Traffic (Sidney restrictions)

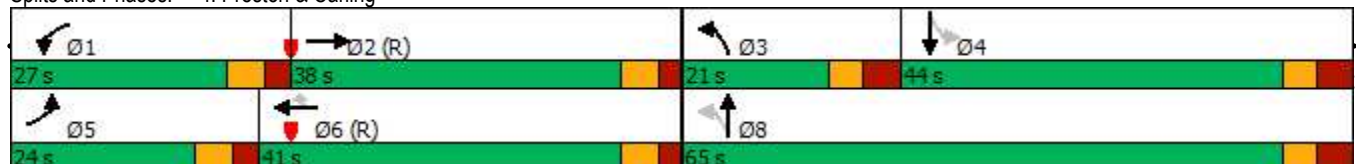


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0		11.2	30.0	30.0	11.9	43.9		43.9	43.9	
Total Split (s)	24.0	38.0		27.0	41.0	41.0	21.0	65.0		44.0	44.0	
Total Split (%)	18.5%	29.2%		20.8%	31.5%	31.5%	16.2%	50.0%		33.8%	33.8%	
Maximum Green (s)	17.8	32.0		20.8	35.0	35.0	14.1	58.1		37.1	37.1	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.3		2.5	2.3	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		6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	Max	
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)		20			20	20		20		20	20	
Act Effct Green (s)	16.4	32.0		20.8	36.4	36.4	58.1	58.1		37.1	37.1	
Actuated g/C Ratio	0.13	0.25		0.16	0.28	0.28	0.45	0.45		0.29	0.29	
v/c Ratio	0.81	0.99		0.95	0.74	0.24	1.03	0.55		1.02	0.98	
Control Delay	88.6	61.5		65.4	41.1	9.0	78.3	8.8		124.0	83.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	88.6	61.5		65.4	41.1	9.0	78.3	8.8		124.0	83.1	
LOS	F	E		E	D	A	E	A		F	F	
Approach Delay		66.2			43.9			27.4			94.4	
Approach LOS		E			D			C			F	
Queue Length 50th (m)	30.1	50.4		53.9	87.2	5.5	~48.1	52.2		~41.1	98.8	
Queue Length 95th (m)	#64.3	#125.4		m#67.4	m89.5	m8.0	#100.7	60.4		#82.3	#160.6	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0			110.0		90.0	75.0					
Base Capacity (vph)	218	784		265	911	425	279	1437		160	442	
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	0.75	0.99		0.95	0.74	0.24	1.03	0.55		1.02	0.98	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 88 (68%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.03  
 Intersection Signal Delay: 53.1  
 Intersection LOS: D  
 Intersection Capacity Utilization 108.9%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Preston & Carling



5: Carling & Booth  
AM Peak Hour

829 Carling Avenue  
2033 Background Traffic (Sidney restrictions)



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	431	671	741	215	240	189
Future Volume (vph)	431	671	741	215	240	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	75.0			25.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				10.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93			0.78	0.98	0.79
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1674	3252	1728	1498	1674	1427
Fl <sub>t</sub> Permitted	0.950				0.950	
Satd. Flow (perm)	1561	3252	1728	1172	1647	1125
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				62		189
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	70			70	14	85
Confl. Bikes (#/hr)				16		23
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	4%	3%	1%	1%	6%
Adj. Flow (vph)	431	671	741	215	240	189
Shared Lane Traffic (%)						
Lane Group Flow (vph)	431	671	741	215	240	189
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4



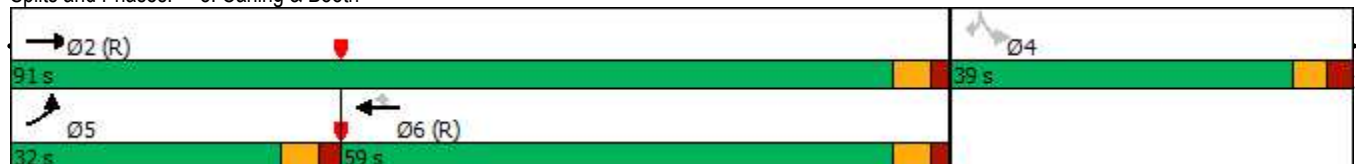


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	15.7	29.7	29.7	39.0	39.0
Total Split (s)	32.0	91.0	59.0	59.0	39.0	39.0
Total Split (%)	24.6%	70.0%	45.4%	45.4%	30.0%	30.0%
Maximum Green (s)	26.1	85.3	53.3	53.3	33.0	33.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			13.0	13.0	7.0	7.0
Flash Dont Walk (s)			11.0	11.0	26.0	26.0
Pedestrian Calls (#/hr)			20	20	20	20
Act Effct Green (s)	31.9	91.1	53.3	53.3	27.2	27.2
Actuated g/C Ratio	0.25	0.70	0.41	0.41	0.21	0.21
v/c Ratio	1.05	0.29	1.05	0.42	0.70	0.49
Control Delay	88.6	2.8	84.3	21.8	57.8	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.6	2.8	84.3	21.8	57.8	9.9
LOS	F	A	F	C	E	A
Approach Delay		36.3	70.2		36.7	
Approach LOS		D	E		D	
Queue Length 50th (m)	~128.7	13.2	~189.6	24.9	49.7	0.0
Queue Length 95th (m)	m#150.0	m14.0	#257.2	44.9	75.0	17.8
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	75.0			25.0		45.0
Base Capacity (vph)	411	2279	708	517	418	426
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	1.05	0.29	1.05	0.42	0.57	0.44

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 16 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 49.4      Intersection LOS: D  
 Intersection Capacity Utilization 107.6%      ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carling & Booth

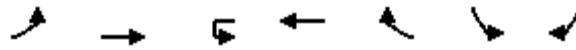




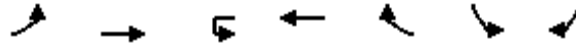
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	89	37	701	509	33
Future Volume (vph)	0	89	37	701	509	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt		0.865			0.992	
Flt Protected				0.997		
Satd. Flow (prot)	0	1510	0	3275	1685	0
Flt Permitted				0.997		
Satd. Flow (perm)	0	1510	0	3275	1685	0
Link Speed (k/h)	30			50	50	
Link Distance (m)	68.0			65.2	71.5	
Travel Time (s)	8.2			4.7	5.1	
Confl. Peds. (#/hr)			28			28
Confl. Bikes (#/hr)						17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	5%	2%
Adj. Flow (vph)	0	89	37	701	509	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	89	0	738	542	0
Enter Blocked Intersection	No	No	Yes	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			2.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	52.8%
ICU Level of Service	A
Analysis Period (min)	15



Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	65	711	13	1303	181	188	7
Future Volume (vph)	65	711	13	1303	181	188	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0		50.0		110.0	0.0	10.0
Storage Lanes	1		1		1	1	1
Taper Length (m)	25.0		25.0			25.0	
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Ped Bike Factor	0.99				0.91	0.99	0.97
Fr <sub>t</sub>					0.850		0.850
Fl <sub>t</sub> Protected	0.950		0.950			0.950	
Satd. Flow (prot)	1674	3252	1674	3316	1498	1674	1498
Fl <sub>t</sub> Permitted	0.950		0.381			0.950	
Satd. Flow (perm)	1654	3252	671	3316	1357	1659	1454
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					181		3
Link Speed (k/h)		60		60		40	
Link Distance (m)		196.1		162.9		242.3	
Travel Time (s)		11.8		9.8		21.8	
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	1.00
Heavy Vehicles (%)	1%	4%	1%	2%	1%	1%	1%
Adj. Flow (vph)	65	711	13	1303	181	188	7
Shared Lane Traffic (%)							
Lane Group Flow (vph)	65	711	13	1303	181	188	7
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	Left	Right	L NA	R NA
Median Width(m)		7.0		7.0		3.5	
Link Offset(m)		0.0		0.0		0.0	
Crosswalk Width(m)		5.0		10.0		5.0	
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14		14	40	14
Number of Detectors	1	2	1	2	1	1	1
Detector Template	Left	Thru	Left	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	6.1	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	1.8	6.1	6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7		28.7			
Detector 2 Size(m)		1.8		1.8			
Detector 2 Type		Cl+Ex		Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)		0.0		0.0			
Turn Type	Prot	NA	Perm	NA	Perm	Perm	Perm
Protected Phases	5	2		6			
Permitted Phases			6		6	4	4
Detector Phase	5	2	6	6	6	4	4



Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.2	33.4	33.4	33.4	33.4	40.1	40.1
Total Split (s)	17.0	99.0	82.0	82.0	82.0	41.0	41.0
Total Split (%)	12.1%	70.7%	58.6%	58.6%	58.6%	29.3%	29.3%
Maximum Green (s)	11.8	92.6	75.6	75.6	75.6	33.9	33.9
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	2.7	2.7	2.7	2.7	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.4	6.4	6.4	6.4	7.1	7.1
Lead/Lag	Lead		Lag	Lag	Lag		
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)		12.0	12.0	12.0	12.0	7.0	7.0
Flash Dont Walk (s)		15.0	15.0	15.0	15.0	26.0	26.0
Pedestrian Calls (#/hr)		20	20	20	20	20	20
Act Effct Green (s)	10.3	100.3	87.2	87.2	87.2	26.2	26.2
Actuated g/C Ratio	0.07	0.72	0.62	0.62	0.62	0.19	0.19
v/c Ratio	0.53	0.31	0.03	0.63	0.20	0.61	0.03
Control Delay	77.4	8.5	6.2	10.0	1.3	59.3	33.3
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	77.4	8.5	6.2	10.1	1.3	59.3	33.3
LOS	E	A	A	B	A	E	C
Approach Delay		14.2		9.0		58.4	
Approach LOS		B		A		E	
Queue Length 50th (m)	16.2	37.7	0.7	68.5	2.2	41.6	0.8
Queue Length 95th (m)	30.2	46.8	m1.6	107.2	4.2	63.9	4.6
Internal Link Dist (m)		172.1		138.9		218.3	
Turn Bay Length (m)	40.0		50.0		110.0		10.0
Base Capacity (vph)	145	2330	417	2064	913	401	354
Starvation Cap Reductn	0	0	0	88	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	0.45	0.31	0.03	0.66	0.20	0.47	0.02

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 7 (5%), Referenced to phase 2:EBT and 6:WBTU, Start of Green  
 Natural Cycle: 85  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.63  
 Intersection Signal Delay: 14.5  
 Intersection LOS: B  
 Intersection Capacity Utilization 72.6%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Carling & Sherwood



2: Carling & Champagne  
PM Peak Hour

829 Carling Avenue  
2033 Background Traffic

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	739	26	27	1164	72	97	0	110	146	0	199
Future Volume (vph)	55	739	26	27	1164	72	97	0	110	146	0	199
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	70.0		30.0	60.0		25.0	0.0		0.0	20.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.95	0.96		0.74	0.95		0.94	0.97		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1409	3283	1483	1658	3316	1498	1658	0	1483	1674	0	1498
Flt Permitted	0.213			0.355			0.950			0.950		
Satd. Flow (perm)	316	3283	1415	594	3316	1106	1580	0	1398	1630	0	1440
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			25			38			110			72
Link Speed (k/h)		60			60			50				50
Link Distance (m)		162.9			117.5			121.7				178.4
Travel Time (s)		9.8			7.1			8.8				12.8
Confl. Peds. (#/hr)	70		70	70		70	20		20	20		20
Confl. Bikes (#/hr)			5			4						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 (%)	20%	3%	2%	2%	2%	1%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	55	739	26	27	1164	72	97	0	110	146	0	199
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	739	26	27	1164	72	97	0	110	146	0	199
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5				3.5
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		5.0			5.0			5.0				5.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1		1	1		1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left		Right	Left		Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1		6.1	6.1		6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1		6.1	6.1		6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 2 Position(m)		28.7			28.7							
Detector 2 Size(m)		1.8			1.8							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm		Perm	Perm		Perm
Protected Phases		2			6							
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	2	2	2	6	6	6	8		8	4		4

2: Carling & Champagne  
PM Peak Hour

829 Carling Avenue  
2033 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0		5.0	10.0		10.0
Minimum Split (s)	15.3	15.3	15.3	25.3	25.3	25.3	24.0		24.0	37.9		37.9
Total Split (s)	95.0	95.0	95.0	95.0	95.0	95.0	45.0		45.0	45.0		45.0
Total Split (%)	67.9%	67.9%	67.9%	67.9%	67.9%	67.9%	32.1%		32.1%	32.1%		32.1%
Maximum Green (s)	89.7	89.7	89.7	89.7	89.7	89.7	39.0		39.0	39.1		39.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0		3.0	3.3		3.3
All-Red Time (s)	1.6	1.6	1.6	1.6	1.6	1.6	3.0		3.0	2.6		2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	6.0		6.0	5.9		5.9
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None		None	None		None
Walk Time (s)				10.0	10.0	10.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)				10.0	10.0	10.0	11.0		11.0	25.0		25.0
Pedestrian Calls (#/hr)				20	20	20	20		20	20		20
Act Effct Green (s)	104.3	104.3	104.3	104.3	104.3	104.3	24.4		24.4	24.5		24.5
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.74	0.74	0.17		0.17	0.18		0.18
v/c Ratio	0.23	0.30	0.02	0.06	0.47	0.09	0.35		0.33	0.51		0.64
Control Delay	10.1	7.2	2.5	3.0	3.2	1.9	52.0		10.2	56.9		41.8
Queue Delay	0.0	0.0	0.0	0.0	0.3	0.0	0.0		0.0	0.0		0.0
Total Delay	10.1	7.2	2.5	3.0	3.5	1.9	52.0		10.2	56.9		41.8
LOS	B	A	A	A	A	A	D		B	E		D
Approach Delay		7.3			3.4			29.8				48.2
Approach LOS		A			A			C				D
Queue Length 50th (m)	3.1	21.8	0.4	1.1	24.4	0.7	20.5		0.0	31.8		28.3
Queue Length 95th (m)	16.7	32.9	m1.5	m2.3	27.2	2.0	35.6		14.0	51.0		51.6
Internal Link Dist (m)		138.9			93.5			97.7				154.4
Turn Bay Length (m)	70.0		30.0	60.0		25.0				20.0		
Base Capacity (vph)	235	2446	1061	442	2471	833	440		468	455		454
Starvation Cap Reductn	0	0	0	0	603	0	0		0	0		0
Spillback Cap Reductn	0	0	0	0	44	0	0		0	0		0
Storage Cap Reductn	0	0	0	0	0	0	0		0	0		0
Reduced v/c Ratio	0.23	0.30	0.02	0.06	0.62	0.09	0.22		0.24	0.32		0.44

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 5 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.64  
 Intersection Signal Delay: 12.5 Intersection LOS: B  
 Intersection Capacity Utilization 74.6% ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Carling & Champagne



3: Trillium Pathway & Carling  
PM Peak Hour

829 Carling Avenue  
2033 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑							
Traffic Volume (vph)	0	1036	0	0	1297	0	0	0	0	0	0	0
Future Volume (vph)	0	1036	0	0	1297	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected												
Satd. Flow (prot)	0	3283	0	0	3316	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3283	0	0	3316	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (k/h)	60				60				50			
Link Distance (m)	117.5				124.7				157.3			
Travel Time (s)	7.1				7.5				11.3			
Confl. Peds. (#/hr)	35					35	25			35	35	25
Confl. Bikes (#/hr)			11			10			13			34
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	1036	0	0	1297	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1036	0	0	1297	0	0	0	0	0	0	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)	7.0				7.0				0.0			
Link Offset(m)	0.0				0.0				0.0			
Crosswalk Width(m)	5.0				5.0				5.0			
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14		24	14		24	14		24	14	
Number of Detectors	2				2							
Detector Template	Thru				Thru							
Leading Detector (m)	30.5				30.5							
Trailing Detector (m)	0.0				0.0							
Detector 1 Position(m)	0.0				0.0							
Detector 1 Size(m)	1.8				1.8							
Detector 1 Type	CI+Ex				CI+Ex							
Detector 1 Channel												
Detector 1 Extend (s)	0.0				0.0							
Detector 1 Queue (s)	0.0				0.0							
Detector 1 Delay (s)	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	NA				NA							
Protected Phases	2				6							
Permitted Phases												
Detector Phase	2				6							
Switch Phase												
Minimum Initial (s)	10.0				10.0							
Minimum Split (s)	25.1				25.1							

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	35.6



3: Trillium Pathway & Carling  
PM Peak Hour

829 Carling Avenue  
2033 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)		104.0			104.0							
Total Split (%)		74.3%			74.3%							
Maximum Green (s)		98.9			98.9							
Yellow Time (s)		3.7			3.7							
All-Red Time (s)		1.4			1.4							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		5.1			5.1							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0							
Recall Mode		C-Max			C-Max							
Walk Time (s)		15.0			15.0							
Flash Dont Walk (s)		5.0			5.0							
Pedestrian Calls (#/hr)		20			20							
Act Effct Green (s)		115.6			115.6							
Actuated g/C Ratio		0.83			0.83							
v/c Ratio		0.38			0.47							
Control Delay		4.2			2.2							
Queue Delay		0.1			0.1							
Total Delay		4.3			2.3							
LOS		A			A							
Approach Delay		4.3			2.3							
Approach LOS		A			A							
Queue Length 50th (m)		34.7			26.4							
Queue Length 95th (m)		42.5			m25.8							
Internal Link Dist (m)		93.5			100.7			133.3			30.9	
Turn Bay Length (m)												
Base Capacity (vph)		2710			2737							
Starvation Cap Reductn		636			414							
Spillback Cap Reductn		244			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.50			0.56							

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 108 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.47  
 Intersection Signal Delay: 3.2 Intersection LOS: A  
 Intersection Capacity Utilization 42.1% ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Trillium Pathway & Carling

Ø2 (R) 104 s	Ø4 36 s
Ø5 (R) 104 s	

Lane Group	Ø4
Total Split (s)	36.0
Total Split (%)	26%
Maximum Green (s)	29.4
Yellow Time (s)	3.0
All-Red Time (s)	3.6
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	22.0
Pedestrian Calls (#/hr)	20
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
2033 Background Traffic

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	179	577	374	366	868	66	355	373	204	109	338	124
Future Volume (vph)	179	577	374	366	868	66	355	373	204	109	338	124
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		0.0	110.0		90.0	75.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.97	0.97		0.98		0.89	0.98	0.97		0.97	0.98	
Frt		0.941				0.850		0.947			0.960	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1610	3005	0	1674	3316	1427	1674	3061	0	1537	1625	0
Flt Permitted	0.950			0.950			0.096			0.435		
Satd. Flow (perm)	1566	3005	0	1648	3316	1272	166	3061	0	684	1625	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		103				132		92			13	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		124.7			193.9			164.5			65.2	
Travel Time (s)		7.5			11.6			11.8			4.7	
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 (%)	5%	3%	2%	1%	2%	6%	1%	2%	1%	10%	2%	5%
Adj. Flow (vph)	179	577	374	366	868	66	355	373	204	109	338	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	179	951	0	366	868	66	355	577	0	109	462	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	3	8		4	4	

4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
2033 Background Traffic

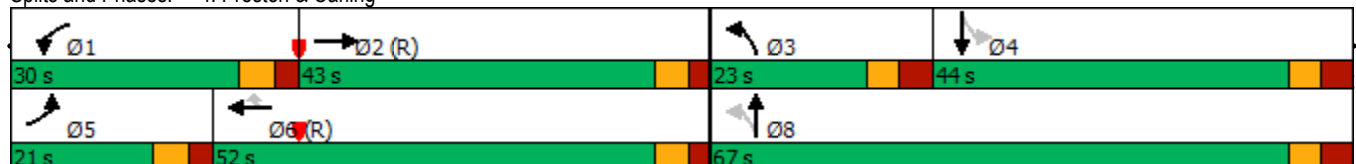


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0		11.2	30.0	30.0	11.9	43.9		43.9	43.9	
Total Split (s)	21.0	43.0		30.0	52.0	52.0	23.0	67.0		44.0	44.0	
Total Split (%)	15.0%	30.7%		21.4%	37.1%	37.1%	16.4%	47.9%		31.4%	31.4%	
Maximum Green (s)	14.8	37.0		23.8	46.0	46.0	16.1	60.1		37.1	37.1	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.3		2.5	2.3	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		6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	Max	
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)		20			20	20		20		20	20	
Act Effct Green (s)	14.8	37.0		23.8	46.0	46.0	60.1	60.1		37.1	37.1	
Actuated g/C Ratio	0.11	0.26		0.17	0.33	0.33	0.43	0.43		0.26	0.26	
v/c Ratio	1.05	1.09		1.29	0.80	0.13	1.45	0.42		0.60	1.05	
Control Delay	147.9	88.8		180.4	38.6	2.1	251.8	6.3		60.8	104.3	
Queue Delay	0.0	2.4		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	147.9	91.2		180.4	38.6	2.1	251.8	6.3		60.8	104.3	
LOS	F	F		F	D	A	F	A		E	F	
Approach Delay		100.1			76.7			99.8			96.0	
Approach LOS		F			E			F			F	
Queue Length 50th (m)	~47.1	~134.0		~117.4	115.7	0.0	~107.2	28.0		24.5	~125.6	
Queue Length 95th (m)	#91.3	#167.1		m#134.5	m119.2	m0.0	m#167.0	35.8		44.7	#187.3	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0			110.0		90.0	75.0					
Base Capacity (vph)	170	869		284	1089	506	244	1366		181	440	
Starvation Cap Reductn	0	16		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	1.05	1.11		1.29	0.80	0.13	1.45	0.42		0.60	1.05	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.45  
 Intersection Signal Delay: 91.7 Intersection LOS: F  
 Intersection Capacity Utilization 125.3% 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Preston & Carling



5: Carling & Booth  
PM Peak Hour

829 Carling Avenue  
2033 Background Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	254	697	894	104	308	323
Future Volume (vph)	254	697	894	104	308	323
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	75.0			25.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				10.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.95			0.79	0.98	0.75
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1674	3316	1745	1498	1674	1483
Fl <sub>t</sub> Permitted	0.950				0.950	
Satd. Flow (perm)	1583	3316	1745	1181	1647	1117
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				28		262
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	65			65	13	81
Confl. Bikes (#/hr)				10		45
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	2%	1%	1%	2%
Adj. Flow (vph)	254	697	894	104	308	323
Shared Lane Traffic (%)						
Lane Group Flow (vph)	254	697	894	104	308	323
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	15.7	29.7	29.7	39.0	39.0
Total Split (s)	24.0	101.0	77.0	77.0	39.0	39.0
Total Split (%)	17.1%	72.1%	55.0%	55.0%	27.9%	27.9%
Maximum Green (s)	18.1	95.3	71.3	71.3	33.0	33.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			13.0	13.0	7.0	7.0
Flash Dont Walk (s)			11.0	11.0	26.0	26.0
Pedestrian Calls (#/hr)			20	20	20	20
Act Effct Green (s)	21.2	98.4	71.3	71.3	29.9	29.9
Actuated g/C Ratio	0.15	0.70	0.51	0.51	0.21	0.21
v/c Ratio	1.00	0.30	1.01	0.17	0.88	0.73
Control Delay	88.5	6.2	66.1	14.1	77.9	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.5	6.2	66.1	14.1	77.9	20.9
LOS	F	A	E	B	E	C
Approach Delay		28.2	60.7		48.7	
Approach LOS		C	E		D	
Queue Length 50th (m)	~75.4	44.0	~226.5	9.9	74.4	12.7
Queue Length 95th (m)	m#88.2	m45.4	#309.3	19.8	#113.7	47.1
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	75.0			25.0		45.0
Base Capacity (vph)	253	2330	888	615	388	463
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	1.00	0.30	1.01	0.17	0.79	0.70

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 62 (44%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.01  
 Intersection Signal Delay: 45.8  
 Intersection LOS: D  
 Intersection Capacity Utilization 106.0%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carling & Booth



6: Preston & Beech  
PM Peak Hour

829 Carling Avenue  
2033 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↗	↗	↗	↗	↗	↗
Traffic Volume (vph)	29	41	34	46	121	31	82	476	59	17	505	54
Future Volume (vph)	29	41	34	46	121	31	82	476	59	17	505	54
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	25.0		0.0	25.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	25.0			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		0.93			0.97	0.84	0.97	0.98		0.95	0.99	
Frt		0.956				0.850		0.983			0.986	
Flt Protected		0.986			0.986		0.950			0.950		
Satd. Flow (prot)	0	1584	0	0	1738	1498	1674	1674	0	1674	1673	0
Flt Permitted		0.874			0.896		0.402			0.417		
Satd. Flow (perm)	0	1373	0	0	1537	1261	685	1674	0	695	1673	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24				31		16			14	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		101.4			151.8			160.5			163.2	
Travel Time (s)		7.3			10.9			11.6			11.8	
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 (%)	1%	1%	1%	1%	1%	1%	1%	3%	1%	1%	4%	2%
Adj. Flow (vph)	29	41	34	46	121	31	82	476	59	17	505	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	104	0	0	167	31	82	535	0	17	559	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	

