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# 1040 Somerset Street West

## Transportation Impact Assessment

**1040 Somerset Street West**  
**Transportation Impact Assessment**

Prepared By:

**NOVATECH**  
Suite 200, 240 Michael Cowpland Drive  
Ottawa, Ontario  
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Submitted: December 18, 2020  
Revised: February 19, 2021

Novatech File: 112191  
Ref: R-2020-143

February 19, 2021

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

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

Dear Sir:

**Reference: 1040 Somerset Street West**  
**Revised Transportation Impact Assessment Report**  
**Novatech File No. 112191**

---

We are pleased to submit the following Revised Transportation Impact Assessment report in support of a Site Plan Control application for the above address. The structure and format of this report is in accordance with the City of Ottawa Transportation Impact Assessment Guidelines (June 2017).

A TIA report was submitted in December 2020 in support of a Site Plan Control application for the above address. This revised TIA report was prepared in order to address comments received from the City in February 2021.

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

Yours truly,

**NOVATECH**



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



## **TIA Plan Reports**

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

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

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

### **CERTIFICATION**

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

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Dated at Ottawa this 19 day of February, 2021.  
(City)

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

Professional Title: Project Coordinator, Transportation/Traffic



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

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## EXECUTIVE SUMMARY

This revised Transportation Impact Assessment (TIA) report has been prepared in support of a Site Plan Control application for 1040 Somerset Street West.

The subject site is surrounded by the following:

- Somerset Street West and single detached dwellings converted for ground floor commercial uses to the north;
- The O-Train Trillium Line transit corridor to the east;
- A meditation centre and an auto repair shop to the south; and
- Breezehill Avenue and a dollar store to the west.

The subject site is located in the southeast corner of the Somerset Street West/Breezehill Avenue intersection. The site is currently occupied by a one storey building with a crossfit gym and a charity technology store. Access to the existing development is located approximately 8m from the northern property line/Somerset Street West right-of-way. It is also noted that Devonshire Public School is located on the west side of Breezehill Avenue, south of the subject site.

The proposed development consists of a 30-storey mixed-use building and will provide 268 units, 141 m<sup>2</sup> of commercial/retail floor space, and 191 underground parking spaces. Vehicular access is proposed via Breezehill Avenue near the southern limits of the subject site. The subject site is currently zoned TM[2121]H(100)-h, which permits the proposed development. Full build out of the site is anticipated by 2025.

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

### Development Design & Parking

- Pedestrian connectivity will be provided to Somerset Street West and Breezehill Avenue. A paved pedestrian plaza is proposed fronting the site onto Somerset Street West, with steps merging into the sidewalk along Somerset Street West. Unit pavers are proposed along the Breezehill Avenue frontage, creating a wide boulevard with planters near the main building entrance. A clear width of 3m will be provided between the planters and the Breezehill Avenue curblin.
- The minimum vehicular and bicycle parking requirements of the ZBL will be met.
- OC Transpo bus stops are located at the Somerset Street West/Bayswater Avenue intersection, within a 150m walk of the development. The Bayview LRT station is also located within a 500m walk of the development.
- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.
- The proposed development will be served by a new vehicular access to Breezehill Avenue. This access will serve the underground parking. The existing site access will be closed as part of this application.
- The fire route for the proposed development will be located curbside.
- A garbage room is proposed to the north of the access to the underground parking. Garbage collection will occur curbside on Breezehill Avenue.



### Boundary Streets

- Somerset Street West meets the target BLOS, TLOS, and TkLOS but does not meet the target PLOS. Based on the PLOS criteria, the target PLOS A is unachievable along roadways that carry greater than 3,000 AADT and have an operating speed of 60km/hr. Without a reduction in speed or a decrease in AADT, a maximum PLOS C can be achieved with a 2.0m sidewalk and 2.0m boulevard. This is identified for the City's consideration.
- Breezehill Avenue meets the target BLOS but does not meet the target PLOS. To achieve the target PLOS A, either a 1.8m sidewalk with a 2.0m wide boulevard or a 2.0m sidewalk with a minimum 0.5m wide boulevard would be required. Unit pavers are proposed along the Breezehill Avenue frontage, creating a wide boulevard with planters near the main building entrance. A clear width of 3m will be provided between the planters and the Breezehill Avenue curbline.

### Access Intersection Design

- The existing access on-site is to be closed and the depressed curb and sidewalk is to be replaced with full height curb and sidewalk in accordance with City standards.
- The proposed access will be located approximately 35m south of Somerset Street West, measured from the nearest edge of the access to the Somerset Street West ROW. The access will have a width of approximately 6m.
- The width and location of the access adheres to the requirements of the *Private Approach By-Law* and *Zoning By-Law*.
- A waiver to the City's *Private Approach By-Law* is required for the grade of the underground parking ramp. The access will have a grade of 6% for the first 6m within the building and 7.5m within the property, transitioning to a 15% slope. The proposed grade is sufficient for a passenger vehicle to stop entirely within the private property with both tires on the 6% grade and have appropriate sight lines to the sidewalk. Bollards will be provided within the right-of-way along the parking ramp entrance in order to further differentiate the pedestrian and vehicular streams of traffic.

### Transportation Demand Management

- The additional vehicle trips at either signalized intersection within the study area due to the target transit modal share not being met would result in an increase of 1.9% or less to the overall intersection traffic volumes.
- Should the development only meet the Ottawa West or Ottawa Inner Area modal shares, the additional trips generated by the development are anticipated have a minimal impact on the Auto LOS within the study area.
- To encourage travel by sustainable modes, the proponent agrees to provide 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; and
  - Provide a multimodal travel option information package to new residents.

### Neighborhood Traffic Management

- The majority of the traffic being generated by the proposed development is expected to arrive/depart to the north towards Somerset Street West.
- The added traffic generated by the proposed development is not anticipated to have a significant impact on the existing vehicular operations along Breezehill Avenue south of

the site and will not change the classification of Breezehill Avenue from a local road to a collector.

- Based on the 2025 and 2030 total traffic projections, Breezehill Avenue will have sufficient lane capacity to accommodate the additional traffic generated by the site.

### Transit

- The proposed redevelopment is anticipated to generate 83 transit trips (19 in, 64 out) during the AM peak hour, and 75 transit trips (47 in, 28 out) during the PM peak hour.
- The additional trips generated by the development are not anticipated to result in increased service for Route 11 at stop #8039 or #8027.
- No capacity deficiencies are anticipated for Line 1 or Line 2 at Bayview Station.

### Intersection MMLOS Analysis

- The Somerset Street West/Bayswater Avenue intersection does not meet the target PLOS, BLOS, or TkLOS but meets the target TLOS and Auto LOS.
  - A reduction in the pedestrian walking distance on the north, east, and west approaches would have the greatest improvement to the PLOS at this intersection. However, a reduction in the pedestrian walking distance is limited by the number of travel lanes required.
  - The right turn criteria on the east and westbound approaches and left turn criteria on the north approach do not meet the target BLOS C. Bike lanes on all approaches would improve the BLOS to the target BLOS C. A further review of the Ontario Traffic Manual (OTM) Book 18 Desirable Cycling Facility Pre-selection Nomograph has been conducted. Based on an operating speed of 50km/hr and an AADT between 7,000-8,000, consideration should be given to bike lanes on Bayswater Avenue and Somerset Street West which would achieve the target BLOS C. Removal of the right turn lane on the east and westbound approaches would also improve the BLOS along Somerset Street West to the target BLOS C. This is identified for the City's consideration.
  - Increased radii on the all corners of the intersection would improve the TkLOS but would have a negative impact on the PLOS.
- The Somerset Street West/Preston Street intersection does not meet the target PLOS, BLOS, TLOS, or TkLOS but meets the target Auto LOS.
  - A reduction in the pedestrian walking distance on the south approach would have the greatest improvement to the PLOS at this intersection. However, a reduction in the pedestrian walking distance is limited by the number of travel lanes required.
  - The left turn criteria on all approaches does not meet the target BLOS. A reduction in the operating speed to 40km/h or bike lanes on all approaches would improve the BLOS to the target BLOS C. Based on AADT of 8,000-9,000vph and a speed of 50km/h, the OTM Nomograph suggests that consideration should be given to bike lanes on Preston Street and Somerset Street West which would achieve the target BLOS C.
  - The delay on the west approach in the AM peak is in excess of 40 seconds and does not meet the target TLOS D. All other approaches in the AM and PM peak period meets the target TLOS D. The target TLOS D can not be achieved without removal of the advanced walk phases for pedestrians or an increase in the cycle length. Removal of the advanced walk phases would have a negative impact on the PLOS. As signals are coordinated in the area, an increased cycle length would result in an increased cycle length at other intersections within the area and may result in negative impacts on the Auto LOS at other signals.

- Increased radii on the all corners of the intersection would improve the TkLOS but would have a negative impact on the PLOS.

### Assessment of Safety and Operations

- The sight distance east of Breezehill Avenue for vehicles to turn northbound left on Somerset Street West is limited by the vertical curve of the bridge over the O-Train Corridor and is further obstructed by the concrete end treatment of the guiderail. The guiderail and concrete end treatment are to be cut back as part of the proposed development, but the ISD will continue to be limited by the overpass.
- Traffic signal control is recommended at the Somerset Street/Breezehill Avenue intersection to address the inadequate sight distance. A continuous advance warning beacon should be provided based on the available sight distance of 105m for vehicles travelling west on Somerset Street West. A minimum advance placement distance of 140m is recommended on Somerset Street West, east of Breezehill Avenue.
- The 2025 background and total traffic volumes do not meet the MTO warrant criteria for a dedicated westbound left turn lane on Somerset Street West at Breezehill Avenue.
- The 2030 background and total traffic volumes meet the MTO warrant criteria for a dedicated westbound left turn lane on Somerset Street West at Breezehill Avenue. As the westbound left turn lane is warranted under background traffic conditions for the 2030 horizon year and not as a result of site traffic, and as a westbound left turn lane would result in a reduction in sidewalk width along Somerset Street, it is recommended that the City continue to monitor the Somerset Street West/Breezehill Avenue intersection to determine if the westbound left turn lane is required.
- As part of the previous study, several options were explored including the provision of a westbound left turn lane with reduced sidewalk widths, peak hour turn restrictions and no westbound left turn lane, split phase signal timing and no westbound left turn lane, or monitoring to confirm the requirement for a westbound left turn lane.

### Total Intersection Operations

- Under 2025 and 2030 total traffic conditions, all intersections are projected to operate with acceptable conditions.
- A maximum queue of 50m is expected for the eastbound approach of the Somerset Street West/Breezehill Avenue intersection in the PM peak period. A maximum of 65m is expected for the westbound approach of the Somerset Street West/Bayswater Avenue intersection in the PM peak. Sufficient storage is available for the projected queue length as the spacing between the Bayswater Avenue and proposed Breezehill Avenue stop bars is approximately 85m.
- The analysis shows that the signalized intersection of Somerset Street West/Breezehill Avenue is anticipated to operate with acceptable conditions without a westbound left turn lane.
- Although anticipated to operate with a LOS E in the AM peak given the current signal timing plan, the Somerset Street West/Preston Street intersection could benefit from adjusted signal timing. Reassigning 5 seconds from the north/south movements to the east/west would improve the v/c ratio to a 0.88, or LOS D. This is identified for the City's consideration.
- Should the development not meet the target modal shares, the Somerset Street West/Preston Street intersection is anticipated to operate with a LOS F in the AM peak given the current signal timing plan. With adjusted signal timing a v/c ratio of 0.89 (LOS D) is anticipated. All other study area intersections are anticipated to operate with acceptable conditions.

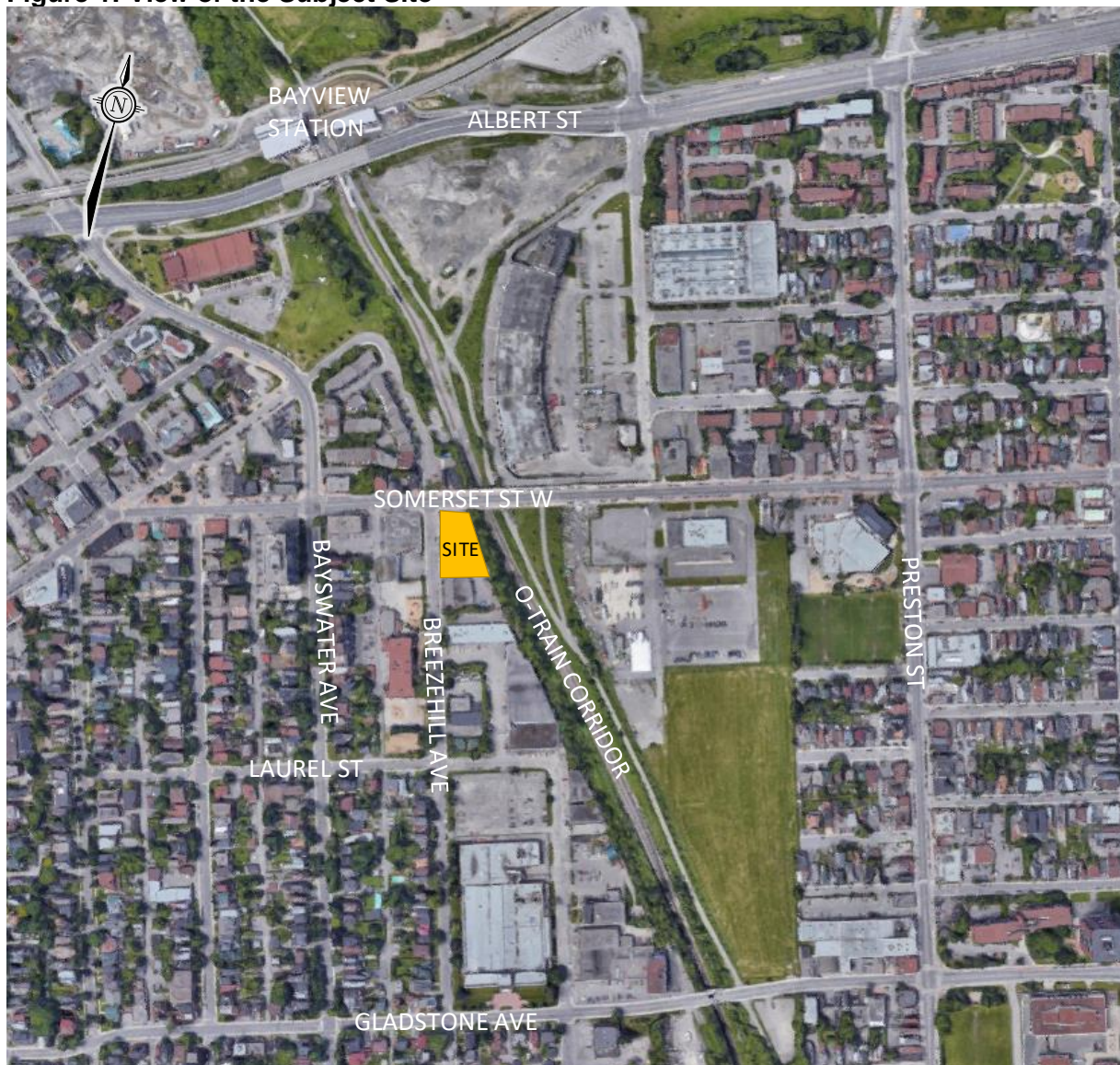
## 1.0 INTRODUCTION

This revised Transportation Impact Assessment (TIA) report has been prepared in support of a Site Plan Control application for 1040 Somerset Street West.

The subject site is located in the southeast corner of the Somerset Street West/Breezehill Avenue intersection. The site is currently occupied by a one storey building with a crossfit gym and a charity technology store. Access to the existing development is located approximately 8m from the northern property line/Somerset Street West right-of-way.

The location and surrounding context of the subject site are shown in **Figure 1**.

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



A CTS was written in 2013 by Novatech in support of a Zoning By-Law amendment for the subject site.

The subject site is surrounded by the following:

- Somerset Street West and single detached dwellings converted for ground floor commercial uses to the north;
- The O-Train Trillium Line transit corridor to the east;
- A meditation centre and an auto repair shop to the south; and
- Breezehill Avenue and a dollar store to the west.

It is also noted that Devonshire Public School is located on the west side of Breezehill Avenue, south of the subject site.

## **2.0 PROPOSED DEVELOPMENT**

The subject site is currently zoned TM[2121]H(100)-h, which permits the proposed development. The proposed development consists of a 30-storey mixed-use building and will provide 268 units, 141 m<sup>2</sup> of commercial/retail floor space, and 189 underground parking spaces. Vehicular access is proposed via Breezehill Avenue near the southern limits of the subject site.

Full build out of the site is anticipated by 2025.

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

## **3.0 SCREENING**

### **3.1 Screening Form**

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

- Trip Generation Trigger – The development is anticipated to generate over 60 peak hour person trips; further assessment is required based on this trigger.
- Location Trigger – The development is located in a Transit-Oriented Development (TOD) Zone (Bayview Station) and a Design Priority Area (Somerset Traditional Mainstreet); further assessment is required based on this trigger.
- Safety Trigger – Vertical curvature on Somerset Street West limits sightlines at Breezehill Avenue; further assessment is required based on this trigger.

The proposed development satisfies all three triggers for completing a TIA. A copy of the TIA screening form is included in **Appendix B**.

## **4.0 SCOPING**

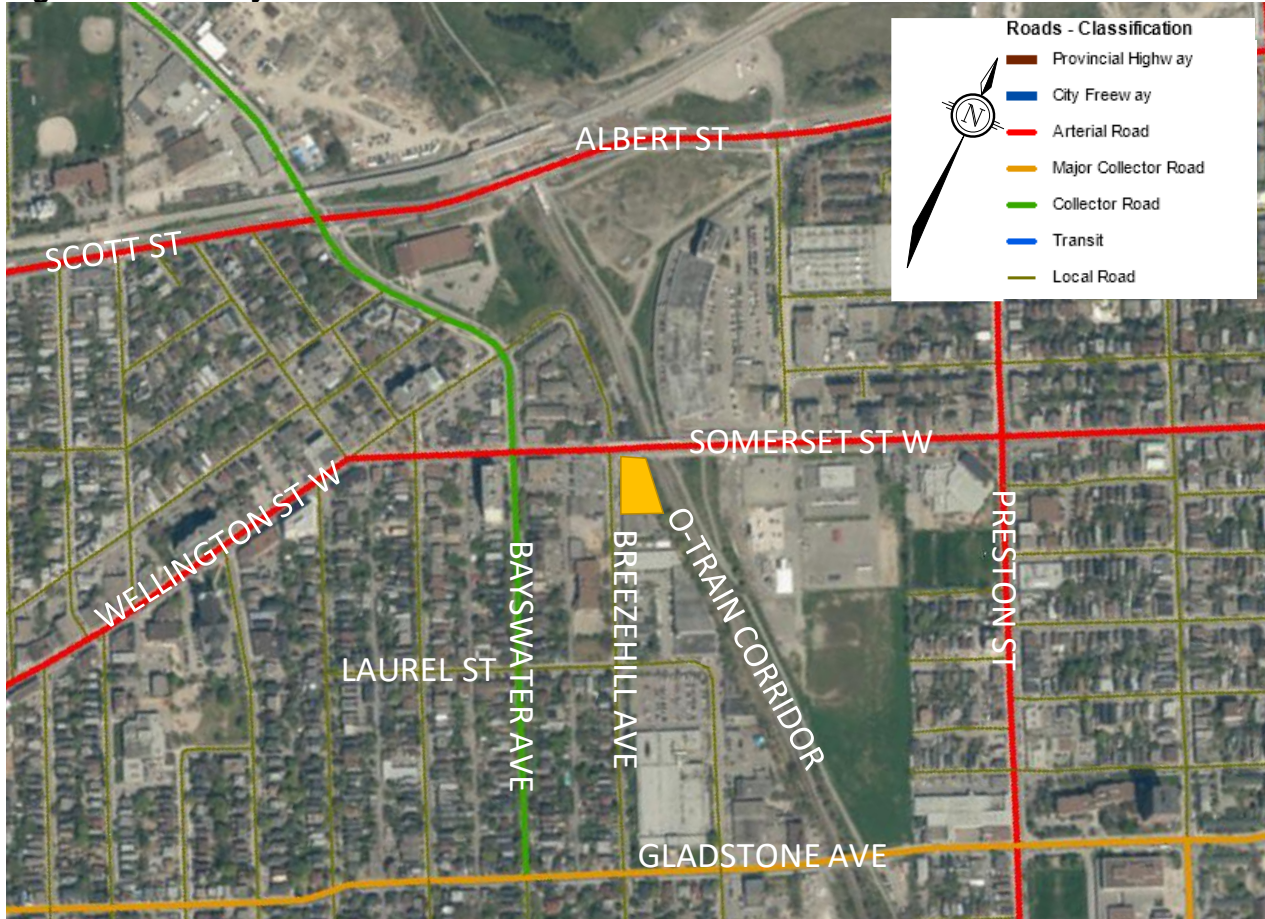
### **4.1 Existing Conditions**

This section provides a review of existing conditions in the vicinity of the subject site including: roadways, intersections, driveways, pedestrian and cycling facilities, transit, area traffic management measures, traffic volumes, and collision records.

### 4.1.1 Roadways

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

**Figure 2: Roadway Network**



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

Somerset Street West is an arterial roadway that runs on an east-west alignment between Queen Elizabeth Drive and Wellington Street West. Somerset Street West has a two-lane urban cross-section and designed parking lanes on both sides of the roadway. Somerset Street West is a designated truck route between Wellington Street West and Elgin Street, with a regulatory speed limit of 50km/h. A short curb-side loading zone is provided on the north side of Somerset Street West, across from the subject site. A speed survey conducted in February 2021 indicates that the 85<sup>th</sup> percentile motor vehicle operating speed along Somerset Street West at Breezehill Avenue is 52km/h.

Bayswater Avenue is a collector road with a two-lane urban cross-section that runs on a north-south alignment between Wellington Street West and Carling Avenue. On-street parking is permitted on the west side of Bayswater Avenue south of Somerset Street West. Bayswater Avenue has a regulatory speed of 50km/h and is a designated truck route north of Somerset Street West. North of the Wellington Street West/Hintonburg Place intersection, Bayswater Avenue continues as Bayview Station Road.

Breezehill Avenue is a local road with a two-lane urban cross-section that runs on a north-south alignment commencing at Somerset Street West and terminating in a dead-end south of Gladstone Avenue. Breezehill Avenue has a posted speed of 40km/h. On-street parking is permitted along the east side of Breezehill Avenue for approximately 70m south of Somerset Street West. On-street parking is permitted on the west side of Breezehill Avenue on weekends. A school bus loading zone is located on the west side of Breezehill Avenue south of the subject site, adjacent to the Devonshire Public School.

Preston Street is an arterial road with a two-lane urban cross-section that runs on a north-south alignment between Prince of Wales Drive/Queen Elizabeth Drive and Albert Street. Designated parking lanes are provided on the east side along sections of Preston Street north of Somerset Street West and on both sides along sections south of Somerset Street West. Preston Street is designated as an urban truck route with a speed limit of 50km/h.

Laurel Street is a local road with a two-lane cross-section that runs on an east-west alignment between Irving Avenue and Loretta Avenue. Laurel Street has a speed limit of 40km/h. On-street parking is permitted on both sides of Laurel Street between Breezehill Avenue and Bayswater Avenue.

Gladstone Avenue is a major collector road with a two-lane urban cross-section that runs on an east-west alignment between Parkdale Avenue and Cartier Street. On street parking is permitted on the south side of Gladstone Avenue on weekends between 3:00PM-9:00AM and on weekdays between 5:30PM-7:00AM. Designated on street parking is provided east of Preston Street. Gladstone Avenue has a posted speed limit of 40km/h.

#### 4.1.2 Intersections

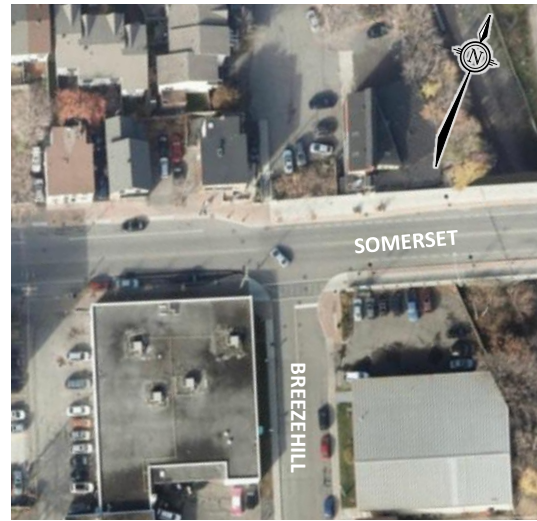
##### Somerset Street West/Bayswater Avenue

- Signalized intersection
- Eastbound/Westbound: one shared through/left turn lane, one dedicated right turn lane
- Northbound: one shared approach lane
- Southbound: one left turn lane, one shared through/right turn lane
- Textured crosswalks on all approaches



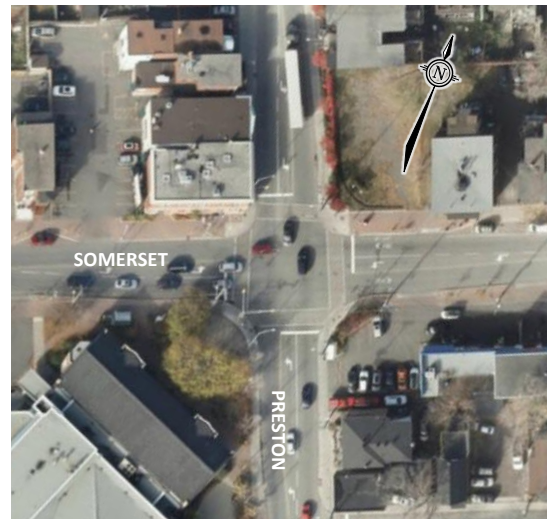
Somerset Street West/Breezehill Avenue

- Unsignalized intersection, with stop control on Breezehill Avenue and free flow on Somerset Street West
- One lane on all approaches
- An overpass over the O-Train corridor is located immediately east of the intersection
- Textured crosswalk on the south approach



Somerset Street West/Preston Street

- Signalized intersection
- All approaches: one left turn lane, one shared through/right turn lane
- All approaches have no right turn on red restrictions, weekdays from 7AM-7PM
- Textured crosswalks on all approaches



Laurel Street/Breezehill Avenue

- Unsignalized intersection, with all way stop control
- One lane on all approaches
- Textured pedestrian crossing on the west approach, standard crossings on all other approaches





- Gladstone Avenue/Breezehill Avenue
- Unsignalized intersection, with stop control on Breezehill Avenue and free flow on Gladstone Avenue
  - One lane on all approaches
  - Standard crosswalks on the north and south approaches



#### 4.1.3 Driveways

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

##### Breezehill Avenue, east side

- Two driveways to the auto repair shop at 53 Breezehill Avenue
- One driveway to the businesses at 73 Breezehill Avenue
- One laneway serving the businesses at 35 Laurel Street
- One driveway to the residence at 99 Breezehill Avenue
- One driveway to the business at 103 Breezehill Avenue
- One driveway to the collision center at 111 Breezehill Avenue

##### Breezehill Avenue, west side

- One driveway to the businesses at 1050 Somerset Street West
- One driveway to the Devonshire Public School at 100 Breezehill Avenue

##### Somerset Street West, south side

- One public lane serving the businesses at 1050&1066 Somerset Street West, providing connectivity to Laurel Street

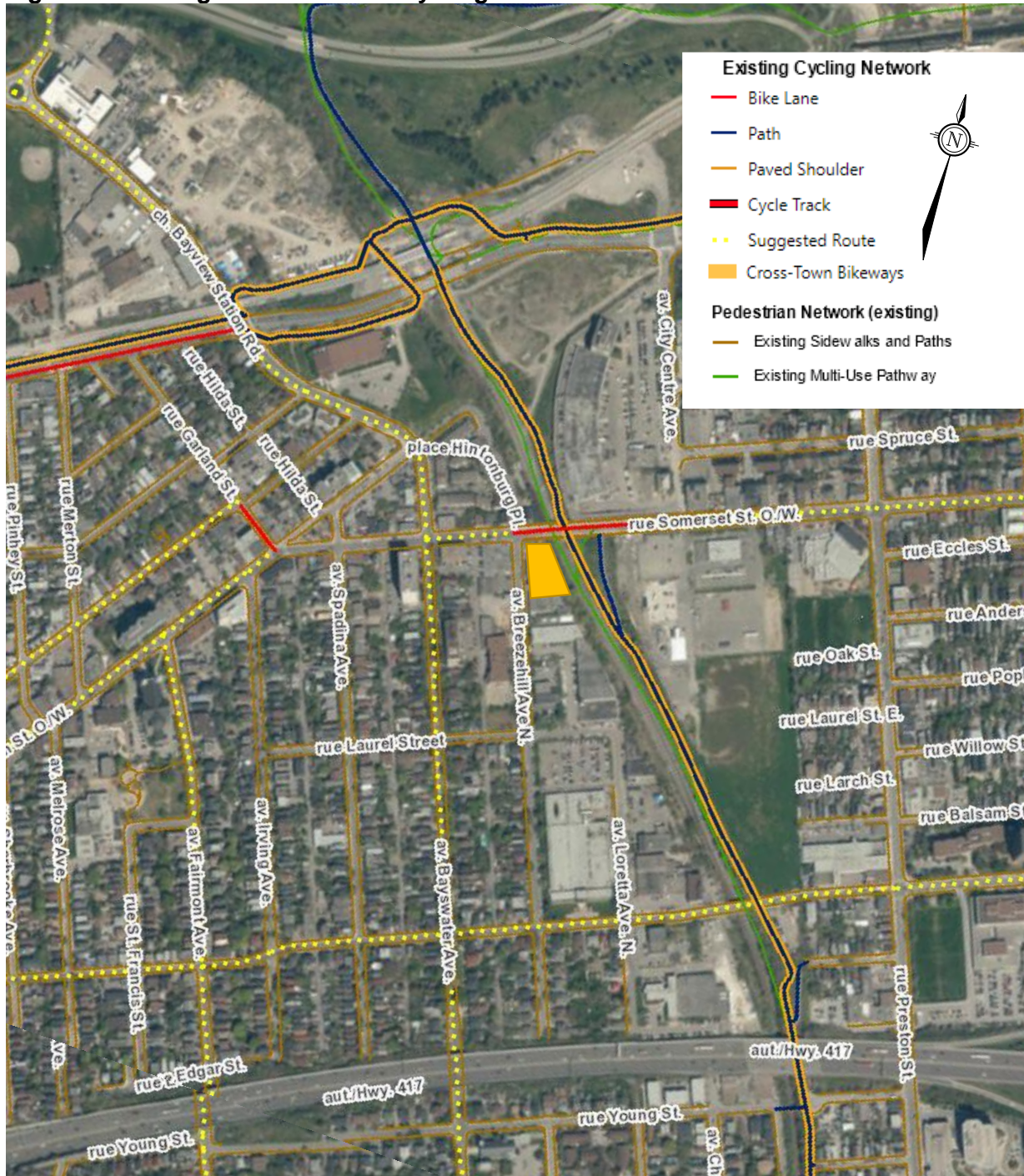
##### Somerset Street West, north side

- One driveway to the residence at 1057 Somerset Street West
- One driveway to the residence with ground floor restaurant at 1055 Somerset Street West
- One driveway to the building at 1053 Somerset Street West

#### 4.1.4 Pedestrian and Cycling Facilities

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

Figure 3: Existing Pedestrian and Cycling Infrastructure



The City of Ottawa's 2013 Cycling Plan identifies Somerset Street West and Gladstone Avenue as Spine Routes in the Ultimate Cycling Network. Bayswater Avenue and Preston Street are identified as Local Routes, while the Trillium Pathway along the O-Train corridor is identified as Cross-Town Bikeway 6.