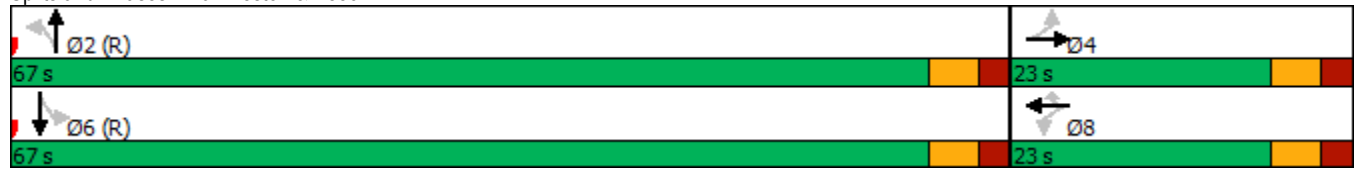


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	22.6	22.6		22.6	22.6	22.6	33.5	33.5		33.5	33.5	
Total Split (s)	23.0	23.0		23.0	23.0	23.0	67.0	67.0		67.0	67.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%	25.6%	74.4%	74.4%		74.4%	74.4%	
Maximum Green (s)	17.4	17.4		17.4	17.4	17.4	61.5	61.5		61.5	61.5	
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3	2.3	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.6			5.6	5.6	5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Ped	Ped		Ped	Ped	Ped	C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	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	10.0	
Pedestrian Calls (#/hr)	20	20		20	20	20	20	20		20	20	
Act Effct Green (s)		17.1			17.1	17.1	61.8	61.8		61.8	61.8	
Actuated g/C Ratio		0.19			0.19	0.19	0.69	0.69		0.69	0.69	
v/c Ratio		0.37			0.57	0.12	0.17	0.46		0.04	0.49	
Control Delay		28.8			41.7	12.2	2.5	4.8		4.9	8.2	
Queue Delay		0.0			0.0	0.0	0.0	0.1		0.0	0.0	
Total Delay		28.8			41.7	12.2	2.5	4.9		4.9	8.2	
LOS		C			D	B	A	A		A	A	
Approach Delay		28.8			37.1			4.6			8.1	
Approach LOS		C			D			A			A	
Queue Length 50th (m)		11.1			24.4	0.0	2.6	35.4		0.8	34.9	
Queue Length 95th (m)		24.5			42.6	6.6	0.5	1.7		2.6	54.7	
Internal Link Dist (m)		77.4			127.8			136.5			139.2	
Turn Bay Length (m)							25.0			25.0		
Base Capacity (vph)		284			297	268	470	1153		477	1152	
Starvation Cap Reductn		0			0	0	0	99		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		0.37			0.56	0.12	0.17	0.51		0.04	0.49	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 43 (48%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.57  
 Intersection Signal Delay: 11.9      Intersection LOS: B  
 Intersection Capacity Utilization 87.1%      ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 6: Preston & Beech







Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	2	10	0	0	0	8	574	27	6	572	15
Future Volume (vph)	4	2	10	0	0	0	8	574	27	6	572	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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		0.92						0.99			1.00	
Flt Protected		0.916						0.994			0.997	
Flt Permitted		0.988						0.999			0.999	
Satd. Flow (prot)	0	1494	0	0	0	0	0	1709	0	0	1717	0
Satd. Flow (perm)	0	1466	0	0	0	0	0	1698	0	0	1710	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10						6			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		114.6			152.9			73.8			160.5	
Travel Time (s)		8.3			11.0			5.3			11.6	
Confl. Peds. (#/hr)	25		27	27		25	46		47	47		46
Confl. Bikes (#/hr)			1			3			21			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 (%)	1%	1%	1%	2%	2%	2%	1%	3%	1%	1%	3%	1%
Adj. Flow (vph)	4	2	10	0	0	0	8	574	27	6	572	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	0	0	0	609	0	0	593	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		-2.0			-1.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2					1	2		1	2	
Detector Template	Left	Thru					Left	Thru		Left	Thru	
Leading Detector (m)	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	
Detector 1 Position(m)	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	
Detector 1 Type	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0					0.0	0.0		0.0	0.0	
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			28.7	
Detector 2 Size(m)		1.8						1.8			1.8	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Detector Phase	4	4					2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0					10.0	10.0		10.0	10.0	
Minimum Split (s)	20.5	20.5					28.1	28.1		28.1	28.1	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	21.0	21.0					69.0	69.0		69.0	69.0	
Total Split (%)	23.3%	23.3%					76.7%	76.7%		76.7%	76.7%	
Maximum Green (s)	15.5	15.5					63.9	63.9		63.9	63.9	
Yellow Time (s)	3.3	3.3					3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2					1.8	1.8		1.8	1.8	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.5						5.1			5.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	
Recall Mode	None	None					C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0					18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	8.0	8.0					5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	20	20					20	20		20	20	
Act Effct Green (s)		12.0						75.6			75.6	
Actuated g/C Ratio		0.13						0.84			0.84	
v/c Ratio		0.08						0.43			0.41	
Control Delay		21.9						4.9			3.6	
Queue Delay		0.0						0.0			0.0	
Total Delay		21.9						4.9			3.6	
LOS		C						A			A	
Approach Delay		21.9						4.9			3.6	
Approach LOS		C						A			A	
Queue Length 50th (m)		0.9						26.7			21.0	
Queue Length 95th (m)		5.8						54.3			32.6	
Internal Link Dist (m)		90.6			128.9			49.8			136.5	
Turn Bay Length (m)												
Base Capacity (vph)		260						1428			1437	
Starvation Cap Reductn		0						0			71	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.06						0.43			0.43	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 27 (30%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.43

Intersection Signal Delay: 4.5

Intersection LOS: A

Intersection Capacity Utilization 58.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 7: Preston & Pamilla



8: Preston & Adeline  
PM Peak Hour

829 Carling Avenue  
2033 Background Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	34	4	25	22	2	17	37	513	48	23	577	5
Future Volume (vph)	34	4	25	22	2	17	37	513	48	23	577	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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												
Frt		0.946			0.944			0.989			0.999	
Flt Protected		0.974			0.974			0.997			0.998	
Satd. Flow (prot)	0	1608	0	0	1605	0	0	1706	0	0	1724	0
Flt Permitted		0.974			0.974			0.997			0.998	
Satd. Flow (perm)	0	1608	0	0	1605	0	0	1706	0	0	1724	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		113.6			154.3			71.5			73.8	
Travel Time (s)		8.2			11.1			5.1			5.3	
Confl. Peds. (#/hr)							46		47	47		46
Confl. Bikes (#/hr)									21			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 (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Adj. Flow (vph)	34	4	25	22	2	17	37	513	48	23	577	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	63	0	0	41	0	0	598	0	0	605	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		-2.0			-2.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 58.9%

ICU Level of Service B

Analysis Period (min) 15



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	26	30	44	572	541	75
Future Volume (vph)	26	30	44	572	541	75
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.928			0.984		
Flt Protected	0.977			0.996		
Satd. Flow (prot)	1582	0	0	3273	1703	0
Flt Permitted	0.977			0.996		
Satd. Flow (perm)	1582	0	0	3273	1703	0
Link Speed (k/h)	30			50	50	
Link Distance (m)	68.0			65.2	71.5	
Travel Time (s)	8.2			4.7	5.1	
Confl. Peds. (#/hr)				46		47
Confl. Bikes (#/hr)						14
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%
Adj. Flow (vph)	26	30	44	572	541	75
Shared Lane Traffic (%)						
Lane Group Flow (vph)	56	0	0	616	616	0
Enter Blocked Intersection	No	No	Yes	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			2.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	62.2%
	ICU Level of Service B
Analysis Period (min)	15



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	475	280	4	2	416	433	5	2	1	414	0	648
Future Volume (vph)	475	280	4	2	416	433	5	2	1	414	0	648
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	55.0		0.0	30.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	2		0	1		1	0		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.89		0.93		0.93			0.81	0.77
Frt		0.998				0.850		0.983				0.850
Flt Protected	0.950			0.950				0.970			0.950	
Satd. Flow (prot)	3185	1754	0	1674	1762	1498	0	1637	0	0	1674	1483
Flt Permitted	0.224			0.586				0.851			0.752	
Satd. Flow (perm)	751	1754	0	917	1762	1397	0	1373	0	0	1077	1144
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				165		1				88
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		233.9			203.3			76.1			164.5	
Travel Time (s)		14.0			12.2			5.5			11.8	
Confl. Peds. (#/hr)	35		62	62		35	73		65	65		73
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 (%)	3%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%
Adj. Flow (vph)	475	280	4	2	416	433	5	2	1	414	0	648
Shared Lane Traffic (%)												
Lane Group Flow (vph)	475	284	0	2	416	433	0	8	0	0	414	648
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)		7.0			7.0			0.0				3.5
Link Offset(m)		2.0			0.0			5.0				0.0
Crosswalk Width(m)		5.0			10.0			5.0				5.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6		6	8			4		4
Detector Phase	5	2		6	6	6	8	8		4	4	5
Switch Phase												

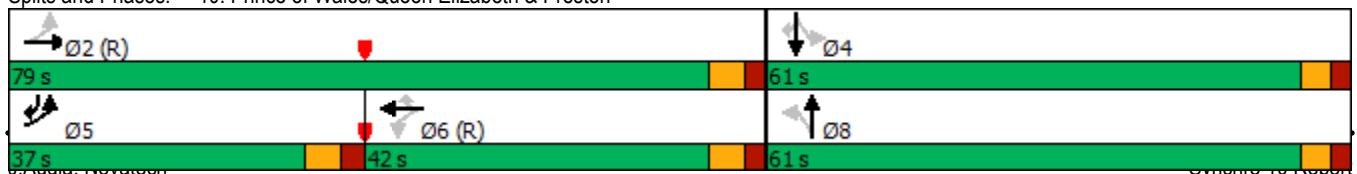


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	5.0
Minimum Split (s)	11.1	32.1		32.1	32.1	32.1	29.5	29.5		29.5	29.5	11.1
Total Split (s)	37.0	79.0		42.0	42.0	42.0	61.0	61.0		61.0	61.0	37.0
Total Split (%)	26.4%	56.4%		30.0%	30.0%	30.0%	43.6%	43.6%		43.6%	43.6%	26.4%
Maximum Green (s)	30.9	72.9		35.9	35.9	35.9	55.5	55.5		55.5	55.5	30.9
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.7
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	2.2	2.2		2.2	2.2	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		5.5			5.5	6.1
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	Max	Max		Max	Max	None
Walk Time (s)		7.0		7.0	7.0	7.0	12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		19.0		19.0	19.0	19.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		20		20	20	20	20	20		20	20	
Act Effct Green (s)	72.9	72.9		44.4	44.4	44.4		55.5			55.5	77.3
Actuated g/C Ratio	0.52	0.52		0.32	0.32	0.32		0.40			0.40	0.55
v/c Ratio	0.61	0.31		0.01	0.75	0.78		0.01			0.97	0.89
Control Delay	22.6	20.3		38.0	53.4	38.3		24.4			43.4	12.0
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.1
Total Delay	22.6	20.3		38.0	53.4	38.3		24.4			43.4	12.1
LOS	C	C		D	D	D		C			D	B
Approach Delay		21.7			45.7			24.4			24.3	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	34.2	40.2		0.3	92.9	63.4		1.1			90.9	57.8
Queue Length 95th (m)	44.4	58.1		2.5	#159.3	#128.8		4.4			m64.4	m22.3
Internal Link Dist (m)		209.9			179.3			52.1			140.5	
Turn Bay Length (m)	55.0			30.0		25.0						
Base Capacity (vph)	928	913		290	558	555		544			426	809
Starvation Cap Reductn	0	0		0	0	0		0			0	6
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.51	0.31		0.01	0.75	0.78		0.01			0.97	0.81

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 53 (38%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 30.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 105.3%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Prince of Wales/Queen Elizabeth & Preston



4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
2033 Background Traffic (demand rationalization)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	507	374	276	868	66	265	373	204	109	308	124
Future Volume (vph)	169	507	374	276	868	66	265	373	204	109	308	124
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		0.0	110.0		90.0	75.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.97	0.97		0.98		0.89	0.98	0.97		0.97	0.98	
Frt		0.936				0.850		0.947			0.957	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1610	2982	0	1674	3316	1427	1674	3061	0	1537	1617	0
Flt Permitted	0.950			0.950			0.134			0.435		
Satd. Flow (perm)	1566	2982	0	1645	3316	1272	231	3061	0	684	1617	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		129				132		92			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		124.7			193.9			164.5			65.2	
Travel Time (s)		7.5			11.6			11.8			4.7	
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 (%)	5%	3%	2%	1%	2%	6%	1%	2%	1%	10%	2%	5%
Adj. Flow (vph)	169	507	374	276	868	66	265	373	204	109	308	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	169	881	0	276	868	66	265	577	0	109	432	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	3	8		4	4	

4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
2033 Background Traffic (demand rationalization)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0		11.2	30.0	30.0	11.9	43.9		43.9	43.9	
Total Split (s)	21.0	43.0		30.0	52.0	52.0	23.0	67.0		44.0	44.0	
Total Split (%)	15.0%	30.7%		21.4%	37.1%	37.1%	16.4%	47.9%		31.4%	31.4%	
Maximum Green (s)	14.8	37.0		23.8	46.0	46.0	16.1	60.1		37.1	37.1	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.3		2.5	2.3	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		6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	Max	
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)		20			20	20		20		20	20	
Act Effct Green (s)	14.8	37.0		23.8	46.0	46.0	60.1	60.1		37.1	37.1	
Actuated g/C Ratio	0.11	0.26		0.17	0.33	0.33	0.43	0.43		0.26	0.26	
v/c Ratio	0.99	1.00		0.97	0.80	0.13	1.00	0.42		0.60	0.99	
Control Delay	135.9	56.5		73.5	37.8	2.2	81.2	5.8		60.8	89.0	
Queue Delay	0.0	16.4		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	135.9	72.9		73.5	37.8	2.2	81.2	5.8		60.8	89.0	
LOS	F	E		E	D	A	F	A		E	F	
Approach Delay		83.0			44.0			29.6			83.3	
Approach LOS		F			D			C			F	
Queue Length 50th (m)	36.5	55.7		67.1	116.2	0.0	-46.6	27.6		24.5	107.2	
Queue Length 95th (m)	#84.1	#142.7		m#84.3	m119.7	m0.0	m#97.6	35.4		44.7	#170.3	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0			110.0		90.0	75.0					
Base Capacity (vph)	170	883		284	1089	506	265	1366		181	438	
Starvation Cap Reductn	0	45		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	0.99	1.05		0.97	0.80	0.13	1.00	0.42		0.60	0.99	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

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

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 57.7

Intersection LOS: E

Intersection Capacity Utilization 112.9%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

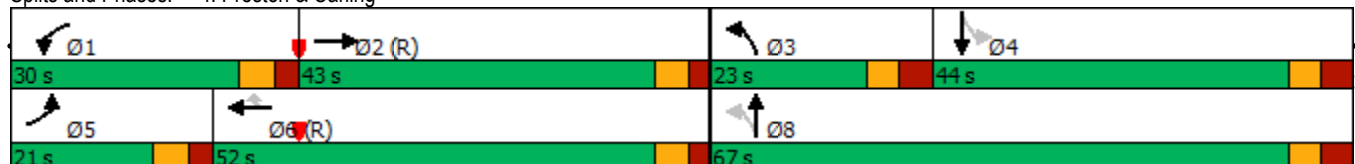
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 4: Preston & Carling





5: Carling & Booth  
PM Peak Hour

829 Carling Avenue  
2033 Background Traffic (demand rationalization)



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	254	697	884	104	308	323
Future Volume (vph)	254	697	884	104	308	323
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	75.0			25.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				10.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.95			0.79	0.98	0.75
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1674	3316	1745	1498	1674	1483
Fl <sub>t</sub> Permitted	0.950				0.950	
Satd. Flow (perm)	1583	3316	1745	1181	1647	1117
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				28		262
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	65			65	13	81
Confl. Bikes (#/hr)				10		45
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	2%	1%	1%	2%
Adj. Flow (vph)	254	697	884	104	308	323
Shared Lane Traffic (%)						
Lane Group Flow (vph)	254	697	884	104	308	323
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	15.7	29.7	29.7	39.0	39.0
Total Split (s)	24.0	101.0	77.0	77.0	39.0	39.0
Total Split (%)	17.1%	72.1%	55.0%	55.0%	27.9%	27.9%
Maximum Green (s)	18.1	95.3	71.3	71.3	33.0	33.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			13.0	13.0	7.0	7.0
Flash Dont Walk (s)			11.0	11.0	26.0	26.0
Pedestrian Calls (#/hr)			20	20	20	20
Act Effct Green (s)	21.2	98.4	71.3	71.3	29.9	29.9
Actuated g/C Ratio	0.15	0.70	0.51	0.51	0.21	0.21
v/c Ratio	1.00	0.30	1.00	0.17	0.88	0.73
Control Delay	98.1	6.1	63.4	14.1	77.9	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.1	6.1	63.4	14.1	77.9	20.9
LOS	F	A	E	B	E	C
Approach Delay		30.7	58.2		48.7	
Approach LOS		C	E		D	
Queue Length 50th (m)	~76.1	39.4	218.6	9.9	74.4	12.7
Queue Length 95th (m)	m#99.3	m44.9	#304.1	19.8	#113.7	47.1
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	75.0			25.0		45.0
Base Capacity (vph)	253	2330	888	615	388	463
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	1.00	0.30	1.00	0.17	0.79	0.70

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 62 (44%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 45.7  
 Intersection LOS: D  
 Intersection Capacity Utilization 105.5%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carling & Booth





4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
2033 Background Traffic (Sidney restrictions)

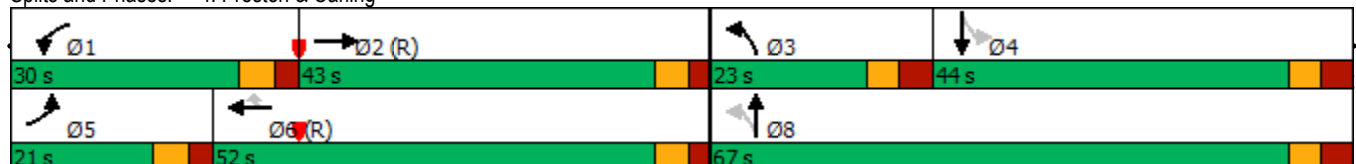


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0		11.2	30.0	30.0	11.9	43.9		43.9	43.9	
Total Split (s)	21.0	43.0		30.0	52.0	52.0	23.0	67.0		44.0	44.0	
Total Split (%)	15.0%	30.7%		21.4%	37.1%	37.1%	16.4%	47.9%		31.4%	31.4%	
Maximum Green (s)	14.8	37.0		23.8	46.0	46.0	16.1	60.1		37.1	37.1	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.3		2.5	2.3	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		6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	Max	
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)		20			20	20		20		20	20	
Act Effct Green (s)	14.8	37.0		23.8	46.0	46.0	60.1	60.1		37.1	37.1	
Actuated g/C Ratio	0.11	0.26		0.17	0.33	0.33	0.43	0.43		0.26	0.26	
v/c Ratio	1.05	1.09		1.29	0.80	0.13	1.45	0.42		0.72	1.05	
Control Delay	147.9	88.8		180.4	38.6	2.1	251.8	6.3		69.9	104.3	
Queue Delay	0.0	2.4		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	147.9	91.2		180.4	38.6	2.1	251.8	6.3		69.9	104.3	
LOS	F	F		F	D	A	F	A		E	F	
Approach Delay		100.1			76.7			99.8			96.8	
Approach LOS		F			E			F			F	
Queue Length 50th (m)	~47.1	~134.0		~117.4	115.7	0.0	~107.2	28.0		30.3	~125.6	
Queue Length 95th (m)	#91.3	#167.1		m#134.5	m119.2	m0.0	m#167.0	35.8		#59.5	#187.3	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0			110.0		90.0	75.0					
Base Capacity (vph)	170	869		284	1089	506	244	1366		181	440	
Starvation Cap Reductn	0	16		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	1.05	1.11		1.29	0.80	0.13	1.45	0.42		0.72	1.05	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.45  
 Intersection Signal Delay: 91.8  
 Intersection LOS: F  
 Intersection Capacity Utilization 125.3%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Preston & Carling



5: Carling & Booth  
PM Peak Hour

829 Carling Avenue  
2033 Background Traffic (Sidney restrictions)



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	275	697	894	104	308	323
Future Volume (vph)	275	697	894	104	308	323
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	75.0			25.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				10.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.95			0.79	0.98	0.75
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1674	3316	1745	1498	1674	1483
Fl <sub>t</sub> Permitted	0.950				0.950	
Satd. Flow (perm)	1583	3316	1745	1181	1647	1117
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				28		262
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	65			65	13	81
Confl. Bikes (#/hr)				10		45
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	2%	1%	1%	2%
Adj. Flow (vph)	275	697	894	104	308	323
Shared Lane Traffic (%)						
Lane Group Flow (vph)	275	697	894	104	308	323
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	15.7	29.7	29.7	39.0	39.0
Total Split (s)	24.0	101.0	77.0	77.0	39.0	39.0
Total Split (%)	17.1%	72.1%	55.0%	55.0%	27.9%	27.9%
Maximum Green (s)	18.1	95.3	71.3	71.3	33.0	33.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			13.0	13.0	7.0	7.0
Flash Dont Walk (s)			11.0	11.0	26.0	26.0
Pedestrian Calls (#/hr)			20	20	20	20
Act Effct Green (s)	21.2	98.4	71.3	71.3	29.9	29.9
Actuated g/C Ratio	0.15	0.70	0.51	0.51	0.21	0.21
v/c Ratio	1.09	0.30	1.01	0.17	0.88	0.73
Control Delay	110.1	6.0	66.1	14.1	77.9	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.1	6.0	66.1	14.1	77.9	20.9
LOS	F	A	E	B	E	C
Approach Delay		35.4	60.7		48.7	
Approach LOS		D	E		D	
Queue Length 50th (m)	~86.3	42.2	~226.5	9.9	74.4	12.7
Queue Length 95th (m)	m#100.0	m43.5	#309.3	19.8	#113.7	47.1
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	75.0			25.0		45.0
Base Capacity (vph)	253	2330	888	615	388	463
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	1.09	0.30	1.01	0.17	0.79	0.70

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 62 (44%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.09  
 Intersection Signal Delay: 48.4      Intersection LOS: D  
 Intersection Capacity Utilization 107.3%      ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carling & Booth





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	51	44	572	541	75
Future Volume (vph)	0	51	44	572	541	75
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt		0.865			0.984	
Flt Protected				0.996		
Satd. Flow (prot)	0	1510	0	3273	1703	0
Flt Permitted				0.996		
Satd. Flow (perm)	0	1510	0	3273	1703	0
Link Speed (k/h)	30			50	50	
Link Distance (m)	68.0			65.2	71.5	
Travel Time (s)	8.2			4.7	5.1	
Confl. Peds. (#/hr)			46			47
Confl. Bikes (#/hr)						14
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%
Adj. Flow (vph)	0	51	44	572	541	75
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	51	0	616	616	0
Enter Blocked Intersection	No	No	Yes	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			2.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.4%
	ICU Level of Service B
Analysis Period (min)	15

## **APPENDIX K**

---

### Transportation Demand Management



# **TRANSPORTATION DEMAND MANAGEMENT**

---

## TDM-Supportive Development Design and Infrastructure Checklist

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

<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

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
<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"/>

<b>TDM-supportive design &amp; infrastructure measures: <i>Non-residential developments</i></b>		<b>Check if completed &amp; add descriptions, explanations or plan/drawing references</b>
<b>REQUIRED</b>	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"/>
<b>REQUIRED</b>	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"/>
<b>REQUIRED</b>	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"/>
<b>BASIC</b>	1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	<input checked="" type="checkbox"/>
<b>BASIC</b>	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	<input type="checkbox"/>
<b>BASIC</b>	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>		
<b>BASIC</b>	1.3.1 Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	<input checked="" type="checkbox"/>
<b>BASIC</b>	1.3.2 Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	<input type="checkbox"/>

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

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
<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"/>
<b>4. RIDESHARING</b>		
<b>4.1 Pick-up &amp; drop-off facilities</b>		
BASIC	4.1.1 Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	<input type="checkbox"/>
<b>4.2 Carpool parking</b>		
BASIC	4.2.1 Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	<input type="checkbox"/>
BETTER	4.2.2 At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	<input type="checkbox"/>
<b>5. CARSHARING &amp; BIKESHARING</b>		
<b>5.1 Carshare parking spaces</b>		
BETTER	5.1.1 Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces ( <i>see Zoning By-law Section 94</i> )	<input type="checkbox"/>
<b>5.2 Bikeshare station location</b>		
BETTER	5.2.1 Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	<input type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
<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 ( <i>see 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 ( <i>see 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 Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	<input type="checkbox"/>
<b>7. OTHER</b>		
<b>7.1 On-site amenities to minimize off-site trips</b>		
<b>BETTER</b>	7.1.1 Provide on-site amenities to minimize mid-day or mid-commute errands	<input type="checkbox"/>

**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

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

<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>REQUIRED</b>	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"/>
<b>REQUIRED</b>	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"/>
<b>REQUIRED</b>	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"/>
<b>BASIC</b>	1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	<input checked="" type="checkbox"/>
<b>BASIC</b>	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	<input type="checkbox"/>
<b>BASIC</b>	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>		
<b>BASIC</b>	1.3.1 Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	<input checked="" type="checkbox"/>
<b>BASIC</b>	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 (see <i>Official Plan policy 4.3.6</i> )	<input checked="" type="checkbox"/>
REQUIRED	2.1.2 Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas (see <i>Zoning By-law Section 111</i> )	<input checked="" type="checkbox"/>
REQUIRED	2.1.3 Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored (see <i>Zoning By-law Section 111</i> )	<input checked="" type="checkbox"/>
BASIC	2.1.4 Provide bicycle parking spaces equivalent to the expected number of 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 (see <i>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 checked="" 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 ( <i>see 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 ( <i>see 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 ( <i>see 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"/>

# **TRANSPORTATION DEMAND MANAGEMENT**

---

## TDM Measures Checklist

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

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

<b>TDM measures: Residential developments</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"/>

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

## **APPENDIX L**

---

MMLOS Review

## Segment MMLOS Analysis

This section provides a review of the boundary streets Preston Street and Sidney Street, using complete streets principles. The *Multi-Modal Level of Service (MMLOS) Guidelines*, produced by IBI Group in October 2015, were used to evaluate the levels of service for each alternative mode of transportation on the boundary streets, based on the targets for areas 'within 600m of a rapid transit station.'