Within the vicinity of the subject site, bike lanes are provided on Somerset Street West for the extent of the overpass over the O-Train corridor. The Trillium Pathway, a Multi-Use Pathway (MUP), is provided along the O-Train corridor, with a connection at the Somerset Street West overpass. The Ottawa Cycling Plan notes as a Phase 1 project (2014-2019) Gladstone Avenue is to have shared use lanes from Preston Street to Parkdale Avenue.

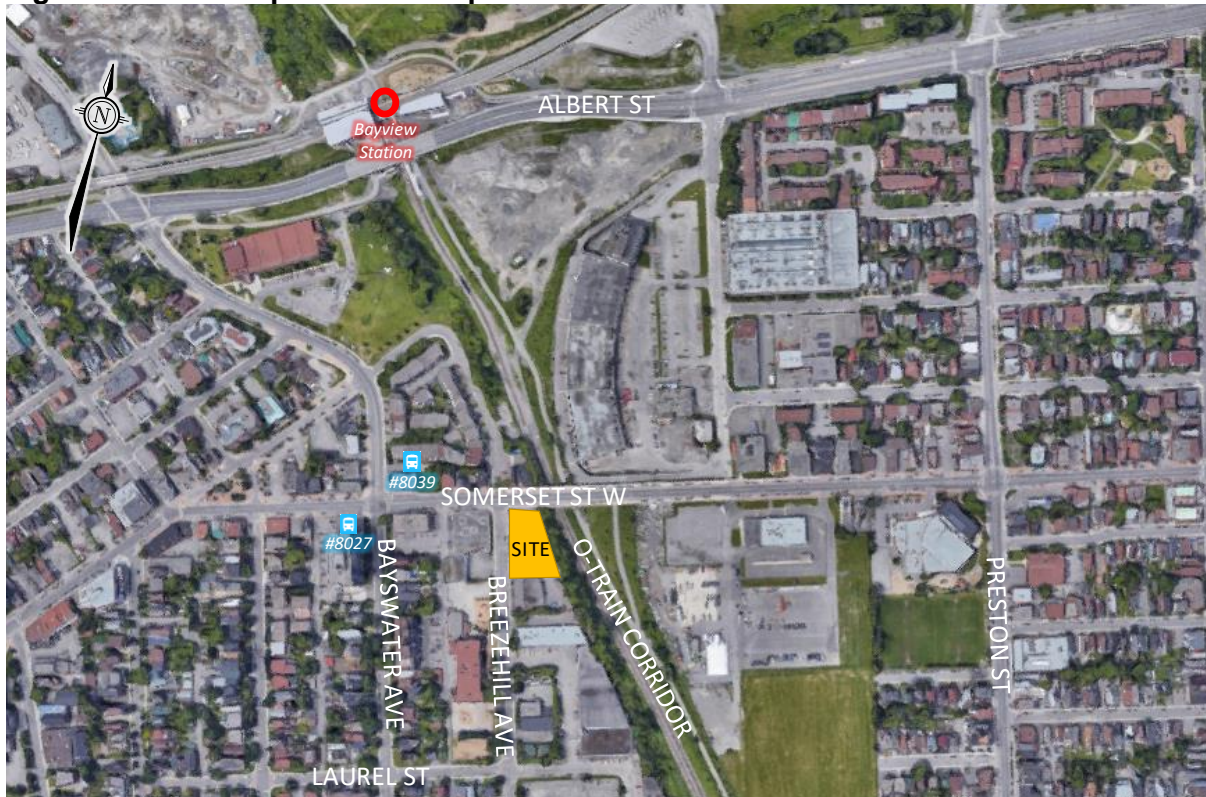
Sidewalks are provided along both sides of all study area roadways, with the exception of the east side of Breezehill Avenue between Gladstone Avenue and Laurel Street, and on both sides of Laurel Street east of Breezehill Avenue. Textured crosswalks are provided at Someserset Street West/Breezehill Avenue, Somerset Street West/Bayswater Avenue, Somerset Street West/Preston Street, and Laurel Street/Breezehill Avenue, as described in Section 4.1.2.

**4.1.5 Transit**

The nearest transit stops to the subject site are located at the Somerset Street West/Bayswater Avenue intersection. Additionally, Bayview Station is located within a 600m radius of the subject site and can be accessed via the Trillium Pathway which runs along the O-Train corridor. Access to the Trillium Pathway is provided via the Somerset Street West overpass over the O-Train corridor, approximately 65m east of Breezehill Avenue. Bayview Station can be found at an approximately 385m walk north of the overpass.

An aerial depicting the nearest transit stops can be found in **Figure 4**. The location of the nearest OC Transpo transit stops, and the route(s) serviced at each stop is summarized in **Table 1**. OC Transpo Route information is included in **Appendix C**.

**Figure 4: OC Transpo Transit Stops**



**Table 1: OC Transpo Transit Stops**

OC Transpo Stop	Location	Route(s) Served
#8039	North side of Somerset Street West, east of Bayswater Avenue	11
#8027	South side of Somerset Street West, west of Bayswater Avenue	11
Bayview Station	Approximately 200m east of the Albert Street/Scott Street/Bayview Station Road intersection	1, 2, 16, 61, 63, 66, 75,

OC Transpo Route 11 travels from Lincoln Fields and Bayshore Station to Parliament Station. It operates seven days a week, with all day service.

Bayview Station connects both O-Train lines. Line 2, the Trillium Line, runs south to Carleton Station. Line 1, the Confederation Line, runs east towards Blair and west to Tunney's Pasture. The full length of O-Train Line 2 is currently closed for construction of the Trillium Line Expansion as described in Section 4.2 below, and Line 2 buses are operating in place of the train. The closure began in May 2020 and is expected to be in place for approximately 2 years.

A screenshot of the OC Transpo network map within the vicinity of the subject site can be found in **Appendix C**. Route 11 travels east/west along Somerset Street West within the vicinity of the subject site, while route 85 travels north/south along Preston Street. Replacement buses for Line 2 currently use Preston Street, Albert Street, Bayswater Avenue, and Somerset Street West.

#### 4.1.6 Existing Area Traffic Management Measures

Speed humps are provided on Breezehill Avenue between Laurel Street and Somerset Street West. Centerline flex posts are located along Breezehill Avenue south of Laurel Street and on Bayswater Avenue between Somerset Street West and Gladstone Avenue. Blue flex posts are provided adjacent to the bike lanes on the Somerset Street West overpass east of Breezehill Avenue.

#### 4.1.7 Existing Traffic Volumes

Weekday traffic counts were obtained from the City of Ottawa at available intersections. A weekday traffic count was obtained from the *951 Gladstone & 145 Loretta North TIA (2019)* at the Breezehill Avenue/Laurel Street intersection. The available weekday traffic counts were completed on the following dates:

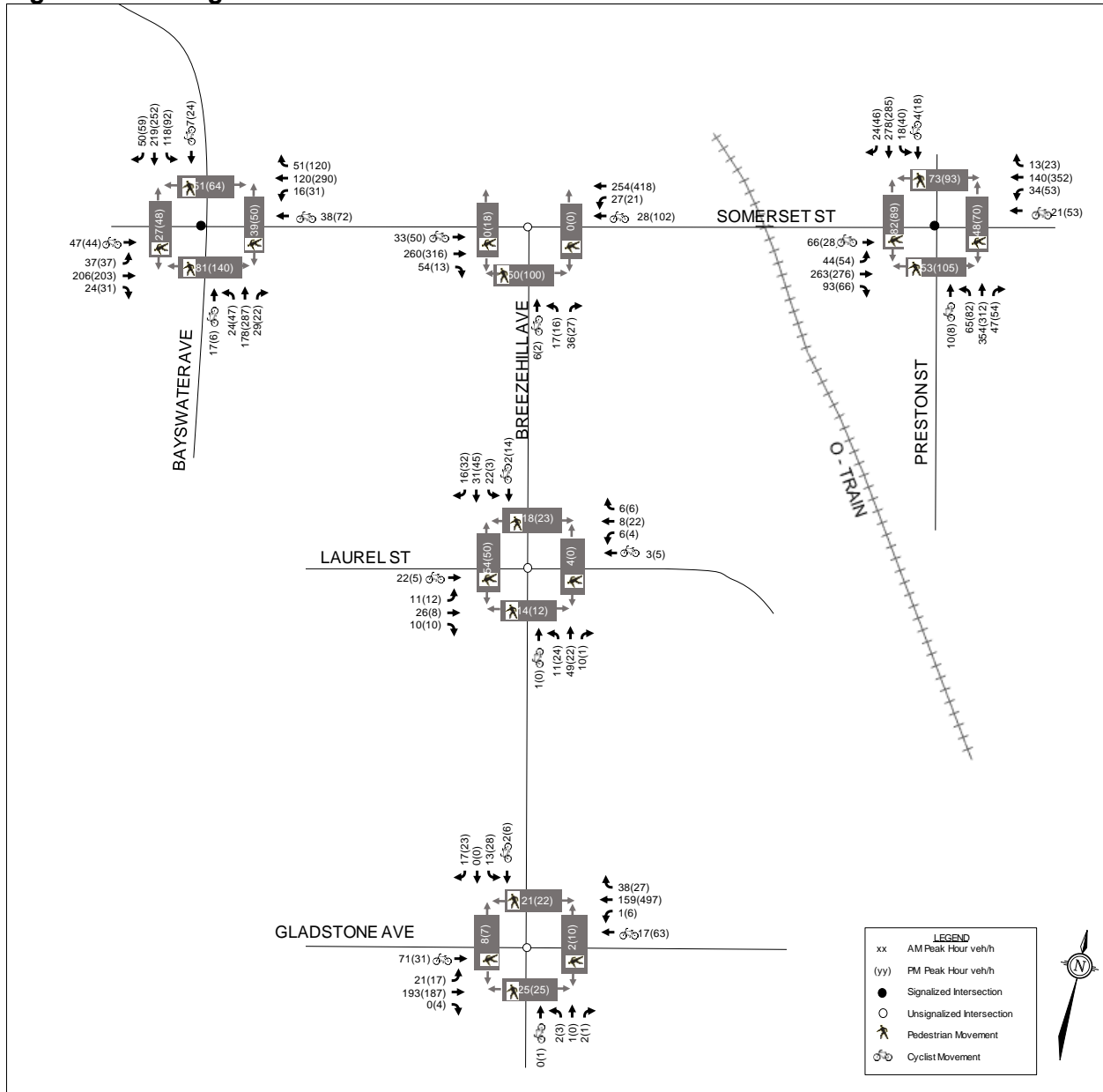
- Somerset Street West/Bayswater Avenue                      September 7, 2016 (Wednesday)
- Somerset Street West/Breezehill Avenue                      August 13, 2015 (Thursday)
- Somerset Street West/Breezehill Avenue                      March 29, 2012 (Thursday)
- Somerset Street West/Preston Street                              June 20, 2017 (Tuesday)
- Breezehill Avenue/Gladstone Avenue                              July 18, 2018 (Wednesday)
- Breezehill Avenue/Laurel Street                                      April 23, 2019 (Tuesday)

The Devonshire Public School is located at 100 Breezehill Avenue, approximately 120m south of the Somerset Street West/Breezehill Avenue intersection. The turning movements collected at this intersection in August 2015 do not reflect school traffic. For this reason, turning movements

from the March 2012 traffic count at Somerset Street West/Breezehill Avenue were used to reflect typical weekday traffic along Breezehill Avenue during school operations. Through movements from the August 2015 count were used to reflect typical weekday traffic along Somerset Street West.

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

**Figure 5: Existing Traffic Volumes**



#### 4.1.8 Collision Records

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

The collision data has been evaluated to determine if there are any identifiable collision patterns. The following summarizes the number of collisions at each intersection from January 1, 2014 to December 31, 2018.

**Table 2: Reported Collisions**

Intersection	Impact Types					Total Number of Collisions
	Angle	Sideswipe	Rear End	Turning Movement	SMV/ Other	
Somerset Street West/Breezehill Avenue	1	-	-	-	-	1
Breezehill Avenue/Gladstone Avenue	2	-	-	1	-	3
Somerset Street West/Bayswater Avenue	1	1	2	4	8	16
Preston Street/Somerset Street West	2	5	8	7	3	25

##### Somerset Street West/Breezehill Avenue

One angle collision was reported at the Somerset Street West/Breezehill Avenue intersection over the course of the last five years. The collision occurred between a northbound left turning and eastbound through vehicle.

##### Breezehill Avenue/Gladstone Avenue

Three collisions were reported at the Breezehill Avenue/Gladstone Avenue intersection over the course of the last five years. Two of the collisions were angle collisions with southbound vehicles failing to observe the right of way, while the other collision was an eastbound left turning vehicle colliding with a westbound through vehicle.

##### Somerset Street West/Bayswater Avenue

Sixteen collisions were reported at the Somerset Street West/Bayswater Avenue intersection over the course of the last five years. Of these, there were four turning movement impacts, two rear ends, one angle impact, one sideswipe, and eight collisions were classified as single vehicle or 'other'.

Of the eight single vehicle or other collisions, four involved pedestrians. Two southbound right turning vehicles struck pedestrians, one northbound left turning vehicle struck a pedestrian, and one eastbound right turning vehicle struck a pedestrian. No fatalities were reported.

##### Preston Street/Somerset Street West

Twenty-five collisions were reported at the Preston Street/Somerset Street West intersection over the course of the last five years. Of these, there were eight rear end collisions, seven turning movement impacts, five sideswipes, three single vehicle/other collisions, and two angle impacts.

Of the eight rear end collisions, five occurred on the westbound approach, and one each on the north, south, and east approaches. All resulted in property damage only.

Of the seven turning movement impacts, three involved cyclists. Two vehicles were turning westbound right and collided with westbound through cyclists, while the other was turning westbound left and collided with an eastbound cyclist. No fatalities were reported.

## **4.2 Planned Conditions**

### **4.2.1 Planned Infrastructure Projects**

The City's 2013 Transportation Master Plan identifies Somerset Street from Wellington Street West to Bank Street as a Transit Priority Corridor with transit signal priority and queue jump lanes at select intersections. This project is included as part of the Affordable Network.

The southern Trillium Line expansion will extend the service to the Airport and to Riverside South and is expected to be complete by 2022. As part of the Trillium Line South extension, a new station is proposed at Gladstone Avenue/Preston Street. The Confederation Line extensions (west and east) will extend Line 1 to Trim Station in the east and to Moodie Station/Baseline Station in the west. The eastern expansion is expected by 2024, while the western expansion is expected to be complete by 2025. A map showing the Confederation Line and Trillium Line extensions is included as **Figure 6**.

### **4.2.2 Other Development**

A review of the City's Development Application Search Tool has been conducted to identify any developments in the vicinity of the subject site that are being constructed, are approved, or are in the approval process. Other developments in the area are described as follows:

#### 1050 Somerset Street West

A mixed-use development is planned with a total of 197 condominium units, 7 townhouse units, 466m<sup>2</sup> of commercial/retail floor space and 2,424m<sup>2</sup> of office space over 23 storeys. A TIS was written in 2012 in support of this development. Vehicular access is proposed via the laneway to the west of the site. It is understood that this development will not proceed until after 1040 Somerset Street West is occupied.

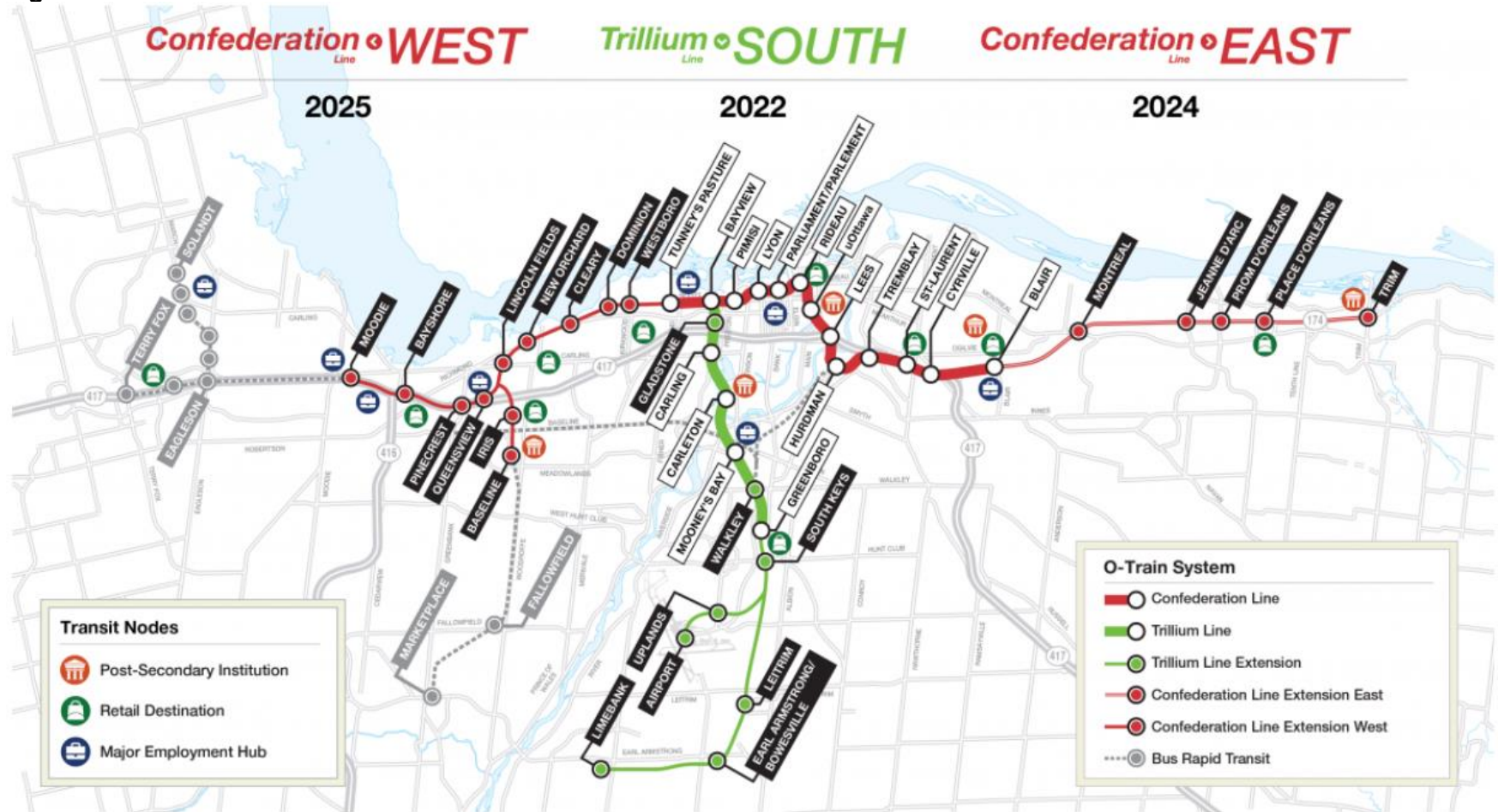
#### 145 Loretta Avenue & 951 Gladstone Avenue

An Official Plan and Zoning By-Law Amendment was filed in support of a mixed-use development with office, retail and residential uses in three high-rise towers at 30, 35, and 41 storeys in height. A total of 745 residential units, 206,480 square feet of office and 17,894 square feet of retail space is proposed. A TIA report was written in 2019 in support of this development. Access is proposed along Loretta Avenue North. Full buildout is anticipated by 2023.

#### 989 Somerset Street West & 158 Spruce Street

A Site Plan Control application has been filed for a 12-storey mixed use building with a total of 127 residential units and 1,409m<sup>2</sup> of retail. A Transportation Overview was written in 2014 in support of this development. The site's vehicular connection is proposed via Spruce Street, and all site generated traffic is expected to use City Center Avenue to access the site.

Figure 6: Confederation Line and Trillium Line Extensions





### 979 Wellington Street West

An Official Plan Amendment has been filed for a 6-storey podium with a 17-storey tower that includes 283 residential dwellings and 12,618 square feet of ground floor commercial. A TIA was written in 2020 in support of this development. The sites vehicular access will be from Armstrong Street.

Other developments within the study area that were listed on the City's Development Application tool but did not have transportation reports include:

- 975 Gladstone Avenue
- 27 O'Meara Street
- 52 Garland Street

## 4.3 Study Area and Time Periods

A boundary street review will be conducted for Somerset Street West and Breezehill Avenue. The study area intersections include the proposed access as well as the signalized intersections of Somerset Street West/Preston Street and Somerset Street West/Bayswater Avenue, and the unsignalized intersections of Somerset Street West/Breezehill Avenue, Breezehill Avenue/Laurel Street, and Breezehill Avenue/Gladstone Avenue.

The selected time periods for the analysis are the weekday AM and PM peak hours, as they represent the 'worst case' combination of site generated traffic and adjacent street traffic. Analysis will be completed for the 2025 buildout year and the 2030 five-year horizon.

## 4.4 Exemptions Review

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

**Table 3: TIA Exemptions**

Module	Element	Exemption Criteria	Exemption Applies
<b>Design Review Component</b>			
4.1 Development Design	4.1.2 Circulation and Access	<ul style="list-style-type: none"> <li>• Only required for site plans</li> </ul>	Not Exempt
	4.1.3 New Street Networks	<ul style="list-style-type: none"> <li>• Only required for plans of subdivision</li> </ul>	Exempt
4.2 Parking	4.2.1 Parking Supply	<ul style="list-style-type: none"> <li>• Only required for site plans</li> </ul>	Not Exempt
	4.2.2 Spillover Parking	<ul style="list-style-type: none"> <li>• Only required for site plans where parking supply is 15% below unconstrained demand</li> </ul>	Exempt
<b>Network Impact Component</b>			
4.5 Transportation Demand Management	<i>All elements</i>	<ul style="list-style-type: none"> <li>• Not required for non-residential site plans expected to have fewer than 60 employees and/or students on location at any given time</li> </ul>	Not Exempt
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	<ul style="list-style-type: none"> <li>• Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds</li> </ul>	Not Exempt

Module	Element	Exemption Criteria	Exemption Applies
4.8 Network Concept	<i>All elements</i>	<ul style="list-style-type: none"> <li>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</li> </ul>	Exempt

As the proposed number of parking spaces will adhere to the requirements of the City’s Zoning By-Law, a review of the Spillover Parking Module is exempt from the analysis.

As the proposed development is permitted under the established zoning, the Network Concept Module is exempt from the analysis.

## 5.0 FORECASTING

### 5.1 Development-Generated Traffic

#### 5.1.1 Trip Generation

The site is currently occupied by a one storey building with a footprint of approximately 800m<sup>2</sup> with a CrossFit gym and a charity technology store. Trips generated by the existing uses were estimated using the peak hour rates identified in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10<sup>th</sup> Edition. Land Use Code 492 (Health/Fitness Club) and Land Use Code 820 for Shopping Center were used. As the technology store does not open until 10AM, no trips were assumed to be generated by this use in the AM peak hour.

The proposed development consists of a 30-storey mixed-use building and will provide 268 units with 141 m<sup>2</sup> of commercial/retail floor space. Trips generated by the proposed residential uses during the weekday AM and PM peak hours have been estimated using the relevant recommended rates outlined in the 2009 TRANS *Trip Generation Manual*. The vehicle trip generation rates, taken from Table 6.3 of the TRANS report, correspond to High-Rise Apartments (10+ Floors) in the Urban Area. The vehicle trip generation using the aforementioned rates have been converted to person trips using the assumed modal shares in the in Table 3.13 of the TRANS report. The directional split between inbound and outbound trips are based on the blended splits presented in Table 3.17 of the TRANS report.

Trips generated by the proposed commercial component have been estimated using land code 820 for Shopping Center in the ITE *Trip Generation Manual*, 10<sup>th</sup> Edition. Person trips were calculated using and ITE Trip to Person Trip factor of 1.28, consistent with the TIA guidelines.

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

**Table 4: Person Trip Generation**

Land Use	Units/ GFA	AM Peak (PPH)			PM Peak (PPH)		
		IN	OUT	TOT	IN	OUT	TOT
<b>Existing Development</b>							
Health/Fitness Club	4,250 ft <sup>2</sup>	4	4	8	10	9	19
Commercial	4,250 ft <sup>2</sup>	0	0	0	10	10	20
<b>Total</b>		<b>4</b>	<b>4</b>	<b>8</b>	<b>20</b>	<b>19</b>	<b>29</b>
<b>Proposed Redevelopment</b>							
High-Rise Apartments	268 units	41	132	173	111	70	181
Commercial	1,520 ft <sup>2</sup>	1	0	1	4	4	8
<b>Total</b>		<b>42</b>	<b>132</b>	<b>174</b>	<b>115</b>	<b>74</b>	<b>189</b>
<b>Difference</b>		<b>38</b>	<b>128</b>	<b>166</b>	<b>95</b>	<b>55</b>	<b>160</b>

Based on the previous table, the proposed redevelopment is anticipated to generate an additional 166 person trips in the AM peak hour and 160 person trips in the PM peak hour.

The 2011 TRANS O-D Survey Report indicates that the proposed development is located on the border of the Ottawa West and the Ottawa Inner Area districts. As the subject site is also located within 600m of the Bayview LRT Station, the site is also located within a Transit-Oriented Development (TOD) Zone. In TOD Zones, the transit share is assumed to increase significantly compared to the TRANS O-D district.

A comparison of the assumed modal shares for a TOD zone and the modal shares for the Ottawa Inner Area is presented in **Table 5**. The modal shares for the TRANS districts are based on all observed trips from/within the district during the AM peak and to/within the district during the PM peak.

**Table 5: Modal Share by District/Zone**

Travel Mode	TOD Zone	Ottawa West	Ottawa Inner Area
Auto Driver	15%	45%	35%
Auto Passenger	5%	10%	10%
Transit	65%	20%	20%
Bicycle	5	10	5
Walk	10	15	30

As the Ottawa Inner Area and Ottawa West have a higher non-auto modal share compared to the TOD zone, the TOD modal shares have been adjusted to reflect a lower transit modal share and higher non-auto modal share. A full breakdown of the projected person trips by modal share are shown in **Table 6**.

**Table 6: Person Trips by Modal Share**

Travel Mode		Modal Share	AM Peak			PM Peak		
			IN	OUT	TOT	IN	OUT	TOT
<b>Existing Development</b>								
<i>Health/Fitness Club Person Trips</i>			4	4	8	10	9	19
Auto Driver	15%		1	1	2	1	1	2
Auto Passenger	5%		0	0	0	1	1	2
Transit	50%		2	2	4	5	4	9
Bicycle	10%		0	0	0	1	1	2
Walk	20%		1	1	2	2	2	4
<i>Commercial Person Trips</i>			0	0	0	10	10	20
Auto Driver	15%		0	0	0	1	1	2
Auto Passenger	5%		0	0	0	1	1	2
Transit	50%		0	0	0	5	5	10
Bicycle	10%		0	0	0	1	1	2
Walk	20%		0	0	0	2	2	4
<b>Auto Driver (Total)</b>			<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>4</b>
<b>Auto Passenger (Total)</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>4</b>
<b>Transit (Total)</b>			<b>2</b>	<b>2</b>	<b>4</b>	<b>10</b>	<b>9</b>	<b>19</b>
<b>Bicycle (Total)</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>4</b>
<b>Walk (Total)</b>			<b>1</b>	<b>1</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>8</b>
<b>Proposed Redevelopment</b>								
<i>High-Rise Apartment Person Trips</i>			41	132	173	111	70	181
Auto Driver	15%		6	20	26	17	11	28
Auto Passenger	5%		3	6	9	6	3	9
Transit	50%		20	66	86	55	35	90
Bicycle	10%		4	13	17	11	7	18
Walk	20%		8	27	35	22	14	36
<i>Commercial Person Trips</i>			1	0	1	4	4	8
Auto Driver	15%		0	0	0	1	1	2
Auto Passenger	5%		0	0	0	0	0	0
Transit	50%		1	0	1	2	2	4
Bicycle	10%		0	0	0	0	0	0
Walk	20%		0	0	0	1	1	2
<b>Auto Driver (Total)</b>			<b>6</b>	<b>20</b>	<b>26</b>	<b>18</b>	<b>12</b>	<b>30</b>
<b>Auto Passenger (Total)</b>			<b>3</b>	<b>6</b>	<b>9</b>	<b>6</b>	<b>3</b>	<b>9</b>
<b>Transit (Total)</b>			<b>21</b>	<b>66</b>	<b>87</b>	<b>57</b>	<b>37</b>	<b>94</b>
<b>Bicycle (Total)</b>			<b>4</b>	<b>13</b>	<b>17</b>	<b>11</b>	<b>7</b>	<b>18</b>
<b>Walk (Total)</b>			<b>8</b>	<b>27</b>	<b>35</b>	<b>23</b>	<b>15</b>	<b>38</b>
<b>Auto Driver (Difference)</b>			<b>5</b>	<b>19</b>	<b>24</b>	<b>16</b>	<b>10</b>	<b>26</b>
<b>Auto Passenger (Difference)</b>			<b>3</b>	<b>6</b>	<b>9</b>	<b>4</b>	<b>1</b>	<b>5</b>
<b>Transit (Difference)</b>			<b>19</b>	<b>64</b>	<b>83</b>	<b>47</b>	<b>28</b>	<b>75</b>
<b>Bicycle (Difference)</b>			<b>4</b>	<b>13</b>	<b>17</b>	<b>9</b>	<b>5</b>	<b>14</b>
<b>Walk (Difference)</b>			<b>7</b>	<b>26</b>	<b>33</b>	<b>19</b>	<b>11</b>	<b>30</b>

Based on the previous table, the proposed redevelopment is anticipated to generate an additional 24 vehicle trips during the AM peak hour and 26 vehicle trips during the PM peak hour.

The commercial land use is expected to generate two types of external peak hour trips; primary and pass-by trips. Primary trips are made for the specific purpose of visiting the site, and pass-by trips are made as intermediate stops on the way to another destination. However, as the retail development is only anticipated to generate one vehicle trip during the AM peak hour and eight vehicle trips during the PM peak hour, pass-by trips are anticipated to be minimal. The analysis presented in this study assumes that all trips generated by the retail development are primary trips.

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

### 5.1.2 Trip Distribution

The distribution of traffic generated by the existing and proposed development has been assumed to be consistent with the distribution outlined in the 2013 CTS. The trip distribution is based on observed traffic patterns at the study area intersections. The residential trip distribution is based on all trips departing in the AM and arriving in the PM, while the commercial trip distribution is based on the prevailing off-peak hour traffic patterns. The assumed trip distribution is summarized as follows:

#### Residential

- 15% to/from the south via Breezehill Avenue
- 35% to/from the west via Somerset Street West
- 50% to/from the east via Somerset Street West

#### Commercial

- 15% to/from the south via Breezehill Avenue
- 45% to/from the west via Somerset Street West
- 40% to/from the east via Somerset Street West

## 5.2 Background Traffic

### 5.2.1 General Background Growth Rate

The 2019 *951 Gladstone Avenue and 145 Loretta Avenue North TIA* utilized no background growth rate for Somerset Street West, Gladstone Avenue, Preston Street, Breezehill Avenue, or Laurel Street.

The 2013 CTS for the subject site identified that traffic volumes along the study area roadways were decreasing, based on a review of historic counts, but applied a nominal 1% background growth rate in the interest of ensuring a conservative analysis of future operating conditions within the study area.

A review of the City of Ottawa's Long-Range Transportation Model has been conducted to determine an appropriate background growth rate for the area roadways.

**Table 7: Long-Range Transportation Model Summary**

Roadway Segment	2011 Traffic Volumes	2031 Traffic Volumes	Growth per Annum
Somerset Street West – Between Breezehill Avenue and Preston Street	565	665	0.8%
Preston Street – North of Somerset Street West	1018	1047	0.1%
Preston Street – South of Somerset Street West	868	918	0.3%
Gladstone Avenue – Between Bayswater Avenue and Preston Street	251	418	3.3%
Bayswater Avenue – Between Somerset Street West and Laurel Street	474	474	0.0%
Bayswater Avenue – Between Somerset Street West and Bayview Station Road	386	485	1.3%

Traffic counts obtained for the 2013 CTS were compared against newer traffic counts obtained for this study. Historically, based on the traffic counts, the AADT on Gladstone Avenue grew 1.5% per year, while no growth was found on Preston Street.

The City's intersection traffic growth rate figures suggest that the Somerset Street West/Bayswater Avenue has historically grown 0.2% to 2% per year from 2000 to 2016. The figures also suggest that the Somerset Street West/Preston Street and Gladstone Avenue/Preston Street intersections have grown -2% to 0.2% per year.

For the purposes of this analysis, a 1% per annum growth rate will be applied to traffic along Somerset Street West and Bayswater Avenue. A 1.5% annual growth rate will be applied to traffic along Gladstone Avenue. No growth rate will be applied to traffic along Preston Street, Breezehill Avenue, or Laurel Street.

### 5.2.2 Other Area Development

Traffic generated by the developments at 979 Wellington Street West and 145 Loretta Avenue & 951 Gladstone Avenue were added to the 2025 background traffic volumes. Traffic generated by the development at 1050 Somerset Street West was added to the 2030 background traffic volumes. As no traffic reports were required in support of the development at 975 Gladstone, 27 O'Meara Street, and 52 Garland Street, traffic generated by this development is anticipated to be negligible. Traffic generated by the development at 989 Somerset Street West & 158 Spruce Street are not anticipated to utilize the study area intersections.

Relevant excerpts from other area developments are included in **Appendix F**.

Existing site traffic, proposed site traffic, and net site traffic are shown in **Figures 7, 8, and 9**, respectively. Background traffic volumes for the 2025 buildout and 2030 five-year horizon are shown in **Figures 11 and 12**. Total traffic volumes for the 2025 buildout and 2030 five-year horizon year are shown in **Figures 13 and 14**.

Figure 7: Existing Site Traffic

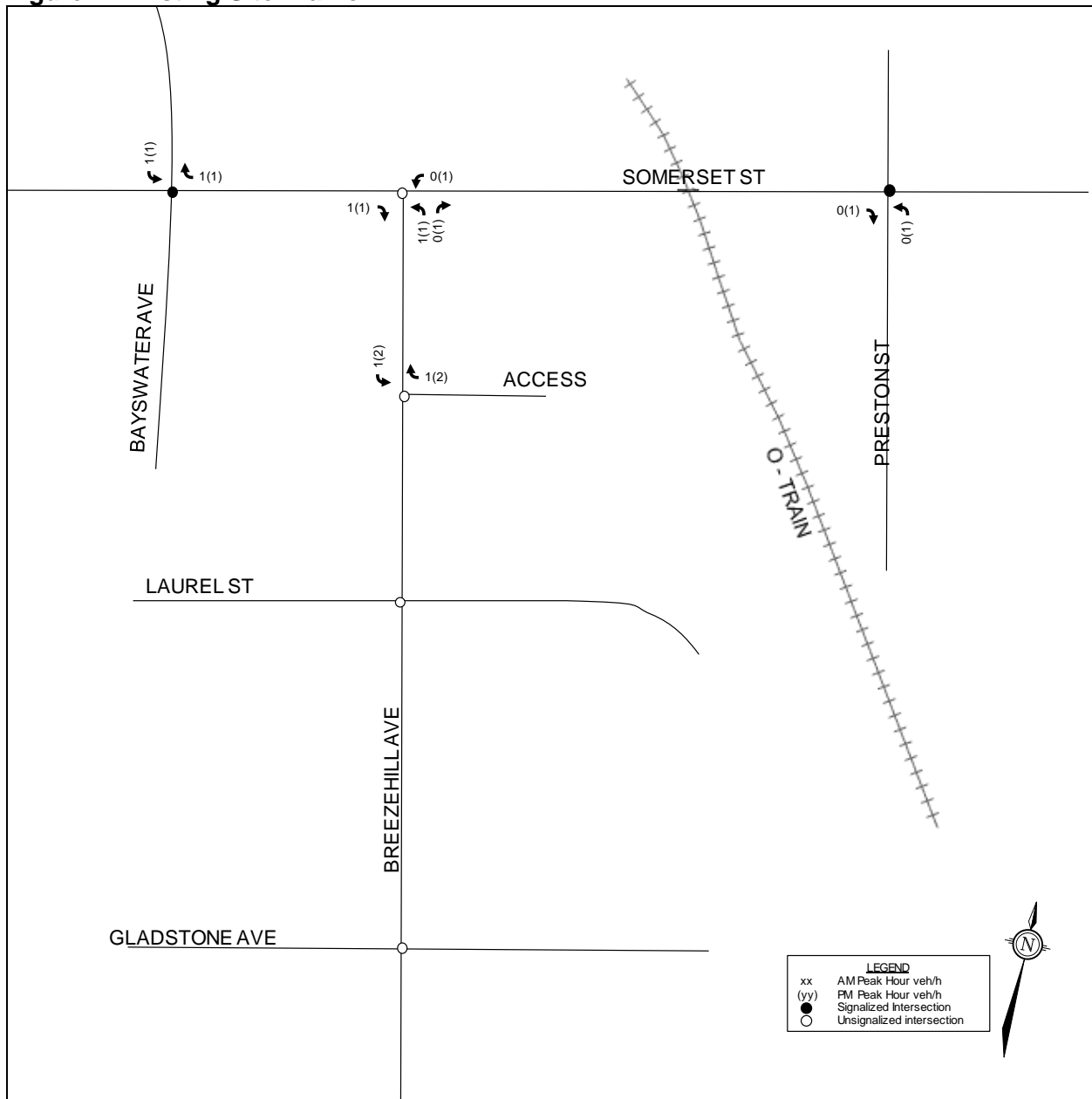


Figure 8: Proposed Site Traffic

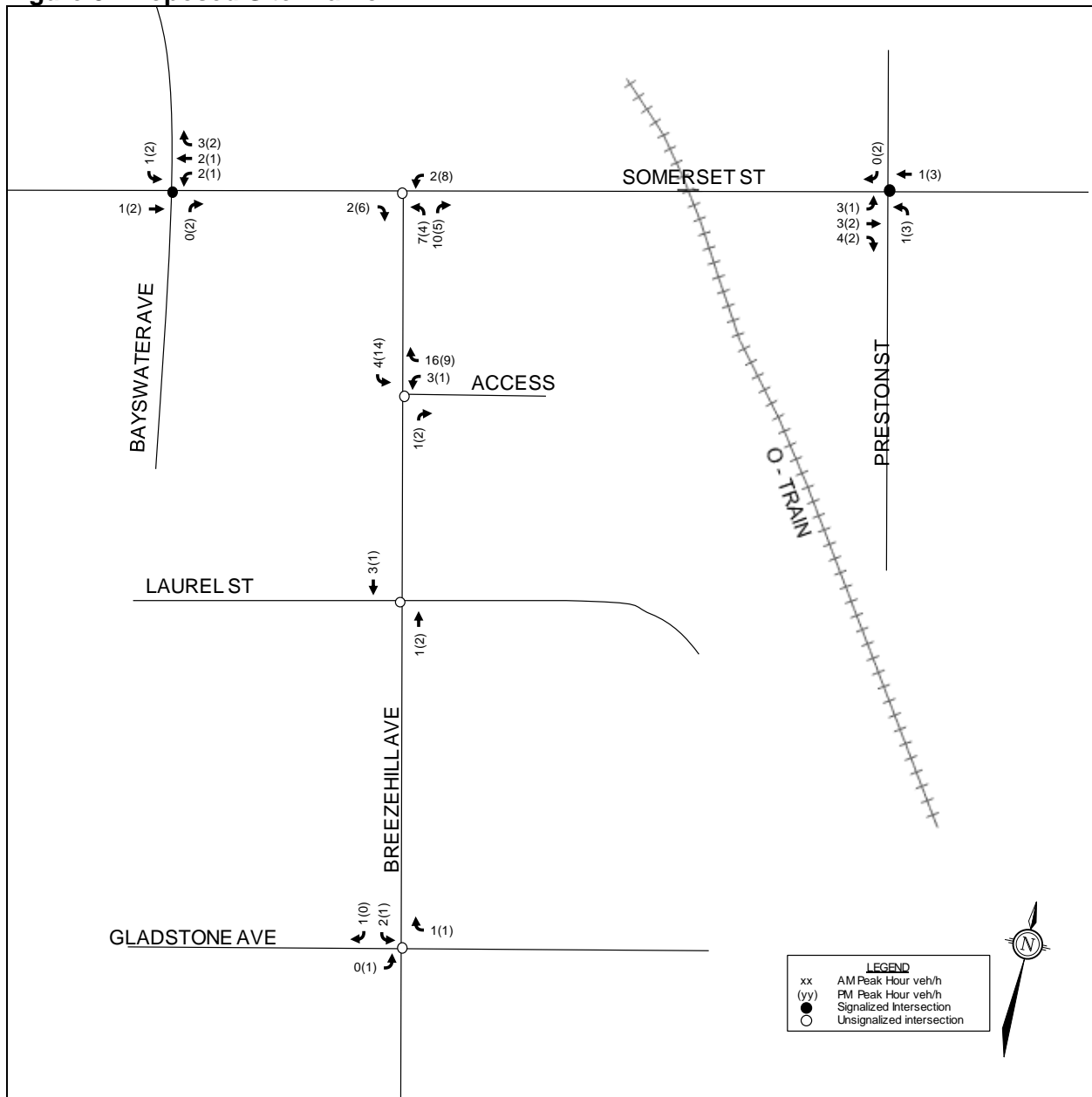




Figure 9: Net Site Traffic

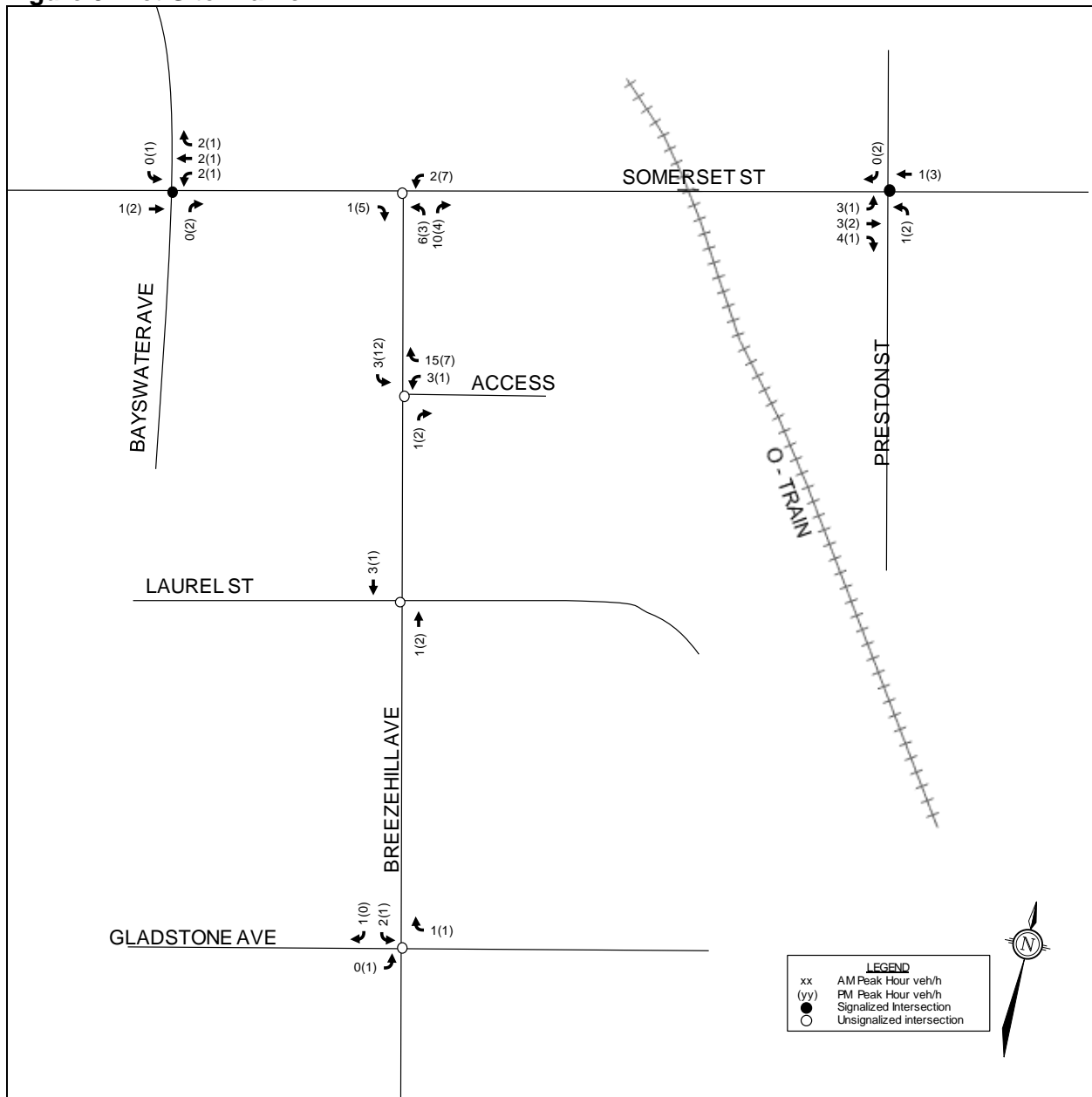


Figure 10: 2025 Background Traffic

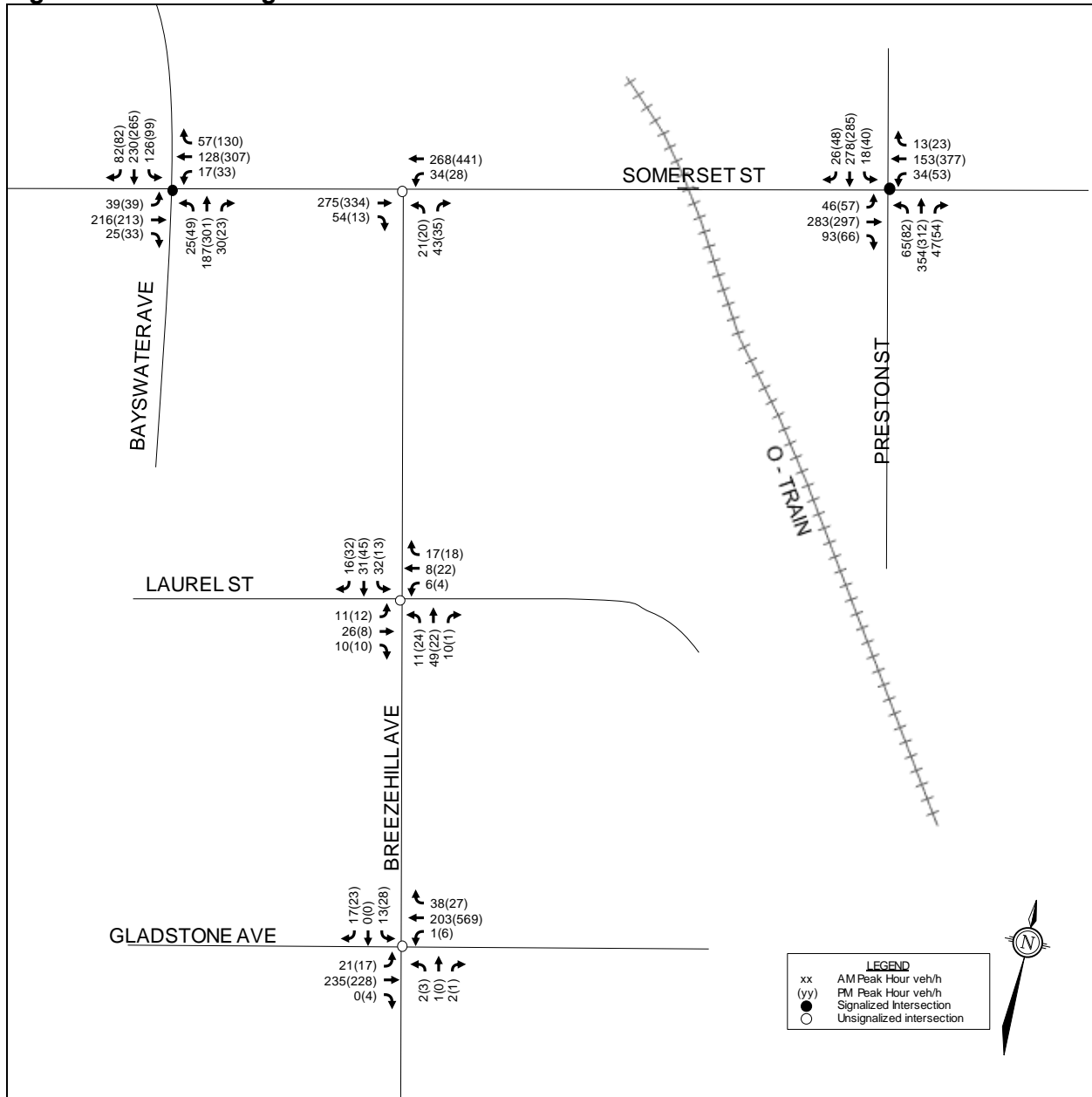


Figure 11: 2030 Background Traffic

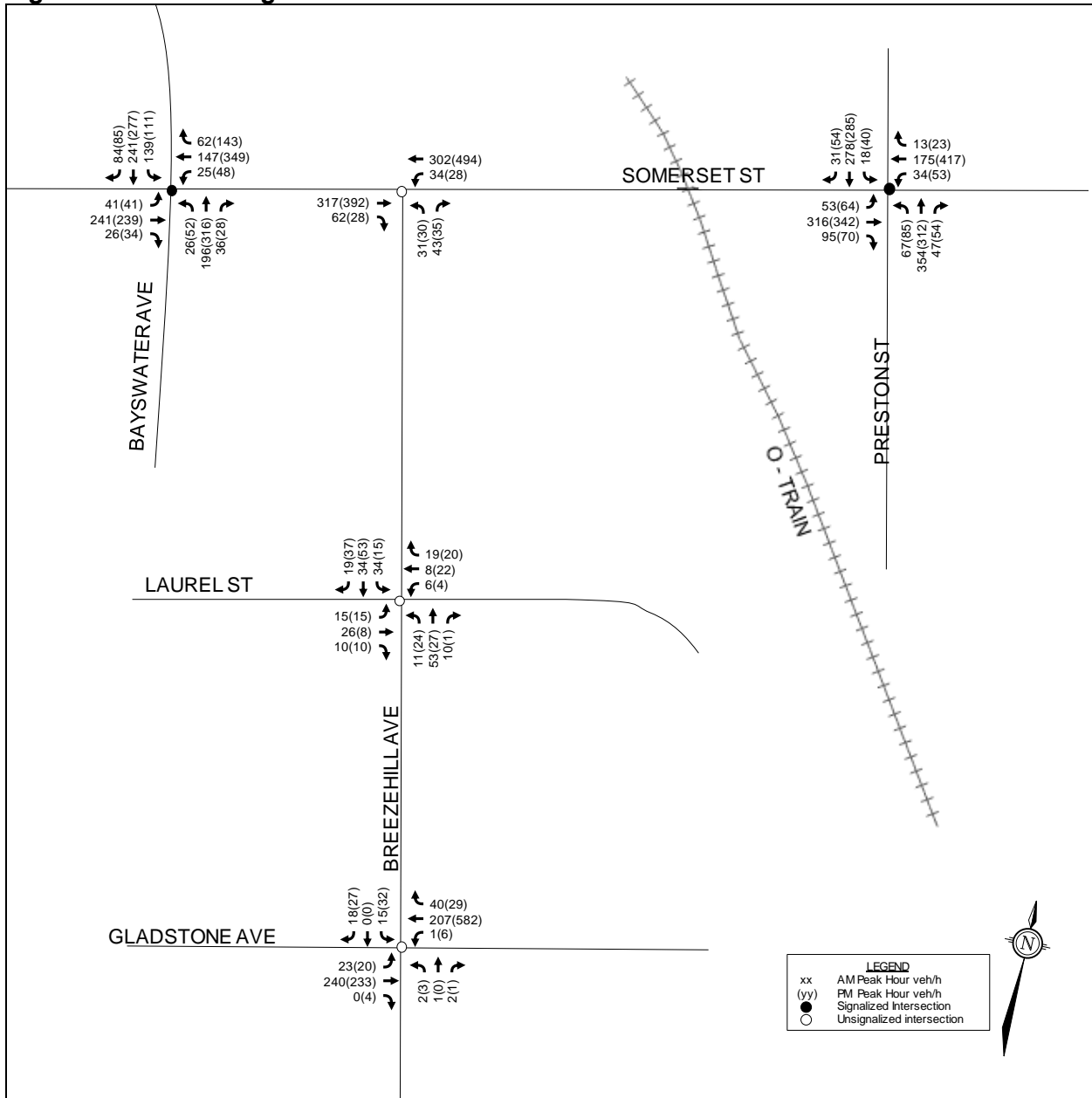
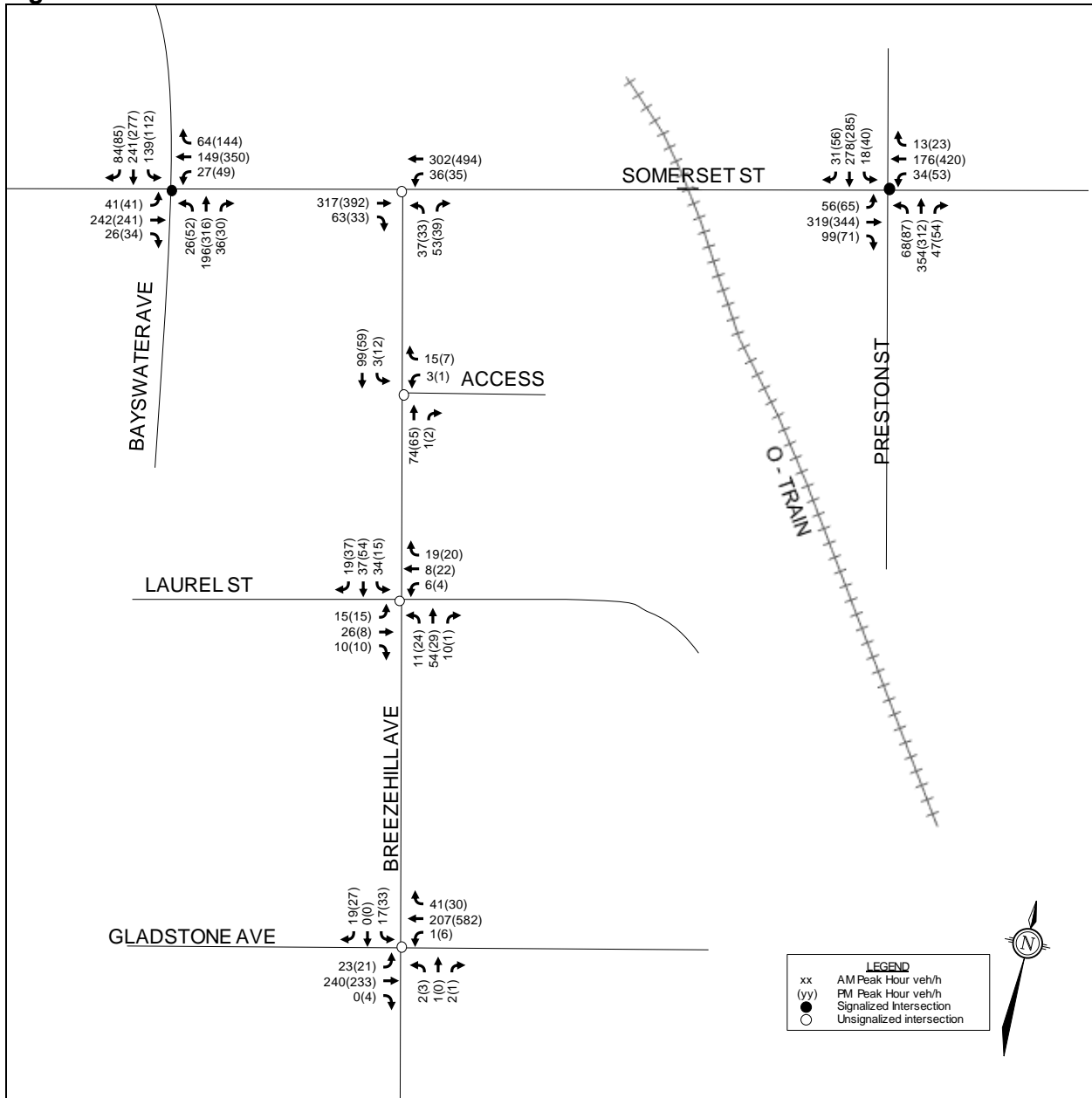




Figure 13: 2030 Total Traffic



### 5.3 Demand Rationalization

A review of the background intersection operations has been conducted to determine if and when the projected background traffic will exceed the capacity within the study area. The intersection parameters used in the analysis are consistent with the TIA guidelines (saturated flow rate: 1800 vphpl, PHF: 1.0). Intersection lane arrangements are consistent with the existing conditions described in Section 4.1. Intersection signal timing plans were obtained from the City, and are included in **Appendix D**. Detailed Synchro Reports are included in **Appendix J**.