Exhibit 4 of the MMLOS Guidelines has been used to evaluate the segment pedestrian level of service (PLOS) of the boundary streets. Exhibit 22 of the MMLOS Guidelines suggest a target PLOS A for all roadways within 600m of a rapid transit station. The results of the segment PLOS analysis are summarized in **Table 1**.

Exhibit 11 of the MMLOS Guidelines has been used to evaluate the segment bicycle level of service (BLOS) of the boundary streets. Within 600m of a rapid transit station, Exhibit 22 of the MMLOS Guidelines suggest a target BLOS B for roadways with a local cycling route designation (Preston Street), and a target BLOS D for roadways with no cycling route designation (Sidney Street). The results of the segment BLOS analysis are summarized in **Table 2**.

Exhibit 15 of the MMLOS Guidelines has been used to evaluate the segment transit level of service (TLOS) of Preston Street only. Despite having no TLOS target, Preston Street has been evaluated for TLOS, as it currently has transit service. The results of the segment TLOS analysis are summarized in **Table 3**.

Exhibit 20 of the MMLOS Guidelines has been used to evaluate the segment truck level of service (TkLOS) of Preston Street only. Within 600m of a rapid transit station, Exhibit 22 of the MMLOS Guidelines suggest a target TkLOS D for arterial roadways with a truck route designation. The results of the segment TkLOS analysis are summarized in **Table 4**.



Table 1: PLOS Segment Analysis

Sidewalk Width	Boulevard Width	Avg. Daily Curb Lane Traffic Volume	Presence of On-Street Parking	Operating Speed <sup>(1)</sup>	PLOS
<b>Preston Street (east side, Carling Avenue to Sidney Street)</b>					
2.0m	0m	> 3,000 vpd	No	60 km/h	E
<b>Preston Street (west side, Carling Avenue to Sidney Street)</b>					
2.0m	0m	> 3,000 vpd	No	60 km/h	E
<b>Sidney Street (north side, west of Preston Street)</b>					
1.8m	0m	< 3,000 vpd	No	30 km/h	A
<b>Sidney Street (south side, west of Preston Street)</b>					
1.8m	0m	< 3,000 vpd	Yes	30 km/h	A

1. Operating speed of Preston Street taken as the speed limit plus 10 km/h; operating speed of Sidney Street assumed to be 30 km/h.

Table 2: BLOS Segment Analysis

Road Class	Type of Route	Type of Bikeway	Travel Lanes	Operating Speed	BLOS
<b>Preston Street (Carling Avenue to Preston Street)</b>					
Arterial	Local Route	Mixed Traffic	3	60 km/h	F
<b>Sidney Street (west of Carling Avenue)</b>					
Local	No Route	Mixed Traffic	2	30 km/h	A

Table 3: TLOS Segment Analysis

Facility Type	Exposure to Congestion Delay, Friction, and Incidents			TLOS
	Congestion	Friction	Incident Potential	
<b>Preston Street</b>				
Mixed Traffic; Frequent Parking/Driveway Friction	Yes	High	High	F

Table 4: TkLOS Segment Analysis

Curb Lane Width	Number of Travel Lanes Per Direction	TkLOS
<b>Preston Street</b>		
> 3.7m	1	B

## Intersection MMLOS Analysis

The following is a review of the MMLOS of the signalized intersections within the study area, using complete streets principles. All of these intersections have been evaluated using the MMLOS targets for intersections within 600m of a rapid transit station, and are based on existing conditions.

Exhibit 5 of the Addendum to the MMLOS Guidelines has been used to evaluate the existing PLOS at the intersections listed above. Exhibit 22 of the MMLOS Guidelines suggests a target PLOS A for all roadways within 600m of a rapid transit station. The results of the intersection PLOS analysis are summarized in **Table 5** through **Table 12**.

Exhibit 12 of the MMLOS Guidelines has been used to evaluate the existing BLOS at the intersections listed above. Within 600m of a rapid transit station, Exhibit 22 of the MMLOS Guidelines suggests a target BLOS B for local cycling routes (Sherwood Drive, Preston Street), a target BLOS C for arterial spine routes (Carling Avenue, Booth Street, Prince of Wales Drive), and a target BLOS D for roadways without a Crosstown Bikeway, Local Route, or Spine Route designation (Champagne Avenue, Trillium Pathway, Beech Street, Pamilla Street, Queen Elizabeth Driveway). The results of the intersection BLOS analysis are summarized in **Table 13**.

Exhibit 16 of the MMLOS Guidelines has been used to evaluate the existing TLOS at the intersections listed above. Exhibit 22 of the MMLOS Guidelines identifies a target TLOS C for roadways with a Transit Priority – Continuous Lanes designation (Carling Avenue), and does not identify a target TLOS for roadways without a Rapid Transit or Transit Priority designation (all others). The TLOS has been evaluated for every approach that is currently used by transit. The results of the intersection TLOS analysis are summarized in **Table 14**.

Exhibit 21 of the MMLOS Guidelines has been used to evaluate the existing TkLOS at the intersections listed above. Within 600m of a rapid transit station, Exhibit 22 of the MMLOS Guidelines identifies a target TkLOS D for arterial truck routes (Carling Avenue, Preston Street, Prince of Wales Drive) and collector truck routes (Booth Street), and no target TkLOS otherwise (Sherwood Drive, Champagne Avenue, Beech Street, Pamilla Street, Queen Elizabeth Driveway). The results of the intersection TkLOS analysis are summarized in **Table 15**.

**Table 5: PLOS Intersection Analysis – Carling Avenue/Sherwood Drive**

CRITERIA	North Approach		South Approach		East Approach		West Approach	
<b>PETSI SCORE</b>								
<i>CROSSING DISTANCE CONDITIONS</i>								
Median > 2.4m in Width	No	72	N/A	0	No	23	No	6
Lanes Crossed (3.5m Lane Width)	5		N/A		8		9	
<i>SIGNAL PHASING AND TIMING</i>								
Left Turn Conflict	Protected	0	N/A	0	Permissive	-8	No Left Turn/Prohibited	0
Right Turn Conflict	Permissive or Yield	-5	N/A	0	No Right Turn/Prohibited	0	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	N/A	0	RTOR Allowed	-3	N/A	0
Leading Pedestrian Interval	No	-2	N/A	0	No	-2	No	-2
<i>CORNER RADIUS</i>								
Parallel Radius	> 25m	-9	N/A	0	No Right Turn	0	> 5m to 10m	-5
Parallel Right Turn Channel	No Right Turn Channel	-4	N/A	0	No Right Turn	0	Conventional without Receiving	0
Perpendicular Radius	> 5m to 10m	-5	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	Conventional without Receiving	0	N/A	0	N/A	0	N/A	0
<i>CROSSING TREATMENT</i>								
Treatment	Zebra Stripe	-4	N/A	0	Zebra Stripe	-4	Zebra Stripe	-4
	<b>PETSI SCORE</b>	<b>40</b>				<b>6</b>		<b>-10</b>
	<b>LOS</b>	<b>E</b>				<b>F</b>		<b>F</b>
<b>DELAY SCORE</b>								
Cycle Length		120				140		140
Pedestrian Walk Time		44.6				26.9		26.9
	<b>DELAY SCORE</b>	<b>23.7</b>				<b>45.7</b>		<b>45.7</b>
	<b>LOS</b>	<b>C</b>				<b>E</b>		<b>E</b>
	<b>OVERALL</b>	<b>E</b>				<b>F</b>		<b>F</b>

**Table 6: PLOS Intersection Analysis – Carling Avenue/Champagne Avenue**

CRITERIA	North Approach		South Approach		East Approach		West Approach	
<b>PETSI SCORE</b>								
<i>CROSSING DISTANCE CONDITIONS</i>								
Median > 2.4m in Width	No	88	N/A	0	No	23	No	23
Lanes Crossed (3.5m Lane Width)	4		N/A		8		8	
<i>SIGNAL PHASING AND TIMING</i>								
Left Turn Conflict	Permissive	-8	N/A	0	Permissive	-8	No Left Turn/Prohibited	0
Right Turn Conflict	Permissive or Yield	-5	N/A	0	No Right Turn/Prohibited	0	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	N/A	0	RTOR Allowed	-3	N/A	0
Leading Pedestrian Interval	No	-2	N/A	0	No	-2	No	-2
<i>CORNER RADIUS</i>								
Parallel Radius	> 3m to 5m	-4	N/A	0	No Right Turn	0	> 10m to 15m	-6
Parallel Right Turn Channel	No Right Turn Channel	-4	N/A	0	No Right Turn	0	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
<i>CROSSING TREATMENT</i>								
Treatment	Standard	-7	N/A	0	Standard	-7	Standard	-7
	<b>PETSI SCORE</b>	<b>55</b>				<b>3</b>		<b>-1</b>
	<b>LOS</b>	<b>D</b>				<b>F</b>		<b>F</b>
<b>DELAY SCORE</b>								
Cycle Length		70				120		120
Pedestrian Walk Time		16.7				7.1		7.1
	<b>DELAY SCORE</b>	<b>20.3</b>				<b>53.1</b>		<b>53.1</b>
	<b>LOS</b>	<b>C</b>				<b>E</b>		<b>E</b>
	<b>OVERALL</b>	<b>D</b>				<b>F</b>		<b>F</b>

**Table 7: PLOS Intersection Analysis – Carling Avenue/Trillium Pathway**

CRITERIA	North Approach		South Approach		East Approach		West Approach	
<b>PETSI SCORE</b>								
<i>CROSSING DISTANCE CONDITIONS</i>								
Median > 2.4m in Width	No	120	No	120	No	23	No	23
Lanes Crossed (3.5m Lane Width)	1		1		8		8	
<i>SIGNAL PHASING AND TIMING</i>								
Left Turn Conflict	No Left Turn/Prohibited	0	No Left Turn/Prohibited	0	No Left Turn/Prohibited	0	No Left Turn/Prohibited	0
Right Turn Conflict	No Right Turn/Prohibited	0	No Right Turn/Prohibited	0	No Right Turn/Prohibited	0	No Right Turn/Prohibited	0
Right Turn on Red	N/A	0	N/A	0	N/A	0	N/A	0
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
<i>CORNER RADIUS</i>								
Parallel Radius	No Right Turn	0	No Right Turn	0	No Right Turn	0	No Right Turn	0
Parallel Right Turn Channel	No Right Turn	0	No Right Turn	0	No Right Turn	0	No Right Turn	0
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
<i>CROSSING TREATMENT</i>								
Treatment	Zebra Stripe	-4	Zebra Stripe	-4	Zebra Stripe	-4	Zebra Stripe	-4
	<b>PETSI SCORE</b>	<b>114</b>	<b>PETSI SCORE</b>	<b>114</b>	<b>PETSI SCORE</b>	<b>17</b>	<b>PETSI SCORE</b>	<b>17</b>
	<b>LOS</b>	<b>A</b>	<b>LOS</b>	<b>A</b>	<b>LOS</b>	<b>F</b>	<b>LOS</b>	<b>F</b>
<b>DELAY SCORE</b>								
Cycle Length		70		70		120		120
Pedestrian Walk Time		24.9		24.9		7.4		7.4
	<b>DELAY SCORE</b>	<b>14.5</b>	<b>DELAY SCORE</b>	<b>14.5</b>	<b>DELAY SCORE</b>	<b>52.8</b>	<b>DELAY SCORE</b>	<b>52.8</b>
	<b>LOS</b>	<b>B</b>	<b>LOS</b>	<b>B</b>	<b>LOS</b>	<b>E</b>	<b>LOS</b>	<b>E</b>
	<b>OVERALL</b>	<b>B</b>	<b>OVERALL</b>	<b>B</b>	<b>OVERALL</b>	<b>F</b>	<b>OVERALL</b>	<b>F</b>

**Table 8: PLOS Intersection Analysis – Carling Avenue/Preston Street**

CRITERIA	North Approach		South Approach		East Approach		West Approach	
<b>PETSI SCORE</b>								
<i>CROSSING DISTANCE CONDITIONS</i>								
Median > 2.4m in Width	No	88	No	55	Yes	15	Yes	15
Lanes Crossed (3.5m Lane Width)	4		6		9		9	
<i>SIGNAL PHASING AND TIMING</i>								
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
<i>CORNER RADIUS</i>								
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
<i>CROSSING TREATMENT</i>								
Treatment	Standard	-7	Standard	-7	Standard	-7	Standard	-7
	<b>PETSI SCORE</b>	<b>63</b>	<b>PETSI SCORE</b>	<b>30</b>	<b>PETSI SCORE</b>	<b>-20</b>	<b>PETSI SCORE</b>	<b>-18</b>
	<b>LOS</b>	<b>C</b>	<b>LOS</b>	<b>E</b>	<b>LOS</b>	<b>F</b>	<b>LOS</b>	<b>F</b>
<b>DELAY SCORE</b>								
Cycle Length		140		140		140		140
Pedestrian Walk Time		18.0		18.0		32.1		8.1
	<b>DELAY SCORE</b>	<b>53.2</b>	<b>DELAY SCORE</b>	<b>53.2</b>	<b>DELAY SCORE</b>	<b>41.6</b>	<b>DELAY SCORE</b>	<b>62.1</b>
	<b>LOS</b>	<b>E</b>	<b>LOS</b>	<b>E</b>	<b>LOS</b>	<b>F</b>	<b>LOS</b>	<b>F</b>
	<b>OVERALL</b>	<b>E</b>	<b>OVERALL</b>	<b>E</b>	<b>OVERALL</b>	<b>F</b>	<b>OVERALL</b>	<b>F</b>

**Table 9: PLOS Intersection Analysis – Carling Avenue/Booth Street**

CRITERIA	North Approach		South Approach		East Approach		West Approach	
<b>PETSI SCORE</b>								
<i>CROSSING DISTANCE CONDITIONS</i>								
Median > 2.4m in Width	No	88	N/A	0	Yes	30	No	23
Lanes Crossed (3.5m Lane Width)	4		N/A		8			
<i>SIGNAL PHASING AND TIMING</i>								
Left Turn Conflict	Perm + Prot	-8	N/A	0	Permissive	-8	No Left Turn/Prohibited	0
Right Turn Conflict	Permissive or Yield	-5	N/A	0	No Right Turn/Prohibited	0	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	N/A	0	RTOR Allowed	-3	N/A	0
Leading Pedestrian Interval	No	-2	N/A	0	No	-2	No	-2
<i>CORNER RADIUS</i>								
Parallel Radius	> 5m to 10m	-5	N/A	0	No Right Turn	0	> 3m to 5m	-4
Parallel Right Turn Channel	No Right Turn Channel	-4	N/A	0	No Right Turn	0	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
<i>CROSSING TREATMENT</i>								
Treatment	Standard	-7	N/A	0	Standard	-7	Standard	-7
	<b>PETSI SCORE</b>	<b>54</b>			<b>10</b>		<b>1</b>	
	<b>LOS</b>	<b>D</b>			<b>F</b>		<b>F</b>	
<b>DELAY SCORE</b>								
Cycle Length		120				130		130
Pedestrian Walk Time		30.3				8.0		8.0
	<b>DELAY SCORE</b>	<b>33.5</b>				<b>57.2</b>		<b>57.2</b>
	<b>LOS</b>	<b>D</b>				<b>E</b>		<b>E</b>
	<b>OVERALL</b>	<b>D</b>				<b>F</b>		<b>F</b>

**Table 10: PLOS Intersection Analysis – Preston Street/Beech Street**

CRITERIA	North Approach		South Approach		East Approach		West Approach	
<b>PETSI SCORE</b>								
<i>CROSSING DISTANCE CONDITIONS</i>								
Median > 2.4m in Width	No	88	No	88	No	88	No	105
Lanes Crossed (3.5m Lane Width)	4		4		4		3	
<i>SIGNAL PHASING AND TIMING</i>								
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
<i>CORNER RADIUS</i>								
Parallel Radius	> 5m to 10m	-5	> 5m to 10m	-5	> 5m to 10m	-5	> 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
<i>CROSSING TREATMENT</i>								
Treatment	Textured	-4	Textured	-4	Textured	-4	Textured	-4
	<b>PETSI SCORE</b>	<b>57</b>		<b>57</b>		<b>57</b>		<b>74</b>
	<b>LOS</b>	<b>D</b>		<b>D</b>		<b>D</b>		<b>C</b>
<b>DELAY SCORE</b>								
Cycle Length		90		90		90		90
Pedestrian Walk Time		7.4		7.4		51.5		51.5
	<b>DELAY SCORE</b>	<b>37.9</b>		<b>37.9</b>		<b>8.2</b>		<b>8.2</b>
	<b>LOS</b>	<b>D</b>		<b>D</b>		<b>A</b>		<b>A</b>
	<b>OVERALL</b>	<b>D</b>		<b>D</b>		<b>D</b>		<b>C</b>

**Table 11: PLOS Intersection Analysis – Preston Street/Pamilla Street**

CRITERIA	North Approach		South Approach		East Approach		West Approach	
<b>PETSI SCORE</b>								
<i>CROSSING DISTANCE CONDITIONS</i>								
Median > 2.4m in Width	No	88	No	88	No	120	No	105
Lanes Crossed (3.5m Lane Width)	4		4		2		3	
<i>SIGNAL PHASING AND TIMING</i>								
Left Turn Conflict	Permissive	-8	No Left Turn/Prohibited	0	Permissive	-8	Permissive	-8
Right Turn Conflict	No Right Turn/Prohibited	0	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	RTOR Allowed	-3	N/A	0	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
<i>CORNER RADIUS</i>								
Parallel Radius	No Right Turn	0	> 5m to 10m	-5	> 3m to 5m	-4	> 5m to 10m	-5
Parallel Right Turn Channel	No Right Turn	0	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
<i>CROSSING TREATMENT</i>								
Treatment	Standard	-7	Standard	-7	Textured	-4	Textured	-4
	<b>PETSI SCORE</b>	<b>68</b>		<b>62</b>		<b>93</b>		<b>74</b>
	<b>LOS</b>	<b>C</b>		<b>C</b>		<b>A</b>		<b>C</b>
<b>DELAY SCORE</b>								
Cycle Length		90		90		90		90
Pedestrian Walk Time		7.5		7.5		58.9		58.9
	<b>DELAY SCORE</b>	<b>37.8</b>		<b>37.8</b>		<b>5.4</b>		<b>5.4</b>
	<b>LOS</b>	<b>D</b>		<b>D</b>		<b>A</b>		<b>A</b>
	<b>OVERALL</b>	<b>D</b>		<b>D</b>		<b>A</b>		<b>C</b>

**Table 12: PLOS Intersection Analysis – Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway**

CRITERIA	North Approach		South Approach		East Approach		West Approach	
<b>PETSI SCORE</b>								
<i>CROSSING DISTANCE CONDITIONS</i>								
Median > 2.4m in Width	No	23	No	88	No	72	No	72
Lanes Crossed (3.5m Lane Width)	8		4		5		5	
<i>SIGNAL PHASING AND TIMING</i>								
Left Turn Conflict	Perm + Prot	-8	Permissive	-8	Permissive	-8	Permissive	-8
Right Turn Conflict	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5	Perm + Prot	-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
<i>CORNER RADIUS</i>								
Parallel Radius	> 15m to 25m	-8	> 5m to 10m	-5	> 10m to 15m	-6	> 25m	-9
Parallel Right Turn Channel	Conventional with Receiving	-3	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	> 15m to 25m	-8	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	Conventional with Receiving	-3	N/A	0
<i>CROSSING TREATMENT</i>								
Treatment	Standard	-7	Standard	-7	Standard	-7	Standard	-7
	<b>PETSI SCORE</b>	<b>-13</b>		<b>54</b>		<b>26</b>		<b>34</b>
	<b>LOS</b>	<b>F</b>		<b>D</b>		<b>F</b>		<b>E</b>
<b>DELAY SCORE</b>								
Cycle Length		130		130		120		120
Pedestrian Walk Time		16.9		55.9		12.5		12.5
	<b>DELAY SCORE</b>	<b>49.2</b>		<b>21.1</b>		<b>48.2</b>		<b>48.2</b>
	<b>LOS</b>	<b>E</b>		<b>C</b>		<b>E</b>		<b>E</b>
	<b>OVERALL</b>	<b>F</b>		<b>D</b>		<b>F</b>		<b>E</b>

**Table 13: BLOS Intersection Analysis**

Approach	Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
<b>Carling Avenue/Sherwood Drive</b>				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared left turn/right turn lane	A
		Left Turn Accommodation	No lane crossed; $\leq 50$ km/h	B
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No left turn	-
West Approach	Curbside Lane (shared with transit)	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	Three lanes crossed; $\geq 50$ km/h	F
<b>Carling Avenue/Champagne Avenue</b>				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane is primary lane	A
		Left Turn Accommodation	One lane crossed; $\leq 40$ km/h	D
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane $< 50$ m; turning speed $< 25$ km/h	D
		Left Turn Accommodation	No left turn	-
West Approach	Curbside Lane (shared with transit)	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	Three lanes crossed; $\geq 50$ km/h	F
<b>Carling Avenue/Trillium Pathway</b>				
North Approach	Mixed-Use Pathway	Right Turn Lane Characteristics	No lanes for vehicular traffic; cyclists wishing to turn onto Carling Avenue can do so during north-south phase	A
		Left Turn Accommodation		
South Approach	Mixed-Use Pathway	Right Turn Lane Characteristics	No lanes for vehicular traffic; cyclists wishing to turn onto Carling Avenue can do so during north-south phase	A
		Left Turn Accommodation		
East Approach	Mixed Traffic	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	No left turn	-
West Approach	Curbside Lane (shared with transit)	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	No left turn	-

Approach	Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
<b>Carling Avenue/Preston Street</b>				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	One lane crossed; $\geq 60$ km/h	F
South Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	Two lanes crossed; $\geq 50$ km/h	F
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	Three lanes crossed; $\geq 50$ km/h	F
West Approach	Pocket Lane (shared with transit)	Right Turn Lane Characteristics	Right turn lane introduced to the right; lane $< 50$ m, turning speed $\leq 25$ km/h	B
		Left Turn Accommodation	Three lanes crossed; $\geq 50$ km/h	F
<b>Carling Avenue/Booth Street</b>				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane $< 50$ m; turning speed $\leq 25$ km/h	D
		Left Turn Accommodation	One lane crossed; $\geq 60$ km/h	F
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane $< 50$ m; turning speed $\leq 25$ km/h	D
		Left Turn Accommodation	No left turn	-
West Approach	Curbside Lane (shared with transit)	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	Three lanes crossed; $\geq 50$ km/h	F
<b>Preston Street/Beech Street</b>				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	One lane crossed; $\geq 60$ km/h	F
South Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	One lane crossed; $\geq 60$ km/h	F
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane $< 50$ m; turning speed $\leq 25$ km/h	D
		Left Turn Accommodation	One lane crossed; 50 km/h	D
West Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared left turn/through/right turn lane	A
		Left Turn Accommodation	No lanes crossed; $\leq 50$ km/h	B



Approach	Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
<b>Preston Street/Pamilla Street</b>				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared left turn/through/right turn lane	A
		Left Turn Accommodation	No lanes crossed; $\geq 60$ km/h	D
South Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared left turn/through/right turn lane	A
		Left Turn Accommodation	No lanes crossed; $\geq 60$ km/h	D
West Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared left turn/through/right turn lane	A
		Left Turn Accommodation	No lanes crossed; $\leq 50$ km/h	B
<b>Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway</b>				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane > 50m	F
		Left Turn Accommodation	One lane crossed; $\geq 60$ km/h	F
South Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared left turn/through/right turn lane	A
		Left Turn Accommodation	No lanes crossed; $\leq 50$ km/h	B
East Approach	Multi-Use Pathway	Right Turn Lane Characteristics	No impact on level of traffic stress	A
		Left Turn Accommodation	Pathway is located to the left of the roadway	A
West Approach	Curbside Bike Lane	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	One lane crossed; $\geq 60$ km/h	E

Table 14: TLOS Intersection Analysis

Approach	Delay <sup>(1)</sup>		TLOS
	AM Peak	PM Peak	
<b>Carling Avenue/Sherwood Drive</b>			
East Approach	7 sec	17 sec	C
West Approach	11 sec	14 sec	C
<b>Carling Avenue/Champagne Avenue</b>			
East Approach	2 sec	6 sec	B
West Approach	7 sec	11 sec	C
<b>Carling Avenue/Trillium Pathway</b>			
East Approach	3 sec	8 sec	B
West Approach	2 sec	6 sec	B
<b>Carling Avenue/Preston Street</b>			
North Approach	41 sec	91 sec	F
East Approach	55 sec	91 sec	F
West Approach	48 sec	39 sec	F
<b>Carling Avenue/Booth Street</b>			
North Approach	36 sec	43 sec	F
East Approach	23 sec	20 sec	D
West Approach	22 sec	14 sec	D
<b>Preston Street/Beech Street</b>			
North Approach	6 sec	7 sec	B
South Approach	7 sec	3 sec	B
<b>Preston Street/Pamilla Street</b>			
North Approach	5 sec	4 sec	B
South Approach	2 sec	4 sec	B