#### 5.3.1 2025 Background Intersection Operations

Intersection capacity analysis has been completed for the 2025 background traffic conditions. The results of the analysis are summarized in **Table 8** for the weekday AM and PM peak hours.

**Table 8: 2025 Background Intersection Operations**

Intersection	AM Peak			PM Peak		
	Max. v/c or delay	LOS	Mvmt	Max. v/c or delay	LOS	Mvmt
Somerset Street West/Bayswater Avenue	0.65	B	SBT/R	0.87	D	NB
Somerset Street West/Preston Street	0.91	E	EBT/R	0.80	C	EBT/R
Somerset Street West/Breezehill Avenue	13 sec.	B	NB	16 sec.	C	NB
Breezehill Avenue/Laurel Street	8 sec.	A	SB	8 sec.	A	NB
Breezehill Avenue/Gladstone Avenue	12 sec.	B	NB	20 sec.	C	SB

All intersections within the study area are anticipated to operate with acceptable conditions under 2025 background traffic conditions.

#### 5.3.2 2030 Background Intersection Operations

Intersection capacity analysis has been completed for the 2030 background traffic conditions. The results of the analysis are summarized in **Table 9** for the weekday AM and PM peak hours.

**Table 9: 2030 Background Intersection Operations**

Intersection	AM Peak			PM Peak		
	Max. v/c or delay	LOS	Mvmt	Max. v/c or delay	LOS	Mvmt
Somerset Street West/Bayswater Avenue	0.66	B	SBT/R	0.91	E	NB
Somerset Street West/Preston Street	0.99	E	EBT/R	0.84	D	EB/WB
Somerset Street West/Breezehill Avenue	15 sec.	C	NB	20 sec.	C	NB

Intersection	AM Peak			PM Peak		
	Max. v/c or delay	LOS	Mvmt	Max. v/c or delay	LOS	Mvmt
Breezehill Avenue/Laurel Street	8 sec.	A	SB	8 sec.	A	NB
Breezehill Avenue/Gladstone Avenue	12 sec.	B	NB	20 sec.	C	SB

All intersections within the study area are anticipated to operate with acceptable conditions under 2030 background traffic conditions.

## 6.0 ANALYSIS

### 6.1 Development Design

#### 6.1.1 Design for Sustainable Modes

Pedestrian connectivity will be provided to Somerset Street West and Breezehill Avenue. A paved pedestrian plaza is proposed fronting the site onto Somerset Street West, with steps merging into the sidewalk along Somerset Street West. Unit pavers are proposed along the Breezehill Avenue frontage, creating a wide boulevard with planters near the main building entrance. A clear width of 3m will be provided between the planters and the Breezehill Avenue curbline.

The proposed bicycle parking will exceed the minimum requirements of the City’s Zoning By-law. A total of 93 bicycle parking stalls will be provided in the at-grade bicycle storage room, with 175 additional bicycle parking spaces available in the underground parking garage.

The nearest bus stops to the subject site are described in Section 4.1.5. OC Transpo’s service design guideline for peak period service is to provide service within a five minute (400m) walk of the home, school and work location of 95% of urban residents. OC Transpo bus stops are located at the Somerset Street West/Bayswater Avenue intersection, within a 150m walk of the development. The Bayview LRT station is also located within a 500m walk of the development.

A review of the Transportation Demand Management (TDM) – Supportive Development Design and Infrastructure checklist has been conducted, and is included in **Appendix G**. All required TDM-supportive design and infrastructure measures in the TDM checklist are met. Measures proposed for this site that go above and beyond the basic requirements include:

- Locating the building close to the street, and not locating parking areas between the street and building entrances;
- Locating building entrances in order to minimize walking distances to sidewalks and transit stops/stations;
- Locating the building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort;
- Ensuring safe, direct and attractive walking routes from building entrances to nearby transit stops;
- Ensuring walking routes to transit stops are secure, visible, lighted, shaded, and wind-protected wherever possible; and
- Providing secure bicycle parking spaces equivalent to at least the number of units.

### 6.1.2 Circulation and Access

The proposed development will be served by a new vehicular access to Breezehill Avenue. This access will serve the underground parking. The existing site access will be closed as part of this application.

The fire route for the proposed development will be located curbside.

A garbage room is proposed to the north of the access to the underground parking. Garbage collection will occur curbside on Breezehill Avenue.

### 6.2 Parking

The subject site is located in Area X and Y on Schedule 1A of the City of Ottawa’s Zoning By-Law (ZBL). Urban Exception 2121 also applies to the subject site. Minimum vehicular and bicycle parking rates for the proposed development are identified in the ZBL and summarized in the following table.

**Table 10: Parking Requirements**

Land Use	Rate	GFA/units	Requirement
<i>Vehicle Parking</i>			
Apartment	Resident: 0.5 spaces per dwelling unit in excess of 12 <sup>1</sup> Visitor: 0.083 spaces per dwelling unit in excess of 12 <sup>2</sup>	268	Resident: 115 Visitor: 21
Retail	None required <sup>2</sup>	141m <sup>2</sup>	0
<b>Total</b>			<b>136</b>
<i>Bicycle Parking</i>			
Apartment	1 space per dwelling unit <sup>2</sup>	268	268
Retail	1 space per 250m <sup>2</sup> of GFA	141m <sup>2</sup>	0

- Where all parking spaces provided for a land use are located below grade in the same building as that land use, the parking required may be reduced by the lesser of 10% of the required parking spaces, or 20 parking spaces.
- Urban Exception 2121

A total of 21 visitor and 168 resident parking spaces will be provided on seven levels of underground parking. A total of 93 bicycle parking stalls will be provided in the at-grade bicycle storage room, with 175 additional bicycle parking spaces available in the underground parking garage. The minimum vehicular and bicycle parking requirements of the ZBL will be met.

As the proposed development is also located within 600m of a rapid transit station, the number of vehicle parking spaces provided for a use must not exceed the maximum limits set out in Section 103 of the City’s ZBL. Based on the ZBL, a maximum of 1.75 parking spaces are permitted per unit (combined total of resident and visitor), equating to a maximum of 469 on-site parking spaces. The proposed 189 vehicular parking spaces adhere to the maximum requirements of the City’s ZBL.



### 6.3 Boundary Streets

This section provides a review of the boundary streets using complete streets principles. The Multi-Modal Level of Service (MMLOS) guidelines produced by IBI Group in 2015 were used to evaluate the LOS of the boundary roadways for each mode of transportation.

Schedule 'B' of the City of Ottawa's Official Plan indicates that Somerset Street West is a Traditional Mainstreet while Breezehill Avenue is located within the General Urban Area. Additionally, the subject site is within 300m of a school (Devonshire Public School) and within 600m of a rapid transit station (Bayview Station).

Targets for the Pedestrian Level of Service (PLOS), Bicycle Level of Service (BLOS), Transit Level of Service (TLOS), and Truck Level of Service (TkLOS) for the study area roadways are based on the targets for roadways within 600m of a rapid transit station and within 300m of a school, as identified in Exhibit 22 of the MMLOS guidelines.

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

**Table 11: Segment MMLOS Summary**

Segment	PLOS	BLOS	TLOS	TkLOS
Somerset Street West	D	C	D	B
<b>Target</b>	<b>A</b>	<b>C</b>	<b>D</b>	<b>D</b>
Breezehill Avenue	E	B	-	-
<b>Target</b>	<b>A</b>	<b>D</b>	-	-

Somerset Street West does not currently meet the target PLOS A. Based on the PLOS criteria, the target PLOS A is unachievable along roadways that carry greater than 3,000 AADT and have an operating speed of 60km/hr. Without a reduction in speed or a decrease in AADT, a maximum PLOS C can be achieved with a 2.0m sidewalk and 2.0m boulevard. This is identified for the City's consideration.

Breezehill Avenue does not currently meet the target PLOS A. To achieve the PLOS A, either a 1.8m sidewalk with a 2.0m wide boulevard or a 2.0m sidewalk with a minimum 0.5m wide boulevard would be required. Unit pavers are proposed along the Breezehill Avenue frontage, creating a wide boulevard with planters near the main building entrance. A clear width of 3m will be provided between the planters and the Breezehill Avenue curbline.

### 6.4 Access Intersections Design

The existing access on-site is to be closed and the depressed curb and sidewalk is to be replaced with full height curb and sidewalk in accordance with City standards.

The proposed access will be located approximately 35m south of Somerset Street West, measured from the nearest edge of the access to the Somerset Street West ROW. The access will have a width of approximately 6m.

Section 25 (c) of the City of Ottawa’s *Private Approach By-Law* identifies a requirement for two-way accesses to have a width no greater than 9m, as measured at the street line. The *Zoning By-Law* which identifies a minimum width requirement of 6m and a maximum width requirement of 6.7m for parking garages. The proposed driveway width satisfies these requirements.

A review of the suggested minimum corner clearances to accesses at major intersections from the Transport Association of Canada (TAC) *Geometric Design Guide for Canadian Roads* was conducted. For an arterial road intersecting with local road, with either stop control or traffic signal control at the cross road, a minimum clearance of 15m (from nearest edge to nearest edge) is suggested between the intersection and any access. Based on the proposed spacing of the access, this minimum requirement is satisfied.

Section 25 (p) of the *Private Approach By-Law* identifies a requirement to provide a minimum spacing of 3m between the nearest edge of the private approach and the property line, as measured at the street line. The access to the underground parking is located approximately 6m from the southern property line, thereby meeting this requirement.

Section 25 (u) of the *Private Approach By-Law* requires a maximum ramp grade of 2-6% for a distance of 9m within the property, for an underground parking garage serving more than 50 parking spaces. The access will have a grade of 6% for the first 6m within the building and 7.5m within the property, transitioning to a 15% slope. A grade of 6% for a distance of 9m within the property is unachievable due to the layout of the underground parking garage. As such a waiver to the City’s *Private Approach By-Law* is required for the grade of the underground parking ramp. The Transportation Association of Canada (TAC) *Geometric Design Guidelines for Canadian Roads* provide vehicle characteristics for various design vehicles. Based on TAC, passenger vehicles have a wheel base of 3.2m and a front bumper overhand of 1.1m. Based on the foregoing vehicle characteristics, the proposed 6% grade for a distance of 6m within the building and 7.5m within the property is sufficient for a passenger vehicle to stop entirely within the private property with both tires on the 6% grade and have appropriate sight lines to the sidewalk. Bollards will be provided within the ROW along the parking ramp entrance in order to further differentiate the pedestrian and vehicular streams of traffic.

## 6.5 Transportation Demand Management

### 6.5.1 Context for TDM

The development will consist of 268 residential units and approximately 141m<sup>2</sup> of commercial space. The tenant for the commercial development is not known at this time. The residential unit breakdown is summarized in the following table.

**Table 12: Residential Unit Breakdown**

Unit Type	Number of Units
Studio	2
One Bedroom	82
One Bedroom + Den	66
Two Bedroom	112
Two Bedroom + Den	2
Three Bedroom	2

## 6.5.2 Need and Opportunity

The proposed development is located within TOD Zone as it is within a 600m walking distance of the Bayview LRT station. As described in Section 5.1, the target 15% auto driver, 5% auto passenger, 50% transit, 30% bike/walk modal shares for the proposed development are based on the City's TOD zone modal shares and have been adjusted to reflect a higher non-auto modal share associated with the Ottawa West and Ottawa Inner Area.

Using the 2011 TRANS O-D Survey Report, the typical residential commuter pattern in the Ottawa West and Ottawa Inner Area is represented by all observed trips from/within the district during the AM peak hour and all observed trips to/within the district in the PM peak hour. Based TRANS O-D Survey Report data, typical residential modal shares in the Ottawa Inner Area equate to approximately 35% auto driver, 10% passenger, 20% transit, 35% non-auto. Typical residential modal shares in the Ottawa West Area equate to approximately 45% auto driver, 10% passenger, 20% transit, and 25% non-auto.

The TOD modal shares represent an increased transit modal share and a reduced auto/passenger modal share compared to the Ottawa West and Ottawa Inner Area.

Should the development only meet the Ottawa Inner Area modal shares, the development is anticipated to generate an additional 35 and 36 vehicle trips two-way during the AM and PM peak hours. Based on the trip distribution presented above, this translates to:

- an additional 18 trips added to the Somerset Street West/Preston Street intersection in the AM and PM peak hours.
- an additional 12 and 13 trips added to the Somerset Street West/Bayswater Avenue intersection in the AM and PM peak hours.
- an additional 5 trips added to the Breezehill Avenue/Gladstone Avenue intersection in the AM and PM peak hours.

Should the development only meet to Ottawa West Area modal shares, the development is anticipated to generate an additional 52 and 55 vehicle trips two-way during the AM and PM peak hours. Based on the trip distribution presented above, this translates to:

- an additional 26 and 28 trips added to the Somerset Street West/Preston Street intersection in the AM and PM peak hours.
- an additional 18 and 19 trips added to the Somerset Street West/Bayswater Avenue intersection in the AM and PM peak hours.
- an additional 8 trips added to the Breezehill Avenue/Gladstone Avenue intersection in the AM and PM peak hours.

Based on the latest intersection counts, total intersection volumes are:

- Somerset Street West/Preston Street: 1375vph in the AM and 1645vph in the PM
- Somerset Street West/Bayswater Avenue: 1070vph in the AM and 1470vph in the PM
- Breezehill Avenue/Gladstone Avenue: 445 in the AM and 795 in the PM.

The additional vehicle trips at either signalized intersection due to the target transit modal share not being met would result in an increase of 1.9% or less to the overall intersection traffic volumes.

Should the development only meet the Ottawa West or Ottawa Inner Area modal shares, the additional trips generated by the development are anticipated have a minimal impact on the Auto LOS within the study area. The additional traffic would not impact the PLOS and BLOS along Somerset Street West or Breezehill Avenue, based on the criteria presented in Section 6.3 above.

Further sensitivity analysis has been conducted in Section 6.8.3.3 to qualify the impact to the study area intersections should the redevelopment not meet the target mode shares.

### 6.5.3 TDM Program

The proposed development conforms to the City's TDM initiatives by providing easy access to the local pedestrian, bicycle and transit systems as outlined in Section 5.1.

A review of the TDM – Measures checklist was conducted and can be found in **Appendix G**. To encourage travel by sustainable modes, the proponent agrees to provide 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; and
- Provide a multimodal travel option information package to new residents.

### 6.6 Neighborhood Traffic Management

Based on projected 2030 total traffic projections, a two-way total of 189 vehicles will use Breezehill Avenue north of the site during the AM peak hour and 140 vehicles during the PM peak hour. A two-way total of 178 vehicles will use Breezehill Avenue south of the site during the AM peak hour and 170 vehicles during the PM peak hour. The TIA guidelines identify an Area Traffic Management (ATM) threshold of 120 vehicles during the peak hour for a local roadway.

The AM peak directional traffic volume along Breezehill Avenue is approximately 100 vehicles (southbound) while the PM peak directional traffic volume is approximately 105 vehicles (southbound). The lane capacity along Breezehill Avenue is estimated at 400 vehicles per hour per lane based on the City's TRANS Long Range Transportation Model. Based on the foregoing, the v/c ratio is 0.25 during the AM peak hour and 0.26 during the PM peak hour.

The majority of the traffic being generated by the proposed development is expected to arrive/depart to the north towards Somerset Street West. Based on the foregoing, the added traffic generated by the proposed development is not anticipated to have a significant impact on the existing vehicular operations along Breezehill Avenue south of the site and will not change the classification of Breezehill Avenue from a local road to a collector. Based on the 2025 and 2030 total traffic projections, Breezehill Avenue will have sufficient lane capacity to accommodate the additional traffic generated by the site.

Speed humps are currently provided on Breezehill Avenue, south of the subject site and north of Laurel Street. Centreline flexposts are provided on Breezehill Avenue between Laurel Street and Gladstone Avenue. School Area warning signs are provided on Breezehill Avenue north and south of the Devonshire Public School and along Laurel Street, east and west of Breezehill Avenue. In

addition to the School Area warning signs, School Speed Zone warning signs could be considered to establish a reduced speed limit in proximity to the school.

## 6.7 Transit

Based on the trip generation presented in Section 5.1, the proposed redevelopment is anticipated to generate 83 transit trips (19 in, 64 out) during the AM peak hour, and 75 transit trips (47 in, 28 out) during the PM peak hour.

The 2011 TRANS O-D Survey Report indicates that the proposed development is located on the border of the Ottawa West and the Ottawa Inner Area districts. The distribution of transit trips to and from the development has been estimated based on origin-destination data from the TRANS O-D Survey Report. The top destinations of trips from the Ottawa West and Ottawa Inner Area districts within the AM peak period include the Ottawa West, Ottawa Inner Area, Merivale, Bayshore-Cedarview, and Alta Vista districts. The destinations of trips from the Ottawa West and Ottawa Inner Area districts to all TRANS O-D districts during the AM peak period were used to develop the following transit distribution:

- 30% to/from the east via Route 11
- 10% to/from the west via Route 11
- 35% to/from the east via Line 1
- 5% to/from the west via Line 1
- 20% to/from the south via Line 2

Winter 2020 (January 5<sup>th</sup> to March 7<sup>th</sup>) transit utilization data within the study area was obtained from OC Transpo and is included in **Appendix C**. This period is the last 'normal' ridership period before COVID-19 related impacts began. Peak period (06:00-09:00, 15:00-18:00) boarding, alighting, and average bus load at departure information was received for OC Transpo Bus Stops #8039 and #8027. PM Peak hour fare gate activity for Bayview Station was also received, however average train load at departure information was unavailable.

For the purposes of this analysis AM peak hour fare gate activity at Bayview Station is assumed to be the inverse of the PM peak hour data received from OC Transpo. The distribution of existing transit trips at Bayview Station is assumed to be consistent with the transit distribution presented above.

Existing and projected boarding and alighting information is summarized in **Table 13**.

The development is anticipated to add 6 and 14 trips alighting Route 11 at bus stop #8039 during the AM and PM peak hours. As Route 11 currently runs on 15-minute intervals during the AM and PM peak hours, this equates to approximately 2 to 4 trips alighting per bus. Based on the data received from OC Transpo, the existing average bus load at departure for Route 11 at stop #8039 is approximately 13 and 21 people during the AM and PM peak hours. The additional trips generated by the development are not anticipated to result in increased service for Route 11 at stop #8039.

**Table 13: Projected Transit Utilization**

Bus Stop	Route	Boarding <sup>1</sup>			Alighting <sup>1</sup>		
		Existing	Site	Total	Existing	Site	Total
AM Peak hour							
Bayview Station	Line 1 EB	168	23	191	14	1	15
	Line 1 WB	24	3	27	96	6	107
	Line 2	96	13	109	55	4	62
#8039	11	2	6	8	1	6	7
#8027	11	7	19	26	1	2	3
PM Peak Hour							
Bayview Station	Line 1 EB	96	10	106	24	2	26
	Line 1 WB	14	1	15	168	17	185
	Line 2	55	6	61	96	9	105
#8039	11	4	3	7	7	14	21
#8027	11	4	8	12	3	5	8

The development is anticipated to add 8 and 19 trips boarding Route 11 at bus stop #8027 during the AM and PM peak hours respectively. As Route 11 currently runs on 15-minute intervals during the AM and PM peak hours, this equates to approximately 2 to 5 trips boarding per bus. Based on the data received from OC Transpo, the existing average bus load at departure is approximately 14 and 15 people during the AM and PM peak hours. The additional trips generated by the development are not anticipated to result in an increased service for Route 11 at stop #8027.

The development is anticipated to add 24 trips (23 boarding, 1 alighting) during the AM peak hour and 12 trips (10 boarding, 2 alighting) during the PM peak hour to O-Train Line 1 Eastbound. The development is anticipated to add approximately 9 trips (3 boarding, 6 alighting) during the AM peak hour and 18 trips (1 boarding, 17 alighting) during the PM peak hour to O-Train Line 1 Westbound. Average load at departure information for Line 1 at Bayview Station was unavailable. However, based on OC Transpo service schedules, Line 1 stops at Bayview Station on four-minute headways during peak hours. This equates to approximately 14-15 trains with a capacity of 600 people in each direction during the peak hours. Based on the foregoing, no capacity deficiencies are anticipated for Line 1 at Bayview Station.

The development is anticipated to add 17 trips (13 boarding, 4 alighting) during the AM peak hour and 15 trips (6 boarding, 9 alighting) during the PM peak hour to O-Train Line 2. Average load at departure information for Line 2 at Bayview Station was unavailable. However, based on OC Transpo service schedules, Line 2 stops at Bayview Station on six- to seven-minute headways during peak hours. This equates to approximately 8-10 trains with a capacity of 600 people in each direction during the peak hours. Based on the foregoing, no capacity deficiencies are anticipated for Line 2 at Bayview Station.

**6.8 Intersection Design**

**6.8.1 Existing Intersection MMLOS Analysis**

This section provides a review of the study area intersections using the complete streets principles. The Multi-Modal Level of Service (MMLOS) guidelines produced by IBI Group in 2015 were used to evaluate the LOS of the signalized intersections for each mode of transportation.

Schedule ‘B’ of the City of Ottawa’s Official Plan indicates that Somerset Street West is a Traditional Mainstreet, the Somerset Street West/Breezehill Avenue intersection is located within the General Urban Area while the Somerset Street West/Preston Street intersection is located a Mixed-Use Center. Both intersections are also within 600m of a rapid transit station.

Target PLOS, BLOS, TLOS, TkLOS, and Auto LOS for the study area intersections are based on targets for areas within 600m of rapid transit, as identified in Exhibit 22 of the MMLOS guidelines.

A summary of the results of the MMLOS analysis for the signalized intersections is provided in the following table. Detailed MMLOS calculations can be found in **Appendix H**.

**Table 14: Intersection MMLOS Summary**

Intersection	PLOS	BLOS	TLOS	TkLOS	Auto LOS
Somerset Street West/Bayswater Avenue	D	D	C	F	E
Somerset Street West/Preston Street	D	D	F	F	C
<b>Target</b>	<b>A</b>	<b>C</b>	<b>D</b>	<b>D</b>	<b>E</b>

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

- Neither intersection meets the target PLOS A;
- Neither intersection meets the target BLOS C;
- The Somerset Street West/Bayswater Avenue intersection meets the target TLOS D;
- The Somerset Street West/Preston Street Avenue does not meet the target TLOS D;
- Neither intersection meets the target TkLOS D; and
- Both intersections meet the target Auto LOS E.

Somerset Street West/Bayswater Avenue

The Somerset Street West/Bayswater Avenue intersection does not meet the target PLOS, BLOS, or TkLOS but meets the target TLOS and Auto LOS.

A reduction in the pedestrian walking distance on the north, east, and west approaches would have the greatest improvement to the PLOS at this intersection. However, a reduction in the pedestrian walking distance is limited by the number of travel lanes required.

The right turn criteria on the east and westbound approaches and left turn criteria on the north approach do not meet the target BLOS C. Bike lanes on all approaches would improve the BLOS to the target BLOS C. A further review of the Ontario Traffic Manual (OTM) Book 18 Desirable Cycling Facility Pre-selection Nomograph has been conducted. Based on an operating speed of 50km/hr and an AADT between 7,000-8,000, consideration should be given to bike lanes on Bayswater Avenue and Somerset Street West which would achieve the target BLOS C. Removal of the right turn lane on the east and westbound approaches would also improve the BLOS along Somerset Street West to the target BLOS C. This is identified for the City’s consideration.

Increased radii on the all corners of the intersection would improve the TkLOS but would have a negative impact on the PLOS.

Somerset Street West/Preston Street

The Somerset Street West/Preston Street intersection does not meet the target PLOS, BLOS, TLOS, or TkLOS but meets the target Auto LOS.

A reduction in the pedestrian walking distance on the south approach would have the greatest improvement to the PLOS at this intersection. However, a reduction in the pedestrian walking distance is limited by the number of travel lanes required.

The left turn criteria on all approaches does not meet the target BLOS. A reduction in the operating speed to 40km/h or bike lanes on all approaches would improve the BLOS to the target BLOS C. Based on AADT of 8,000-9,000vph and a speed of 50km/h, the OTM Nomograph suggests that consideration should be given to bike lanes on Preston Street and Somerset Street West which would achieve the target BLOS C.

The delay on the west approach in the AM peak is in excess of 40 seconds and does not meet the target TLOS D. All other approaches in the AM and PM peak period meets the target TLOS D. The target TLOS D can not be achieved without removal of the advanced walk phases for pedestrians or an increase in the cycle length. Removal of the advanced walk phases would have a negative impact on the PLOS. As signals are coordinated in the area, an increased cycle length would result in an increased cycle length at other intersections within the area and may result in negative impacts on the Auto LOS at other signals.

Increased radii on the all corners of the intersection would improve the TkLOS but would have a negative impact on the PLOS.

**6.8.2 Assessment of Safety and Operations**

Sight Distance

A comprehensive appraisal of sight distances was completed for the intersection of Somerset Street West at Breezehill Avenue, using the relevant standards and guidelines presented in the Transportation Association of Canada (TAC) *Geometric Design Guide for Canadian Roads*.

A speed survey conducted in February 2021 indicates that the 85<sup>th</sup> percentile motor vehicle operating speed along Somerset Street West at Breezehill Avenue is 52km/h. The results of the speed survey can be found in **Appendix D**. The following table indicates the required sight distances for a design speed of 50km/h and 60km/h (10km/h above the posted speed).

**Table 15: Required Sight Distances**

Sight Distance		Requirement	
		50 km/h Design Speed	60 km/h Design Speed
Stopping Sight Distance (SSD)		65m	85m
Intersection Sight Distance (ISD)	Left Turn from Stop	105m	130m
	Right Turn from Stop	95m	110m

Approximately 105m of SSD is available for vehicles approaching Breezehill Avenue from the east over the O-Train Trillium line overpass.

Based on field measurements, there is adequate sight distance west of Breezehill Avenue for vehicles to turn right. The sight distance east of Breezehill Avenue for vehicles to turn left is limited



by the vertical curve of the bridge over the O-Train Corridor and is further obstructed by the concrete end treatment of the guiderail. An ISD of 75m is available for a vehicle stopped in advance of the concrete end treatment (i.e., looking through the guiderail), and approximately 50m is available for a vehicle stopped at the concrete end treatment. The guiderail and concrete end treatment are to be cut back as part of the proposed development, but the ISD will continue to be limited by the overpass.

It is noted that recent collision records do not indicate that there is an existing issue at this intersection. A total of two collisions were reported at the intersection in 8 years of collision data (2008-2010 per the CTS and 2014-2018 per the data in Section 4.1.8) and neither of these collisions were between a northbound left turning vehicle and a westbound vehicle. However, the City Councillor and community have previously expressed safety concerns with this intersection.

Based on comments received from City staff, potential mitigations to this intersection include:

1. The restriction of the northbound left movement through a channelized island on Breezehill Avenue.
2. A wa-13 intersection warning sign on the westbound approach.
3. The provision of a raised south crosswalk at Somerset Street West and Breezehill Avenue to slightly increase the eye-height of drivers as they encroach over the south crosswalk to make the northbound left maneuver.
4. Traffic signal control.

Option 1 would likely result in an additional 35 vehicles per hour along Laurel Street and Bayswater Avenue and while there would likely be sufficient lane capacity to accommodate the added traffic, extra precautions may be required at the crosswalk on the west leg of the Laurel/Breezehill Avenue intersection as it is heavily used by children walking to the Devonshire Community Public School. This option was discussed as part of the 2013 CTS/TIS and not carried forward due to the potential impacts to the school.

Option 2 will increase driver awareness on the westbound approach. However, the intersection sight distance for vehicles turning left from Breezehill Avenue onto Somerset Street will continue to be deficient.

Option 3 may slightly improve sight lines if drivers encroach onto the sidewalk, however it is not anticipated to achieve the TAC requirement. Vehicles encroaching into the crosswalk will introduce additional pedestrian/vehicle conflicts, will impede pedestrian flow on Somerset Street, and may result in a lower level of comfort for pedestrians.

Option 4 may be used to safely and efficiently alternate the right-of-way when visibility is inadequate. Advance flashing beacons are typically required for 85<sup>th</sup> percentile speeds of 60km/h or higher and visibility distances of less than 110m. The traffic control signal warrant at the Somerset Street West/Breezehill Avenue was reviewed according to the procedure outlined in the *Ontario Traffic Manual* Book 12. Traffic signal justifications are provided in **Appendix I**. Based on the results of the warrant analysis, signals are not warranted under total traffic conditions. The Somerset Street/Breezehill Avenue and Somerset Street/Bayswater Avenue intersections will be spaced approximately 85m apart, measured from stop bar to stop bar. While it is noted that the spacing between the proposed intersection and the Somerset Street/Bayswater Avenue intersection does not meet OTM standards, Somerset Street West has other signals spaced at similar distances. To the east, Somerset/Empress and Somerset/Arthur are spaced

approximately 75m apart, and Somerset/Booth and Somerset/Rochester are spaced 100m apart. Both of these examples are located within 1km of the Somerset/Breezehill intersection. A review of queue lengths anticipated at both signals is included in Section 6.8.3. Sufficient storage is available for the projected queue lengths as the spacing between the Bayswater Avenue and proposed Breezehill Avenue stop bars is approximately 85m. This option may introduce the potential for more westbound rear-end collisions, however an advanced warning beacon will alert drivers of the need to stop and assist in preventing these collisions.

Based on the foregoing, traffic signal control is recommended at the Somerset Street/Breezehill Avenue intersection to address the inadequate sight distance. A continuous advance warning beacon should be provided based on the available sight distance of 105m for vehicles travelling west on Somerset Street West.

A minimum advance placement distance of 140m is recommended on Somerset Street West, east of Breezehill Avenue, based on Table 4 of the Ontario Traffic Manual Book 6, as shown in Figure 14.

**Figure 14: Minimum Advance Placement Distance**



Turn Lane Requirements

A review of MTO left turn lane storage graphs for the 2025 build-out and 2030 horizon year has been conducted and is included in **Appendix I**. It was found that no left turn lane is warranted under 2025 background or total traffic conditions. The 2030 background and total traffic volumes meet the MTO warrant criteria for a dedicated westbound left turn lane on Somerset Street West at Breezehill Avenue.

As part of the previous study, several options were explored including the provision of a westbound left turn lane with reduced sidewalk widths, peak hour turn restrictions and no

westbound left turn lane, split phase signal timing and no westbound left turn lane, or monitoring to confirm the requirement for a westbound left turn lane. It should be noted that all options included the provision of traffic signal control due to limited sightlines.

The westbound approach currently consists of 2.5m sidewalks, 1m inner boulevards, 1.8m bike lanes, and two 3.7m general travel lanes. Pedestrian lighting is located in the inner boulevards on either side of the overpass. A 3.3m left turn lane could be accommodated through the elimination of the inner boulevards for a minimum distance of 60m across the bridge, relocation of the pedestrian lighting to the back of the sidewalk or to the streetlight poles at the back of the guardrail, and a reduction of the sidewalk widths to 2m. However, a reduction in the sidewalk width is undesirable due to the existing pedestrian volumes along Somerset Street and since these sidewalks are heavily frequented by children travelling to/from the Devonshire Community Public School.

As the westbound left turn lane is warranted under background traffic conditions for the 2030 horizon year and not as a result of site traffic, and as a westbound left turn lane would result in a reduction in sidewalk width along Somerset Street, it is recommended that the City continue to monitor the Somerset Street West/Breezehill Avenue intersection to determine if the westbound left turn lane is required.

**6.8.3 Total Intersection Operations**

A review of the total intersection operations has been conducted to determine if and when the projected total traffic will exceed the capacity within the study area. The intersection parameters used in the analysis are consistent with the TIA guidelines (saturated flow rate: 1800 vphpl, PHF: 1.0).

The Somerset Street West/Breezehill Avenue intersection has been modeled per existing conditions (unsignalized) as well as with traffic signals and no westbound left turn lane.

**6.8.3.1 2025 Total Intersection Operations**

Intersection capacity analysis has been completed for the 2025 total traffic conditions. The results of the analysis are summarized in **Table 16** for the weekday AM and PM peak hours.

**Table 16: 2025 Total Intersection Operations**

Intersection	AM Peak			PM Peak		
	Max. v/c or delay	LOS	Mvmt	Max. v/c or delay	LOS	Mvmt
Somerset Street West/Bayswater Avenue	0.65	B	SBT/R	0.87	D	NB
Somerset Street West/Preston Street	0.92	E	EBT/R	0.80	C	NBT/R
Somerset Street West/Breezehill Avenue <sup>1</sup>	14 sec.	B	NB	16 sec.	C	NB
Breezehill Avenue/Laurel Street	8 sec.	A	SB	8 sec.	A	NB
Breezehill Avenue/Gladstone Avenue	12 sec.	B	NB	20 sec.	C	SB

Intersection	AM Peak			PM Peak		
	Max. v/c or delay	LOS	Mvmt	Max. v/c or delay	LOS	Mvmt
Breezehill Avenue/Site Access	9 sec.	A	WB	9 sec.	A	WB
Somerset Street West/Breezehill Avenue <sup>2</sup>	0.38	A	NB	0.41	A	WB

1. Unsignalized intersection
2. Signalized intersection

With the addition of site traffic, all intersections are projected to operate with acceptable conditions. With traffic signalization, a maximum queue of 50m is expected for the eastbound approach of the Somerset Street West/Breezehill Avenue intersection in the PM peak period. A maximum queue of 65m is expected for the westbound approach of the Somerset Street West/Bayswater Avenue intersection in the PM peak. Sufficient storage is available for the projected queue length as the spacing between the Bayswater Avenue and proposed Breezehill Avenue stop bars is approximately 85m. As a result of the new signal, the maximum delay experienced by vehicles travelling eastbound along Somerset Street West at Breezehill Avenue will be 7 seconds, while the maximum delay experienced by vehicles travelling westbound will be 12 seconds.

The analysis shows that the signalized intersection of Somerset Street West/Breezehill Avenue is anticipated to operate with acceptable conditions without a westbound left turn lane.

### 6.8.3.2 2030 Total Intersection Operations

Intersection capacity analysis has been completed for the 2030 total traffic conditions. The results of the analysis are summarized in **Table 17** for the weekday AM and PM peak hours.

**Table 17: 2030 Total Intersection Operations**

Intersection	AM Peak			PM Peak		
	Max. v/c or delay	LOS	Mvmt	Max. v/c or delay	LOS	Mvmt
Somerset Street West/Bayswater Avenue	0.66	B	SBT/R	0.91	E	NB
Somerset Street West/Preston Street	1.00	E	EBT/R	0.84	D	EB/WB
Somerset Street West/Breezehill Avenue <sup>1</sup>	15 sec.	C	NB	21 sec.	C	NB
Breezehill Avenue/Laurel Street	8 sec.	A	SB	8 sec.	A	NB
Breezehill Avenue/Gladstone Avenue	12 sec.	B	NB	20 sec.	C	SB
Breezehill Avenue/Site Access	9 sec.	A	WB	9 sec.	A	WB
Somerset Street West/Breezehill Avenue <sup>2</sup>	0.41	A	NB	0.43	A	WB

1. Unsignalized intersection
2. Signalized intersection

Under 2030 total traffic conditions, all intersections are projected to operate with acceptable conditions. Minor increases in queue lengths and delays are anticipated from 2025 total conditions.

Although anticipated to operate with a LOS E in the AM peak given the current signal timing plan, the Somerset Street West/Preston Street intersection could benefit from adjusted signal timing. Reassigning 5 seconds from the north/south movements to the east/west would improve the v/c ratio to a 0.88, or LOS D. This is identified for the City’s consideration.

**6.8.3.3 Sensitivity Analysis**

An analysis of 2030 total traffic using the Ottawa West Area modal shares was conducted in order to qualify the impact to the study area intersections should the redevelopment not meet the target mode shares. Typical residential modal shares in the Ottawa West Area equate to approximately 45% auto driver, 10% passenger, 20% transit, and 25% non-auto.

Should the redevelopment only meet to Ottawa West Area modal shares, the redevelopment is anticipated to generate an additional 52 vehicle trips during the AM peak hour and 55 vehicle trips during the PM peak hour compared to the target modal shares.

Intersection capacity analysis has been completed for the 2030 total traffic conditions. The results of the analysis are summarized in **Table 17** for the weekday AM and PM peak hours.

**Table 18: 2030 Total Intersection Operations – Sensitivity Analysis**

Intersection	AM Peak			PM Peak		
	Max. v/c or delay	LOS	Mvmt	Max. v/c or delay	LOS	Mvmt
Somerset Street West/Bayswater Avenue	0.70	B	SBT/R	0.95	E	NB
Somerset Street West/Preston Street	1.05	F	EBT/R	0.87	D	EBT/R
Somerset Street West/Breezehill Avenue <sup>1</sup>	18 sec.	C	NB	25 sec.	C	NB
Breezehill Avenue/Laurel Street	8 sec.	A	SB	8 sec.	A	NB
Breezehill Avenue/Gladstone Avenue	13 sec.	B	NB	21 sec.	C	SB
Breezehill Avenue/Site Access	9 sec.	A	WB	9 sec.	A	WB
Somerset Street West/Breezehill Avenue <sup>2</sup>	0.49	A	NB	0.51	A	WB

- 1. Unsignalized intersection
- 2. Signalized intersection

Should the development not meet the target modal shares, the Somerset Street West/Preston Street intersection is anticipated to operate with a LOS F in the AM peak given the current signal timing plan. With adjusted signal timing as identified in Section 6.8.3.2, a v/c ratio of 0.89 (LOS D) is anticipated.

All other study area intersections are anticipated to operate with acceptable conditions. Minor increases in queue lengths and delays are anticipated from the 2030 total traffic analysis with the target modal shares.

## 7.0 CONCLUSIONS AND RECOMMENDATIONS

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

### Development Design & Parking

- Pedestrian connectivity will be provided to Somerset Street West and Breezehill Avenue. A paved pedestrian plaza is proposed fronting the site onto Somerset Street West, with steps merging into the sidewalk along Somerset Street West. Unit pavers are proposed along the Breezehill Avenue frontage, creating a wide boulevard with planters near the main building entrance. A clear width of 3m will be provided between the planters and the Breezehill Avenue curblines.
- The minimum vehicular and bicycle parking requirements of the ZBL will be met.
- OC Transpo bus stops are located at the Somerset Street West/Bayswater Avenue intersection, within a 150m walk of the development. The Bayview LRT station is also located within a 500m walk of the development.
- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.
- The proposed development will be served by a new vehicular access to Breezehill Avenue. This access will serve the underground parking. The existing site access will be closed as part of this application.
- The fire route for the proposed development will be located curbside.
- A garbage room is proposed to the north of the access to the underground parking. Garbage collection will occur curbside on Breezehill Avenue.

### Boundary Streets

- Somerset Street West meets the target BLOS, TLOS, and TkLOS but does not meet the target PLOS. Based on the PLOS criteria, the target PLOS A is unachievable along roadways that carry greater than 3,000 AADT and have an operating speed of 60km/hr. Without a reduction in speed or a decrease in AADT, a maximum PLOS C can be achieved with a 2.0m sidewalk and 2.0m boulevard. This is identified for the City's consideration.
- Breezehill Avenue meets the target BLOS but does not meet the target PLOS. To achieve the target PLOS A, either a 1.8m sidewalk with a 2.0m wide boulevard or a 2.0m sidewalk with a minimum 0.5m wide boulevard would be required. Unit pavers are proposed along the Breezehill Avenue frontage, creating a wide boulevard with planters near the main building entrance. A clear width of 3m will be provided between the planters and the Breezehill Avenue curblines.

### Access Intersection Design

- The existing access on-site is to be closed and the depressed curb and sidewalk is to be replaced with full height curb and sidewalk in accordance with City standards.
- The proposed access will be located approximately 35m south of Somerset Street West, measured from the nearest edge of the access to the Somerset Street West ROW. The access will have a width of approximately 6m.

- The width and location of the access adheres to the requirements of the *Private Approach By-Law* and *Zoning By-Law*.
- A waiver to the City's *Private Approach By-Law* is required for the grade of the underground parking ramp. The access will have a grade of 6% for the first 6m within the building and 7.5m within the property, transitioning to a 15% slope. The proposed grade is sufficient for a passenger vehicle to stop entirely within the private property with both tires on the 6% grade and have appropriate sight lines to the sidewalk. Bollards will be provided within the right-of-way along the parking ramp entrance in order to further differentiate the pedestrian and vehicular streams of traffic.

#### Transportation Demand Management

- The additional vehicle trips at either signalized intersection within the study area due to the target transit modal share not being met would result in an increase of 1.9% or less to the overall intersection traffic volumes.
- Should the development only meet the Ottawa West or Ottawa Inner Area modal shares, the additional trips generated by the development are anticipated have a minimal impact on the Auto LOS within the study area.
- To encourage travel by sustainable modes, the proponent agrees to provide 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; and
  - Provide a multimodal travel option information package to new residents.

#### Neighborhood Traffic Management

- The majority of the traffic being generated by the proposed development is expected to arrive/depart to the north towards Somerset Street West.
- The added traffic generated by the proposed development is not anticipated to have a significant impact on the existing vehicular operations along Breezehill Avenue south of the site and will not change the classification of Breezehill Avenue from a local road to a collector.
- Based on the 2025 and 2030 total traffic projections, Breezehill Avenue will have sufficient lane capacity to accommodate the additional traffic generated by the site.

#### Transit

- The proposed redevelopment is anticipated to generate 83 transit trips (19 in, 64 out) during the AM peak hour, and 75 transit trips (47 in, 28 out) during the PM peak hour.
- The additional trips generated by the development are not anticipated to result in increased service for Route 11 at stop #8039 or #8027.
- No capacity deficiencies are anticipated for Line 1 or Line 2 at Bayview Station.

#### Intersection MMLoS Analysis

- The Somerset Street West/Bayswater Avenue intersection does not meet the target PLOS, BLOS, or TkLOS but meets the target TLOS and Auto LOS.
  - A reduction in the pedestrian walking distance on the north, east, and west approaches would have the greatest improvement to the PLOS at this intersection. However, a reduction in the pedestrian walking distance is limited by the number of travel lanes required.

- The right turn criteria on the east and westbound approaches and left turn criteria on the north approach do not meet the target BLOS C. Bike lanes on all approaches would improve the BLOS to the target BLOS C. A further review of the Ontario Traffic Manual (OTM) Book 18 Desirable Cycling Facility Pre-selection Nomograph has been conducted. Based on an operating speed of 50km/hr and an AADT between 7,000-8,000, consideration should be given to bike lanes on Bayswater Avenue and Somerset Street West which would achieve the target BLOS C. Removal of the right turn lane on the east and westbound approaches would also improve the BLOS along Somerset Street West to the target BLOS C. This is identified for the City's consideration.
- Increased radii on the all corners of the intersection would improve the TkLOS but would have a negative impact on the PLOS.
- The Somerset Street West/Preston Street intersection does not meet the target PLOS, BLOS, TLOS, or TkLOS but meets the target Auto LOS.
  - A reduction in the pedestrian walking distance on the south approach would have the greatest improvement to the PLOS at this intersection. However, a reduction in the pedestrian walking distance is limited by the number of travel lanes required.
  - The left turn criteria on all approaches does not meet the target BLOS. A reduction in the operating speed to 40km/h or bike lanes on all approaches would improve the BLOS to the target BLOS C. Based on AADT of 8,000-9,000vph and a speed of 50km/h, the OTM Nomograph suggests that consideration should be given to bike lanes on Preston Street and Somerset Street West which would achieve the target BLOS C.
  - The delay on the west approach in the AM peak is in excess of 40 seconds and does not meet the target TLOS D. All other approaches in the AM and PM peak period meets the target TLOS D. The target TLOS D can not be achieved without removal of the advanced walk phases for pedestrians or an increase in the cycle length. Removal of the advanced walk phases would have a negative impact on the PLOS. As signals are coordinated in the area, an increased cycle length would result in an increased cycle length at other intersections within the area and may result in negative impacts on the Auto LOS at other signals.
  - Increased radii on the all corners of the intersection would improve the TkLOS but would have a negative impact on the PLOS.

#### Assessment of Safety and Operations

- The sight distance east of Breezehill Avenue for vehicles to turn northbound left on Somerset Street West is limited by the vertical curve of the bridge over the O-Train Corridor and is further obstructed by the concrete end treatment of the guiderail. The guiderail and concrete end treatment are to be cut back as part of the proposed development, but the ISD will continue to be limited by the overpass.
- Traffic signal control is recommended at the Somerset Street/Breezehill Avenue intersection to address the inadequate sight distance. A continuous advance warning beacon should be provided based on the available sight distance of 105m for vehicles travelling west on Somerset Street West. A minimum advance placement distance of 140m is recommended on Somerset Street West, east of Breezehill Avenue.
- The 2025 background and total traffic volumes do not meet the MTO warrant criteria for a dedicated westbound left turn lane on Somerset Street West at Breezehill Avenue.
- The 2030 background and total traffic volumes meet the MTO warrant criteria for a dedicated westbound left turn lane on Somerset Street West at Breezehill Avenue. As the westbound left turn lane is warranted under background traffic conditions for the 2030



horizon year and not as a result of site traffic, and as a westbound left turn lane would result in a reduction in sidewalk width along Somerset Street, it is recommended that the City continue to monitor the Somerset Street West/Breezehill Avenue intersection to determine if the westbound left turn lane is required.

- As part of the previous study, several options were explored including the provision of a westbound left turn lane with reduced sidewalk widths, peak hour turn restrictions and no westbound left turn lane, split phase signal timing and no westbound left turn lane, or monitoring to confirm the requirement for a westbound left turn lane.

#### Total Intersection Operations

- Under 2025 and 2030 total traffic conditions, all intersections are projected to operate with acceptable conditions.
- A maximum queue of 50m is expected for the eastbound approach of the Somerset Street West/Breezehill Avenue intersection in the PM peak period. A maximum of 65m is expected for the westbound approach of the Somerset Street West/Bayswater Avenue intersection in the PM peak. Sufficient storage is available for the projected queue length as the spacing between the Bayswater Avenue and proposed Breezehill Avenue stop bars is approximately 85m.
- The analysis shows that the signalized intersection of Somerset Street West/Breezehill Avenue is anticipated to operate with acceptable conditions without a westbound left turn lane.
- Although anticipated to operate with a LOS E in the AM peak given the current signal timing plan, the Somerset Street West/Preston Street intersection could benefit from adjusted signal timing. Reassigning 5 seconds from the north/south movements to the east/west would improve the v/c ratio to a 0.88, or LOS D. This is identified for the City's consideration.
- Should the development not meet the target modal shares, the Somerset Street West/Preston Street intersection is anticipated to operate with a LOS F in the AM peak given the current signal timing plan. With adjusted signal timing a v/c ratio of 0.89 (LOS D) is anticipated. All other study area intersections are anticipated to operate with acceptable conditions.

## **NOVATECH**

Prepared by:

Reviewed by:



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

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

## **APPENDIX A**

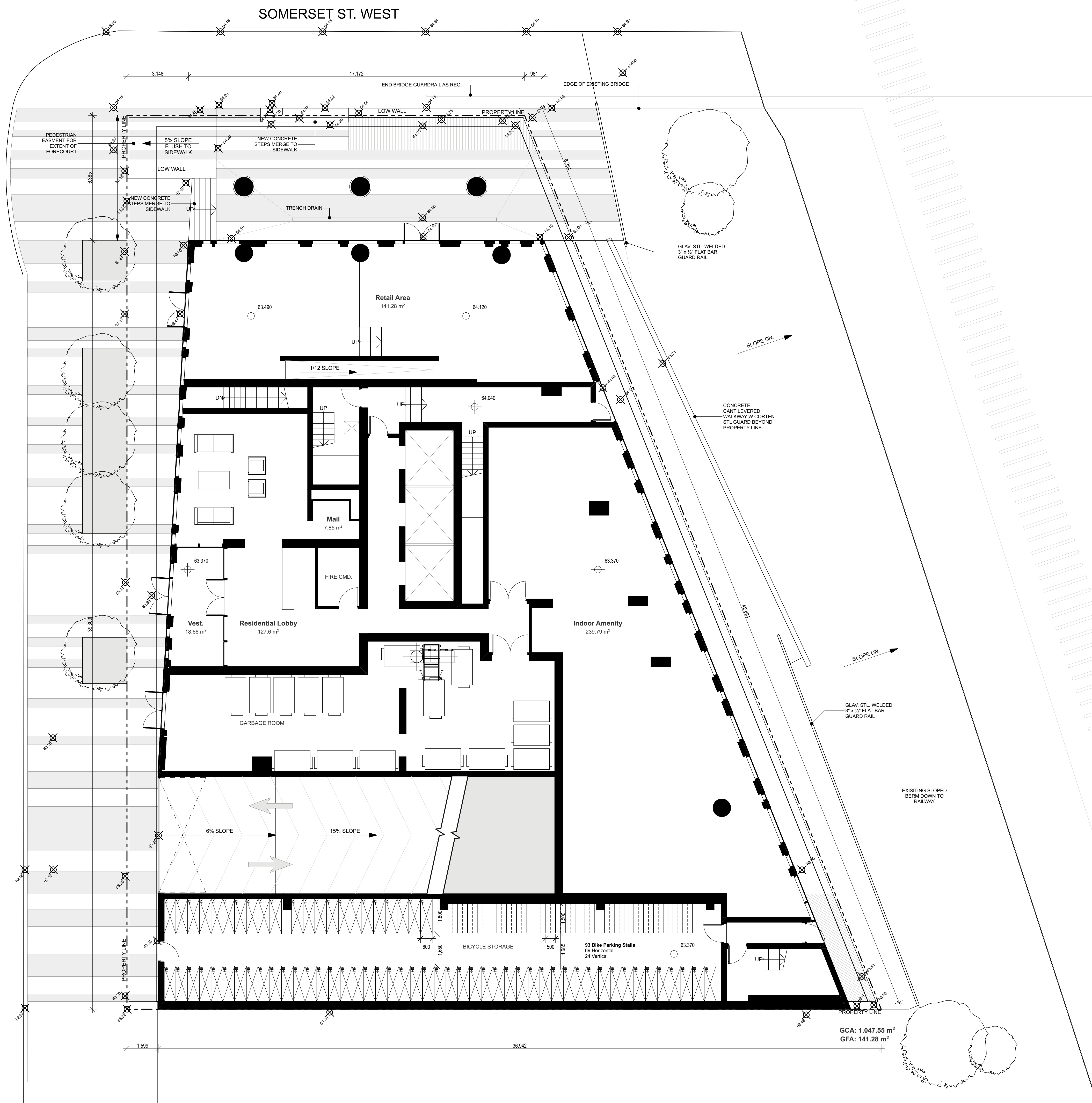
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Site Plan

- Copyright of this drawing is reserved by the Architect. The drawing and all associated documents are an instrument of service by the Architect. The drawing and the information contained therein may not be reproduced in whole or in part without prior written permission of the Architect.
- These Contract Documents are the property of the Architect. The Architect bears no responsibility for the interpretation 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. The Contractor is 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 any work.
- Positions of exposed finished mechanical or electrical devices, fittings, and fixtures are indicated on 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.
- These drawings are not to be used for construction unless noted below as "Issuance: For Construction".
- All work is to be carried out in conformance with the Code and Bylaws of the authorities having jurisdiction.
- The Architect of these plans and specifications gives no warranty or representation to any party about the constructability of the building(s) represented by them. All contractors or subcontractors must satisfy themselves when bidding and at all times ensure that they can properly construct the work represented by these plans.

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NO	ISSUANCE	DATE
01	SPA / ZONING BYLAW AMENDMENT	03-04-2013
02	SPA / ZONING BYLAW AMENDMENT	10-30-2013
03	SPA / ZONING BYLAW AMENDMENT	07-02-2015
04	SPA / ZONING BYLAW AMENDMENT	08-25-2015
05	SPA / ZONING BYLAW AMENDMENT	11-27-2020



# aA

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**1040 SOMERSET ST**

**1040 Somerset St. West  
 Ottawa ON K1Y 4L3**

**Ground Floor**

21062  
 1:100  
 2020-12-01

**A-2.6**

## **APPENDIX B**

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TIA Screening Form

## City of Ottawa 2017 TIA Guidelines Screening Form

### 1. Description of Proposed Development

Municipal Address	<b>1040 Somerset Street W</b>
Description of Location	<b>Southeast corner of Somerset St W/Breezehill Ave N</b>
Land Use Classification	<b>Residential with ground floor commercial</b>
Development Size (units)	<b>268 units</b>
Development Size (m <sup>2</sup> )	<b>141 m<sup>2</sup> of ground floor commercial</b>
Number of Accesses and Locations	<b>One access to Breezehill Avenue</b>
Phase of Development	<b>1</b>
Buildout Year	<b>2025</b>

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

### 2. Trip Generation Trigger

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

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

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

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

### 3. Location Triggers

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

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

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

### 4. Safety Triggers

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

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

### 5. Summary

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

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

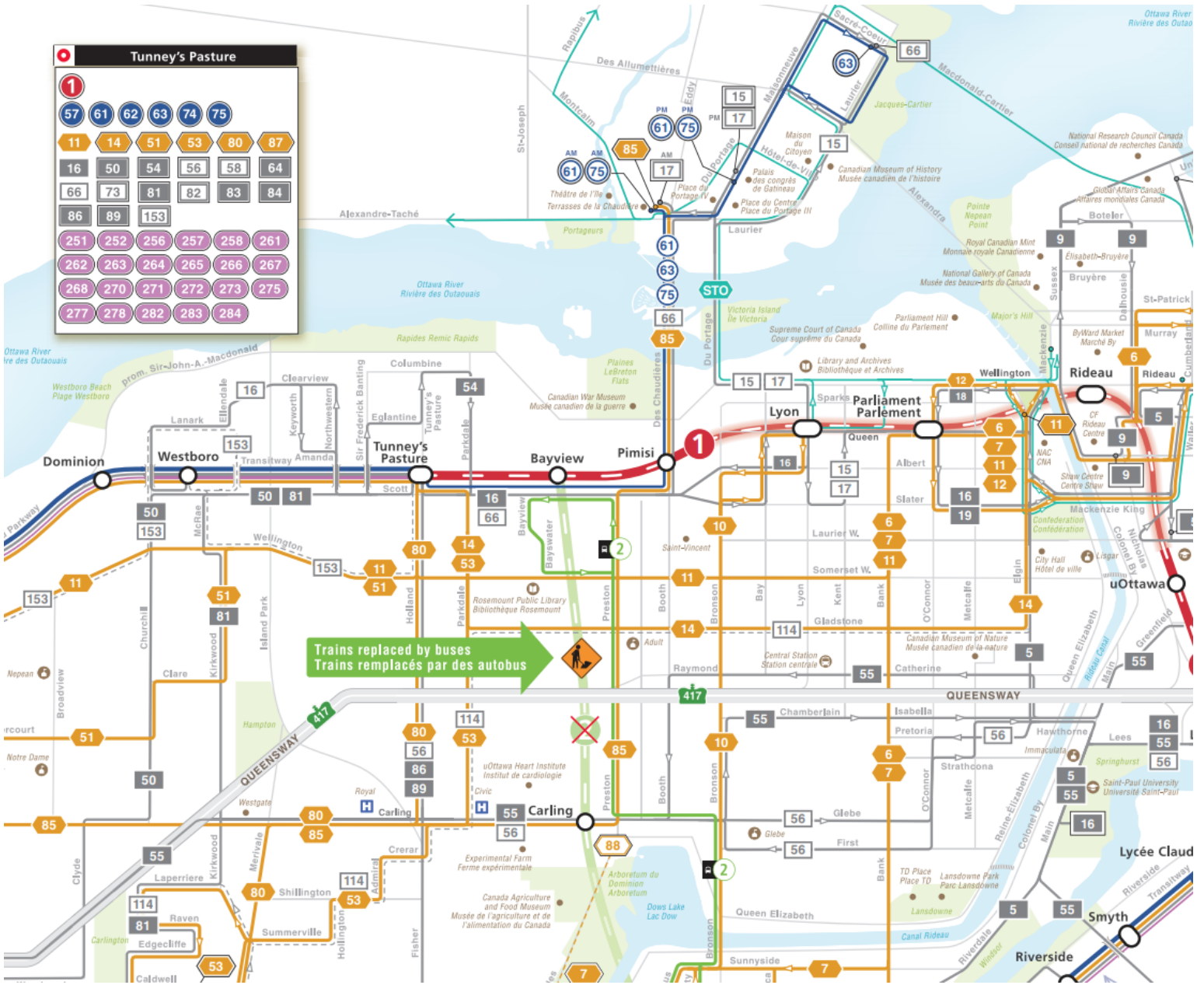
## **APPENDIX C**

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OC Transpo System Information