1. Delay based on outputs from Synchro analysis of existing conditions

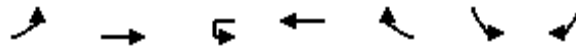
Table 15: TkLOS Intersection Analysis

Approach	Effective Corner Radius	Number of Receiving Lanes Departing Intersection	TkLOS
<b>Carling Avenue/Sherwood Drive</b>			
North Approach	< 10m	3	D
East Approach	> 15m	1	C
<b>Carling Avenue/Champagne Avenue</b>			
North Approach	< 10m	3	D
East Approach	< 10m	1	F
<b>Carling Avenue/Preston Street</b>			
North Approach	< 10m	3	D
South Approach	10m to 15m	3	B
East Approach	< 10m	2	D
West Approach	< 10m	2	D
<b>Carling Avenue/Booth Street</b>			
North Approach	< 10m	3	D
East Approach	< 10m	1	F
<b>Preston Street/Beech Street</b>			
North Approach	< 10m	1	F
South Approach	< 10m	1	F
East Approach	< 10m	1	F
West Approach	< 10m	1	F
<b>Preston Street/Pamilla Street</b>			
North Approach	< 10m	1	F
South Approach	< 10m	1	F
West Approach	< 10m	1	F
<b>Preston Street/Prince of Wales Drive/Queen Elizabeth Driveway</b>			
North Approach	> 15m	1	C
South Approach	10m to 15m	1	E
East Approach	> 15m	2	A
West Approach	< 10m	1	F

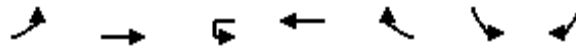
## **APPENDIX M**

---

Total Synchro Analysis



Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	31	849	13	612	143	176	5
Future Volume (vph)	31	849	13	612	143	176	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0		50.0		110.0	0.0	10.0
Storage Lanes	1		1		1	1	1
Taper Length (m)	25.0		25.0			25.0	
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Ped Bike Factor	0.97				0.90	0.96	0.95
Fr <sub>t</sub>					0.850		0.850
Fl <sub>t</sub> Protected	0.950		0.950			0.950	
Satd. Flow (prot)	1642	3283	1674	3161	1483	1674	1498
Fl <sub>t</sub> Permitted	0.950		0.333			0.950	
Satd. Flow (perm)	1591	3283	587	3161	1328	1615	1425
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					143		3
Link Speed (k/h)		60		60		40	
Link Distance (m)		196.1		162.9		242.3	
Travel Time (s)		11.8		9.8		21.8	
Confl. Peds. (#/hr)	30				30	30	30
Confl. Bikes (#/hr)					17		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	1%	7%	2%	1%	1%
Adj. Flow (vph)	31	849	13	612	143	176	5
Shared Lane Traffic (%)							
Lane Group Flow (vph)	31	849	13	612	143	176	5
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	Left	Right	L NA	R NA
Median Width(m)		7.0		7.0		3.5	
Link Offset(m)		0.0		0.0		0.0	
Crosswalk Width(m)		5.0		10.0		5.0	
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14		14	40	14
Number of Detectors	1	2	1	2	1	1	1
Detector Template	Left	Thru	Left	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	6.1	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	1.8	6.1	6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7		28.7			
Detector 2 Size(m)		1.8		1.8			
Detector 2 Type		Cl+Ex		Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)		0.0		0.0			
Turn Type	Prot	NA	Perm	NA	Perm	Perm	Perm
Protected Phases	5	2		6			
Permitted Phases			6		6	4	4
Detector Phase	5	2	6	6	6	4	4

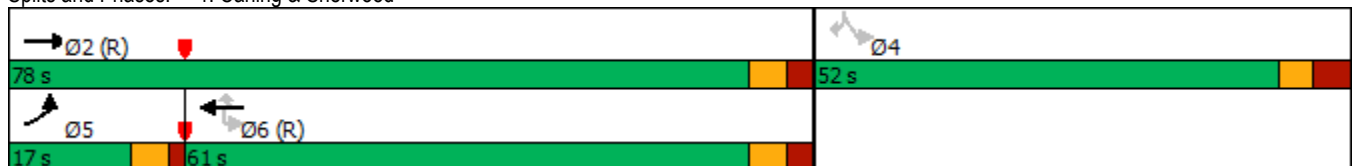


Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.2	33.4	33.4	33.4	33.4	40.1	40.1
Total Split (s)	17.0	78.0	61.0	61.0	61.0	52.0	52.0
Total Split (%)	13.1%	60.0%	46.9%	46.9%	46.9%	40.0%	40.0%
Maximum Green (s)	11.8	71.6	54.6	54.6	54.6	44.9	44.9
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	2.7	2.7	2.7	2.7	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.4	6.4	6.4	6.4	7.1	7.1
Lead/Lag	Lead		Lag	Lag	Lag		
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)		12.0	12.0	12.0	12.0	7.0	7.0
Flash Dont Walk (s)		15.0	15.0	15.0	15.0	26.0	26.0
Pedestrian Calls (#/hr)		20	20	20	20	20	20
Act Effct Green (s)	8.0	90.9	82.3	82.3	82.3	25.6	25.6
Actuated g/C Ratio	0.06	0.70	0.63	0.63	0.63	0.20	0.20
v/c Ratio	0.31	0.37	0.04	0.31	0.16	0.56	0.02
Control Delay	65.6	9.6	5.8	5.0	0.7	52.2	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.6	9.6	5.8	5.0	0.7	52.2	27.4
LOS	E	A	A	A	A	D	C
Approach Delay		11.5		4.2		51.5	
Approach LOS		B		A		D	
Queue Length 50th (m)	7.2	47.4	0.5	11.1	0.0	35.0	0.4
Queue Length 95th (m)	16.3	58.8	1.6	15.3	1.3	55.4	3.4
Internal Link Dist (m)		172.1		138.9		218.3	
Turn Bay Length (m)	40.0		50.0		110.0		10.0
Base Capacity (vph)	149	2295	371	2000	892	557	494
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	0.21	0.37	0.04	0.31	0.16	0.32	0.01

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 107 (82%), Referenced to phase 2:EBT and 6:WBTU, Start of Green  
 Natural Cycle: 85  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.56  
 Intersection Signal Delay: 12.4      Intersection LOS: B  
 Intersection Capacity Utilization 59.6%      ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 1: Carling & Sherwood



2: Carling & Champagne  
AM Peak Hour

829 Carling Avenue  
2028 Total Traffic

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	813	174	180	692	168	62	0	69	89	0	54
Future Volume (vph)	103	813	174	180	692	168	62	0	69	89	0	54
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	70.0		30.0	60.0		25.0	0.0		0.0	20.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.90		0.95	0.95		0.69	0.96		0.95	0.98		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1674	3283	1483	1658	3252	1414	1658	0	1483	1658	0	1498
Flt Permitted	0.374			0.325			0.950			0.950		
Satd. Flow (perm)	596	3283	1404	542	3252	978	1586	0	1403	1617	0	1443
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			174			168			69			54
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		162.9			117.5			121.7			178.4	
Travel Time (s)		9.8			7.1			8.8			12.8	
Confl. Peds. (#/hr)	90		90	90		90	20		20	20		20
Confl. Bikes (#/hr)			5			4						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 (%)	1%	3%	2%	2%	4%	7%	2%	2%	2%	2%	2%	1%
Adj. Flow (vph)	103	813	174	180	692	168	62	0	69	89	0	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	813	174	180	692	168	62	0	69	89	0	54
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1		1	1		1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left		Right	Left		Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1		6.1	6.1		6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1		6.1	6.1		6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 2 Position(m)		28.7			28.7							
Detector 2 Size(m)		1.8			1.8							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm		Perm	Perm		Perm
Protected Phases		2			6							
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	2	2	2	6	6	6	8		8	4		4

2: Carling & Champagne  
AM Peak Hour

829 Carling Avenue  
2028 Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0		5.0	10.0		10.0
Minimum Split (s)	15.3	15.3	15.3	25.3	25.3	25.3	24.0		24.0	37.9		37.9
Total Split (s)	92.0	92.0	92.0	92.0	92.0	92.0	38.0		38.0	38.0		38.0
Total Split (%)	70.8%	70.8%	70.8%	70.8%	70.8%	70.8%	29.2%		29.2%	29.2%		29.2%
Maximum Green (s)	86.7	86.7	86.7	86.7	86.7	86.7	32.0		32.0	32.1		32.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0		3.0	3.3		3.3
All-Red Time (s)	1.6	1.6	1.6	1.6	1.6	1.6	3.0		3.0	2.6		2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	6.0		6.0	5.9		5.9
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None		None	None		None
Walk Time (s)				10.0	10.0	10.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)				10.0	10.0	10.0	11.0		11.0	25.0		25.0
Pedestrian Calls (#/hr)				20	20	20	20		20	20		20
Act Effct Green (s)	95.5	95.5	95.5	95.5	95.5	95.5	23.2		23.2	23.3		23.3
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.73	0.73	0.18		0.18	0.18		0.18
v/c Ratio	0.24	0.34	0.16	0.45	0.29	0.22	0.22		0.23	0.31		0.18
Control Delay	5.9	5.0	0.9	7.5	3.2	2.0	43.8		10.5	46.1		11.2
Queue Delay	0.0	0.1	0.0	0.0	0.2	0.0	0.0		0.0	0.0		0.0
Total Delay	5.9	5.1	0.9	7.5	3.3	2.0	43.8		10.5	46.1		11.2
LOS	A	A	A	A	A	A	D		B	D		B
Approach Delay		4.5			3.8			26.2				32.9
Approach LOS		A			A			C				C
Queue Length 50th (m)	4.7	19.2	1.1	9.3	18.8	2.9	11.6		0.0	16.9		0.0
Queue Length 95th (m)	7.7	22.6	2.6	13.8	22.5	7.9	22.6		10.8	30.5		9.7
Internal Link Dist (m)		138.9			93.5			97.7				154.4
Turn Bay Length (m)	70.0		30.0	60.0		25.0				20.0		
Base Capacity (vph)	437	2412	1077	397	2389	762	390		397	399		396
Starvation Cap Reductn	0	433	0	0	801	0	0		0	0		0
Spillback Cap Reductn	0	0	0	0	0	0	0		0	0		0
Storage Cap Reductn	0	0	0	0	0	0	0		0	0		0
Reduced v/c Ratio	0.24	0.41	0.16	0.45	0.44	0.22	0.16		0.17	0.22		0.14

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 85 (65%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.45  
 Intersection Signal Delay: 7.1  
 Intersection LOS: A  
 Intersection Capacity Utilization 56.3%  
 ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 2: Carling & Champagne





3: Trillium Pathway & Carling  
AM Peak Hour

829 Carling Avenue  
2028 Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑							
Traffic Volume (vph)	0	968	0	0	1088	0	0	0	0	0	0	0
Future Volume (vph)	0	968	0	0	1088	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected												
Satd. Flow (prot)	0	3283	0	0	3283	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3283	0	0	3283	0	0	0	0	0	0	0
Right Turn on Red			Yes				Yes				Yes	
Satd. Flow (RTOR)												
Link Speed (k/h)	60				60				50			
Link Distance (m)	117.5				124.7				157.3			
Travel Time (s)	7.1				7.5				11.3			
Confl. Peds. (#/hr)	40		14	14		40	18		20	20		18
Confl. Bikes (#/hr)			7			25						17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	968	0	0	1088	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	968	0	0	1088	0	0	0	0	0	0	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)	7.0				7.0				0.0			
Link Offset(m)	0.0				0.0				0.0			
Crosswalk Width(m)	5.0				5.0				5.0			
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	2				2							
Detector Template	Thru				Thru							
Leading Detector (m)	30.5				30.5							
Trailing Detector (m)	0.0				0.0							
Detector 1 Position(m)	0.0				0.0							
Detector 1 Size(m)	1.8				1.8							
Detector 1 Type	CI+Ex				CI+Ex							
Detector 1 Channel												
Detector 1 Extend (s)	0.0				0.0							
Detector 1 Queue (s)	0.0				0.0							
Detector 1 Delay (s)	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	NA				NA							
Protected Phases	2				6							
Permitted Phases												
Detector Phase	2				6							
Switch Phase												
Minimum Initial (s)	10.0				10.0							
Minimum Split (s)	25.1				25.1							

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	35.6

3: Trillium Pathway & Carling  
AM Peak Hour

829 Carling Avenue  
2028 Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)		94.0			94.0							
Total Split (%)		72.3%			72.3%							
Maximum Green (s)		88.9			88.9							
Yellow Time (s)		3.7			3.7							
All-Red Time (s)		1.4			1.4							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		5.1			5.1							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0							
Recall Mode		C-Max			C-Max							
Walk Time (s)		15.0			15.0							
Flash Dont Walk (s)		5.0			5.0							
Pedestrian Calls (#/hr)		20			20							
Act Effct Green (s)		105.6			105.6							
Actuated g/C Ratio		0.81			0.81							
v/c Ratio		0.36			0.41							
Control Delay		4.5			3.2							
Queue Delay		0.1			0.1							
Total Delay		4.6			3.3							
LOS		A			A							
Approach Delay		4.6			3.3							
Approach LOS		A			A							
Queue Length 50th (m)		34.2			29.4							
Queue Length 95th (m)		41.9			m31.9							
Internal Link Dist (m)		93.5			100.7			133.3			30.9	
Turn Bay Length (m)												
Base Capacity (vph)		2666			2666							
Starvation Cap Reductn		486			469							
Spillback Cap Reductn		180			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.44			0.50							

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 59 (45%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.41  
 Intersection Signal Delay: 3.9 Intersection LOS: A  
 Intersection Capacity Utilization 36.0% ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

























Splits and Phases: 3: Trillium Pathway & Carling



Lane Group	Ø4
Total Split (s)	36.0
Total Split (%)	28%
Maximum Green (s)	29.4
Yellow Time (s)	3.0
All-Red Time (s)	3.6
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	22.0
Pedestrian Calls (#/hr)	20
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

4: Preston & Carling  
AM Peak Hour

829 Carling Avenue  
2028 Total Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 				
Traffic Volume (vph)	161	602	233	253	702	102	287	478	308	124	302	131
Future Volume (vph)	161	602	233	253	702	102	287	478	308	124	302	131
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		0.0	110.0		90.0	75.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.94	0.97		0.98		0.84	0.98	0.98		1.00	0.98	
Frt		0.958				0.850		0.941			0.955	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1595	3049	0	1658	3252	1375	1674	3035	0	1510	1506	0
Flt Permitted	0.950			0.950			0.169			0.354		
Satd. Flow (perm)	1507	3049	0	1623	3252	1153	292	3035	0	561	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42				143		145				17
Link Speed (k/h)		60			60			50				50
Link Distance (m)		124.7			193.9			164.5				65.2
Travel Time (s)		7.5			11.6			11.8				4.7
Confl. Peds. (#/hr)	90		41	41		90	60		10	10		60
Confl. Bikes (#/hr)			22			10			36			5
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%	2%	2%	4%	10%	1%	4%	2%	12%	6%	20%
Adj. Flow (vph)	161	602	233	253	702	102	287	478	308	124	302	131
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	835	0	253	702	102	287	786	0	124	433	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5				3.5
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		5.0			5.0			5.0				5.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	3	8		4	4	

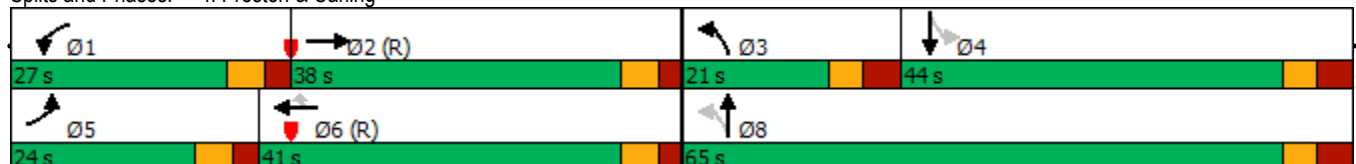


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0		11.2	30.0	30.0	11.9	43.9		43.9	43.9	
Total Split (s)	24.0	38.0		27.0	41.0	41.0	21.0	65.0		44.0	44.0	
Total Split (%)	18.5%	29.2%		20.8%	31.5%	31.5%	16.2%	50.0%		33.8%	33.8%	
Maximum Green (s)	17.8	32.0		20.8	35.0	35.0	14.1	58.1		37.1	37.1	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.3		2.5	2.3	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		6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	Max	
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)		20			20	20		20		20	20	
Act Effct Green (s)	16.3	32.0		20.8	36.5	36.5	58.1	58.1		37.1	37.1	
Actuated g/C Ratio	0.13	0.25		0.16	0.28	0.28	0.45	0.45		0.29	0.29	
v/c Ratio	0.81	1.07		0.95	0.77	0.24	1.02	0.55		0.78	0.98	
Control Delay	88.3	83.0		63.1	41.3	9.2	76.1	8.9		74.5	83.1	
Queue Delay	0.0	2.7		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	88.3	85.7		63.1	41.3	9.2	76.1	8.9		74.5	83.1	
LOS	F	F		E	D	A	E	A		E	F	
Approach Delay		86.1			43.4			26.9			81.1	
Approach LOS		F			D			C			F	
Queue Length 50th (m)	29.7	~107.0		53.6	90.7	6.0	~47.5	52.5		26.9	98.4	
Queue Length 95th (m)	#63.1	#140.8		m57.8	m90.1	m7.8	#99.7	60.7		#57.8	#160.0	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0			110.0		90.0	75.0					
Base Capacity (vph)	218	782		265	913	426	280	1436		160	441	
Starvation Cap Reductn	0	5		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	0.74	1.07		0.95	0.77	0.24	1.02	0.55		0.78	0.98	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 88 (68%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.07  
 Intersection Signal Delay: 55.8  
 Intersection LOS: E  
 Intersection Capacity Utilization 110.5%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Preston & Carling



5: Carling & Booth  
AM Peak Hour

829 Carling Avenue  
2028 Total Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	401	726	771	215	240	190
Future Volume (vph)	401	726	771	215	240	190
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	75.0			25.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				10.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.94			0.78	0.98	0.79
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1674	3252	1728	1498	1674	1427
Fl <sub>t</sub> Permitted	0.950				0.950	
Satd. Flow (perm)	1565	3252	1728	1172	1647	1125
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				60		190
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	70			70	14	85
Confl. Bikes (#/hr)				16		23
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	4%	3%	1%	1%	6%
Adj. Flow (vph)	401	726	771	215	240	190
Shared Lane Traffic (%)						
Lane Group Flow (vph)	401	726	771	215	240	190
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	15.7	29.7	29.7	39.0	39.0
Total Split (s)	32.0	91.0	59.0	59.0	39.0	39.0
Total Split (%)	24.6%	70.0%	45.4%	45.4%	30.0%	30.0%
Maximum Green (s)	26.1	85.3	53.3	53.3	33.0	33.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			13.0	13.0	7.0	7.0
Flash Dont Walk (s)			11.0	11.0	26.0	26.0
Pedestrian Calls (#/hr)			20	20	20	20
Act Effct Green (s)	31.9	91.1	53.3	53.3	27.2	27.2
Actuated g/C Ratio	0.25	0.70	0.41	0.41	0.21	0.21
v/c Ratio	0.98	0.32	1.09	0.42	0.70	0.49
Control Delay	68.3	2.8	97.5	22.1	57.8	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	2.8	97.5	22.1	57.8	9.9
LOS	E	A	F	C	E	A
Approach Delay		26.1	81.0		36.6	
Approach LOS		C	F		D	
Queue Length 50th (m)	~113.1	14.3	~204.3	25.3	49.7	0.0
Queue Length 95th (m)	m#133.3	m16.7	#272.4	45.4	75.0	17.8
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	75.0			25.0		45.0
Base Capacity (vph)	411	2279	708	515	418	427
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	0.98	0.32	1.09	0.42	0.57	0.44

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 16 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.09  
 Intersection Signal Delay: 49.2 Intersection LOS: D  
 Intersection Capacity Utilization 107.5% ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carling & Booth



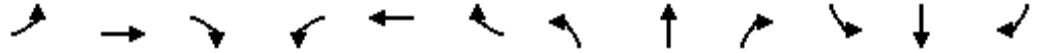


6: Preston & Beech  
AM Peak Hour

829 Carling Avenue  
2028 Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↗	↗	↗	↗	↗	↗
Traffic Volume (vph)	43	56	26	37	55	12	28	643	56	18	401	38
Future Volume (vph)	43	56	26	37	55	12	28	643	56	18	401	38
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	25.0		0.0	25.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	25.0			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			0.97	0.89	0.96	0.99		0.98	0.99	
Frt		0.972				0.850		0.988			0.987	
Flt Protected		0.983			0.980		0.950			0.950		
Satd. Flow (prot)	0	1558	0	0	1568	1498	1537	1693	0	1537	1645	0
Flt Permitted		0.865			0.853		0.473			0.304		
Satd. Flow (perm)	0	1336	0	0	1325	1339	738	1693	0	481	1645	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				34		11			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		101.4			151.8			160.5			163.2	
Travel Time (s)		7.3			10.9			11.6			11.8	
Confl. Peds. (#/hr)	36		40	40		36	50		55	55		50
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 (%)	9%	4%	4%	25%	2%	1%	10%	3%	3%	10%	6%	5%
Adj. Flow (vph)	43	56	26	37	55	12	28	643	56	18	401	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	125	0	0	92	12	28	699	0	18	439	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	

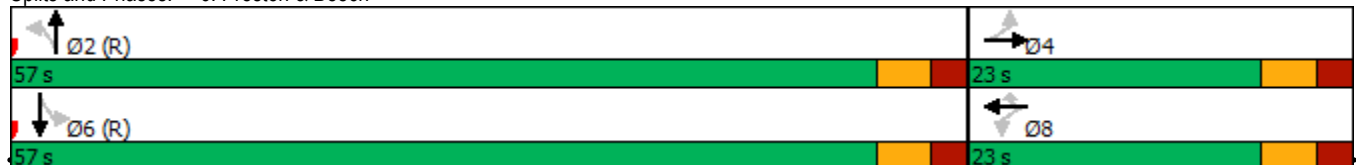


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	22.6	22.6		22.6	22.6	22.6	33.5	33.5		33.5	33.5	
Total Split (s)	23.0	23.0		23.0	23.0	23.0	57.0	57.0		57.0	57.0	
Total Split (%)	28.8%	28.8%		28.8%	28.8%	28.8%	71.3%	71.3%		71.3%	71.3%	
Maximum Green (s)	17.4	17.4		17.4	17.4	17.4	51.5	51.5		51.5	51.5	
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3	2.3	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.6			5.6	5.6	5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Ped	Ped		Ped	Ped	Ped	C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	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	10.0	
Pedestrian Calls (#/hr)	20	20		20	20	20	20	20		20	20	
Act Effct Green (s)		17.1			17.1	17.1	51.8	51.8		51.8	51.8	
Actuated g/C Ratio		0.21			0.21	0.21	0.65	0.65		0.65	0.65	
v/c Ratio		0.42			0.33	0.04	0.06	0.64		0.06	0.41	
Control Delay		28.9			30.4	2.8	5.5	9.6		5.8	8.0	
Queue Delay		0.0			0.0	0.0	0.0	0.1		0.0	0.0	
Total Delay		28.9			30.4	2.8	5.5	9.7		5.8	8.0	
LOS		C			C	A	A	A		A	A	
Approach Delay		28.9			27.2			9.5			7.9	
Approach LOS		C			C			A			A	
Queue Length 50th (m)		13.3			11.0	0.0	1.3	50.2		0.8	24.8	
Queue Length 95th (m)		27.3			22.7	1.2	m2.6	40.6		3.0	40.7	
Internal Link Dist (m)		77.4			127.8			136.5			139.2	
Turn Bay Length (m)							25.0			25.0		
Base Capacity (vph)		302			288	317	477	1100		311	1069	
Starvation Cap Reductn		0			0	0	0	37		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			0.32	0.04	0.06	0.66		0.06	0.41	

Intersection Summary

Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 40 (50%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.64  
 Intersection Signal Delay: 12.0 Intersection LOS: B  
 Intersection Capacity Utilization 81.9% ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Preston & Beech





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	3	0	0	0	8	679	46	10	495	5
Future Volume (vph)	1	0	3	0	0	0	8	679	46	10	495	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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		0.93						0.99			1.00	
Flt Protected		0.999						0.992			0.999	
Satd. Flow (prot)	0	1470	0	0	0	0	0	1704	0	0	1617	0
Flt Permitted		0.988						0.995			0.987	
Satd. Flow (perm)	0	1453	0	0	0	0	0	1696	0	0	1597	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29						9			1	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		114.6			152.9			73.8			160.5	
Travel Time (s)		8.3			11.0			5.3			11.6	
Confl. Peds. (#/hr)	17		18	18		17	35		45	45		35
Confl. Bikes (#/hr)			8						21			17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	3%	1%	1%	10%	1%
Adj. Flow (vph)	1	0	3	0	0	0	8	679	46	10	495	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	0	0	0	733	0	0	510	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		-2.0			-1.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2					1	2		1	2	
Detector Template	Left	Thru					Left	Thru		Left	Thru	
Leading Detector (m)	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	
Detector 1 Position(m)	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	
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			28.7	
Detector 2 Size(m)		1.8						1.8			1.8	
Detector 2 Type		CI+Ex						CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Detector Phase	4	4					2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0					10.0	10.0		10.0	10.0	
Minimum Split (s)	20.5	20.5					28.1	28.1		28.1	28.1	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	21.0	21.0					59.0	59.0		59.0	59.0	
Total Split (%)	26.3%	26.3%					73.8%	73.8%		73.8%	73.8%	
Maximum Green (s)	15.5	15.5					53.9	53.9		53.9	53.9	
Yellow Time (s)	3.3	3.3					3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2					1.8	1.8		1.8	1.8	
Lost Time Adjust (s)			0.0					0.0			0.0	
Total Lost Time (s)		5.5						5.1			5.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	
Recall Mode	None	None					C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0					18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	8.0	8.0					5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	20	20					20	20		20	20	
Act Effct Green (s)		12.0						69.8			69.8	
Actuated g/C Ratio		0.15						0.87			0.87	
v/c Ratio		0.02						0.50			0.37	
Control Delay		0.0						5.4			2.5	
Queue Delay		0.0						0.0			0.0	
Total Delay		0.0						5.4			2.5	
LOS		A						A			A	
Approach Delay								5.4			2.5	
Approach LOS								A			A	
Queue Length 50th (m)		0.0						0.0			0.0	
Queue Length 95th (m)		0.0						77.5			17.6	
Internal Link Dist (m)		90.6			128.9			49.8			136.5	
Turn Bay Length (m)												
Base Capacity (vph)		304						1480			1393	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.01						0.50			0.37	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 48 (60%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 4.2

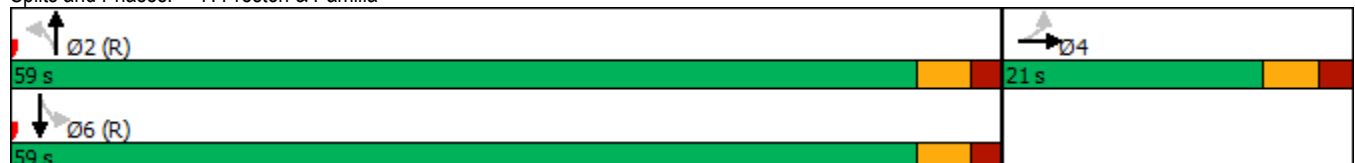
Intersection LOS: A

Intersection Capacity Utilization 64.2%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 7: Preston & Pamilla





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	29	1	22	20	5	26	12	641	90	34	488	15
Future Volume (vph)	29	1	22	20	5	26	12	641	90	34	488	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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												
Frt		0.943			0.931			0.984			0.996	
Flt Protected		0.973			0.981			0.999			0.997	
Satd. Flow (prot)	0	1601	0	0	1594	0	0	1701	0	0	1688	0
Flt Permitted		0.973			0.981			0.999			0.997	
Satd. Flow (perm)	0	1601	0	0	1594	0	0	1701	0	0	1688	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		113.6			154.3			71.5			73.8	
Travel Time (s)		8.2			11.1			5.1			5.3	
Confl. Peds. (#/hr)							28		45	45		28
Confl. Bikes (#/hr)									21			17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	5%	2%
Adj. Flow (vph)	29	1	22	20	5	26	12	641	90	34	488	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	52	0	0	51	0	0	743	0	0	537	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		-2.0			-2.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

**Intersection Summary**

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 60.0% ICU Level of Service B

Analysis Period (min) 15



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	44	60	39	699	498	30
Future Volume (vph)	44	60	39	699	498	30
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.922			0.992		
Flt Protected	0.979			0.997		
Satd. Flow (prot)	1575	0	0	3275	1684	0
Flt Permitted	0.979			0.997		
Satd. Flow (perm)	1575	0	0	3275	1684	0
Link Speed (k/h)	30			50	50	
Link Distance (m)	68.0			65.2	71.5	
Travel Time (s)	8.2			4.7	5.1	
Confl. Peds. (#/hr)				28		28
Confl. Bikes (#/hr)						17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	5%	2%
Adj. Flow (vph)	44	60	39	699	498	30
Shared Lane Traffic (%)						
Lane Group Flow (vph)	104	0	0	738	528	0
Enter Blocked Intersection	No	No	Yes	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			2.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	64.2%
	ICU Level of Service C
Analysis Period (min)	15



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	693	286	2	2	213	318	1	4	3	278	4	487
Future Volume (vph)	693	286	2	2	213	318	1	4	3	278	4	487
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	55.0		0.0	30.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	2		0	1		1	0		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.97		0.97		0.96			0.94	0.91
Frt		0.999				0.850		0.949				0.850
Flt Protected	0.950			0.950				0.994			0.953	
Satd. Flow (prot)	3185	1760	0	1674	1762	1498	0	1209	0	0	1668	1469
Flt Permitted	0.459			0.583				0.979			0.724	
Satd. Flow (perm)	1519	1760	0	1002	1762	1460	0	1185	0	0	1187	1340
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						258		3				358
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		233.9			203.3			76.1			164.5	
Travel Time (s)		14.0			12.2			5.5			11.8	
Confl. Peds. (#/hr)	9		15	15		9	25		24	24		25
Confl. Bikes (#/hr)			3						1			2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	1%	1%	1%	1%	1%	50%	25%	1%	50%	3%
Adj. Flow (vph)	693	286	2	2	213	318	1	4	3	278	4	487
Shared Lane Traffic (%)												
Lane Group Flow (vph)	693	288	0	2	213	318	0	8	0	0	282	487
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)		7.0			7.0			0.0			3.5	
Link Offset(m)		2.0			0.0			5.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6		6	8			4		4
Detector Phase	5	2		6	6	6	8	8		4	4	5

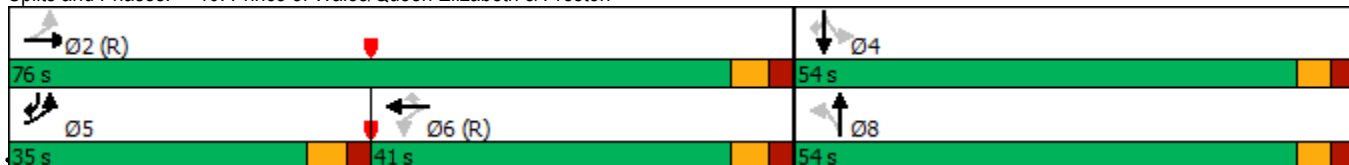


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	5.0
Minimum Split (s)	11.1	32.1		32.1	32.1	32.1	29.5	29.5		29.5	29.5	11.1
Total Split (s)	35.0	76.0		41.0	41.0	41.0	54.0	54.0		54.0	54.0	35.0
Total Split (%)	26.9%	58.5%		31.5%	31.5%	31.5%	41.5%	41.5%		41.5%	41.5%	26.9%
Maximum Green (s)	28.9	69.9		34.9	34.9	34.9	48.5	48.5		48.5	48.5	28.9
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.7
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	2.2	2.2		2.2	2.2	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		5.5			5.5	6.1
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	Max	Max		Max	Max	None
Walk Time (s)		7.0		7.0	7.0	7.0	12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		19.0		19.0	19.0	19.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		20		20	20	20	20	20		20	20	
Act Effct Green (s)	69.9	69.9		39.7	39.7	39.7		48.5			48.5	72.0
Actuated g/C Ratio	0.54	0.54		0.31	0.31	0.31		0.37			0.37	0.55
v/c Ratio	0.62	0.30		0.01	0.40	0.51		0.02			0.64	0.53
Control Delay	20.5	17.7		34.5	39.6	11.6		21.4			28.2	2.2
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	20.5	17.7		34.5	39.6	11.6		21.4			28.2	2.2
LOS	C	B		C	D	B		C			C	A
Approach Delay		19.7			22.8			21.4			11.8	
Approach LOS		B			C			C			B	
Queue Length 50th (m)	48.0	36.2		0.3	39.8	10.3		0.7			45.3	9.8
Queue Length 95th (m)	60.7	53.1		2.3	64.0	36.6		3.9			m44.8	m9.4
Internal Link Dist (m)		209.9			179.3			52.1			140.5	
Turn Bay Length (m)	55.0			30.0		25.0						
Base Capacity (vph)	1187	946		305	537	624		443			442	966
Starvation Cap Reductn	0	0		0	0	0		0			0	21
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.58	0.30		0.01	0.40	0.51		0.02			0.64	0.52

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 7 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.64  
 Intersection Signal Delay: 17.8      Intersection LOS: B  
 Intersection Capacity Utilization 90.6%      ICU Level of Service E  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

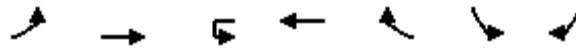
Splits and Phases: 10: Prince of Wales/Queen Elizabeth & Preston



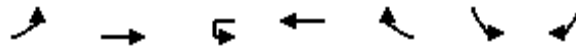




Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	87	0	8	61	0	17
Future Volume (vph)	87	0	8	61	0	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>						0.865
Fl <sub>t</sub> Protected				0.994		
Satd. Flow (prot)	1745	0	0	1735	1510	0
Fl <sub>t</sub> Permitted				0.994		
Satd. Flow (perm)	1745	0	0	1735	1510	0
Link Speed (k/h)	30			30	50	
Link Distance (m)	49.5			68.0	46.2	
Travel Time (s)	5.9			8.2	3.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	87	0	8	61	0	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	87	0	0	69	17	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	0.0			0.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	20.5%			ICU Level of Service A		
Analysis Period (min)	15					



Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	65	745	13	1449	179	186	7
Future Volume (vph)	65	745	13	1449	179	186	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0		50.0		110.0	0.0	10.0
Storage Lanes	1		1		1	1	1
Taper Length (m)	25.0		25.0			25.0	
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Ped Bike Factor	0.99				0.91	0.99	0.97
Fr					0.850		0.850
Flt Protected	0.950		0.950			0.950	
Satd. Flow (prot)	1674	3252	1674	3316	1498	1674	1498
Flt Permitted	0.950		0.369			0.950	
Satd. Flow (perm)	1658	3252	650	3316	1357	1659	1454
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					179		3
Link Speed (k/h)		60		60		40	
Link Distance (m)		196.1		162.9		242.3	
Travel Time (s)		11.8		9.8		21.8	
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	1.00
Heavy Vehicles (%)	1%	4%	1%	2%	1%	1%	1%
Adj. Flow (vph)	65	745	13	1449	179	186	7
Shared Lane Traffic (%)							
Lane Group Flow (vph)	65	745	13	1449	179	186	7
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	Left	Right	L NA	R NA
Median Width(m)		7.0		7.0		3.5	
Link Offset(m)		0.0		0.0		0.0	
Crosswalk Width(m)		5.0		10.0		5.0	
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14		14	40	14
Number of Detectors	1	2	1	2	1	1	1
Detector Template	Left	Thru	Left	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	6.1	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	1.8	6.1	6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7		28.7			
Detector 2 Size(m)		1.8		1.8			
Detector 2 Type		Cl+Ex		Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)		0.0		0.0			
Turn Type	Prot	NA	Perm	NA	Perm	Perm	Perm
Protected Phases	5	2		6			
Permitted Phases			6		6	4	4
Detector Phase	5	2	6	6	6	4	4



Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.2	33.4	33.4	33.4	33.4	40.1	40.1
Total Split (s)	17.0	99.0	82.0	82.0	82.0	41.0	41.0
Total Split (%)	12.1%	70.7%	58.6%	58.6%	58.6%	29.3%	29.3%
Maximum Green (s)	11.8	92.6	75.6	75.6	75.6	33.9	33.9
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	2.7	2.7	2.7	2.7	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.4	6.4	6.4	6.4	7.1	7.1
Lead/Lag	Lead		Lag	Lag	Lag		
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)		12.0	12.0	12.0	12.0	7.0	7.0
Flash Dont Walk (s)		15.0	15.0	15.0	15.0	26.0	26.0
Pedestrian Calls (#/hr)		20	20	20	20	20	20
Act Effct Green (s)	10.3	100.4	87.2	87.2	87.2	26.1	26.1
Actuated g/C Ratio	0.07	0.72	0.62	0.62	0.62	0.19	0.19
v/c Ratio	0.53	0.32	0.03	0.70	0.20	0.60	0.03
Control Delay	77.4	8.6	5.8	10.7	1.1	59.1	33.3
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	77.4	8.6	5.8	10.9	1.1	59.1	33.3
LOS	E	A	A	B	A	E	C
Approach Delay		14.1		9.8		58.2	
Approach LOS		B		A		E	
Queue Length 50th (m)	16.2	40.0	0.6	91.9	0.4	41.2	0.8
Queue Length 95th (m)	30.2	49.7	m1.4	135.8	3.3	63.3	4.6
Internal Link Dist (m)		172.1		138.9		218.3	
Turn Bay Length (m)	40.0		50.0		110.0		10.0
Base Capacity (vph)	145	2331	404	2065	912	401	354
Starvation Cap Reductn	0	0	0	78	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	0.45	0.32	0.03	0.73	0.20	0.46	0.02

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 7 (5%), Referenced to phase 2:EBT and 6:WBTU, Start of Green  
 Natural Cycle: 95  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 14.6      Intersection LOS: B  
 Intersection Capacity Utilization 76.8%      ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Carling & Sherwood



2: Carling & Champagne  
PM Peak Hour

829 Carling Avenue  
2028 Total Traffic

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	775	26	27	1300	71	97	0	110	146	0	199
Future Volume (vph)	55	775	26	27	1300	71	97	0	110	146	0	199
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	70.0		30.0	60.0		25.0	0.0		0.0	20.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.95	0.96		0.74	0.95		0.94	0.97		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1409	3283	1483	1658	3316	1498	1658	0	1483	1674	0	1498
Flt Permitted	0.178			0.340			0.950			0.950		
Satd. Flow (perm)	264	3283	1415	571	3316	1106	1580	0	1398	1630	0	1440
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			24			34			110			54
Link Speed (k/h)		60			60			50				50
Link Distance (m)		162.9			117.5			121.7				178.4
Travel Time (s)		9.8			7.1			8.8				12.8
Confl. Peds. (#/hr)	70		70	70		70	20		20	20		20
Confl. Bikes (#/hr)			5			4						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 (%)	20%	3%	2%	2%	2%	1%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	55	775	26	27	1300	71	97	0	110	146	0	199
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	775	26	27	1300	71	97	0	110	146	0	199
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5				3.5
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		5.0			5.0			5.0				5.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1		1	1		1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left		Right	Left		Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1		6.1	6.1		6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1		6.1	6.1		6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 2 Position(m)		28.7			28.7							
Detector 2 Size(m)		1.8			1.8							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm		Perm	Perm		Perm
Protected Phases		2			6							
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	2	2	2	6	6	6	8		8	4		4

2: Carling & Champagne  
PM Peak Hour

829 Carling Avenue  
2028 Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0		5.0	10.0		10.0
Minimum Split (s)	15.3	15.3	15.3	25.3	25.3	25.3	24.0		24.0	37.9		37.9
Total Split (s)	95.0	95.0	95.0	95.0	95.0	95.0	45.0		45.0	45.0		45.0
Total Split (%)	67.9%	67.9%	67.9%	67.9%	67.9%	67.9%	32.1%		32.1%	32.1%		32.1%
Maximum Green (s)	89.7	89.7	89.7	89.7	89.7	89.7	39.0		39.0	39.1		39.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0		3.0	3.3		3.3
All-Red Time (s)	1.6	1.6	1.6	1.6	1.6	1.6	3.0		3.0	2.6		2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	6.0		6.0	5.9		5.9
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None		None	None		None
Walk Time (s)				10.0	10.0	10.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)				10.0	10.0	10.0	11.0		11.0	25.0		25.0
Pedestrian Calls (#/hr)				20	20	20	20		20	20		20
Act Effct Green (s)	104.1	104.1	104.1	104.1	104.1	104.1	24.6		24.6	24.7		24.7
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.74	0.74	0.18		0.18	0.18		0.18
v/c Ratio	0.28	0.32	0.02	0.06	0.53	0.09	0.35		0.33	0.51		0.67
Control Delay	12.0	7.1	2.3	2.8	3.2	1.8	51.8		10.2	56.6		48.6
Queue Delay	0.0	0.1	0.0	0.0	0.4	0.0	0.0		0.0	0.0		0.0
Total Delay	12.0	7.2	2.3	2.8	3.6	1.8	51.8		10.2	56.6		48.6
LOS	B	A	A	A	A	A	D		B	E		D
Approach Delay		7.4			3.5			29.7				52.0
Approach LOS		A			A			C				D
Queue Length 50th (m)	3.0	22.0	0.3	1.0	25.5	0.7	20.5		0.0	31.8		32.6
Queue Length 95th (m)	17.7	32.7	m1.5	m1.9	28.4	2.0	35.6		14.0	51.0		56.4
Internal Link Dist (m)		138.9			93.5			97.7				154.4
Turn Bay Length (m)	70.0		30.0	60.0		25.0				20.0		
Base Capacity (vph)	196	2441	1058	424	2466	831	440		468	455		441
Starvation Cap Reductn	0	590	0	0	599	0	0		0	0		0
Spillback Cap Reductn	0	0	0	0	115	0	0		0	0		1
Storage Cap Reductn	0	0	0	0	0	0	0		0	0		0
Reduced v/c Ratio	0.28	0.42	0.02	0.06	0.70	0.09	0.22		0.24	0.32		0.45

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 5 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.67  
 Intersection Signal Delay: 12.6 Intersection LOS: B  
 Intersection Capacity Utilization 78.6% ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Carling & Champagne



3: Trillium Pathway & Carling  
PM Peak Hour

829 Carling Avenue  
2028 Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑							
Traffic Volume (vph)	0	1081	0	0	1442	0	0	0	0	0	0	0
Future Volume (vph)	0	1081	0	0	1442	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected												
Satd. Flow (prot)	0	3283	0	0	3316	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3283	0	0	3316	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (k/h)	60				60				50			
Link Distance (m)	117.5				124.7				157.3			
Travel Time (s)	7.1				7.5				11.3			
Confl. Peds. (#/hr)	35					35	25			35	35	25
Confl. Bikes (#/hr)			11			10			13			34
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	1081	0	0	1442	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1081	0	0	1442	0	0	0	0	0	0	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)	7.0				7.0				0.0			
Link Offset(m)	0.0				0.0				0.0			
Crosswalk Width(m)	5.0				5.0				5.0			
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14		24	14		24	14		24	14	
Number of Detectors	2				2							
Detector Template	Thru				Thru							
Leading Detector (m)	30.5				30.5							
Trailing Detector (m)	0.0				0.0							
Detector 1 Position(m)	0.0				0.0							
Detector 1 Size(m)	1.8				1.8							
Detector 1 Type	CI+Ex				CI+Ex							
Detector 1 Channel												
Detector 1 Extend (s)	0.0				0.0							
Detector 1 Queue (s)	0.0				0.0							
Detector 1 Delay (s)	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	NA				NA							
Protected Phases	2				6							
Permitted Phases												
Detector Phase	2				6							
Switch Phase												
Minimum Initial (s)	10.0				10.0							
Minimum Split (s)	25.1				25.1							

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	35.6

3: Trillium Pathway & Carling  
PM Peak Hour

829 Carling Avenue  
2028 Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)		104.0			104.0							
Total Split (%)		74.3%			74.3%							
Maximum Green (s)		98.9			98.9							
Yellow Time (s)		3.7			3.7							
All-Red Time (s)		1.4			1.4							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		5.1			5.1							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0							
Recall Mode		C-Max			C-Max							
Walk Time (s)		15.0			15.0							
Flash Dont Walk (s)		5.0			5.0							
Pedestrian Calls (#/hr)		20			20							
Act Effct Green (s)		115.6			115.6							
Actuated g/C Ratio		0.83			0.83							
v/c Ratio		0.40			0.53							
Control Delay		4.3			2.2							
Queue Delay		0.1			0.1							
Total Delay		4.5			2.4							
LOS		A			A							
Approach Delay		4.5			2.4							
Approach LOS		A			A							
Queue Length 50th (m)		38.1			27.8							
Queue Length 95th (m)		45.7			m27.4							
Internal Link Dist (m)		93.5			100.7			133.3			30.9	
Turn Bay Length (m)												
Base Capacity (vph)		2710			2737							
Starvation Cap Reductn		585			367							
Spillback Cap Reductn		264			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.51			0.61							

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 108 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 3.3

Intersection LOS: A

Intersection Capacity Utilization 46.3%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 3: Trillium Pathway & Carling

Ø2 (R) 104 s	Ø4 36 s
Ø5 (R) 104 s	



Lane Group	Ø4
Total Split (s)	36.0
Total Split (%)	26%
Maximum Green (s)	29.4
Yellow Time (s)	3.0
All-Red Time (s)	3.6
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	22.0
Pedestrian Calls (#/hr)	20
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
2028 Total Traffic

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	604	374	366	962	66	353	371	204	105	336	127
Future Volume (vph)	174	604	374	366	962	66	353	371	204	105	336	127
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		0.0	110.0		90.0	75.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.98	0.97		0.98		0.89	0.98	0.97		0.97	0.98	
Frt		0.943				0.850		0.947			0.959	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1610	3014	0	1674	3316	1427	1674	3061	0	1537	1622	0
Flt Permitted	0.950			0.950			0.094			0.436		
Satd. Flow (perm)	1571	3014	0	1649	3316	1272	163	3061	0	686	1622	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		93				132		93				13
Link Speed (k/h)		60			60			50				50
Link Distance (m)		124.7			193.9			164.5				65.2
Travel Time (s)		7.5			11.6			11.8				4.7
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 (%)	5%	3%	2%	1%	2%	6%	1%	2%	1%	10%	2%	5%
Adj. Flow (vph)	174	604	374	366	962	66	353	371	204	105	336	127
Shared Lane Traffic (%)												
Lane Group Flow (vph)	174	978	0	366	962	66	353	575	0	105	463	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5				3.5
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		5.0			5.0			5.0				5.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	1	2		1	2
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	3	8		4	4	

4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
2028 Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0		11.2	30.0	30.0	11.9	43.9		43.9	43.9	
Total Split (s)	21.0	43.0		30.0	52.0	52.0	23.0	67.0		44.0	44.0	
Total Split (%)	15.0%	30.7%		21.4%	37.1%	37.1%	16.4%	47.9%		31.4%	31.4%	
Maximum Green (s)	14.8	37.0		23.8	46.0	46.0	16.1	60.1		37.1	37.1	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.3		2.5	2.3	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		6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	Max	
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)		20			20	20		20		20	20	
Act Effct Green (s)	14.8	37.0		23.8	46.0	46.0	60.1	60.1		37.1	37.1	
Actuated g/C Ratio	0.11	0.26		0.17	0.33	0.33	0.43	0.43		0.26	0.26	
v/c Ratio	1.02	1.13		1.29	0.88	0.13	1.45	0.42		0.58	1.05	
Control Delay	141.8	102.9		177.2	40.7	2.1	251.1	6.2		59.3	105.6	
Queue Delay	0.0	0.1		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	141.8	103.0		177.2	40.7	2.1	251.1	6.2		59.3	105.6	
LOS	F	F		F	D	A	F	A		E	F	
Approach Delay		108.8			74.7			99.4			97.1	
Approach LOS		F			E			F			F	
Queue Length 50th (m)	~40.9	~143.5		~117.3	133.2	0.0	~106.7	27.7		23.3	~126.3	
Queue Length 95th (m)	#88.5	#175.0		m#120.3	m124.3	m0.0	m#166.0	35.4		42.9	#188.0	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0			110.0		90.0	75.0					
Base Capacity (vph)	170	864		284	1089	506	243	1367		181	439	
Starvation Cap Reductn	0	17		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	1.02	1.15		1.29	0.88	0.13	1.45	0.42		0.58	1.05	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

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

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.45

Intersection Signal Delay: 93.2

Intersection LOS: F

Intersection Capacity Utilization 126.0%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

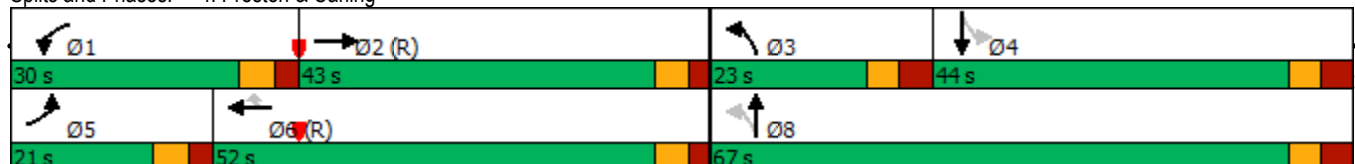
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 4: Preston & Carling



5: Carling & Booth  
PM Peak Hour

829 Carling Avenue  
2028 Total Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	255	724	987	104	308	324
Future Volume (vph)	255	724	987	104	308	324
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	75.0			25.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				10.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.95			0.79	0.98	0.75
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1674	3316	1745	1498	1674	1483
Fl <sub>t</sub> Permitted	0.950				0.950	
Satd. Flow (perm)	1594	3316	1745	1181	1647	1117
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				25		263
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	65			65	13	81
Confl. Bikes (#/hr)				10		45
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	2%	1%	1%	2%
Adj. Flow (vph)	255	724	987	104	308	324
Shared Lane Traffic (%)						
Lane Group Flow (vph)	255	724	987	104	308	324
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	15.7	29.7	29.7	39.0	39.0
Total Split (s)	24.0	101.0	77.0	77.0	39.0	39.0
Total Split (%)	17.1%	72.1%	55.0%	55.0%	27.9%	27.9%
Maximum Green (s)	18.1	95.3	71.3	71.3	33.0	33.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			13.0	13.0	7.0	7.0
Flash Dont Walk (s)			11.0	11.0	26.0	26.0
Pedestrian Calls (#/hr)			20	20	20	20
Act Effct Green (s)	21.2	98.4	71.3	71.3	29.9	29.9
Actuated g/C Ratio	0.15	0.70	0.51	0.51	0.21	0.21
v/c Ratio	1.01	0.31	1.11	0.17	0.88	0.73
Control Delay	86.9	6.6	98.8	14.7	77.9	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.9	6.6	98.8	14.7	77.9	20.8
LOS	F	A	F	B	E	C
Approach Delay		27.5	90.7		48.6	
Approach LOS		C	F		D	
Queue Length 50th (m)	~75.8	49.3	~287.1	10.3	74.4	12.7
Queue Length 95th (m)	m#85.3	m48.6	#359.6	20.3	#113.7	47.2
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	75.0			25.0		45.0
Base Capacity (vph)	253	2330	888	613	388	464
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	1.01	0.31	1.11	0.17	0.79	0.70

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 62 (44%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.11  
 Intersection Signal Delay: 58.0  
 Intersection LOS: E  
 Intersection Capacity Utilization 111.3%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carling & Booth