Tunney's Pasture							
1							
57	61	62	63	74	75		
11	14	51	53	80	87		
16	50	54	56	58	64		
66	73	81	82	83	84		
86	89	153					
251	252	256	257	258	261		
262	263	264	265	266	267		
268	270	271	272	273	275		
277	278	282	283	284			





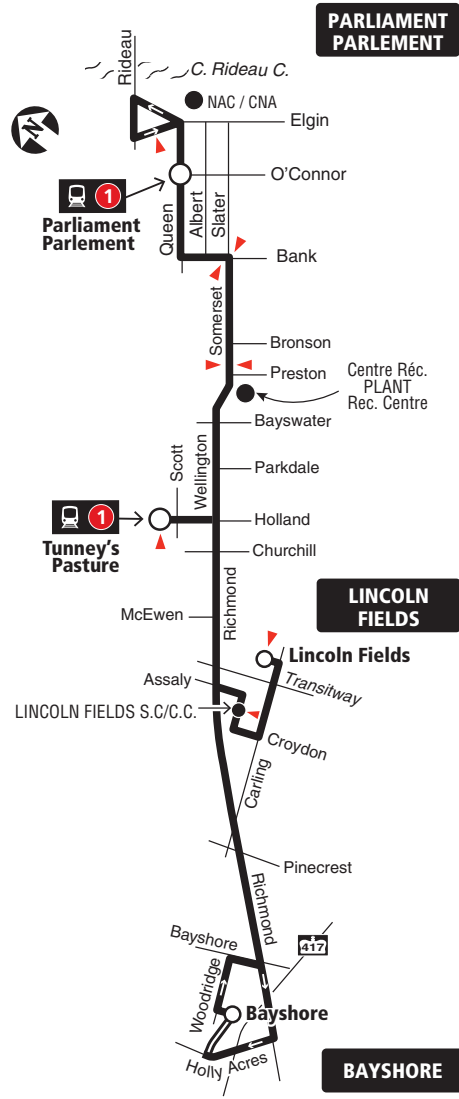
# 11

## LINCOLN FIELDS BAYSHORE PARLIAMENT PARLEMENT

Fréquent

7 days a week / 7 jours par semaine

All day service  
Service toute la journée



Transitway & Station  
 Timepoint / Heures de passage

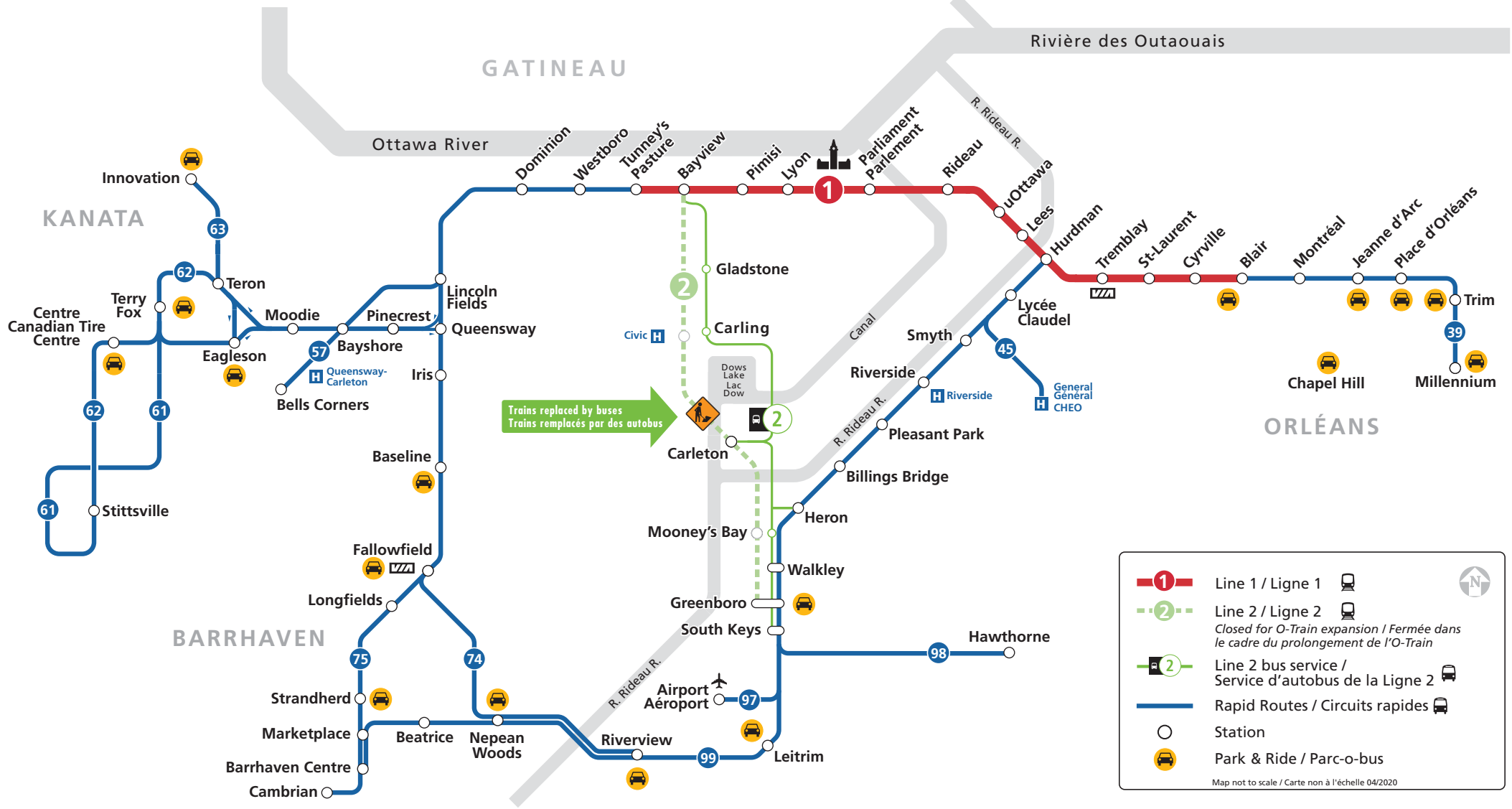
2019.07

**1**

**Future route after O-Train Line 1 is open**  
**Trajet du circuit après l'ouverture de la Ligne 1 de l'O-Train**

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

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



## **APPENDIX D**

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Traffic Count and Signal Timing Data

Weather: 3C, Overcast  
Serial Number: TDC-12-1614  
Collected By: H.Donald, H.Lu  
Notes: Thursday

File Name : 20120329 - Somerset&Breezehill  
Site Code : 11115214  
Start Date : 3/29/2012  
Page No : 1

Groups Printed- Cars - LGV - HGV

Start Time	Breezehill Avenue N Northbound			Somerset Street Westbound			Somerset Street Eastbound			Int. Total
	Left	Right	App. Total	Left	Thru	App. Total	Thru	Right	App. Total	
07:00	0	3	3	0	8	8	24	1	25	36
07:15	2	1	3	1	17	18	29	6	35	56
07:30	4	5	9	7	31	38	29	4	33	80
07:45	3	2	5	4	28	32	52	3	55	92
<b>Total</b>	<b>9</b>	<b>11</b>	<b>20</b>	<b>12</b>	<b>84</b>	<b>96</b>	<b>134</b>	<b>14</b>	<b>148</b>	<b>264</b>
08:00	2	6	8	8	39	47	64	14	78	133
08:15	5	14	19	9	28	37	71	19	90	146
08:30	8	9	17	6	43	49	70	14	84	150
08:45	2	7	9	4	31	35	80	7	87	131
<b>Total</b>	<b>17</b>	<b>36</b>	<b>53</b>	<b>27</b>	<b>141</b>	<b>168</b>	<b>285</b>	<b>54</b>	<b>339</b>	<b>560</b>
09:00	3	4	7	4	38	42	41	3	44	93
09:15	6	2	8	3	37	40	55	7	62	110
09:30	5	2	7	3	45	48	63	2	65	120
09:45	2	2	4	1	53	54	43	4	47	105
<b>Total</b>	<b>16</b>	<b>10</b>	<b>26</b>	<b>11</b>	<b>173</b>	<b>184</b>	<b>202</b>	<b>16</b>	<b>218</b>	<b>428</b>
11:00	0	0	0	1	9	10	0	0	0	10
11:15	0	3	3	2	9	11	0	0	0	14
11:30	2	9	11	8	53	61	65	3	68	140
11:45	2	5	7	3	37	40	58	3	61	108
<b>Total</b>	<b>4</b>	<b>17</b>	<b>21</b>	<b>14</b>	<b>108</b>	<b>122</b>	<b>123</b>	<b>6</b>	<b>129</b>	<b>272</b>
12:00	6	7	13	8	55	63	53	4	57	133
12:15	5	4	9	3	55	58	44	8	52	119
12:30	4	4	8	4	46	50	58	4	62	120
12:45	3	4	7	6	51	57	61	4	65	129
<b>Total</b>	<b>18</b>	<b>19</b>	<b>37</b>	<b>21</b>	<b>207</b>	<b>228</b>	<b>216</b>	<b>20</b>	<b>236</b>	<b>501</b>
13:00	3	3	6	5	39	44	55	4	59	109
13:15	8	5	13	5	43	48	57	6	63	124
<b>Total</b>	<b>11</b>	<b>8</b>	<b>19</b>	<b>10</b>	<b>82</b>	<b>92</b>	<b>112</b>	<b>10</b>	<b>122</b>	<b>233</b>
14:30	0	2	2	0	7	7	0	0	0	9
14:45	0	3	3	0	10	10	0	0	0	13
<b>Total</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>17</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>22</b>
15:00	10	20	30	3	58	61	58	11	69	160
15:15	8	5	13	5	61	66	65	1	66	145
15:30	2	4	6	3	63	66	66	3	69	141
15:45	1	5	6	3	72	75	60	0	60	141
<b>Total</b>	<b>21</b>	<b>34</b>	<b>55</b>	<b>14</b>	<b>254</b>	<b>268</b>	<b>249</b>	<b>15</b>	<b>264</b>	<b>587</b>
16:00	2	7	9	2	77	79	61	1	62	150
16:15	1	2	3	2	82	84	45	5	50	137
16:30	1	5	6	5	87	92	66	0	66	164
16:45	2	10	12	9	91	100	67	5	72	184
<b>Total</b>	<b>6</b>	<b>24</b>	<b>30</b>	<b>18</b>	<b>337</b>	<b>355</b>	<b>239</b>	<b>11</b>	<b>250</b>	<b>635</b>

Weather: 3C, Overcast  
Serial Number: TDC-12-1614  
Collected By: H.Donald, H.Lu  
Notes: Thursday

File Name : 20120329 - Somerset&Breezehill  
Site Code : 11115214  
Start Date : 3/29/2012  
Page No : 2

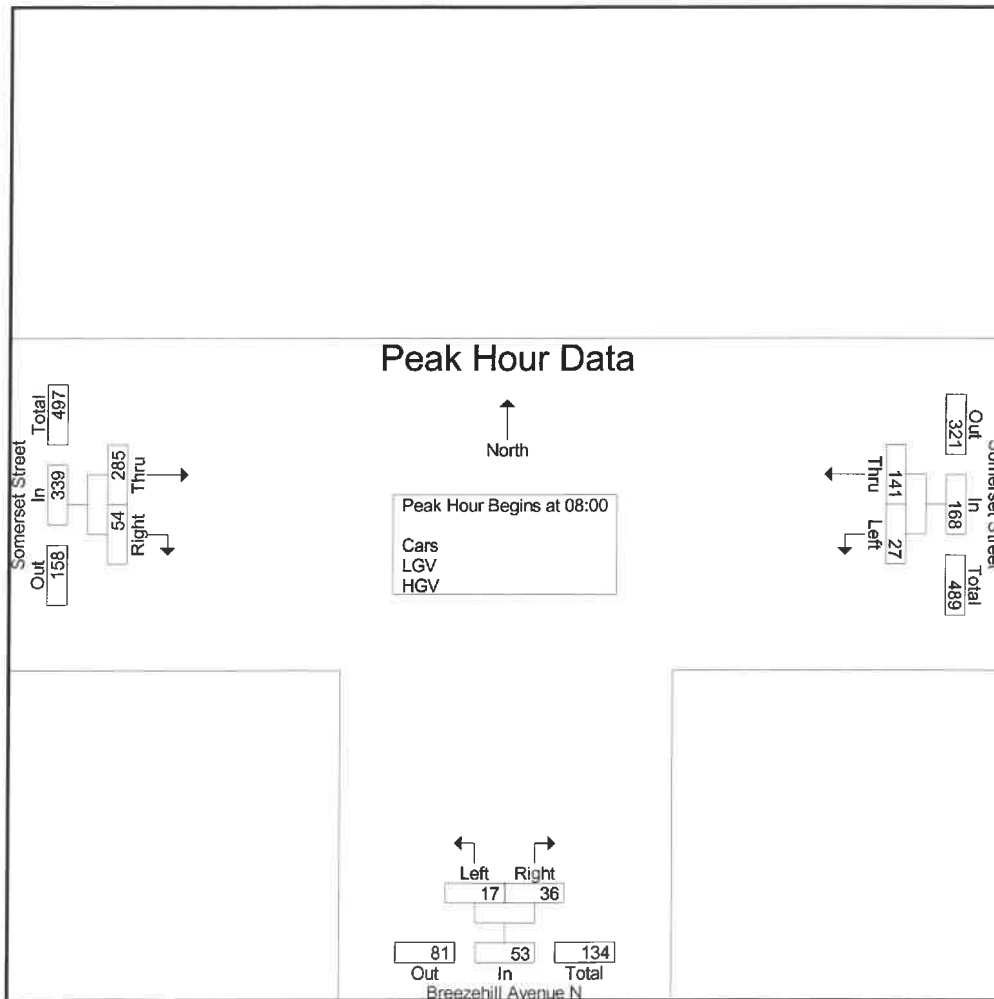
Groups Printed- Cars - LGV - HGV

Start Time	Breezehill Avenue N Northbound			Somerset Street Westbound			Somerset Street Eastbound			Int. Total
	Left	Right	App. Total	Left	Thru	App. Total	Thru	Right	App. Total	
17:00	9	5	14	6	99	105	49	4	53	172
17:15	4	7	11	1	70	71	80	4	84	166
17:30	4	5	9	8	52	60	59	1	60	129
17:45	2	3	5	4	57	61	58	2	60	126
Total	19	20	39	19	278	297	246	11	257	593
Grand Total	121	184	305	146	1681	1827	1806	157	1963	4095
Apprch %	39.7	60.3		8	92		92	8		
Total %	3	4.5	7.4	3.6	41.1	44.6	44.1	3.8	47.9	
Cars	121	163	284	133	1531	1664	1806	157	1963	3911
% Cars	100	88.6	93.1	91.1	91.1	91.1	100	100	100	95.5
LGV	0	18	18	11	118	129	0	0	0	147
% LGV	0	9.8	5.9	7.5	7	7.1	0	0	0	3.6
HGV	0	3	3	2	32	34	0	0	0	37
% HGV	0	1.6	1	1.4	1.9	1.9	0	0	0	0.9

Weather: 3C, Overcast  
Serial Number: TDC-12-1614  
Collected By: H.Donald, H.Lu  
Notes: Thursday

File Name : 20120329 - Somerset&Breezehill  
Site Code : 11115214  
Start Date : 3/29/2012  
Page No : 4

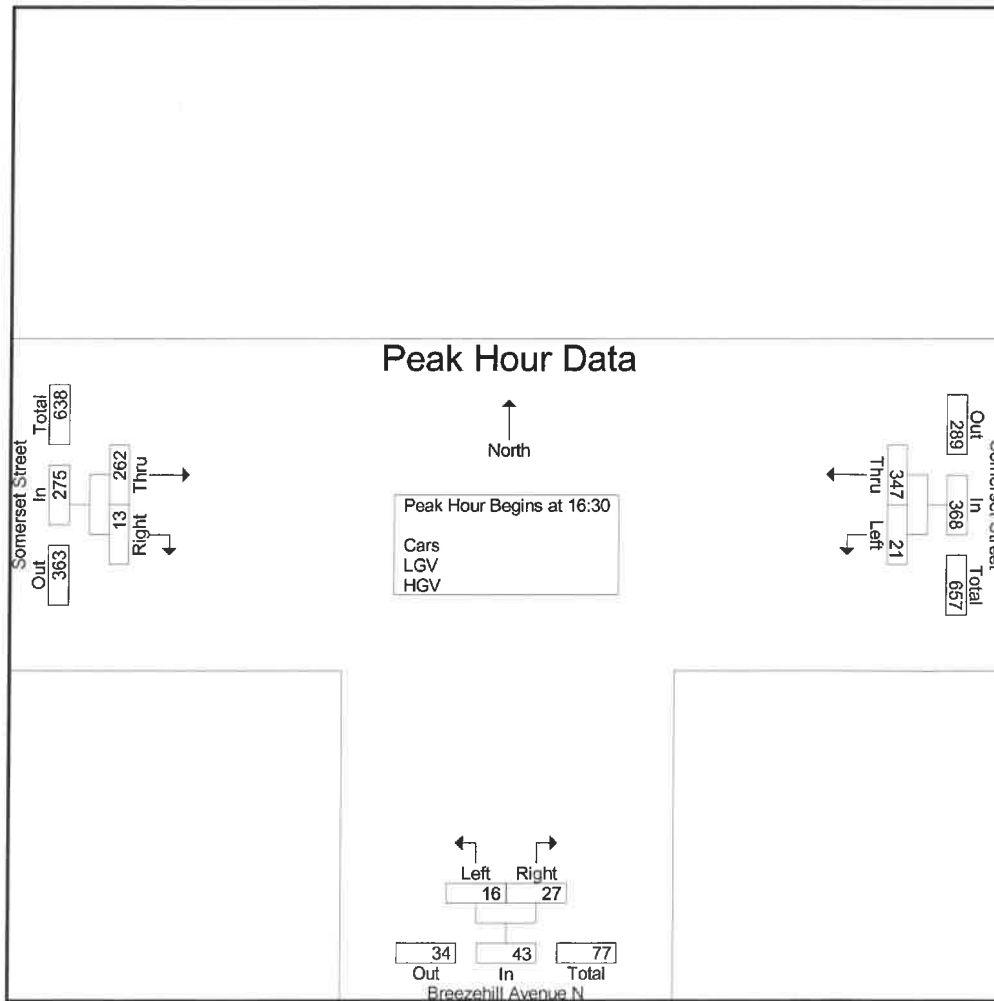
Start Time	Breezehill Avenue N Northbound			Somerset Street Westbound			Somerset Street Eastbound			Int. Total
	Left	Right	App. Total	Left	Thru	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 to 09:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00										
08:00	2	6	8	8	39	47	64	14	78	133
08:15	5	14	19	9	28	37	71	19	90	146
08:30	8	9	17	6	43	49	70	14	84	150
08:45	2	7	9	4	31	35	80	7	87	131
Total Volume	17	36	53	27	141	168	285	54	339	560
% App. Total	32.1	67.9		16.1	83.9		84.1	15.9		
PHF	.531	.643	.697	.750	.820	.857	.891	.711	.942	.933



Weather: 3C, Overcast  
Serial Number: TDC-12-1614  
Collected By: H.Donald, H.Lu  
Notes: Thursday

File Name : 20120329 - Somerset&Breezehill  
Site Code : 11115214  
Start Date : 3/29/2012  
Page No : 6

Start Time	Breezehill Avenue N Northbound			Somerset Street Westbound			Somerset Street Eastbound			Int. Total
	Left	Right	App. Total	Left	Thru	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 14:00 to 17:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 16:30										
16:30	1	5	6	5	87	92	66	0	66	164
16:45	2	10	12	9	91	100	67	5	72	184
17:00	9	5	14	6	99	105	49	4	53	172
17:15	4	7	11	1	70	71	80	4	84	166
Total Volume	16	27	43	21	347	368	262	13	275	686
% App. Total	37.2	62.8		5.7	94.3		95.3	4.7		
PHF	.444	.675	.768	.583	.876	.876	.819	.650	.818	.932





## Turning Movement Count - Peak Hour Diagram

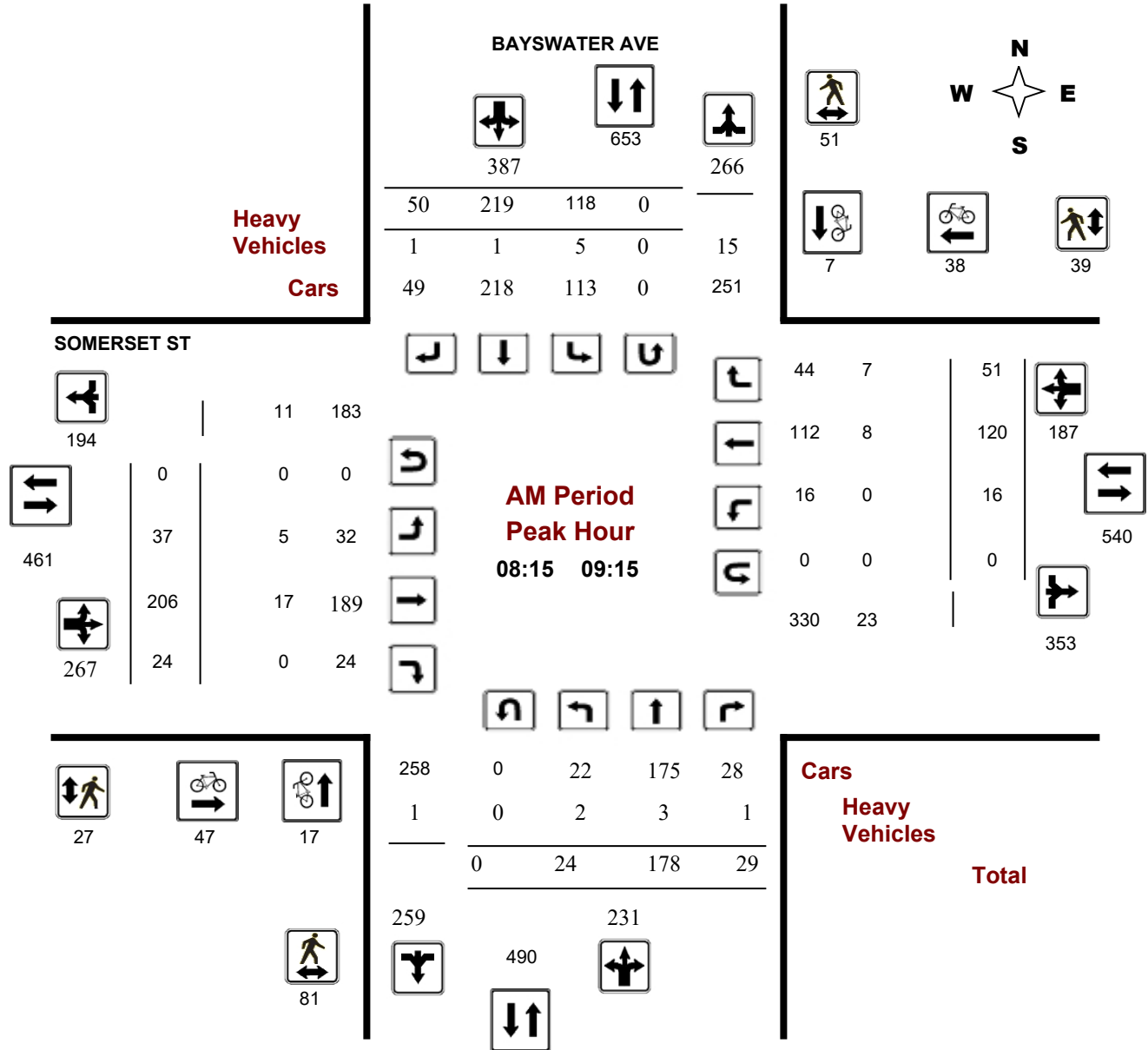
### BAYSWATER AVE @ SOMERSET ST

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

**Start Time:** 07:00

**WO No:** 36276

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

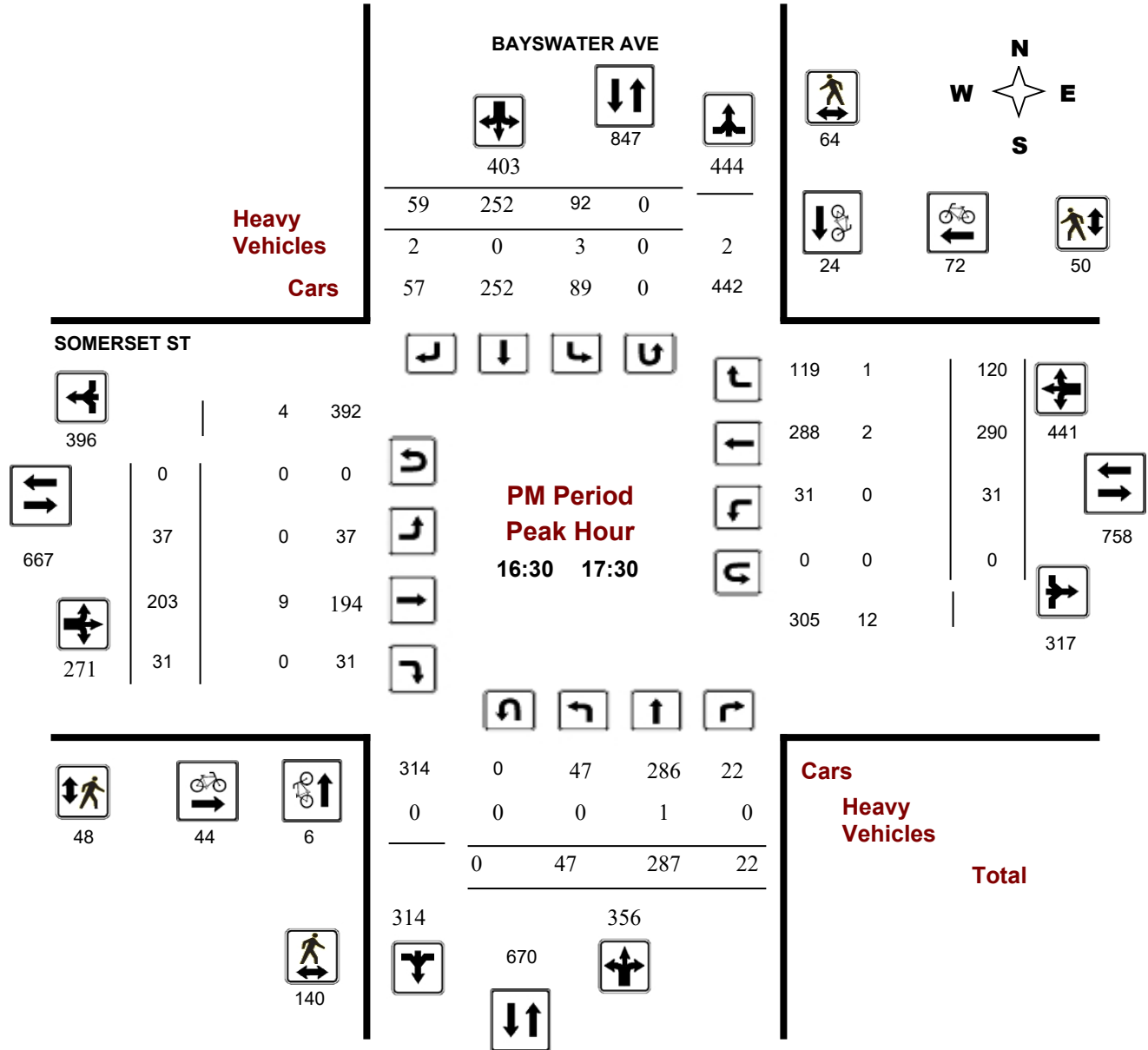
### BAYSWATER AVE @ SOMERSET ST

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

**Start Time:** 07:00

**WO No:** 36276

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BAYSWATER AVE @ SOMERSET ST

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

**WO No:** 36276

**Start Time:** 07:00

**Device:** Miovision

### Full Study Summary (8 HR Standard)

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

**Total Observed U-Turns**  
 Northbound: 0      Southbound: 0  
 Eastbound: 0      Westbound: 0

**AADT Factor**  
 1.00

#### BAYSWATER AVE

#### SOMERSET ST

Period	Northbound					Southbound					Eastbound					Westbound					Grand Total
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT			
07:00 08:00	22	99	14	135	70	198	34	302	437	22	150	17	189	2	89	33	124	313	750		
08:00 09:00	23	168	26	217	120	217	45	382	599	45	201	30	276	16	114	54	184	460	1059		
09:00 10:00	23	106	23	152	88	152	40	280	432	24	184	30	238	12	151	44	207	445	877		
11:30 12:30	31	101	16	148	112	107	61	280	428	22	221	24	267	18	233	75	326	593	1021		
12:30 13:30	34	93	11	138	84	112	52	248	386	30	206	21	257	17	223	71	311	568	954		
15:00 16:00	34	315	16	365	85	180	54	319	684	25	182	20	227	21	216	94	331	558	1242		
16:00 17:00	49	328	16	393	97	219	48	364	757	32	222	33	287	24	260	111	395	682	1439		
17:00 18:00	43	224	26	293	72	208	58	338	631	31	191	25	247	43	280	101	424	671	1302		
<b>Sub Total</b>	259	1434	148	1841	728	1393	392	2513	4354	231	1557	200	1988	153	1566	583	2302	4290	8644		
<b>U Turns</b>	0			0	0			0	0	0			0	0			0	0	0		
<b>Total</b>	259	1434	148	1841	728	1393	392	2513	4354	231	1557	200	1988	153	1566	583	2302	4290	8644		
<b>EQ 12Hr</b>	360	1993	206	2559	1012	1936	545	3493	6052	321	2164	278	2763	213	2177	810	3200	5963	12015		
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																<b>1.39</b>					
<b>AVG 12Hr</b>	360	1993	206	2559	1012	1936	545	3493	6052	321	2164	278	2763	213	2177	810	3200	5963	12015		
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																<b>1.00</b>					
<b>AVG 24Hr</b>	472	2611	270	3353	1326	2536	714	4576	7929	421	2835	364	3620	279	2852	1061	4192	7812	15741		
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																<b>1.31</b>					