6: Preston & Beech  
PM Peak Hour

829 Carling Avenue  
2028 Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↗	↗	↗	↗	↗	↗
Traffic Volume (vph)	29	41	34	42	121	31	82	463	57	17	487	54
Future Volume (vph)	29	41	34	42	121	31	82	463	57	17	487	54
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	25.0		0.0	25.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	25.0			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		0.93			0.97	0.84	0.97	0.98		0.94	0.99	
Frt		0.956				0.850		0.984			0.985	
Flt Protected		0.986			0.987		0.950			0.950		
Satd. Flow (prot)	0	1584	0	0	1739	1498	1674	1676	0	1674	1670	0
Flt Permitted		0.875			0.904		0.413			0.426		
Satd. Flow (perm)	0	1374	0	0	1553	1261	703	1676	0	709	1670	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24				31		16			14	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		101.4			151.8			160.5			163.2	
Travel Time (s)		7.3			10.9			11.6			11.8	
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 (%)	1%	1%	1%	1%	1%	1%	1%	3%	1%	1%	4%	2%
Adj. Flow (vph)	29	41	34	42	121	31	82	463	57	17	487	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	104	0	0	163	31	82	520	0	17	541	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	22.6	22.6		22.6	22.6	22.6	33.5	33.5		33.5	33.5	
Total Split (s)	23.0	23.0		23.0	23.0	23.0	67.0	67.0		67.0	67.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%	25.6%	74.4%	74.4%		74.4%	74.4%	
Maximum Green (s)	17.4	17.4		17.4	17.4	17.4	61.5	61.5		61.5	61.5	
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3	2.3	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.6			5.6	5.6	5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Ped	Ped		Ped	Ped	Ped	C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	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	10.0	
Pedestrian Calls (#/hr)	20	20		20	20	20	20	20		20	20	
Act Effct Green (s)		17.1			17.1	17.1	61.8	61.8		61.8	61.8	
Actuated g/C Ratio		0.19			0.19	0.19	0.69	0.69		0.69	0.69	
v/c Ratio		0.37			0.55	0.12	0.17	0.45		0.03	0.47	
Control Delay		28.8			41.1	12.2	2.5	4.6		4.8	8.0	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		28.8			41.1	12.2	2.5	4.6		4.8	8.0	
LOS		C			D	B	A	A		A	A	
Approach Delay		28.8			36.5			4.3			7.9	
Approach LOS		C			D			A			A	
Queue Length 50th (m)		11.1			23.7	0.0	2.6	33.8		0.8	33.4	
Queue Length 95th (m)		24.5			41.6	6.6	0.5	1.8		2.6	52.2	
Internal Link Dist (m)		77.4			127.8			136.5			139.2	
Turn Bay Length (m)							25.0			25.0		
Base Capacity (vph)		285			300	268	482	1156		486	1151	
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		0.36			0.54	0.12	0.17	0.45		0.03	0.47	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 43 (48%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.55  
 Intersection Signal Delay: 11.7  
 Intersection LOS: B  
 Intersection Capacity Utilization 86.1%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 6: Preston & Beech





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	2	10	0	0	0	8	559	27	6	560	15
Future Volume (vph)	4	2	10	0	0	0	8	559	27	6	560	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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		0.92						0.99			1.00	
Flt Protected		0.916						0.994			0.997	
Flt Permitted		0.988						0.999			0.999	
Satd. Flow (prot)	0	1494	0	0	0	0	0	1709	0	0	1717	0
Satd. Flow (perm)	0	1466	0	0	0	0	0	1698	0	0	1710	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10						7			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		114.6			152.9			73.8			160.5	
Travel Time (s)		8.3			11.0			5.3			11.6	
Confl. Peds. (#/hr)	25		27	27		25	46		47	47		46
Confl. Bikes (#/hr)			1			3			21			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 (%)	1%	1%	1%	2%	2%	2%	1%	3%	1%	1%	3%	1%
Adj. Flow (vph)	4	2	10	0	0	0	8	559	27	6	560	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	0	0	0	594	0	0	581	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		-2.0			-1.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2					1	2		1	2	
Detector Template	Left	Thru					Left	Thru		Left	Thru	
Leading Detector (m)	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	
Detector 1 Position(m)	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	
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			28.7	
Detector 2 Size(m)		1.8						1.8			1.8	
Detector 2 Type		CI+Ex						CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Detector Phase	4	4					2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0					10.0	10.0		10.0	10.0	
Minimum Split (s)	20.5	20.5					28.1	28.1		28.1	28.1	





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	21.0	21.0					69.0	69.0		69.0	69.0	
Total Split (%)	23.3%	23.3%					76.7%	76.7%		76.7%	76.7%	
Maximum Green (s)	15.5	15.5					63.9	63.9		63.9	63.9	
Yellow Time (s)	3.3	3.3					3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2					1.8	1.8		1.8	1.8	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.5						5.1			5.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	
Recall Mode	None	None					C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0					18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	8.0	8.0					5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	20	20					20	20		20	20	
Act Effct Green (s)		12.0						75.6			75.6	
Actuated g/C Ratio		0.13						0.84			0.84	
v/c Ratio		0.08						0.42			0.40	
Control Delay		21.9						4.8			3.6	
Queue Delay		0.0						0.0			0.0	
Total Delay		21.9						4.8			3.6	
LOS		C						A			A	
Approach Delay		21.9						4.8			3.6	
Approach LOS		C						A			A	
Queue Length 50th (m)		0.9						25.5			20.6	
Queue Length 95th (m)		5.8						52.2			32.4	
Internal Link Dist (m)		90.6			128.9			49.8			136.5	
Turn Bay Length (m)												
Base Capacity (vph)		260						1428			1437	
Starvation Cap Reductn		0						0			84	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.06						0.42			0.43	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 27 (30%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 4.4

Intersection LOS: A

Intersection Capacity Utilization 57.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 7: Preston & Pamilla





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	19	4	17	22	2	17	22	513	48	22	598	5
Future Volume (vph)	19	4	17	22	2	17	22	513	48	22	598	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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												
Frt		0.943			0.944			0.989			0.999	
Flt Protected		0.977			0.974			0.998			0.998	
Satd. Flow (prot)	0	1608	0	0	1605	0	0	1708	0	0	1724	0
Flt Permitted		0.977			0.974			0.998			0.998	
Satd. Flow (perm)	0	1608	0	0	1605	0	0	1708	0	0	1724	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		113.6			154.3			71.5			73.8	
Travel Time (s)		8.2			11.1			5.1			5.3	
Confl. Peds. (#/hr)							46		47	47		46
Confl. Bikes (#/hr)									21			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 (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Adj. Flow (vph)	19	4	17	22	2	17	22	513	48	22	598	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	40	0	0	41	0	0	583	0	0	625	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		-2.0			-2.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

**Intersection Summary**

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 52.6% ICU Level of Service A

Analysis Period (min) 15



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	26	35	51	557	533	68
Future Volume (vph)	26	35	51	557	533	68
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.923			0.985		
Flt Protected	0.979			0.996		
Satd. Flow (prot)	1577	0	0	3273	1704	0
Flt Permitted	0.979			0.996		
Satd. Flow (perm)	1577	0	0	3273	1704	0
Link Speed (k/h)	30			50	50	
Link Distance (m)	68.0			65.2	71.5	
Travel Time (s)	8.2			4.7	5.1	
Confl. Peds. (#/hr)				46		47
Confl. Bikes (#/hr)						14
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%
Adj. Flow (vph)	26	35	51	557	533	68
Shared Lane Traffic (%)						
Lane Group Flow (vph)	61	0	0	608	601	0
Enter Blocked Intersection	No	No	Yes	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			2.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

**Intersection Summary**

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 66.0% ICU Level of Service C

Analysis Period (min) 15



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	472	280	4	2	416	432	5	2	1	415	0	646
Future Volume (vph)	472	280	4	2	416	432	5	2	1	415	0	646
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	55.0		0.0	30.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	2		0	1		1	0		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.89		0.93		0.93			0.81	0.77
Frt		0.998				0.850		0.983				0.850
Flt Protected	0.950			0.950				0.970			0.950	
Satd. Flow (prot)	3185	1754	0	1674	1762	1498	0	1637	0	0	1674	1483
Flt Permitted	0.225			0.586				0.851			0.752	
Satd. Flow (perm)	754	1754	0	917	1762	1397	0	1373	0	0	1077	1144
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				164		1				88
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		233.9			203.3			76.1			164.5	
Travel Time (s)		14.0			12.2			5.5			11.8	
Confl. Peds. (#/hr)	35		62	62		35	73		65	65		73
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 (%)	3%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%
Adj. Flow (vph)	472	280	4	2	416	432	5	2	1	415	0	646
Shared Lane Traffic (%)												
Lane Group Flow (vph)	472	284	0	2	416	432	0	8	0	0	415	646
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)		7.0			7.0			0.0			3.5	
Link Offset(m)		2.0			0.0			5.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6		6	8			4		4
Detector Phase	5	2		6	6	6	8	8		4	4	5
Switch Phase												

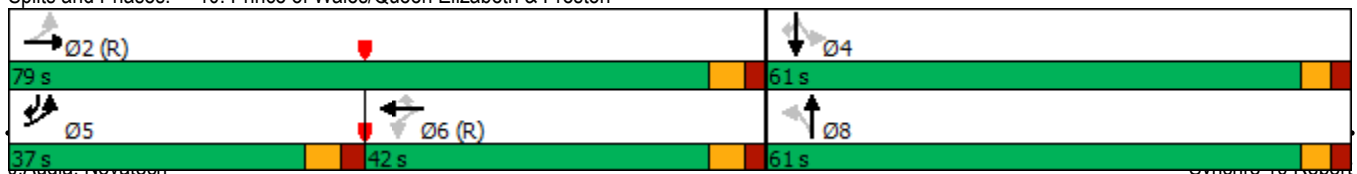


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	5.0
Minimum Split (s)	11.1	32.1		32.1	32.1	32.1	29.5	29.5		29.5	29.5	11.1
Total Split (s)	37.0	79.0		42.0	42.0	42.0	61.0	61.0		61.0	61.0	37.0
Total Split (%)	26.4%	56.4%		30.0%	30.0%	30.0%	43.6%	43.6%		43.6%	43.6%	26.4%
Maximum Green (s)	30.9	72.9		35.9	35.9	35.9	55.5	55.5		55.5	55.5	30.9
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.7
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	2.2	2.2		2.2	2.2	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		5.5			5.5	6.1
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	Max	Max		Max	Max	None
Walk Time (s)		7.0		7.0	7.0	7.0	12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		19.0		19.0	19.0	19.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		20		20	20	20	20	20		20	20	
Act Effct Green (s)	72.9	72.9		44.6	44.6	44.6		55.5			55.5	77.1
Actuated g/C Ratio	0.52	0.52		0.32	0.32	0.32		0.40			0.40	0.55
v/c Ratio	0.61	0.31		0.01	0.74	0.78		0.01			0.97	0.89
Control Delay	22.5	20.3		38.0	53.2	38.1		24.4			43.9	12.0
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.1
Total Delay	22.5	20.3		38.0	53.2	38.1		24.4			43.9	12.1
LOS	C	C		D	D	D		C			D	B
Approach Delay		21.7			45.5			24.4			24.5	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	33.9	40.2		0.3	92.6	63.3		1.1			93.0	57.6
Queue Length 95th (m)	44.1	58.1		2.5	#159.3	#128.6		4.4			m63.9	m21.4
Internal Link Dist (m)		209.9			179.3			52.1			140.5	
Turn Bay Length (m)	55.0			30.0		25.0						
Base Capacity (vph)	929	913		291	560	556		544			426	809
Starvation Cap Reductn	0	0		0	0	0		0			0	6
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.51	0.31		0.01	0.74	0.78		0.01			0.97	0.80

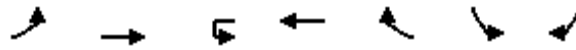
Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 53 (38%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 30.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 105.1%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

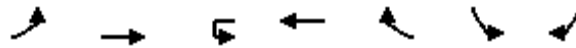
Splits and Phases: 10: Prince of Wales/Queen Elizabeth & Preston



	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	47	0	18	101	0	14
Future Volume (vph)	47	0	18	101	0	14
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected				0.992		
Satd. Flow (prot)	1745	0	0	1731	1510	0
Flt Permitted				0.992		
Satd. Flow (perm)	1745	0	0	1731	1510	0
Link Speed (k/h)	30			30	50	
Link Distance (m)	49.5			68.0	48.5	
Travel Time (s)	5.9			8.2	3.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	47	0	18	101	0	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	0	0	119	14	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	0.0			0.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	23.3%			ICU Level of Service A		
Analysis Period (min)	15					



Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	31	774	13	591	145	177	5
Future Volume (vph)	31	774	13	591	145	177	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0		50.0		110.0	0.0	10.0
Storage Lanes	1		1		1	1	1
Taper Length (m)	25.0		25.0			25.0	
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Ped Bike Factor	0.97				0.90	0.96	0.95
Fr					0.850		0.850
Flt Protected	0.950		0.950			0.950	
Satd. Flow (prot)	1642	3283	1674	3161	1483	1674	1498
Flt Permitted	0.950		0.358			0.950	
Satd. Flow (perm)	1590	3283	631	3161	1328	1615	1425
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					145		3
Link Speed (k/h)		60		60		40	
Link Distance (m)		196.1		162.9		242.3	
Travel Time (s)		11.8		9.8		21.8	
Confl. Peds. (#/hr)	30				30	30	30
Confl. Bikes (#/hr)					17		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	1%	7%	2%	1%	1%
Adj. Flow (vph)	31	774	13	591	145	177	5
Shared Lane Traffic (%)							
Lane Group Flow (vph)	31	774	13	591	145	177	5
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	Left	Right	L NA	R NA
Median Width(m)		7.0		7.0		3.5	
Link Offset(m)		0.0		0.0		0.0	
Crosswalk Width(m)		5.0		10.0		5.0	
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14		14	40	14
Number of Detectors	1	2	1	2	1	1	1
Detector Template	Left	Thru	Left	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	6.1	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	1.8	6.1	6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7		28.7			
Detector 2 Size(m)		1.8		1.8			
Detector 2 Type		Cl+Ex		Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)		0.0		0.0			
Turn Type	Prot	NA	Perm	NA	Perm	Perm	Perm
Protected Phases	5	2		6			
Permitted Phases			6		6	4	4
Detector Phase	5	2	6	6	6	4	4

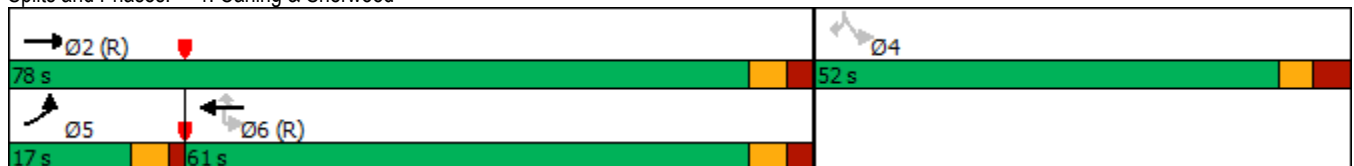


Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.2	33.4	33.4	33.4	33.4	40.1	40.1
Total Split (s)	17.0	78.0	61.0	61.0	61.0	52.0	52.0
Total Split (%)	13.1%	60.0%	46.9%	46.9%	46.9%	40.0%	40.0%
Maximum Green (s)	11.8	71.6	54.6	54.6	54.6	44.9	44.9
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	2.7	2.7	2.7	2.7	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.4	6.4	6.4	6.4	7.1	7.1
Lead/Lag	Lead		Lag	Lag	Lag		
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)		12.0	12.0	12.0	12.0	7.0	7.0
Flash Dont Walk (s)		15.0	15.0	15.0	15.0	26.0	26.0
Pedestrian Calls (#/hr)		20	20	20	20	20	20
Act Effct Green (s)	8.0	90.9	82.2	82.2	82.2	25.6	25.6
Actuated g/C Ratio	0.06	0.70	0.63	0.63	0.63	0.20	0.20
v/c Ratio	0.31	0.34	0.03	0.30	0.16	0.56	0.02
Control Delay	65.6	9.2	5.8	5.2	0.8	52.3	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.6	9.2	5.8	5.2	0.8	52.3	27.4
LOS	E	A	A	A	A	D	C
Approach Delay		11.4		4.3		51.6	
Approach LOS		B		A		D	
Queue Length 50th (m)	7.2	42.0	0.5	11.1	0.0	35.2	0.4
Queue Length 95th (m)	16.3	52.5	1.6	15.4	1.3	55.6	3.4
Internal Link Dist (m)		172.1		138.9		218.3	
Turn Bay Length (m)	40.0		50.0		110.0		10.0
Base Capacity (vph)	149	2294	399	1999	893	557	494
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	0.21	0.34	0.03	0.30	0.16	0.32	0.01

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 107 (82%), Referenced to phase 2:EBT and 6:WBTU, Start of Green  
 Natural Cycle: 85  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.56  
 Intersection Signal Delay: 12.6  
 Intersection LOS: B  
 Intersection Capacity Utilization 59.6%  
 ICU Level of Service B  
 Analysis Period (min) 15

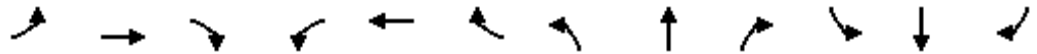
Splits and Phases: 1: Carling & Sherwood





2: Carling & Champagne  
AM Peak Hour

829 Carling Avenue  
2033 Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕	↗	↖	↕	↗	↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	103	728	174	180	666	168	62	0	69	89	0	54
Future Volume (vph)	103	728	174	180	666	168	62	0	69	89	0	54
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	70.0		30.0	60.0		25.0	0.0		0.0	20.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.90		0.95	0.95		0.69	0.96		0.95	0.98		0.96
Fr t			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1674	3283	1483	1658	3252	1414	1658	0	1483	1658	0	1498
Flt Permitted	0.386			0.359			0.950			0.950		
Satd. Flow (perm)	612	3283	1404	593	3252	978	1586	0	1403	1617	0	1443
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			174			168			69			54
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		162.9			117.5			121.7			178.4	
Travel Time (s)		9.8			7.1			8.8			12.8	
Confl. Peds. (#/hr)	90		90	90		90	20		20	20		20
Confl. Bikes (#/hr)			5			4						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 (%)	1%	3%	2%	2%	4%	7%	2%	2%	2%	2%	2%	1%
Adj. Flow (vph)	103	728	174	180	666	168	62	0	69	89	0	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	728	174	180	666	168	62	0	69	89	0	54
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1		1	1		1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left		Right	Left		Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1		6.1	6.1		6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1		6.1	6.1		6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 2 Position(m)		28.7			28.7							
Detector 2 Size(m)		1.8			1.8							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm		Perm	Perm		Perm
Protected Phases		2			6							
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	2	2	2	6	6	6	8		8	4		4

2: Carling & Champagne  
AM Peak Hour

829 Carling Avenue  
2033 Total Traffic

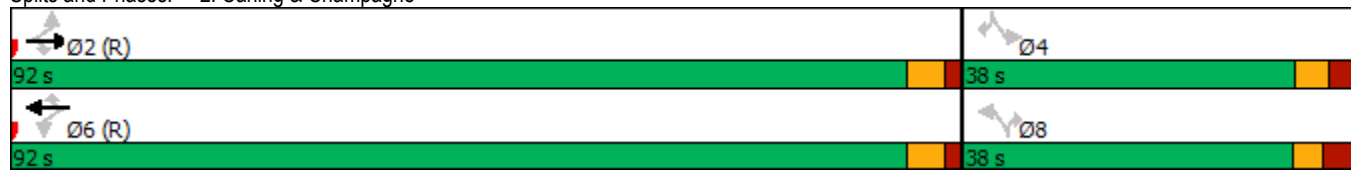


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0		5.0	10.0		10.0
Minimum Split (s)	15.3	15.3	15.3	25.3	25.3	25.3	24.0		24.0	37.9		37.9
Total Split (s)	92.0	92.0	92.0	92.0	92.0	92.0	38.0		38.0	38.0		38.0
Total Split (%)	70.8%	70.8%	70.8%	70.8%	70.8%	70.8%	29.2%		29.2%	29.2%		29.2%
Maximum Green (s)	86.7	86.7	86.7	86.7	86.7	86.7	32.0		32.0	32.1		32.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0		3.0	3.3		3.3
All-Red Time (s)	1.6	1.6	1.6	1.6	1.6	1.6	3.0		3.0	2.6		2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	6.0		6.0	5.9		5.9
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None		None	None		None
Walk Time (s)				10.0	10.0	10.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)				10.0	10.0	10.0	11.0		11.0	25.0		25.0
Pedestrian Calls (#/hr)				20	20	20	20		20	20		20
Act Effct Green (s)	95.5	95.5	95.5	95.5	95.5	95.5	23.2		23.2	23.3		23.3
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.73	0.73	0.18		0.18	0.18		0.18
v/c Ratio	0.23	0.30	0.16	0.41	0.28	0.22	0.22		0.23	0.31		0.18
Control Delay	6.3	5.2	1.2	6.3	3.2	2.1	43.8		10.5	46.1		11.2
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0	0.0		0.0	0.0		0.0
Total Delay	6.3	5.2	1.2	6.3	3.3	2.1	43.8		10.5	46.1		11.2
LOS	A	A	A	A	A	A	D		B	D		B
Approach Delay		4.6			3.7			26.2				32.9
Approach LOS		A			A			C				C
Queue Length 50th (m)	4.9	18.4	1.4	9.3	18.1	2.8	11.6		0.0	16.9		0.0
Queue Length 95th (m)	8.2	21.9	3.2	13.8	21.8	8.0	22.6		10.8	30.5		9.7
Internal Link Dist (m)		138.9			93.5			97.7				154.4
Turn Bay Length (m)	70.0		30.0	60.0		25.0				20.0		
Base Capacity (vph)	449	2412	1077	435	2389	762	390		397	399		396
Starvation Cap Reductn	0	0	0	0	825	0	0		0	0		0
Spillback Cap Reductn	0	0	0	0	0	0	0		0	0		0
Storage Cap Reductn	0	0	0	0	0	0	0		0	0		0
Reduced v/c Ratio	0.23	0.30	0.16	0.41	0.43	0.22	0.16		0.17	0.22		0.14

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 85 (65%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.41  
 Intersection Signal Delay: 7.2  
 Intersection LOS: A  
 Intersection Capacity Utilization 55.2%  
 ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 2: Carling & Champagne



3: Trillium Pathway & Carling  
AM Peak Hour

829 Carling Avenue  
2033 Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑							
Traffic Volume (vph)	0	877	0	0	1050	0	0	0	0	0	0	0
Future Volume (vph)	0	877	0	0	1050	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected												
Satd. Flow (prot)	0	3283	0	0	3283	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3283	0	0	3283	0	0	0	0	0	0	0
Right Turn on Red			Yes				Yes				Yes	
Satd. Flow (RTOR)												
Link Speed (k/h)	60				60				50			
Link Distance (m)	117.5				124.7				157.3			
Travel Time (s)	7.1				7.5				11.3			
Confl. Peds. (#/hr)	40		14	14		40	18		20	20		18
Confl. Bikes (#/hr)			7			25						17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	877	0	0	1050	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	877	0	0	1050	0	0	0	0	0	0	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)	7.0				7.0				0.0			
Link Offset(m)	0.0				0.0				0.0			
Crosswalk Width(m)	5.0				5.0				5.0			
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	2				2							
Detector Template	Thru				Thru							
Leading Detector (m)	30.5				30.5							
Trailing Detector (m)	0.0				0.0							
Detector 1 Position(m)	0.0				0.0							
Detector 1 Size(m)	1.8				1.8							
Detector 1 Type	CI+Ex				CI+Ex							
Detector 1 Channel												
Detector 1 Extend (s)	0.0				0.0							
Detector 1 Queue (s)	0.0				0.0							
Detector 1 Delay (s)	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	NA				NA							
Protected Phases	2				6							
Permitted Phases												
Detector Phase	2				6							
Switch Phase												
Minimum Initial (s)	10.0				10.0							
Minimum Split (s)	25.1				25.1							

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	35.6

3: Trillium Pathway & Carling  
AM Peak Hour

829 Carling Avenue  
2033 Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)		94.0			94.0							
Total Split (%)		72.3%			72.3%							
Maximum Green (s)		88.9			88.9							
Yellow Time (s)		3.7			3.7							
All-Red Time (s)		1.4			1.4							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		5.1			5.1							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0							
Recall Mode		C-Max			C-Max							
Walk Time (s)		15.0			15.0							
Flash Dont Walk (s)		5.0			5.0							
Pedestrian Calls (#/hr)		20			20							
Act Effct Green (s)		105.6			105.6							
Actuated g/C Ratio		0.81			0.81							
v/c Ratio		0.33			0.39							
Control Delay		4.3			3.2							
Queue Delay		0.1			0.1							
Total Delay		4.4			3.3							
LOS		A			A							
Approach Delay		4.4			3.3							
Approach LOS		A			A							
Queue Length 50th (m)		31.3			28.2							
Queue Length 95th (m)		38.8			m30.7							
Internal Link Dist (m)		93.5			100.7			133.3			30.9	
Turn Bay Length (m)												
Base Capacity (vph)		2666			2666							
Starvation Cap Reductn		602			481							
Spillback Cap Reductn		81			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.42			0.48							

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 59 (45%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.39

Intersection Signal Delay: 3.8

Intersection LOS: A

Intersection Capacity Utilization 34.9%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 3: Trillium Pathway & Carling