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

## Turning Movement Count - Peak Hour Diagram

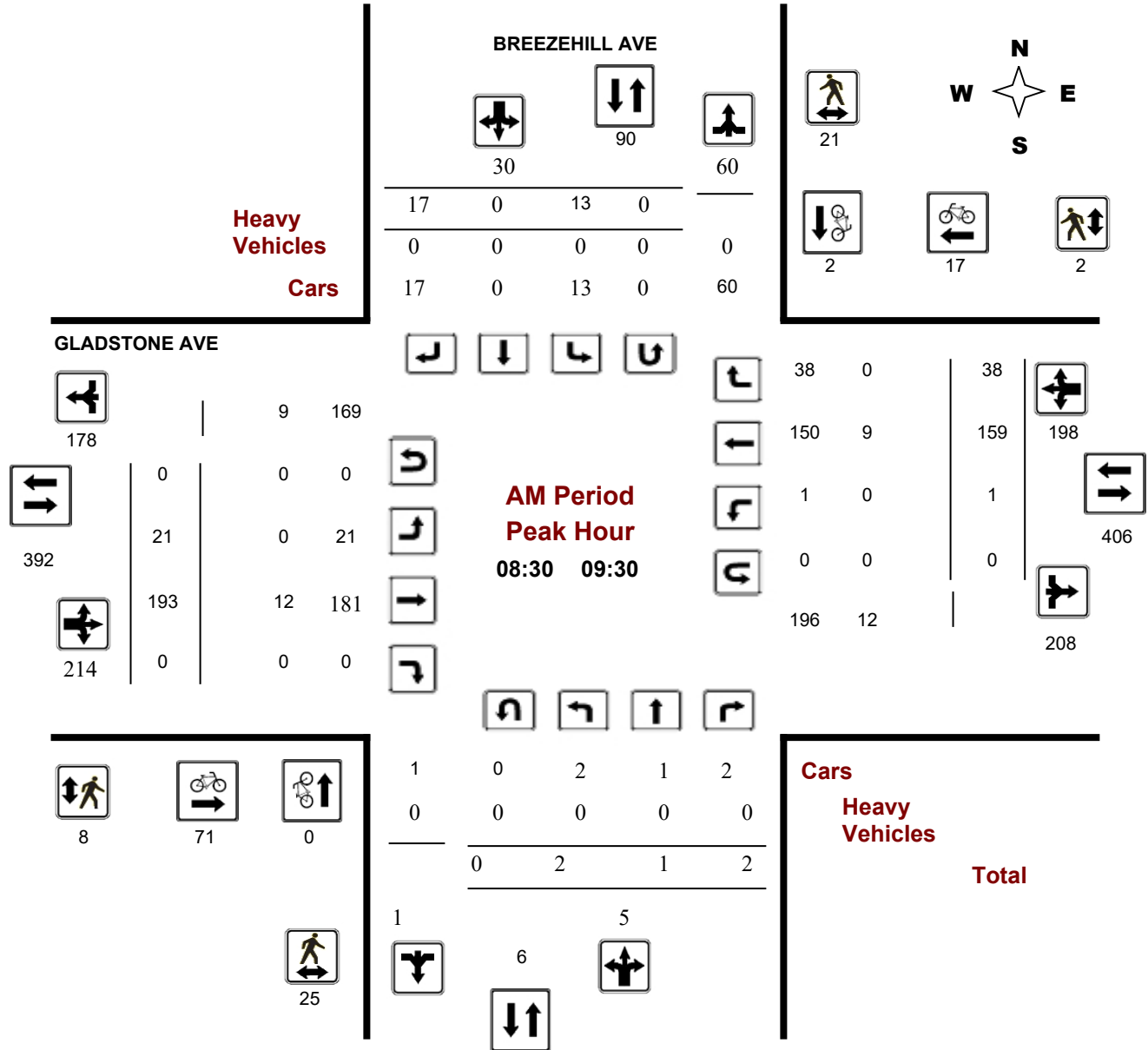
### BREEZEHILL AVE @ GLADSTONE AVE

**Survey Date:** Wednesday, July 18, 2018

**Start Time:** 07:00

**WO No:** 37971

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

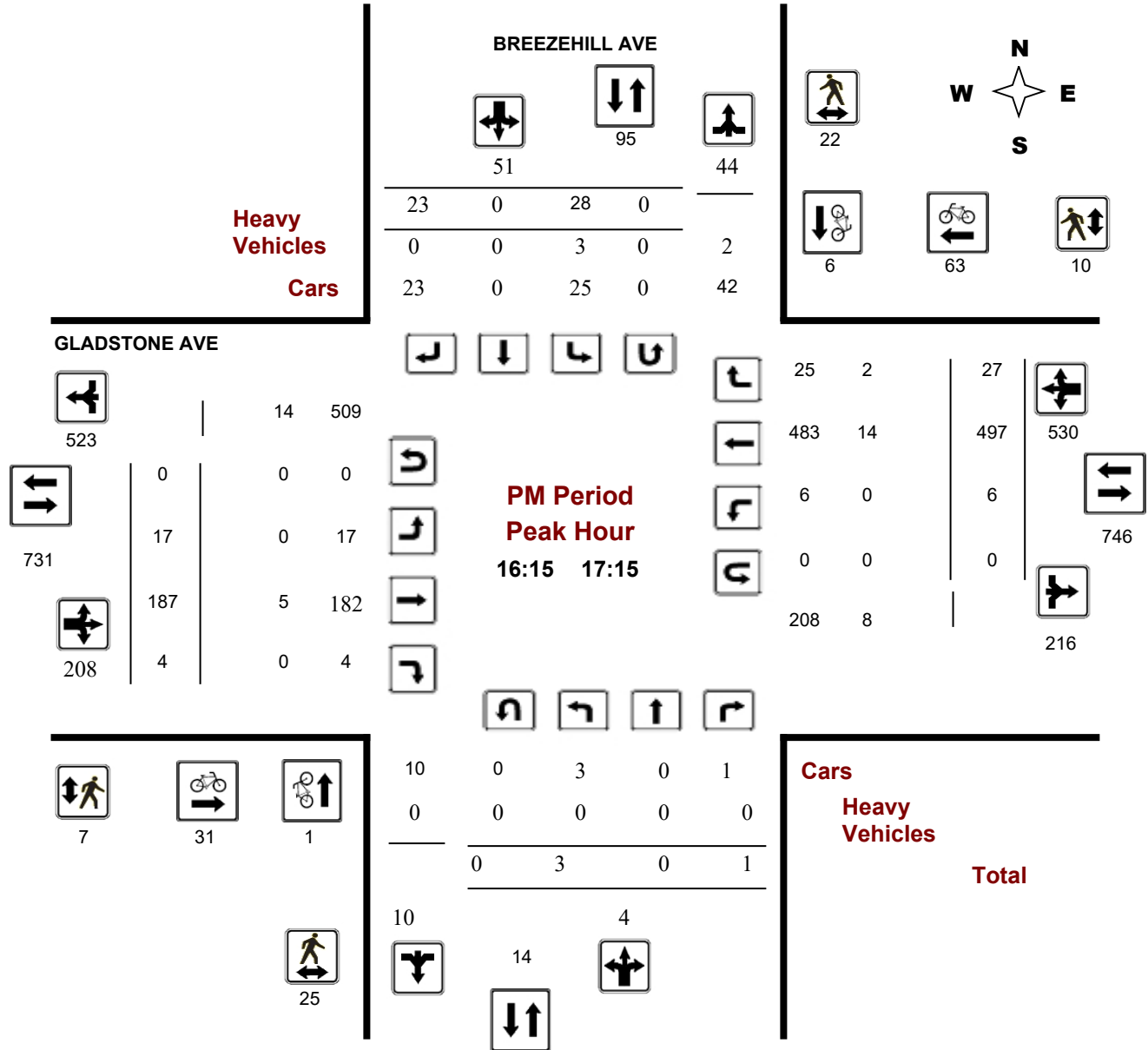
### BREEZEHILL AVE @ GLADSTONE AVE

**Survey Date:** Wednesday, July 18, 2018

**Start Time:** 07:00

**WO No:** 37971

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BREEZEHILL AVE @ GLADSTONE AVE

**Survey Date:** Wednesday, July 18, 2018

**WO No:** 37971

**Start Time:** 07:00

**Device:** Miovision

### Full Study Summary (8 HR Standard)

**Survey Date:** Wednesday, July 18, 2018

**Total Observed U-Turns**

**AADT Factor**

Northbound: 0      Southbound: 0

.90

Eastbound: 0      Westbound: 0

#### BREEZEHILL AVE

#### GLADSTONE AVE

Period	Northbound					Southbound					Eastbound					Westbound					Grand Total
	LT	ST	RT	NB TOT	STR TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	STR TOT	LT	ST	RT	WB TOT	STR TOT	
07:00 08:00	0	1	2	3	22	8	1	10	19	22	17	132	0	149	22	0	101	16	117	266	288
08:00 09:00	1	1	3	5	35	10	0	20	30	35	23	202	0	225	35	1	156	27	184	409	444
09:00 10:00	3	1	1	5	47	22	0	20	42	47	24	157	0	181	47	2	143	32	177	358	405
11:30 12:30	5	0	2	7	52	24	0	21	45	52	20	166	5	191	52	2	168	20	190	381	433
12:30 13:30	1	2	3	6	40	17	2	15	34	40	13	157	1	171	40	2	175	9	186	357	397
15:00 16:00	4	3	3	10	48	18	0	20	38	48	8	164	1	173	48	0	347	16	363	536	584
16:00 17:00	1	0	1	2	51	25	0	24	49	51	17	199	5	221	51	3	478	24	505	726	777
17:00 18:00	5	0	3	8	39	16	1	14	31	39	6	157	3	166	39	6	441	14	461	627	666
<b>Sub Total</b>	20	8	18	46	334	140	4	144	288	334	128	1334	15	1477	334	16	2009	158	2183	3660	3994
<b>U Turns</b>	0			0	0	0			0	0	0			0	0	0			0	0	0
<b>Total</b>	20	8	18	46	334	140	4	144	288	334	128	1334	15	1477	334	16	2009	158	2183	3660	3994
<b>EQ 12Hr</b>	28	11	25	64	465	195	6	200	401	465	178	1854	21	2053	465	22	2793	220	3035	5088	5553
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																	<b>1.39</b>				
<b>AVG 12Hr</b>	25	10	22	57	418	176	5	180	361	418	160	1669	19	1848	418	20	2514	198	2732	4580	4998
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																	<b>.90</b>				
<b>AVG 24Hr</b>	33	13	29	75	549	231	7	236	474	549	210	2186	25	2421	549	26	3293	259	3578	5999	6548
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																	<b>1.31</b>				

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

## Turning Movement Count - Peak Hour Diagram

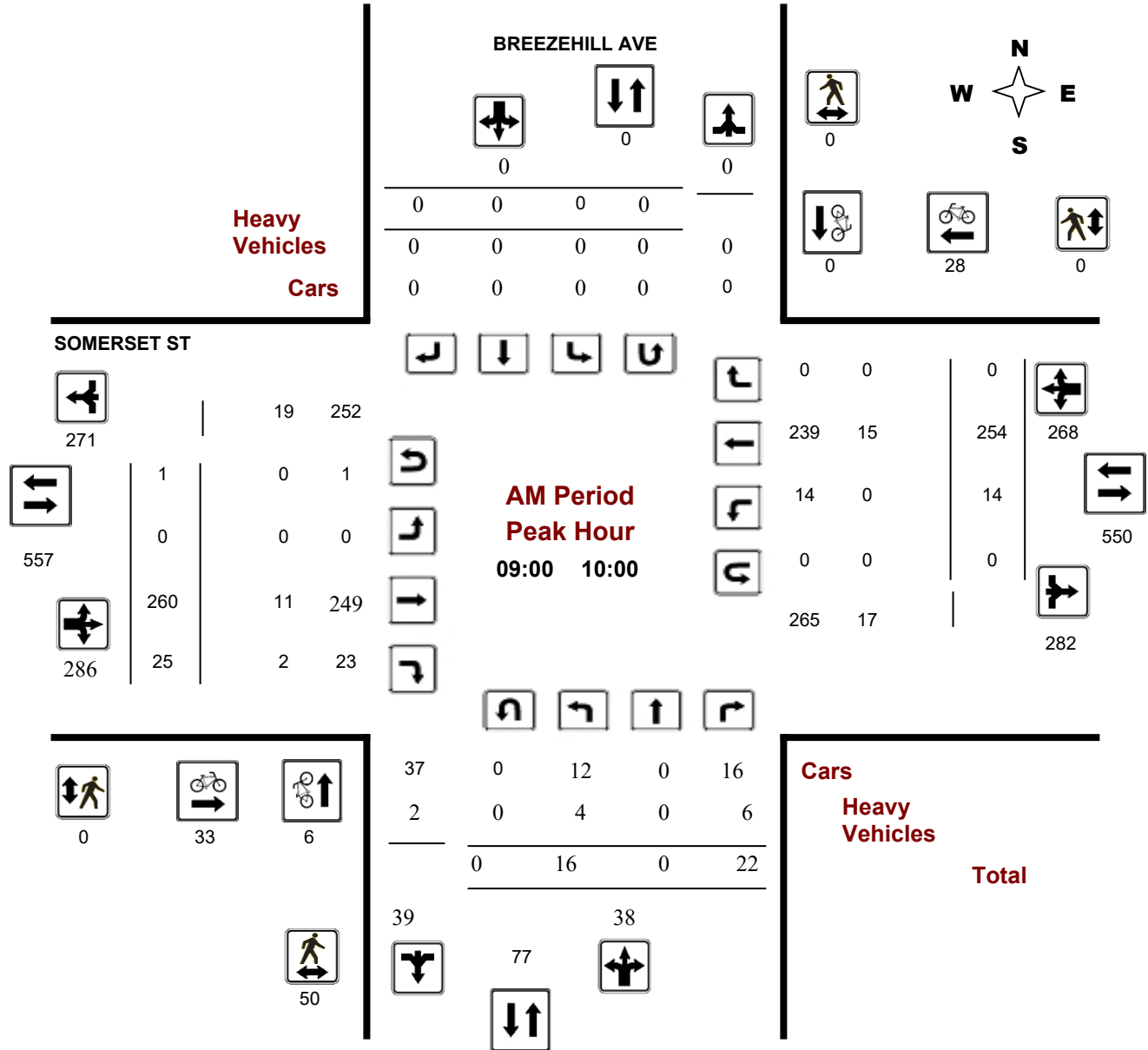
### BREEZEHILL AVE @ SOMERSET ST

**Survey Date:** Thursday, August 13, 2015

**Start Time:** 07:00

**WO No:** 35301

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

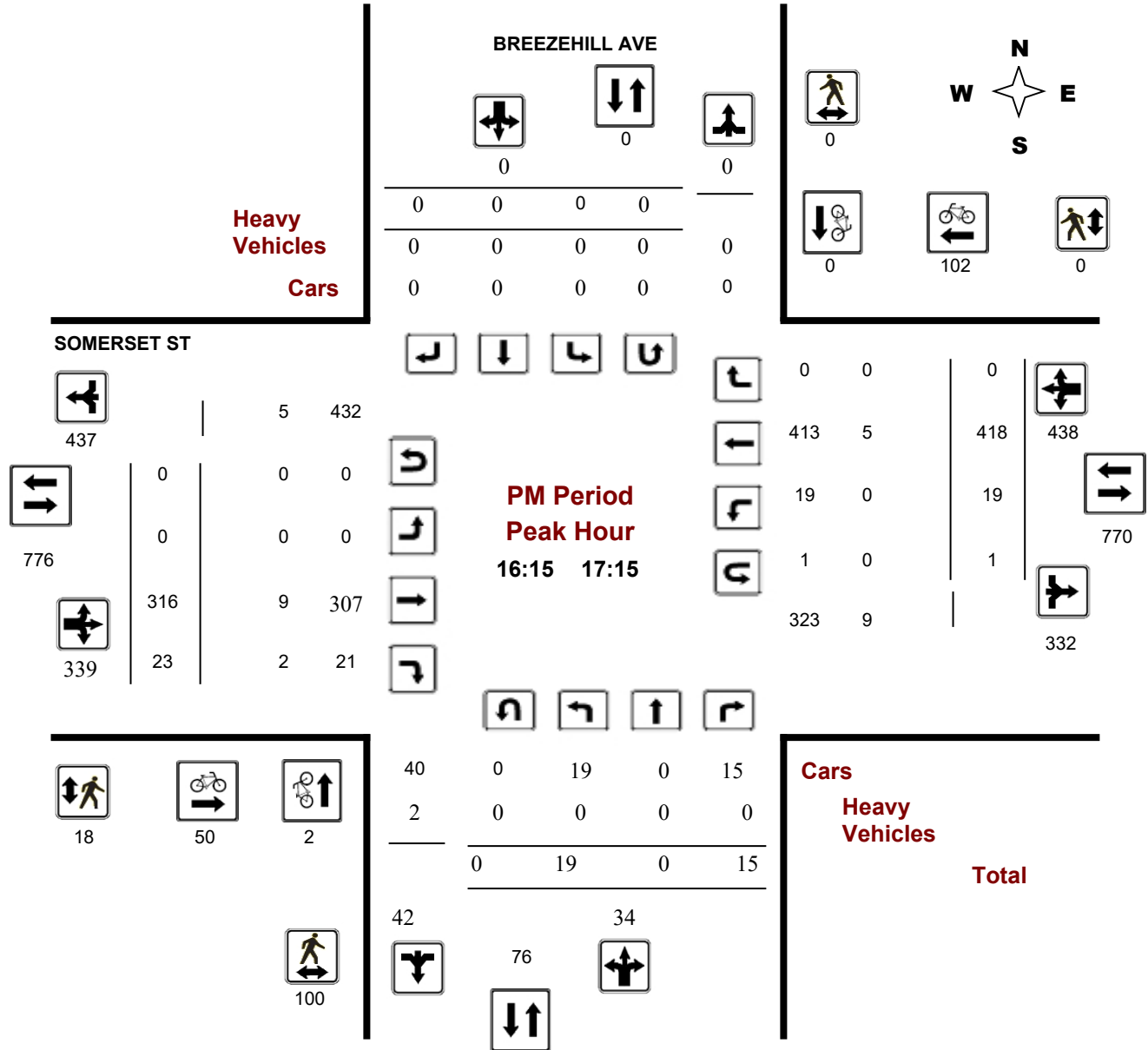
### BREEZEHILL AVE @ SOMERSET ST

**Survey Date:** Thursday, August 13, 2015

**Start Time:** 07:00

**WO No:** 35301

**Device:** Miovision







# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BREEZEHILL AVE @ SOMERSET ST

**Survey Date:** Thursday, August 13, 2015

**WO No:** 35301

**Start Time:** 07:00

**Device:** Miovision

### Full Study Summary (8 HR Standard)

**Survey Date:** Thursday, August 13, 2015

**Total Observed U-Turns**

**AADT Factor**

Northbound: 0      Southbound: 0  
 Eastbound: 4      Westbound: 2

.90

**BREEZEHILL AVE**

**SOMERSET ST**

Period	BREEZEHILL AVE Northbound					BREEZEHILL AVE Southbound					SOMERSET ST Eastbound					SOMERSET ST Westbound					Grand Total
	LT	ST	RT	NB TOT	STR TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	STR TOT	LT	ST	RT	WB TOT	STR TOT	
07:00 08:00	6	0	15	21	21	0	0	0	0	21	0	171	13	184	184	10	145	0	155	339	360
08:00 09:00	13	0	24	37	37	0	0	0	0	37	0	275	17	292	292	15	188	0	203	495	532
09:00 10:00	16	0	22	38	38	0	0	0	0	38	0	260	25	285	285	14	254	0	268	553	591
11:30 12:30	25	0	25	50	50	0	0	0	0	50	0	309	17	326	326	25	293	0	318	644	694
12:30 13:30	16	0	15	31	31	0	0	0	0	31	0	265	26	291	291	15	288	0	303	594	625
15:00 16:00	25	0	18	43	43	0	0	0	0	43	0	250	15	265	265	16	331	0	347	612	655
16:00 17:00	13	0	19	32	32	0	0	0	0	32	0	311	21	332	332	22	422	0	444	776	808
17:00 18:00	18	0	17	35	35	0	0	0	0	35	0	296	13	309	309	19	408	0	427	736	771
<b>Sub Total</b>	132	0	155	287	287	0	0	0	0	287	0	2137	147	2284	2284	136	2329	0	2465	4749	5036
<b>U Turns</b>	0			0	0				0	0	4			4	2				2	6	6
<b>Total</b>	132	0	155	287	287	0	0	0	0	287	4	2137	147	2288	2288	138	2329	0	2467	4755	5042
<b>EQ 12Hr</b>	183	0	215	398	398	0	0	0	0	398	6	2970	204	3180	3180	192	3237	0	3429	6609	7007
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																<b>1.39</b>					
<b>AVG 12Hr</b>	165	0	194	359	359	0	0	0	0	359	5	2673	184	2862	2862	173	2913	0	3086	5948	6307
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																<b>.90</b>					
<b>AVG 24Hr</b>	216	0	254	470	470	0	0	0	0	470	7	3502	241	3750	3750	227	3816	0	4043	7793	8263

Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. **1.31**

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

## Turning Movement Count - Peak Hour Diagram

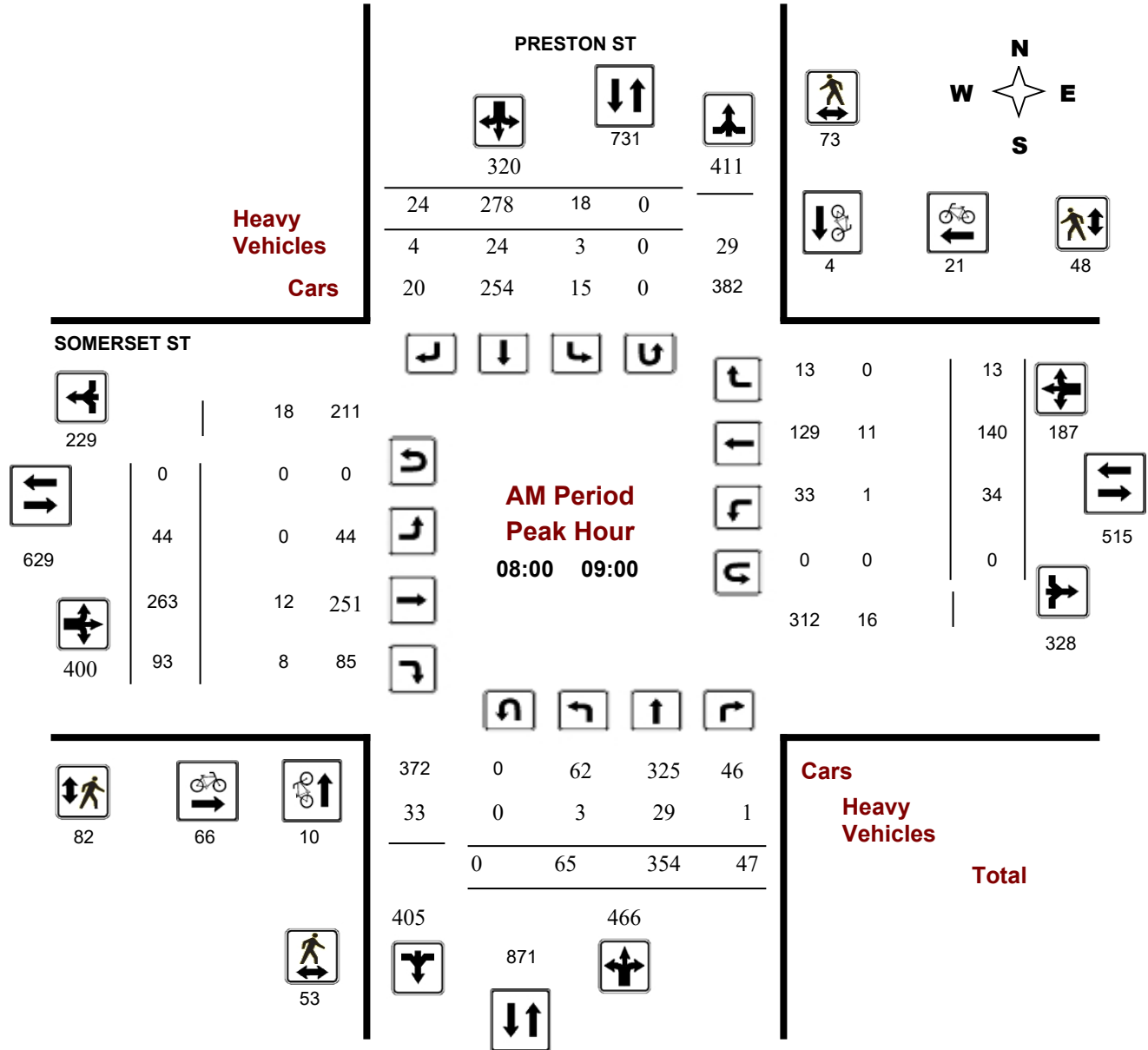
### PRESTON ST @ SOMERSET ST

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

**Start Time:** 07:00

**WO No:** 37133

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

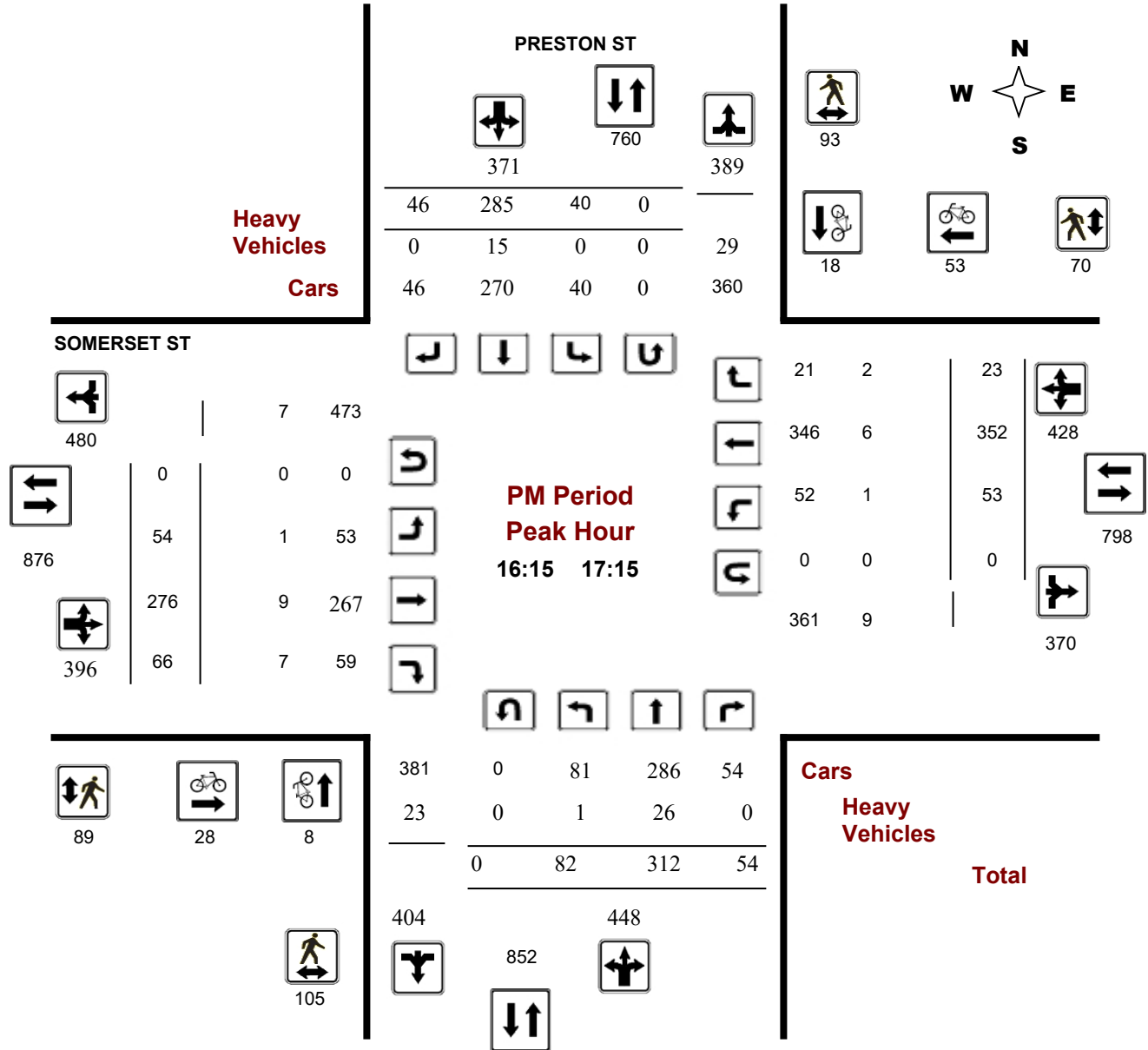
### PRESTON ST @ SOMERSET ST

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

**Start Time:** 07:00

**WO No:** 37133

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### PRESTON ST @ SOMERSET ST