Lane Group	Ø4
Total Split (s)	36.0
Total Split (%)	28%
Maximum Green (s)	29.4
Yellow Time (s)	3.0
All-Red Time (s)	3.6
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	22.0
Pedestrian Calls (#/hr)	20
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	545	233	253	676	103	287	480	308	136	311	131
Future Volume (vph)	163	545	233	253	676	103	287	480	308	136	311	131
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		0.0	110.0		90.0	75.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.94	0.97		0.98		0.84	0.98	0.98		1.00	0.98	
Frt		0.955				0.850		0.941			0.956	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1595	3035	0	1658	3252	1375	1674	3035	0	1510	1509	0
Flt Permitted	0.950			0.950			0.158			0.354		
Satd. Flow (perm)	1504	3035	0	1620	3252	1153	273	3035	0	561	1509	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		49				143		144				16
Link Speed (k/h)		60			60			50				50
Link Distance (m)		124.7			193.9			164.5				65.2
Travel Time (s)		7.5			11.6			11.8				4.7
Confl. Peds. (#/hr)	90		41	41		90	60		10	10		60
Confl. Bikes (#/hr)			22			10			36			5
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%	2%	2%	4%	10%	1%	4%	2%	12%	6%	20%
Adj. Flow (vph)	163	545	233	253	676	103	287	480	308	136	311	131
Shared Lane Traffic (%)												
Lane Group Flow (vph)	163	778	0	253	676	103	287	788	0	136	442	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	3	8		4	4	

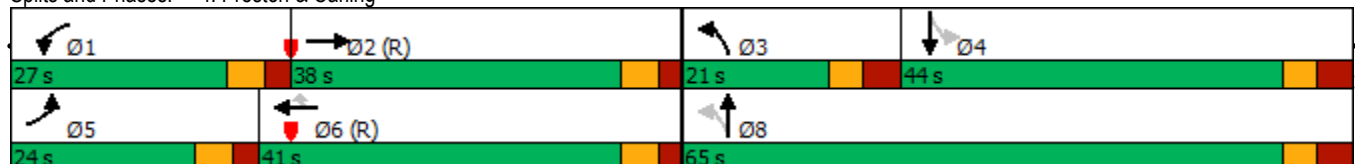


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0		11.2	30.0	30.0	11.9	43.9		43.9	43.9	
Total Split (s)	24.0	38.0		27.0	41.0	41.0	21.0	65.0		44.0	44.0	
Total Split (%)	18.5%	29.2%		20.8%	31.5%	31.5%	16.2%	50.0%		33.8%	33.8%	
Maximum Green (s)	17.8	32.0		20.8	35.0	35.0	14.1	58.1		37.1	37.1	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.3		2.5	2.3	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		6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	Max	
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)		20			20	20		20		20	20	
Act Effct Green (s)	16.4	32.0		20.8	36.4	36.4	58.1	58.1		37.1	37.1	
Actuated g/C Ratio	0.13	0.25		0.16	0.28	0.28	0.45	0.45		0.29	0.29	
v/c Ratio	0.81	0.99		0.95	0.74	0.24	1.05	0.55		0.85	1.00	
Control Delay	88.6	61.5		65.3	41.0	9.3	85.0	8.9		85.5	87.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	88.6	61.5		65.3	41.0	9.3	85.0	8.9		85.5	87.7	
LOS	F	E		E	D	A	F	A		F	F	
Approach Delay		66.2			43.8			29.2			87.2	
Approach LOS		E			D			C			F	
Queue Length 50th (m)	30.1	50.3		54.3	87.1	6.1	~50.6	52.6		30.4	101.6	
Queue Length 95th (m)	#64.4	#125.4		m#63.6	m89.3	m8.9	#102.7	61.1		#65.2	#165.2	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0			110.0		90.0	75.0					
Base Capacity (vph)	218	784		265	911	425	273	1436		160	442	
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	0.75	0.99		0.95	0.74	0.24	1.05	0.55		0.85	1.00	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 88 (68%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 52.2 Intersection LOS: D  
 Intersection Capacity Utilization 108.9% ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Preston & Carling







Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	401	673	742	215	240	190
Future Volume (vph)	401	673	742	215	240	190
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	75.0			25.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				10.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93			0.78	0.98	0.79
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1674	3252	1728	1498	1674	1427
Fl <sub>t</sub> Permitted	0.950				0.950	
Satd. Flow (perm)	1561	3252	1728	1172	1647	1125
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				62		190
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	70			70	14	85
Confl. Bikes (#/hr)				16		23
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	4%	3%	1%	1%	6%
Adj. Flow (vph)	401	673	742	215	240	190
Shared Lane Traffic (%)						
Lane Group Flow (vph)	401	673	742	215	240	190
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	15.7	29.7	29.7	39.0	39.0
Total Split (s)	32.0	91.0	59.0	59.0	39.0	39.0
Total Split (%)	24.6%	70.0%	45.4%	45.4%	30.0%	30.0%
Maximum Green (s)	26.1	85.3	53.3	53.3	33.0	33.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			13.0	13.0	7.0	7.0
Flash Dont Walk (s)			11.0	11.0	26.0	26.0
Pedestrian Calls (#/hr)			20	20	20	20
Act Effct Green (s)	31.9	91.1	53.3	53.3	27.2	27.2
Actuated g/C Ratio	0.25	0.70	0.41	0.41	0.21	0.21
v/c Ratio	0.98	0.30	1.05	0.42	0.70	0.49
Control Delay	71.5	2.7	84.7	21.8	57.8	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.5	2.7	84.7	21.8	57.8	9.9
LOS	E	A	F	C	E	A
Approach Delay		28.4	70.6		36.6	
Approach LOS		C	E		D	
Queue Length 50th (m)	~114.0	12.0	~190.1	24.9	49.7	0.0
Queue Length 95th (m)	m#139.3	m15.3	#257.7	44.9	75.0	17.8
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	75.0			25.0		45.0
Base Capacity (vph)	411	2279	708	517	418	427
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	0.98	0.30	1.05	0.42	0.57	0.44

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 16 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 46.2  
 Intersection LOS: D  
 Intersection Capacity Utilization 105.9%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carling & Booth



6: Preston & Beech  
AM Peak Hour

829 Carling Avenue  
2033 Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↗	↗	↗	↗	↗	↗
Traffic Volume (vph)	43	56	26	38	55	12	28	666	61	18	407	38
Future Volume (vph)	43	56	26	38	55	12	28	666	61	18	407	38
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	25.0		0.0	25.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	25.0			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			0.97	0.89	0.96	0.99		0.98	0.99	
Frt		0.972				0.850		0.987			0.987	
Flt Protected		0.983			0.980		0.950			0.950		
Satd. Flow (prot)	0	1558	0	0	1566	1498	1537	1690	0	1537	1645	0
Flt Permitted		0.865			0.853		0.468			0.287		
Satd. Flow (perm)	0	1336	0	0	1322	1339	730	1690	0	454	1645	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				34		12			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		101.4			151.8			160.5			163.2	
Travel Time (s)		7.3			10.9			11.6			11.8	
Confl. Peds. (#/hr)	36		40	40		36	50		55	55		50
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 (%)	9%	4%	4%	25%	2%	1%	10%	3%	3%	10%	6%	5%
Adj. Flow (vph)	43	56	26	38	55	12	28	666	61	18	407	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	125	0	0	93	12	28	727	0	18	445	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	

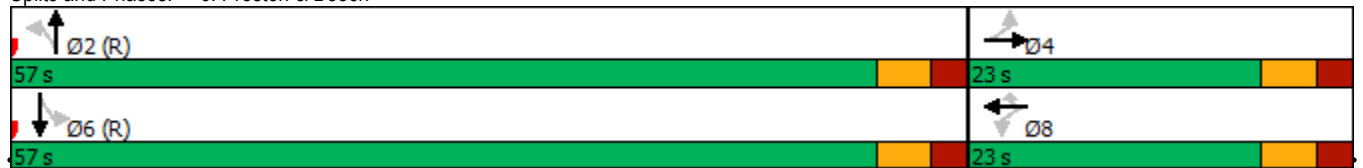


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	22.6	22.6		22.6	22.6	22.6	33.5	33.5		33.5	33.5	
Total Split (s)	23.0	23.0		23.0	23.0	23.0	57.0	57.0		57.0	57.0	
Total Split (%)	28.8%	28.8%		28.8%	28.8%	28.8%	71.3%	71.3%		71.3%	71.3%	
Maximum Green (s)	17.4	17.4		17.4	17.4	17.4	51.5	51.5		51.5	51.5	
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3	2.3	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.6			5.6	5.6	5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Ped	Ped		Ped	Ped	Ped	C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	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	10.0	
Pedestrian Calls (#/hr)	20	20		20	20	20	20	20		20	20	
Act Effct Green (s)		17.1			17.1	17.1	51.8	51.8		51.8	51.8	
Actuated g/C Ratio		0.21			0.21	0.21	0.65	0.65		0.65	0.65	
v/c Ratio		0.42			0.33	0.04	0.06	0.66		0.06	0.42	
Control Delay		28.9			30.5	2.8	5.8	10.2		5.9	8.0	
Queue Delay		0.0			0.0	0.0	0.0	0.1		0.0	0.0	
Total Delay		28.9			30.5	2.8	5.8	10.3		5.9	8.0	
LOS		C			C	A	A	B		A	A	
Approach Delay		28.9			27.3			10.2			8.0	
Approach LOS		C			C			B			A	
Queue Length 50th (m)		13.3			11.1	0.0	1.3	53.7		0.8	25.4	
Queue Length 95th (m)		27.3			22.8	1.2	m2.7	45.2		3.0	41.4	
Internal Link Dist (m)		77.4			127.8			136.5			139.2	
Turn Bay Length (m)							25.0			25.0		
Base Capacity (vph)		302			287	317	472	1098		294	1069	
Starvation Cap Reductn		0			0	0	0	32		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			0.32	0.04	0.06	0.68		0.06	0.42	

Intersection Summary

Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 40 (50%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.66  
 Intersection Signal Delay: 12.3 Intersection LOS: B  
 Intersection Capacity Utilization 83.5% ICU Level of Service E  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Preston & Beech





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	3	0	0	0	8	708	46	10	503	5
Future Volume (vph)	1	0	3	0	0	0	8	708	46	10	503	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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		0.93						0.99			1.00	
Flt Protected		0.999						0.992			0.999	
Satd. Flow (prot)	0	1470	0	0	0	0	0	1704	0	0	1617	0
Flt Permitted		0.988						0.995			0.987	
Satd. Flow (perm)	0	1453	0	0	0	0	0	1697	0	0	1597	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29						9			1	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		114.6			152.9			73.8			160.5	
Travel Time (s)		8.3			11.0			5.3			11.6	
Confl. Peds. (#/hr)	17		18	18		17	35		45	45		35
Confl. Bikes (#/hr)			8						21			17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	3%	1%	1%	10%	1%
Adj. Flow (vph)	1	0	3	0	0	0	8	708	46	10	503	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	0	0	0	762	0	0	518	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		-2.0			-1.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2					1	2		1	2	
Detector Template	Left	Thru					Left	Thru		Left	Thru	
Leading Detector (m)	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	
Detector 1 Position(m)	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	
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			28.7	
Detector 2 Size(m)		1.8						1.8			1.8	
Detector 2 Type		CI+Ex						CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Detector Phase	4	4					2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0					10.0	10.0		10.0	10.0	
Minimum Split (s)	20.5	20.5					28.1	28.1		28.1	28.1	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	21.0	21.0					59.0	59.0		59.0	59.0	
Total Split (%)	26.3%	26.3%					73.8%	73.8%		73.8%	73.8%	
Maximum Green (s)	15.5	15.5					53.9	53.9		53.9	53.9	
Yellow Time (s)	3.3	3.3					3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2					1.8	1.8		1.8	1.8	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)		5.5						5.1			5.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	
Recall Mode	None	None					C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0					18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	8.0	8.0					5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	20	20					20	20		20	20	
Act Effct Green (s)		12.0						69.8			69.8	
Actuated g/C Ratio		0.15						0.87			0.87	
v/c Ratio		0.02						0.51			0.37	
Control Delay		0.0						5.7			2.5	
Queue Delay		0.0						0.0			0.0	
Total Delay		0.0						5.7			2.5	
LOS		A						A			A	
Approach Delay												
Approach LOS												
Queue Length 50th (m)		0.0						0.0			0.0	
Queue Length 95th (m)		0.0						83.3			17.9	
Internal Link Dist (m)		90.6			128.9			49.8			136.5	
Turn Bay Length (m)												
Base Capacity (vph)		304						1481			1393	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.01						0.51			0.37	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 48 (60%), 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: 4.4

Intersection LOS: A

Intersection Capacity Utilization 65.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 7: Preston & Pamilla





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	49	1	33	20	5	26	14	650	90	37	493	15
Future Volume (vph)	49	1	33	20	5	26	14	650	90	37	493	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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												
Frt		0.946			0.931			0.984			0.996	
Flt Protected		0.971			0.981			0.999			0.997	
Satd. Flow (prot)	0	1603	0	0	1594	0	0	1701	0	0	1688	0
Flt Permitted		0.971			0.981			0.999			0.997	
Satd. Flow (perm)	0	1603	0	0	1594	0	0	1701	0	0	1688	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		113.6			154.3			71.5			73.8	
Travel Time (s)		8.2			11.1			5.1			5.3	
Confl. Peds. (#/hr)							28		45	45		28
Confl. Bikes (#/hr)									21			17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	5%	2%
Adj. Flow (vph)	49	1	33	20	5	26	14	650	90	37	493	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	83	0	0	51	0	0	754	0	0	545	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		-2.0			-2.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

**Intersection Summary**

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 64.2% ICU Level of Service C

Analysis Period (min) 15



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	53	70	43	701	509	33
Future Volume (vph)	53	70	43	701	509	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.923			0.992		
Flt Protected	0.979			0.997		
Satd. Flow (prot)	1577	0	0	3275	1685	0
Flt Permitted	0.979			0.997		
Satd. Flow (perm)	1577	0	0	3275	1685	0
Link Speed (k/h)	30			50	50	
Link Distance (m)	68.0			65.2	71.5	
Travel Time (s)	8.2			4.7	5.1	
Confl. Peds. (#/hr)	28			28		
Confl. Bikes (#/hr)				17		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	5%	2%
Adj. Flow (vph)	53	70	43	701	509	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	123	0	0	744	542	0
Enter Blocked Intersection	No	No	Yes	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			2.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

**Intersection Summary**

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 68.8% ICU Level of Service C

Analysis Period (min) 15





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	694	286	2	2	213	319	1	4	3	281	4	493
Future Volume (vph)	694	286	2	2	213	319	1	4	3	281	4	493
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	55.0		0.0	30.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	2		0	1		1	0		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.97		0.97		0.96			0.94	0.91
Frt		0.999				0.850		0.949				0.850
Flt Protected	0.950			0.950				0.994			0.953	
Satd. Flow (prot)	3185	1760	0	1674	1762	1498	0	1209	0	0	1668	1469
Flt Permitted	0.459			0.583				0.979			0.724	
Satd. Flow (perm)	1519	1760	0	1002	1762	1460	0	1185	0	0	1187	1340
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						259		3				358
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		233.9			203.3			76.1			164.5	
Travel Time (s)		14.0			12.2			5.5			11.8	
Confl. Peds. (#/hr)	9		15	15		9	25		24	24		25
Confl. Bikes (#/hr)			3						1			2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	1%	1%	1%	1%	1%	50%	25%	1%	50%	3%
Adj. Flow (vph)	694	286	2	2	213	319	1	4	3	281	4	493
Shared Lane Traffic (%)												
Lane Group Flow (vph)	694	288	0	2	213	319	0	8	0	0	285	493
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)		7.0			7.0			0.0			3.5	
Link Offset(m)		2.0			0.0			5.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6		6	8			4		4
Detector Phase	5	2		6	6	6	8	8		4	4	5

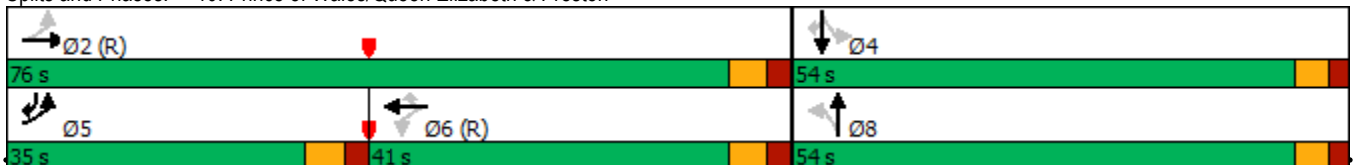


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	5.0
Minimum Split (s)	11.1	32.1		32.1	32.1	32.1	29.5	29.5		29.5	29.5	11.1
Total Split (s)	35.0	76.0		41.0	41.0	41.0	54.0	54.0		54.0	54.0	35.0
Total Split (%)	26.9%	58.5%		31.5%	31.5%	31.5%	41.5%	41.5%		41.5%	41.5%	26.9%
Maximum Green (s)	28.9	69.9		34.9	34.9	34.9	48.5	48.5		48.5	48.5	28.9
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.7
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	2.2	2.2		2.2	2.2	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		5.5			5.5	6.1
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	Max	Max		Max	Max	None
Walk Time (s)		7.0		7.0	7.0	7.0	12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		19.0		19.0	19.0	19.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		20		20	20	20	20	20		20	20	
Act Effct Green (s)	69.9	69.9		39.7	39.7	39.7		48.5			48.5	72.0
Actuated g/C Ratio	0.54	0.54		0.31	0.31	0.31		0.37			0.37	0.55
v/c Ratio	0.62	0.30		0.01	0.40	0.51		0.02			0.64	0.53
Control Delay	20.5	17.7		34.5	39.6	11.6		21.4			28.4	2.4
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	20.5	17.7		34.5	39.6	11.6		21.4			28.4	2.4
LOS	C	B		C	D	B		C			C	A
Approach Delay		19.7			22.8			21.4			11.9	
Approach LOS		B			C			C			B	
Queue Length 50th (m)	48.1	36.2		0.3	39.8	10.3		0.7			45.7	10.1
Queue Length 95th (m)	60.8	53.1		2.3	64.0	36.8		3.9			m46.7	m10.5
Internal Link Dist (m)		209.9			179.3			52.1			140.5	
Turn Bay Length (m)	55.0			30.0		25.0						
Base Capacity (vph)	1187	946		305	537	625		443			442	966
Starvation Cap Reductn	0	0		0	0	0		0			0	21
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.58	0.30		0.01	0.40	0.51		0.02			0.64	0.52

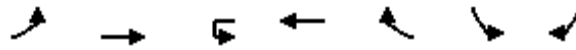
Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 7 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.64  
 Intersection Signal Delay: 17.8      Intersection LOS: B  
 Intersection Capacity Utilization 91.0%      ICU Level of Service E  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

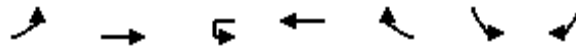
Splits and Phases: 10: Prince of Wales/Queen Elizabeth & Preston



	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	106	0	8	68	0	17
Future Volume (vph)	106	0	8	68	0	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>						0.865
Flt Protected				0.995		
Satd. Flow (prot)	1745	0	0	1736	1510	0
Flt Permitted				0.995		
Satd. Flow (perm)	1745	0	0	1736	1510	0
Link Speed (k/h)	30			30	50	
Link Distance (m)	49.5			68.0	46.2	
Travel Time (s)	5.9			8.2	3.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	106	0	8	68	0	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	106	0	0	76	17	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	0.0			0.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	20.8%			ICU Level of Service A		
Analysis Period (min)	15					



Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	65	713	13	1305	181	188	7
Future Volume (vph)	65	713	13	1305	181	188	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0		50.0		110.0	0.0	10.0
Storage Lanes	1		1		1	1	1
Taper Length (m)	25.0		25.0			25.0	
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Ped Bike Factor	0.99				0.91	0.99	0.97
Fr <sub>t</sub>					0.850		0.850
Fl <sub>t</sub> Protected	0.950		0.950			0.950	
Satd. Flow (prot)	1674	3252	1674	3316	1498	1674	1498
Fl <sub>t</sub> Permitted	0.950		0.381			0.950	
Satd. Flow (perm)	1654	3252	671	3316	1357	1659	1454
Right Turn on Red					Yes		Yes
Satd. Flow (RTOR)					181		3
Link Speed (k/h)		60		60		40	
Link Distance (m)		196.1		162.9		242.3	
Travel Time (s)		11.8		9.8		21.8	
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	1.00
Heavy Vehicles (%)	1%	4%	1%	2%	1%	1%	1%
Adj. Flow (vph)	65	713	13	1305	181	188	7
Shared Lane Traffic (%)							
Lane Group Flow (vph)	65	713	13	1305	181	188	7
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	Left	Right	L NA	R NA
Median Width(m)		7.0		7.0		3.5	
Link Offset(m)		0.0		0.0		0.0	
Crosswalk Width(m)		5.0		10.0		5.0	
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14		14	40	14
Number of Detectors	1	2	1	2	1	1	1
Detector Template	Left	Thru	Left	Thru	Right	Left	Right
Leading Detector (m)	6.1	30.5	6.1	30.5	6.1	6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	1.8	6.1	6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7		28.7			
Detector 2 Size(m)		1.8		1.8			
Detector 2 Type		Cl+Ex		Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)		0.0		0.0			
Turn Type	Prot	NA	Perm	NA	Perm	Perm	Perm
Protected Phases	5	2		6			
Permitted Phases			6		6	4	4
Detector Phase	5	2	6	6	6	4	4



Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.2	33.4	33.4	33.4	33.4	40.1	40.1
Total Split (s)	17.0	99.0	82.0	82.0	82.0	41.0	41.0
Total Split (%)	12.1%	70.7%	58.6%	58.6%	58.6%	29.3%	29.3%
Maximum Green (s)	11.8	92.6	75.6	75.6	75.6	33.9	33.9
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	2.7	2.7	2.7	2.7	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.4	6.4	6.4	6.4	7.1	7.1
Lead/Lag	Lead		Lag	Lag	Lag		
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)		12.0	12.0	12.0	12.0	7.0	7.0
Flash Dont Walk (s)		15.0	15.0	15.0	15.0	26.0	26.0
Pedestrian Calls (#/hr)		20	20	20	20	20	20
Act Effct Green (s)	10.3	100.3	87.2	87.2	87.2	26.2	26.2
Actuated g/C Ratio	0.07	0.72	0.62	0.62	0.62	0.19	0.19
v/c Ratio	0.53	0.31	0.03	0.63	0.20	0.61	0.03
Control Delay	77.4	8.5	6.3	10.0	1.3	59.3	33.3
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	77.4	8.5	6.3	10.1	1.3	59.3	33.3
LOS	E	A	A	B	A	E	C
Approach Delay		14.2		9.0		58.4	
Approach LOS		B		A		E	
Queue Length 50th (m)	16.2	37.8	0.7	68.8	2.2	41.6	0.8
Queue Length 95th (m)	30.2	47.1	m1.6	107.5	4.2	63.9	4.6
Internal Link Dist (m)		172.1		138.9		218.3	
Turn Bay Length (m)	40.0		50.0		110.0		10.0
Base Capacity (vph)	145	2330	417	2064	913	401	354
Starvation Cap Reductn	0	0	0	87	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	0.45	0.31	0.03	0.66	0.20	0.47	0.02

**Intersection Summary**

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 7 (5%), Referenced to phase 2:EBT and 6:WBTU, Start of Green  
 Natural Cycle: 95  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.63  
 Intersection Signal Delay: 14.5  
 Intersection LOS: B  
 Intersection Capacity Utilization 72.7%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Carling & Sherwood



2: Carling & Champagne  
PM Peak Hour

829 Carling Avenue  
2033 Total Traffic

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	742	26	27	1166	71	97	0	110	146	0	199
Future Volume (vph)	55	742	26	27	1166	71	97	0	110	146	0	199
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	70.0		30.0	60.0		25.0	0.0		0.0	20.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.95	0.96		0.74	0.95		0.94	0.97		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1409	3283	1483	1658	3316	1498	1658	0	1483	1674	0	1498
Flt Permitted	0.212			0.354			0.950			0.950		
Satd. Flow (perm)	314	3283	1415	592	3316	1106	1580	0	1398	1630	0	1440
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			25			38			110			72
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		162.9			117.5			121.7			178.4	
Travel Time (s)		9.8			7.1			8.8			12.8	
Confl. Peds. (#/hr)	70		70	70		70	20		20	20		20
Confl. Bikes (#/hr)			5			4						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 (%)	20%	3%	2%	2%	2%	1%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	55	742	26	27	1166	71	97	0	110	146	0	199
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	742	26	27	1166	71	97	0	110	146	0	199
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1		1	1		1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left		Right	Left		Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1		6.1	6.1		6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1		6.1	6.1		6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Detector 2 Position(m)		28.7			28.7							
Detector 2 Size(m)		1.8			1.8							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm		Perm	Perm		Perm
Protected Phases		2			6							
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	2	2	2	6	6	6	8		8	4		4

2: Carling & Champagne  
PM Peak Hour

829 Carling Avenue  
2033 Total Traffic

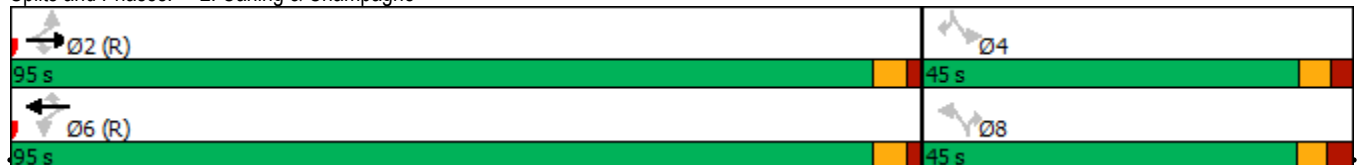


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0		5.0	10.0		10.0
Minimum Split (s)	15.3	15.3	15.3	25.3	25.3	25.3	24.0		24.0	37.9		37.9
Total Split (s)	95.0	95.0	95.0	95.0	95.0	95.0	45.0		45.0	45.0		45.0
Total Split (%)	67.9%	67.9%	67.9%	67.9%	67.9%	67.9%	32.1%		32.1%	32.1%		32.1%
Maximum Green (s)	89.7	89.7	89.7	89.7	89.7	89.7	39.0		39.0	39.1		39.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0		3.0	3.3		3.3
All-Red Time (s)	1.6	1.6	1.6	1.6	1.6	1.6	3.0		3.0	2.6		2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	6.0		6.0	5.9		5.9
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None		None	None		None
Walk Time (s)				10.0	10.0	10.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)				10.0	10.0	10.0	11.0		11.0	25.0		25.0
Pedestrian Calls (#/hr)				20	20	20	20		20	20		20
Act Effct Green (s)	104.3	104.3	104.3	104.3	104.3	104.3	24.4		24.4	24.5		24.5
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.74	0.74	0.17		0.17	0.18		0.18
v/c Ratio	0.24	0.30	0.02	0.06	0.47	0.09	0.35		0.33	0.51		0.64
Control Delay	10.1	7.2	2.5	3.0	3.2	1.8	52.0		10.2	56.9		41.8
Queue Delay	0.0	0.0	0.0	0.0	0.3	0.0	0.0		0.0	0.0		0.0
Total Delay	10.1	7.2	2.5	3.0	3.5	1.8	52.0		10.2	56.9		41.8
LOS	B	A	A	A	A	A	D		B	E		D
Approach Delay		7.3			3.4			29.8				48.2
Approach LOS		A			A			C				D
Queue Length 50th (m)	3.1	21.8	0.4	1.1	24.4	0.7	20.5		0.0	31.8		28.3
Queue Length 95th (m)	16.6	33.0	m1.5	m2.2	27.2	2.0	35.6		14.0	51.0		51.6
Internal Link Dist (m)		138.9			93.5			97.7				154.4
Turn Bay Length (m)	70.0		30.0	60.0		25.0				20.0		
Base Capacity (vph)	234	2446	1061	441	2471	833	440		468	455		454
Starvation Cap Reductn	0	0	0	0	602	0	0		0	0		0
Spillback Cap Reductn	0	0	0	0	45	0	0		0	0		0
Storage Cap Reductn	0	0	0	0	0	0	0		0	0		0
Reduced v/c Ratio	0.24	0.30	0.02	0.06	0.62	0.09	0.22		0.24	0.32		0.44

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 5 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.64  
 Intersection Signal Delay: 12.5 Intersection LOS: B  
 Intersection Capacity Utilization 74.7% ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Carling & Champagne



3: Trillium Pathway & Carling  
PM Peak Hour

829 Carling Avenue  
2033 Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑							
Traffic Volume (vph)	0	1038	0	0	1298	0	0	0	0	0	0	0
Future Volume (vph)	0	1038	0	0	1298	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected												
Satd. Flow (prot)	0	3283	0	0	3316	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3283	0	0	3316	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (k/h)	60				60				50			
Link Distance (m)	117.5				124.7				157.3			
Travel Time (s)	7.1				7.5				11.3			
Confl. Peds. (#/hr)	35					35	25			35	35	25
Confl. Bikes (#/hr)			11			10			13			34
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	1038	0	0	1298	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1038	0	0	1298	0	0	0	0	0	0	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)	7.0				7.0				0.0			
Link Offset(m)	0.0				0.0				0.0			
Crosswalk Width(m)	5.0				5.0				5.0			
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14		24	14		24	14		24	14	
Number of Detectors	2				2							
Detector Template	Thru				Thru							
Leading Detector (m)	30.5				30.5							
Trailing Detector (m)	0.0				0.0							
Detector 1 Position(m)	0.0				0.0							
Detector 1 Size(m)	1.8				1.8							
Detector 1 Type	CI+Ex				CI+Ex							
Detector 1 Channel												
Detector 1 Extend (s)	0.0				0.0							
Detector 1 Queue (s)	0.0				0.0							
Detector 1 Delay (s)	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	NA				NA							
Protected Phases	2				6							
Permitted Phases												
Detector Phase	2				6							
Switch Phase												
Minimum Initial (s)	10.0				10.0							
Minimum Split (s)	25.1				25.1							



Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	35.6

3: Trillium Pathway & Carling  
PM Peak Hour

829 Carling Avenue  
2033 Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)		104.0			104.0							
Total Split (%)		74.3%			74.3%							
Maximum Green (s)		98.9			98.9							
Yellow Time (s)		3.7			3.7							
All-Red Time (s)		1.4			1.4							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		5.1			5.1							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0							
Recall Mode		C-Max			C-Max							
Walk Time (s)		15.0			15.0							
Flash Dont Walk (s)		5.0			5.0							
Pedestrian Calls (#/hr)		20			20							
Act Effct Green (s)		115.6			115.6							
Actuated g/C Ratio		0.83			0.83							
v/c Ratio		0.38			0.47							
Control Delay		4.2			2.2							
Queue Delay		0.1			0.1							
Total Delay		4.3			2.3							
LOS		A			A							
Approach Delay		4.3			2.3							
Approach LOS		A			A							
Queue Length 50th (m)		34.7			26.3							
Queue Length 95th (m)		42.7			m25.6							
Internal Link Dist (m)		93.5			100.7			133.3			30.9	
Turn Bay Length (m)												
Base Capacity (vph)		2710			2737							
Starvation Cap Reductn		632			413							
Spillback Cap Reductn		243			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.50			0.56							

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 108 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 3.2

Intersection LOS: A

Intersection Capacity Utilization 42.1%

ICU Level of Service A

Analysis Period (min) 15

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

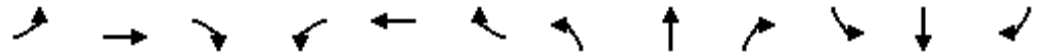
Splits and Phases: 3: Trillium Pathway & Carling

Ø2 (R) 104 s	Ø4 36 s
Ø5 (R) 104 s	

Lane Group	Ø4
Total Split (s)	36.0
Total Split (%)	26%
Maximum Green (s)	29.4
Yellow Time (s)	3.0
All-Red Time (s)	3.6
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	22.0
Pedestrian Calls (#/hr)	20
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
2033 Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	181	577	374	366	867	71	353	378	204	112	341	127
Future Volume (vph)	181	577	374	366	867	71	353	378	204	112	341	127
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	65.0		0.0	110.0		90.0	75.0		0.0	0.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.97	0.97		0.98		0.89	0.98	0.97		0.97	0.98	
Frt		0.941				0.850		0.947			0.959	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1610	3005	0	1674	3316	1427	1674	3062	0	1537	1623	0
Flt Permitted	0.950			0.950			0.091			0.433		
Satd. Flow (perm)	1566	3005	0	1648	3316	1272	157	3062	0	681	1623	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		103				132		90			13	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		124.7			193.9			164.5			65.2	
Travel Time (s)		7.5			11.6			11.8			4.7	
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 (%)	5%	3%	2%	1%	2%	6%	1%	2%	1%	10%	2%	5%
Adj. Flow (vph)	181	577	374	366	867	71	353	378	204	112	341	127
Shared Lane Traffic (%)												
Lane Group Flow (vph)	181	951	0	366	867	71	353	582	0	112	468	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	3	8		4	4	

4: Preston & Carling  
PM Peak Hour

829 Carling Avenue  
2033 Total Traffic



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	30.0		11.2	30.0	30.0	11.9	43.9		43.9	43.9	
Total Split (s)	21.0	43.0		30.0	52.0	52.0	23.0	67.0		44.0	44.0	
Total Split (%)	15.0%	30.7%		21.4%	37.1%	37.1%	16.4%	47.9%		31.4%	31.4%	
Maximum Green (s)	14.8	37.0		23.8	46.0	46.0	16.1	60.1		37.1	37.1	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.3		2.5	2.3	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		6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	Max	
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)		20			20	20		20		20	20	
Act Effct Green (s)	14.8	37.0		23.8	46.0	46.0	60.1	60.1		37.1	37.1	
Actuated g/C Ratio	0.11	0.26		0.17	0.33	0.33	0.43	0.43		0.26	0.26	
v/c Ratio	1.06	1.09		1.29	0.80	0.14	1.46	0.43		0.62	1.07	
Control Delay	150.7	88.7		180.3	38.6	2.4	256.5	6.4		62.3	108.8	
Queue Delay	0.0	2.4		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	150.7	91.1		180.3	38.6	2.4	256.5	6.4		62.3	108.8	
LOS	F	F		F	D	A	F	A		E	F	
Approach Delay		100.7			76.4			100.8			99.8	
Approach LOS		F			E			F			F	
Queue Length 50th (m)	~48.1	~134.2		~117.4	115.4	0.0	~107.4	28.6		25.3	~128.9	
Queue Length 95th (m)	#92.4	#167.0		m#134.4	m118.7	m0.0	m#167.0	36.3		46.1	#190.7	
Internal Link Dist (m)		100.7			169.9			140.5			41.2	
Turn Bay Length (m)	65.0			110.0		90.0	75.0					
Base Capacity (vph)	170	869		284	1089	506	241	1365		180	439	
Starvation Cap Reductn	0	16		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	1.06	1.11		1.29	0.80	0.14	1.46	0.43		0.62	1.07	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

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

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.46

Intersection Signal Delay: 92.5

Intersection LOS: F

Intersection Capacity Utilization 125.2%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

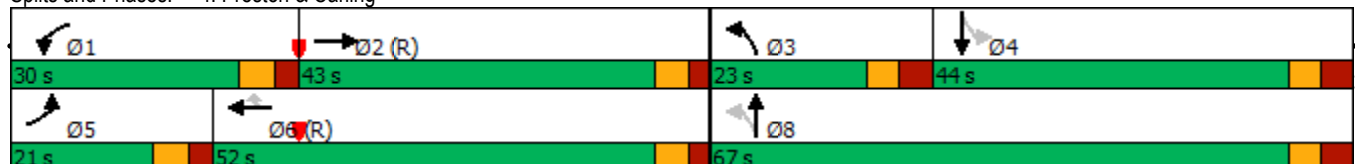
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 4: Preston & Carling



5: Carling & Booth  
PM Peak Hour

829 Carling Avenue  
2033 Total Traffic



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	255	699	897	104	308	324
Future Volume (vph)	255	699	897	104	308	324
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	75.0			25.0	0.0	45.0
Storage Lanes	1			1	1	1
Taper Length (m)	25.0				10.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.95			0.79	0.98	0.75
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1674	3316	1745	1498	1674	1483
Fl <sub>t</sub> Permitted	0.950				0.950	
Satd. Flow (perm)	1583	3316	1745	1181	1647	1117
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				28		263
Link Speed (k/h)		60	60		50	
Link Distance (m)		120.9	518.9		229.0	
Travel Time (s)		7.3	31.1		16.5	
Confl. Peds. (#/hr)	65			65	13	81
Confl. Bikes (#/hr)				10		45
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	2%	1%	1%	2%
Adj. Flow (vph)	255	699	897	104	308	324
Shared Lane Traffic (%)						
Lane Group Flow (vph)	255	699	897	104	308	324
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		7.0	7.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
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	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
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		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	15.7	29.7	29.7	39.0	39.0
Total Split (s)	24.0	101.0	77.0	77.0	39.0	39.0
Total Split (%)	17.1%	72.1%	55.0%	55.0%	27.9%	27.9%
Maximum Green (s)	18.1	95.3	71.3	71.3	33.0	33.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			13.0	13.0	7.0	7.0
Flash Dont Walk (s)			11.0	11.0	26.0	26.0
Pedestrian Calls (#/hr)			20	20	20	20
Act Effct Green (s)	21.2	98.4	71.3	71.3	29.9	29.9
Actuated g/C Ratio	0.15	0.70	0.51	0.51	0.21	0.21
v/c Ratio	1.01	0.30	1.01	0.17	0.88	0.73
Control Delay	89.3	6.2	67.0	14.1	77.9	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	6.2	67.0	14.1	77.9	20.8
LOS	F	A	E	B	E	C
Approach Delay		28.4	61.5		48.6	
Approach LOS		C	E		D	
Queue Length 50th (m)	~75.7	43.9	~229.6	9.9	74.4	12.7
Queue Length 95th (m)	m#88.8	m45.0	#310.9	19.8	#113.7	47.2
Internal Link Dist (m)		96.9	494.9		205.0	
Turn Bay Length (m)	75.0			25.0		45.0
Base Capacity (vph)	253	2330	888	615	388	464
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	1.01	0.30	1.01	0.17	0.79	0.70

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 62 (44%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.01  
 Intersection Signal Delay: 46.1  
 Intersection LOS: D  
 Intersection Capacity Utilization 106.3%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Carling & Booth



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	41	34	47	121	31	82	477	60	17	508	54
Future Volume (vph)	29	41	34	47	121	31	82	477	60	17	508	54
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	25.0		0.0	25.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	25.0			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		0.93			0.97	0.84	0.97	0.98		0.95	0.99	
Frt		0.956				0.850		0.983			0.986	
Flt Protected		0.986			0.986		0.950			0.950		
Satd. Flow (prot)	0	1584	0	0	1738	1498	1674	1674	0	1674	1673	0
Flt Permitted		0.874			0.894		0.399			0.415		
Satd. Flow (perm)	0	1373	0	0	1533	1261	680	1674	0	692	1673	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24				31		16			13	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		101.4			151.8			160.5			163.2	
Travel Time (s)		7.3			10.9			11.6			11.8	
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 (%)	1%	1%	1%	1%	1%	1%	1%	3%	1%	1%	4%	2%
Adj. Flow (vph)	29	41	34	47	121	31	82	477	60	17	508	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	104	0	0	168	31	82	537	0	17	562	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
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	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	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	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	4	4		8	8	8	2	2		6	6	





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	22.6	22.6		22.6	22.6	22.6	33.5	33.5		33.5	33.5	
Total Split (s)	23.0	23.0		23.0	23.0	23.0	67.0	67.0		67.0	67.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%	25.6%	74.4%	74.4%		74.4%	74.4%	
Maximum Green (s)	17.4	17.4		17.4	17.4	17.4	61.5	61.5		61.5	61.5	
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3	2.3	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.6			5.6	5.6	5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Ped	Ped		Ped	Ped	Ped	C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	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	10.0	
Pedestrian Calls (#/hr)	20	20		20	20	20	20	20		20	20	
Act Effct Green (s)		17.2			17.2	17.2	61.7	61.7		61.7	61.7	
Actuated g/C Ratio		0.19			0.19	0.19	0.69	0.69		0.69	0.69	
v/c Ratio		0.37			0.58	0.12	0.18	0.47		0.04	0.49	
Control Delay		28.7			41.9	12.2	2.5	4.8		4.9	8.3	
Queue Delay		0.0			0.0	0.0	0.0	0.1		0.0	0.0	
Total Delay		28.7			41.9	12.2	2.5	4.9		4.9	8.3	
LOS		C			D	B	A	A		A	A	
Approach Delay		28.7			37.2			4.6			8.2	
Approach LOS		C			D			A			A	
Queue Length 50th (m)		11.1			24.6	0.0	2.6	35.5		0.8	35.3	
Queue Length 95th (m)		24.5			43.0	6.6	0.5	1.7		2.6	55.1	
Internal Link Dist (m)		77.4			127.8			136.5			139.2	
Turn Bay Length (m)							25.0			25.0		
Base Capacity (vph)		284			296	268	466	1153		474	1151	
Starvation Cap Reductn		0			0	0	0	98		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		0.37			0.57	0.12	0.18	0.51		0.04	0.49	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	43 (48%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.58
Intersection Signal Delay:	12.0
Intersection LOS:	B
Intersection Capacity Utilization:	87.2%
ICU Level of Service:	E
Analysis Period (min):	15

Splits and Phases: 6: Preston & Beech





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	2	10	0	0	0	8	576	27	6	576	15
Future Volume (vph)	4	2	10	0	0	0	8	576	27	6	576	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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		0.92						0.99			1.00	
Flt Protected		0.916						0.994			0.997	
Flt Permitted		0.988						0.999			0.999	
Satd. Flow (prot)	0	1494	0	0	0	0	0	1709	0	0	1717	0
Satd. Flow (perm)	0	1466	0	0	0	0	0	1698	0	0	1710	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10						6			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		114.6			152.9			73.8			160.5	
Travel Time (s)		8.3			11.0			5.3			11.6	
Confl. Peds. (#/hr)	25		27	27		25	46		47	47		46
Confl. Bikes (#/hr)			1			3			21			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 (%)	1%	1%	1%	2%	2%	2%	1%	3%	1%	1%	3%	1%
Adj. Flow (vph)	4	2	10	0	0	0	8	576	27	6	576	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	0	0	0	611	0	0	597	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		-2.0			-1.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2					1	2		1	2	
Detector Template	Left	Thru					Left	Thru		Left	Thru	
Leading Detector (m)	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	
Detector 1 Position(m)	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	
Detector 1 Type	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0					0.0	0.0		0.0	0.0	
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			28.7	
Detector 2 Size(m)		1.8						1.8			1.8	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Detector Phase	4	4					2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0					10.0	10.0		10.0	10.0	
Minimum Split (s)	20.5	20.5					28.1	28.1		28.1	28.1	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	21.0	21.0					69.0	69.0		69.0	69.0	
Total Split (%)	23.3%	23.3%					76.7%	76.7%		76.7%	76.7%	
Maximum Green (s)	15.5	15.5					63.9	63.9		63.9	63.9	
Yellow Time (s)	3.3	3.3					3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2					1.8	1.8		1.8	1.8	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.5						5.1			5.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	
Recall Mode	None	None					C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0					18.0	18.0		18.0	18.0	
Flash Dont Walk (s)	8.0	8.0					5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	20	20					20	20		20	20	
Act Effct Green (s)		12.0						75.6			75.6	
Actuated g/C Ratio		0.13						0.84			0.84	
v/c Ratio		0.08						0.43			0.42	
Control Delay		21.9						4.9			3.6	
Queue Delay		0.0						0.0			0.0	
Total Delay		21.9						4.9			3.6	
LOS		C						A			A	
Approach Delay		21.9						4.9			3.6	
Approach LOS		C						A			A	
Queue Length 50th (m)		0.9						26.8			21.4	
Queue Length 95th (m)		5.8						54.6			32.8	
Internal Link Dist (m)		90.6			128.9			49.8			136.5	
Turn Bay Length (m)												
Base Capacity (vph)		260						1428			1437	
Starvation Cap Reductn		0						0			69	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.06						0.43			0.44	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 27 (30%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.43

Intersection Signal Delay: 4.5

Intersection LOS: A

Intersection Capacity Utilization 58.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 7: Preston & Pamilla





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	34	4	25	22	2	17	37	515	48	23	581	5
Future Volume (vph)	34	4	25	22	2	17	37	515	48	23	581	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
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												
Frt		0.946			0.944			0.989			0.999	
Flt Protected		0.974			0.974			0.997			0.998	
Satd. Flow (prot)	0	1608	0	0	1605	0	0	1706	0	0	1724	0
Flt Permitted		0.974			0.974			0.997			0.998	
Satd. Flow (perm)	0	1608	0	0	1605	0	0	1706	0	0	1724	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		113.6			154.3			71.5			73.8	
Travel Time (s)		8.2			11.1			5.1			5.3	
Confl. Peds. (#/hr)							46		47	47		46
Confl. Bikes (#/hr)									21			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 (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Adj. Flow (vph)	34	4	25	22	2	17	37	515	48	23	581	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	63	0	0	41	0	0	600	0	0	609	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		-2.0			-2.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

**Intersection Summary**

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 59.1%

ICU Level of Service B

Analysis Period (min) 15



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	28	39	56	572	541	79
Future Volume (vph)	28	39	56	572	541	79
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.921			0.983		
Flt Protected	0.980			0.996		
Satd. Flow (prot)	1575	0	0	3273	1701	0
Flt Permitted	0.980			0.996		
Satd. Flow (perm)	1575	0	0	3273	1701	0
Link Speed (k/h)	30			50	50	
Link Distance (m)	68.0			65.2	71.5	
Travel Time (s)	8.2			4.7	5.1	
Confl. Peds. (#/hr)				46		47
Confl. Bikes (#/hr)						14
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%
Adj. Flow (vph)	28	39	56	572	541	79
Shared Lane Traffic (%)						
Lane Group Flow (vph)	67	0	0	628	620	0
Enter Blocked Intersection	No	No	Yes	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	5.0			2.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

**Intersection Summary**

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 68.2%

ICU Level of Service C

Analysis Period (min) 15



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	477	280	4	2	416	434	5	2	1	416	0	649
Future Volume (vph)	477	280	4	2	416	434	5	2	1	416	0	649
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	55.0		0.0	30.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	2		0	1		1	0		0	0		1
Taper Length (m)	25.0			25.0			25.0			25.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.89		0.93		0.93			0.81	0.77
Frt		0.998				0.850		0.983				0.850
Flt Protected	0.950			0.950				0.970			0.950	
Satd. Flow (prot)	3185	1754	0	1674	1762	1498	0	1637	0	0	1674	1483
Flt Permitted	0.224			0.586				0.851			0.752	
Satd. Flow (perm)	751	1754	0	917	1762	1397	0	1374	0	0	1077	1144
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				165		1				88
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		233.9			203.3			76.1			164.5	
Travel Time (s)		14.0			12.2			5.5			11.8	
Confl. Peds. (#/hr)	35		62	62		35	73		65	65		73
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 (%)	3%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%
Adj. Flow (vph)	477	280	4	2	416	434	5	2	1	416	0	649
Shared Lane Traffic (%)												
Lane Group Flow (vph)	477	284	0	2	416	434	0	8	0	0	416	649
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)		7.0			7.0			0.0				3.5
Link Offset(m)		2.0			0.0			5.0				0.0
Crosswalk Width(m)		5.0			10.0			5.0				5.0
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6		6	8			4		4
Detector Phase	5	2		6	6	6	8	8		4	4	5
Switch Phase												

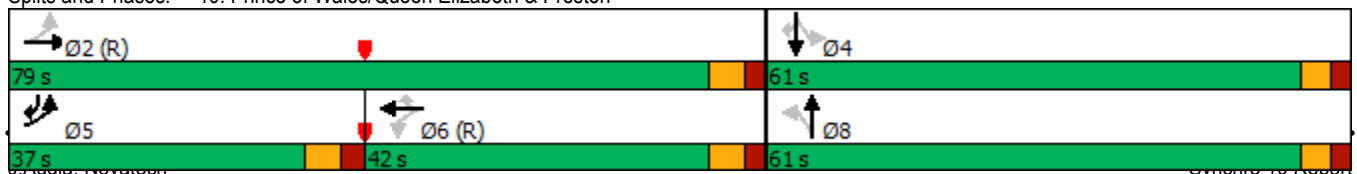


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	10.0	10.0		10.0	10.0	5.0
Minimum Split (s)	11.1	32.1		32.1	32.1	32.1	29.5	29.5		29.5	29.5	11.1
Total Split (s)	37.0	79.0		42.0	42.0	42.0	61.0	61.0		61.0	61.0	37.0
Total Split (%)	26.4%	56.4%		30.0%	30.0%	30.0%	43.6%	43.6%		43.6%	43.6%	26.4%
Maximum Green (s)	30.9	72.9		35.9	35.9	35.9	55.5	55.5		55.5	55.5	30.9
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.3	3.3		3.3	3.3	3.7
All-Red Time (s)	2.4	2.4		2.4	2.4	2.4	2.2	2.2		2.2	2.2	2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		5.5			5.5	6.1
Lead/Lag	Lead			Lag			Lag			Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	Max	Max		Max	Max	None
Walk Time (s)		7.0		7.0	7.0	7.0	12.0	12.0		12.0	12.0	
Flash Dont Walk (s)		19.0		19.0	19.0	19.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		20		20	20	20	20	20		20	20	
Act Effct Green (s)	72.9	72.9		44.4	44.4	44.4		55.5			55.5	77.3
Actuated g/C Ratio	0.52	0.52		0.32	0.32	0.32		0.40			0.40	0.55
v/c Ratio	0.61	0.31		0.01	0.75	0.78		0.01			0.98	0.90
Control Delay	22.6	20.3		38.0	53.5	38.5		24.4			44.1	12.1
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.1
Total Delay	22.6	20.3		38.0	53.5	38.5		24.4			44.1	12.2
LOS	C	C		D	D	D		C			D	B
Approach Delay		21.8			45.8			24.4			24.7	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	34.3	40.2		0.3	93.2	63.9		1.1			93.5	58.0
Queue Length 95th (m)	44.6	58.1		2.5	#159.3	#129.3		4.4			m64.7	m22.3
Internal Link Dist (m)		209.9			179.3			52.1			140.5	
Turn Bay Length (m)	55.0			30.0		25.0						
Base Capacity (vph)	928	913		290	558	555		545			426	809
Starvation Cap Reductn	0	0		0	0	0		0			0	6
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.51	0.31		0.01	0.75	0.78		0.01			0.98	0.81

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 53 (38%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.98  
 Intersection Signal Delay: 30.5  
 Intersection LOS: C  
 Intersection Capacity Utilization 105.3%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Prince of Wales/Queen Elizabeth & Preston



	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	53	0	18	117	0	14
Future Volume (vph)	53	0	18	117	0	14
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>						0.865
Flt Protected				0.993		
Satd. Flow (prot)	1745	0	0	1733	1510	0
Flt Permitted				0.993		
Satd. Flow (perm)	1745	0	0	1733	1510	0
Link Speed (k/h)	30			30	50	
Link Distance (m)	49.5			68.0	48.5	
Travel Time (s)	5.9			8.2	3.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	53	0	18	117	0	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	53	0	0	135	14	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	0.0			0.0	5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	24.2%			ICU Level of Service A		
Analysis Period (min)	15					