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

**WO No:** 37133

**Start Time:** 07:00

**Device:** Miovision

### Full Study Summary (8 HR Standard)

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

**Total Observed U-Turns**  
 Northbound: 0      Southbound: 0  
 Eastbound: 0      Westbound: 0

**AADT Factor**  
 .90

#### PRESTON ST

#### SOMERSET ST

Period	PRESTON ST Northbound					PRESTON ST Southbound					SOMERSET ST Eastbound					SOMERSET ST Westbound					Grand Total
	LT	ST	RT	NB TOT	STR TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	STR TOT	LT	ST	RT	WB TOT	STR TOT	
07:00 08:00	39	260	51	350	703	18	315	20	353	703	29	164	73	266	409	35	97	11	143	409	1112
08:00 09:00	65	354	47	466	786	18	278	24	320	786	44	263	93	400	587	34	140	13	187	587	1373
09:00 10:00	52	239	51	342	730	22	328	38	388	730	38	196	85	319	509	31	146	13	190	509	1239
11:30 12:30	68	221	54	343	626	24	222	37	283	626	45	212	74	331	581	43	181	26	250	581	1207
12:30 13:30	62	236	39	337	633	19	233	44	296	633	48	216	93	357	664	70	213	24	307	664	1297
15:00 16:00	79	342	54	475	818	39	263	41	343	818	55	246	81	382	725	46	273	24	343	725	1543
16:00 17:00	77	323	56	456	833	49	282	46	377	833	40	268	64	372	794	57	346	19	422	794	1627
17:00 18:00	85	310	54	449	760	15	256	40	311	760	55	282	88	425	842	51	333	33	417	842	1602
<b>Sub Total</b>	527	2285	406	3218	5889	204	2177	290	2671	5889	354	1847	651	2852	5111	367	1729	163	2259	5111	11000
<b>U Turns</b>	0			0	0	0			0	0	0			0	0	0			0	0	0
<b>Total</b>	527	2285	406	3218	5889	204	2177	290	2671	5889	354	1847	651	2852	5111	367	1729	163	2259	5111	11000
<b>EQ 12Hr</b>	733	3176	564	4473	8186	284	3026	403	3713	8186	492	2567	905	3964	7104	510	2403	227	3140	7104	15290
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																		<b>1.39</b>			
<b>AVG 12Hr</b>	660	2858	508	4026	7368	256	2723	363	3342	7368	443	2310	814	3567	6393	459	2163	204	2826	6393	13761
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																		<b>.90</b>			
<b>AVG 24Hr</b>	865	3744	665	5274	9652	335	3567	476	4378	9652	580	3026	1066	4672	8374	601	2834	267	3702	8374	18026
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																		<b>1.31</b>			

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

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

## Traffic Signal Operations Unit

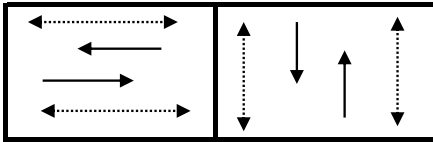
<b>Intersection:</b>	<i>Main:</i> Somerset	<i>Side:</i> Bayswater
<b>Controller:</b>	ATC 3	<b>TSD:</b> 5018
<b>Author:</b>	Matthew Anderson	<b>Date:</b> 04-Nov-20

## 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>	70	60	75	60	65			
<b>Offset</b>	19	38	63	40	38			
EB Thru	35	31	40	31	35	17	8	3.3+2.2
WB Thru	35	31	40	31	35	17	8	3.3+2.2
NB Thru	35	29	35	29	30	13	10	3.3+2.6
SB Thru	35	29	35	29	30	13	10	3.3+2.6

## Phasing Sequence<sup>‡</sup>

Plans: All



## Schedule

### Weekday

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

### Saturday

Time	Plan
0:15	4
6:30	2
9:00	5
18:30	2
22:30	4

### Sunday

Time	Plan
0:15	4
6:30	2
9:00	5
18:00	2
22:30	4

## Notes

<sup>†</sup>: Time for each direction includes amber and all red intervals

<sup>‡</sup>: Start of first phase should be used as reference point for offset

Asterisk (\*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄.....► Pedestrian signal

Cost is \$58.78 (\$52.02 + HST)

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

## Traffic Signal Operations Unit

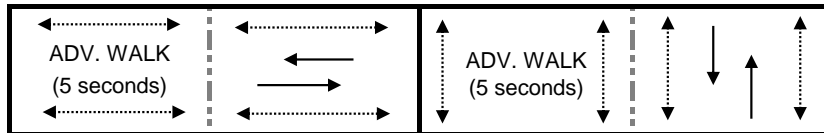
<b>Intersection:</b>	<i>Main:</i> Somerset	<i>Side:</i> Preston
<b>Controller:</b>	<b>ATC 3</b>	<b>TSD: 5079</b>
<b>Author:</b>	Matthew Anderson	<b>Date:</b> 2020-11-04

## 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>	70	70	70	60	65			
<b>Offset</b>	37	33	32	28	28			
EB Thru	31	34	34	30	31	7	12	3.3+2.3
WB Thru	31	34	34	30	31	7	12	3.3+2.3
NB Thru	39	36	36	30	34	7	14	3.3+2.4
SB Thru	39	36	36	30	34	7	14	3.3+2.4

## Phasing Sequence‡

Plan: All



**Notes:** 1) Right turn is prohibited on Redin all directions, weekdays between 700-1900

## Schedule

Weekday		Weekend	
Time	Plan	Time	Plan
0:15	4	0:15	4
6:00	1	8:00	2
9:30	2	12:00	5
15:00	3	18:00	2
18:00	2	22:00	4
22:00	4		

## Notes

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

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

Asterisk (\*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄.....► Pedestrian signal

Cost is \$58.78 (\$52.02 + HST)



# Spot Speed Survey Histogram

Glossary of Relevant Spot Speed Survey Terms



## Somerset Street West between Bayswater Avenue & Breezehill Avenue North

Immediately west of Breezehill Avenue North

Hintonburg

Ward: 15

Ottawa

Wednesday 10 February 2021

Road Surface: Asphalt

Road Condition:

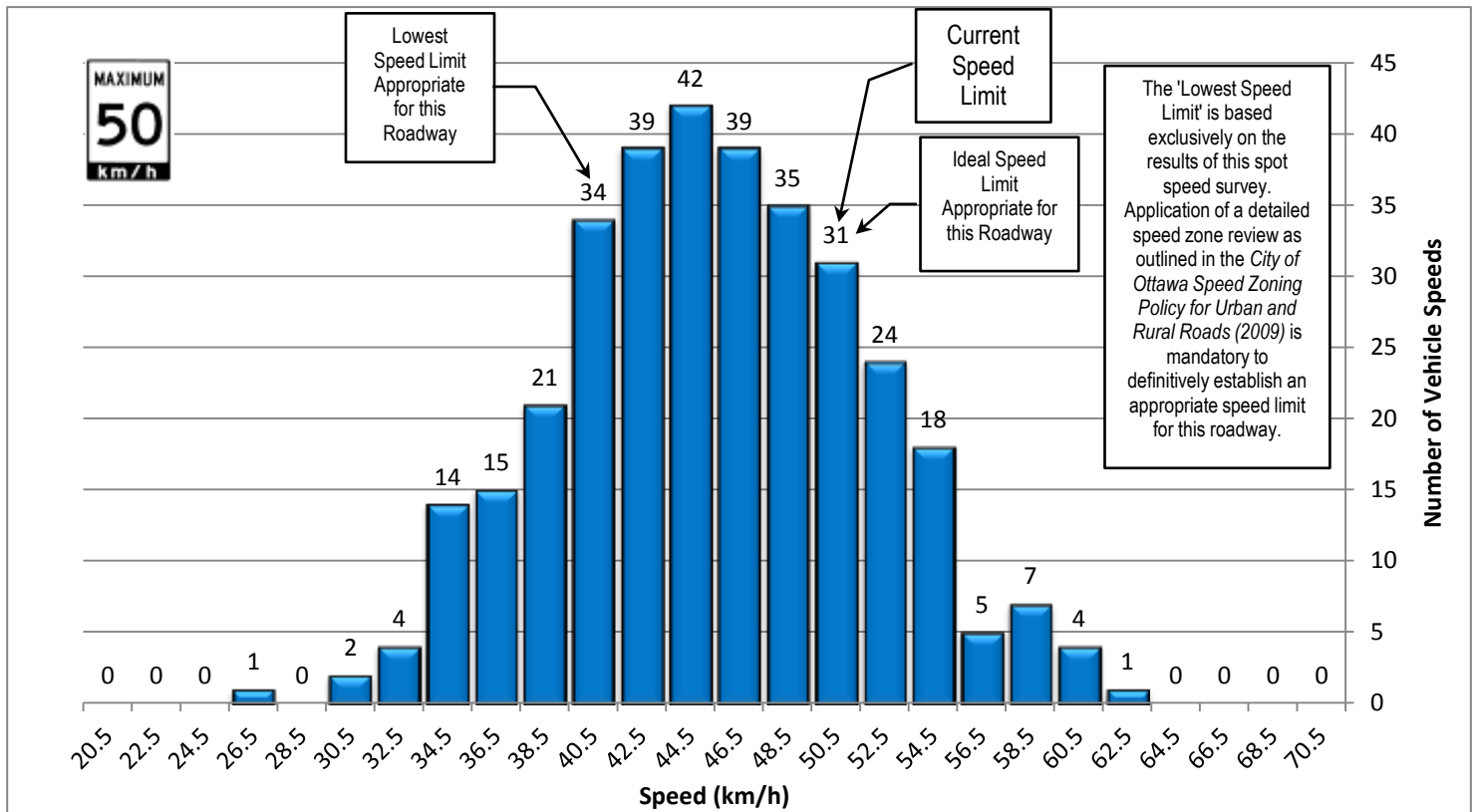
Dry

Weather: Overcast

Survey Hours: 0930-1130

Notes: One westbound driver completed a U-turn in extremely close proximity to a westbound OCTranspo bus.

### Spot Speed Survey Histogram - All Vehicles - Combined Directions



### Glossary of Relevant Spot Speed Survey Terms

- Mean Speed:** The average speed, calculated as the sum of all speeds divided by the number of speed observations.
- Median Speed:** The speed that equally divides the distribution of spot speeds; 50 % of observed speeds are higher than the median; 50 % of the observed speeds are lower than the median.
- Mode:** The number that occurs most frequently in a series of numbers.
- Pace Speed:** The 16 km/h (typically, 15 km/h) increment in speeds that encompass the highest portion of observed speeds; often, the pace speed range is the mean speed plus/minus 8 km/h.
- 85th percentile Speed:** The speed at or below which 85 % of a sample of free-flowing vehicles is travelling (based on the results of a spot speed survey). The 85th percentile speed is typically used as a baseline for establishing the speed limit.

#### DISCLAIMER

The data contained in this data summary are for information purposes only, and may not apply to your situation. Every effort is made to ensure the traffic count or speed survey information is accurate for the survey date provided on the summary, flow chart and/or histogram forms. The author, publisher, and distributor provide no warranty about the content or accuracy of either the summary, flow charts, or histogram. Information provided is subjective. The publisher, author, and distributor shall not be liable for any loss of profit or any other commercial damages resulting from the use of the data.



# Spot Speed Survey Summary

Including Estimated Driver Compliance and Recommended Speed Limits



## Somerset Street West between Bayswater Avenue & Breezehill Avenue North

Immediately west of Breezehill Avenue North

Hintonburg

Ward: 15

Ottawa

Wednesday 10 February 2021

Road Surface: Asphalt

Road Condition:

Dry

Weather: Overcast

Survey Hours: 0930-1130

Notes: One westbound driver completed a U-turn in extremely close proximity to a westbound OCTranspo bus.

### Spot Speed Survey Summaries for All Vehicle Types

Westbound		Speed Limit <b>50</b> km/h	Eastbound	
Total Number of All Vehicles	149		Total Number of All Vehicles	187
Average (Mean) Speed	47 km/h	Average (Mean) Speed	44 km/h	
85th Percentile Speed	53 km/h	85th Percentile Speed	51 km/h	
95th Percentile Speed	57 km/h	95th Percentile Speed	55 km/h	
Upper Limit Pace Speed Range	54 km/h	Upper Limit Pace Speed Range	52 km/h	
Driver Compliance with Speed Limit	71 %	Driver Compliance with Speed Limit	83 %	

Spot Speed Summary - Combined Both Directions	
Total Number of All Vehicles	336
Average (Mean) Speed	45 km/h
85th Percentile Speed	52 km/h
95th Percentile Speed	56 km/h
Upper Limit Pace Speed Range	54 km/h
Driver Compliance with Speed Limit	78%

Additional Survey Details	
Highest vehicle speed in summary	62 km/h
Slowest vehicle speed in summary	26 km/h
Speed Differential	36 km/h
Fastest Speed Observed *	62 km/h

\* The FASTEST speed observed is NOT included in the summary if it is > than the HIGHEST vehicle speed in the summary. It is included for information only.

Arterial Roadway

### Heavy Vehicle Spot Speed Survey Summary

Total Number of Heavy Vehicles *	57
Average (Mean) Speed	41 km/h
85th Percentile Speed	46 km/h
Driver Compliance with Speed Limit	95%

Trucks  
26



Buses  
30



School Buses  
1



\* N/A if the total number of heavy vehicles < 6.

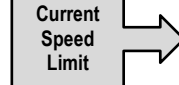
\* If the total number of heavy vehicles is < 30, this value is insufficient for a valid statistical sample.

### Estimated Driver Compliance

with an increase or decrease in the posted speed limit.

Speed Limit	Compliance
30 km/h	1%
40 km/h	22%
50 km/h	78%
60 km/h	99%
70 km/h	100%
80 km/h	100%
90 km/h	100%
100 km/h	100%

Current Speed Limit



### City of Ottawa Speed Zoning Policy for Urban and Rural Roads (2009)

Based <b>exclusively</b> on the results of this spot speed survey and using the criteria set forth in the <i>City of Ottawa Speed Zoning Policy for Urban and Rural Roads (2009)</i> , the ideal speed limit for this roadway is:	<b>50 km/h</b>
The lowest speed limit appropriate for this roadway shall not differ from the 85th percentile speed by more than 13 km/h. In this case, the lowest speed limit must not be lower than:	<b>40 km/h</b>





# Spot Speed Survey Histogram

Glossary of Relevant Spot Speed Survey Terms



## Somerset Street West between Bayswater Avenue & Breezehill Avenue North

Immediately west of Breezehill Avenue North

Hintonburg

Ward: 15

Ottawa

Monday

8 February 2021

Road Surface: Asphalt

Road Condition:

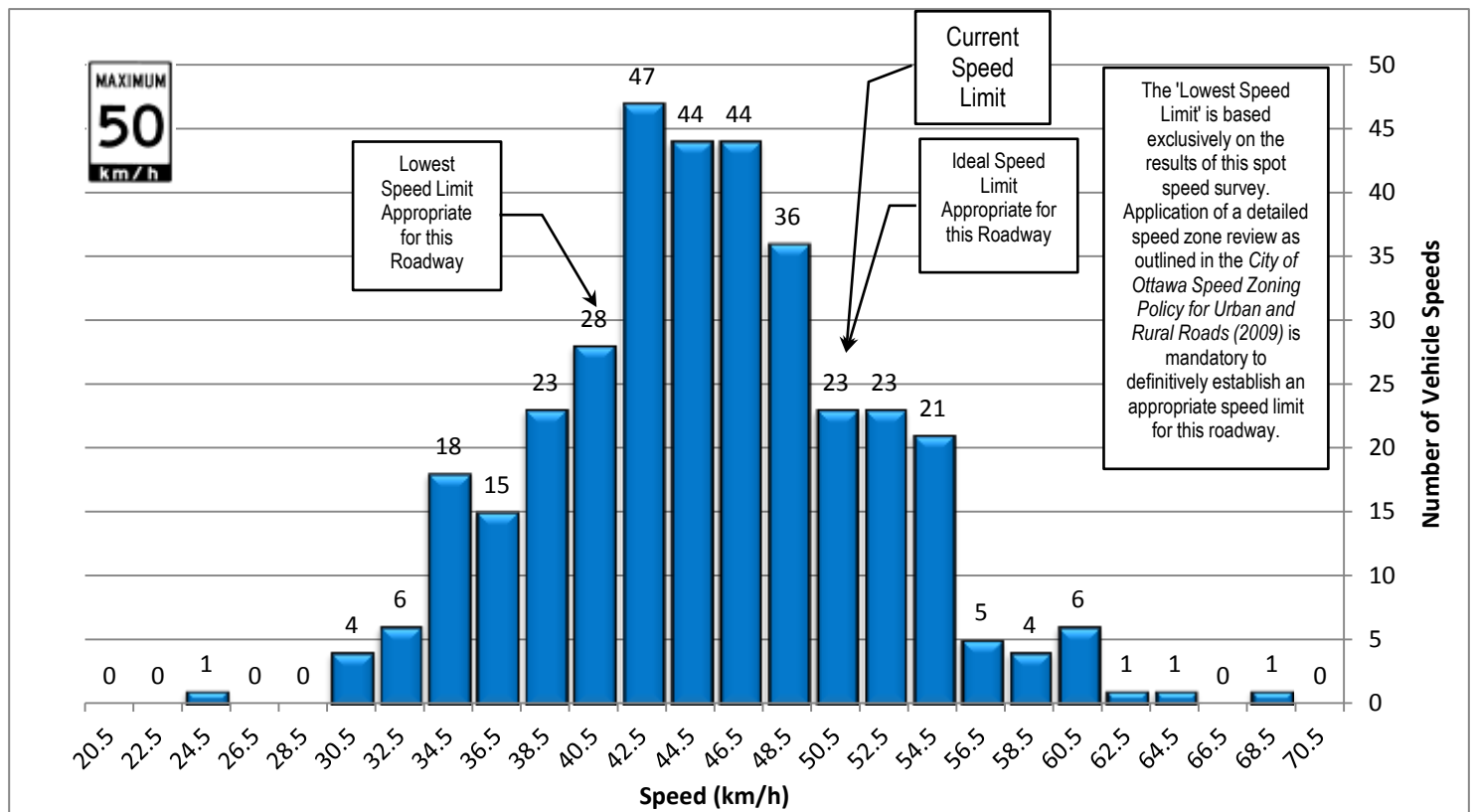
Dry

Weather: Partly Cloudy

Survey Hours: 1400-1600

Notes: Adult school crossing guard assisted pedestrians crossing Bayswater Avenue North 1445H - 1530H

## Spot Speed Survey Histogram - All Vehicles - Combined Directions



### Glossary of Relevant Spot Speed Survey Terms

- Mean Speed:** The average speed, calculated as the sum of all speeds divided by the number of speed observations.
- Median Speed:** The speed that equally divides the distribution of spot speeds; 50 % of observed speeds are higher than the median; 50 % of the observed speeds are lower than the median.
- Mode:** The number that occurs most frequently in a series of numbers.
- Pace Speed:** The 16 km/h (typically, 15 km/h) increment in speeds that encompass the highest portion of observed speeds; often, the pace speed range is the mean speed plus/minus 8 km/h.
- 85th percentile Speed:** The speed at or below which 85 % of a sample of free-flowing vehicles is travelling (based on the results of a spot speed survey). The 85th percentile speed is typically used as a baseline for establishing the speed limit.

#### DISCLAIMER

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# Spot Speed Survey Summary

Including Estimated Driver Compliance and Recommended Speed Limits



## Somerset Street West between Bayswater Avenue & Breezehill Avenue North

Immediately west of Breezehill Avenue North

Hintonburg

Ward: 15

Ottawa

Monday

8 February 2021

Road Surface: Asphalt

Road Condition:

Dry

Weather: Partly Cloudy

Survey Hours: 1400-1600

Notes: Adult school crossing guard assisted pedestrians crossing Bayswater Avenue North 1445H - 1530H

### Spot Speed Survey Summaries for All Vehicle Types

Westbound		Speed Limit <b>50</b> km/h	Eastbound	
Total Number of All Vehicles	158		Total Number of All Vehicles	193
Average (Mean) Speed	46 km/h	Average (Mean) Speed	44 km/h	
85th Percentile Speed	53 km/h	85th Percentile Speed	52 km/h	
95th Percentile Speed	56 km/h	95th Percentile Speed	56 km/h	
Upper Limit Pace Speed Range	54 km/h	Upper Limit Pace Speed Range	54 km/h	
Driver Compliance with Speed Limit	76 %	Driver Compliance with Speed Limit	81 %	

Spot Speed Summary - Combined Both Directions	
Total Number of All Vehicles	351
Average (Mean) Speed	45 km/h
85th Percentile Speed	52 km/h
95th Percentile Speed	56 km/h
Upper Limit Pace Speed Range	54 km/h
Driver Compliance with Speed Limit	79%

Additional Survey Details	
Highest vehicle speed in summary	68 km/h
Slowest vehicle speed in summary	24 km/h
Speed Differential	44 km/h
Fastest Speed Observed *	68 km/h

\* The FASTEST speed observed is NOT included in the summary if it is > than the HIGHEST vehicle speed in the summary. It is included for information only.

Arterial Roadway

### Heavy Vehicle Spot Speed Survey Summary

Total Number of Heavy Vehicles *	42
Average (Mean) Speed	39 km/h
85th Percentile Speed	44 km/h
Driver Compliance with Speed Limit	99%

Trucks  
15



Buses  
26



School Buses  
1



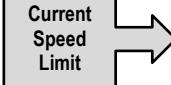
\* N/A if the total number of heavy vehicles < 6.  
\* If the total number of heavy vehicles is < 30, this value is insufficient for a valid statistical sample.

### Estimated Driver Compliance

with an increase or decrease in the posted speed limit.

Speed Limit	Compliance
30 km/h	1%
40 km/h	23%
50 km/h	79%
60 km/h	98%
70 km/h	100%
80 km/h	100%
90 km/h	100%
100 km/h	100%

Current Speed Limit



### City of Ottawa Speed Zoning Policy for Urban and Rural Roads (2009)

Based <b>exclusively</b> on the results of this spot speed survey and using the criteria set forth in the <i>City of Ottawa Speed Zoning Policy for Urban and Rural Roads (2009)</i> , the ideal speed limit for this roadway is:	<b>50 km/h</b>
The lowest speed limit appropriate for this roadway shall not differ from the 85th percentile speed by more than 13 km/h. In this case, the lowest speed limit must not be lower than:	<b>40 km/h</b>

## **APPENDIX E**

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Collision Records



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

From: January 1, 2014 To: December 31, 2018

**Location:** BAYSWATER AVE @ SOMERSET ST

**Traffic Control:** Traffic signal

**Total Collisions:** 16

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Feb-14, Fri,15:15	Snow	SMV other	Non-fatal injury	Wet	South	Turning right	Automobile, station wagon	Pedestrian	1
2014-May-30, Fri,08:59	Clear	Turning movement	P.D. only	Dry	North	Turning left	Passenger van	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Jul-13, Sun,23:03	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Turning left	Pick-up truck	Other motor vehicle	
2014-Sep-24, Wed,14:07	Clear	SMV other	Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Pedestrian	1
2014-Oct-03, Fri,19:46	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	
2015-Mar-22, Sun,14:11	Clear	SMV other	Non-fatal injury	Dry	South	Turning right	Pick-up truck	Pedestrian	1
2015-Oct-18, Sun,17:57	Clear	Other	P.D. only	Dry	North	Reversing	Pick-up truck	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Apr-06, Wed,19:49	Snow	SMV other	P.D. only	Loose snow	East	Turning left	Automobile, station wagon	Curb	0
2016-Aug-27, Sat,11:09	Clear	Sideswipe	P.D. only	Dry	West	Pulling away from shoulder or curb	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Municipal transit bus	Other motor vehicle	
2016-Dec-18, Sun,17:41	Snow	Other	P.D. only	Loose snow	East	Reversing	Construction equipment	Other motor vehicle	0
					East	Turning right	Automobile, station wagon	Other motor vehicle	
2016-Dec-20, Tue,19:05	Clear	Turning movement	P.D. only	Slush	South	Turning left	Pick-up truck	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Feb-15, Wed,10:15	Snow	Rear end	P.D. only	Loose snow	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Oct-30, Mon,07:36	Rain	SMV other	Non-fatal injury	Wet	East	Turning right	Pick-up truck	Pedestrian	1
2017-Dec-27, Wed,11:04	Clear	Turning movement	P.D. only	Ice	North	Turning left	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

From: January 1, 2014 To: December 31, 2018

**Location:** BAYSWATER AVE @ SOMERSET ST

**Traffic Control:** Traffic signal

**Total Collisions:** 16

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-May-10, Thu,11:14	Clear	SMV other	P.D. only	Dry	East	Turning right	Truck - open	Pole (utility, power)	0
2018-Dec-04, Tue,18:28	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	

**Location:** BREEZEHILL AVE @ GLADSTONE AVE

**Traffic Control:** Stop sign

**Total Collisions:** 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Aug-11, Mon,16:00	Clear	Angle	P.D. only	Dry	South	Turning left	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Motorcycle	Other motor vehicle	
2016-Dec-07, Wed,15:25	Clear	Turning movement	Non-fatal injury	Wet	East	Turning left	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Passenger van	Other motor vehicle	
2018-Jun-28, Thu,16:27	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

**Location:** BREEZEHILL AVE @ SOMERSET ST

**Traffic Control:** Stop sign

**Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Dec-14, Mon,16:00	Clear	Angle	Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

**Location:** PRESTON ST @ SOMERSET ST

**Traffic Control:** Traffic signal

**Total Collisions:** 25

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Apr-12, Sat,14:24	Clear	Turning movement	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Cyclist	0
					East	Going ahead	Bicycle	Other motor vehicle	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

From: January 1, 2014 To: December 31, 2018

**Location:** PRESTON ST @ SOMERSET ST

**Traffic Control:** Traffic signal

**Total Collisions:** 25

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Aug-06, Wed,07:52	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Bicycle	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Cyclist	
2014-Dec-22, Mon,17:00	Clear	Rear end	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Feb-08, Sun,13:40	Snow	Rear end	P.D. only	Slush	West	Unknown	Unknown	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Mar-16, Mon,13:30	Clear	Rear end	P.D. only	Dry	East	Unknown	Unknown	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Mar-31, Tue,15:15	Clear	Sideswipe	P.D. only	Dry	South	Unknown	Unknown	Other motor vehicle	0
					South	Turning right	Pick-up truck	Other motor vehicle	
2015-Apr-08, Wed,16:47	Clear	Turning movement	Non-fatal injury	Dry	West	Turning right	Automobile, station wagon	Cyclist	0
					West	Going ahead	Bicycle	Other motor vehicle	
2015-Jul-28, Tue,08:30	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Other motor vehicle	
2015-Sep-15, Tue,18:35	Clear	Sideswipe	P.D. only	Dry	North	Unknown	Unknown	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2015-Sep-23, Wed,16:11	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Tow truck	Other motor vehicle	
2015-Oct-01, Thu,17:28	Clear	SMV other	Non-fatal injury	Dry	West	Turning right	Automobile, station wagon	Pedestrian	1
2015-Oct-24, Sat,23:53	Rain	Turning movement	P.D. only	Wet	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Municipal transit bus	Other motor vehicle	
2015-Oct-30, Fri,11:41	Clear	Turning movement	Non-fatal injury	Dry	West	Going ahead	Bicycle	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Cyclist	



# Transportation Services - Traffic Services

## Collision Details Report - Public Version

From: January 1, 2014 To: December 31, 2018

**Location:** PRESTON ST @ SOMERSET ST

**Traffic Control:** Traffic signal

**Total Collisions:** 25

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Feb-17, Wed,16:42	Snow	Angle	P.D. only	Slush	West	Turning right	Pick-up truck	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2016-Apr-05, Tue,15:07	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	
2016-Jun-10, Fri,07:50	Clear	SMV other	Non-fatal injury	Dry	East	Going ahead	Bicycle	Other	0
2016-Jun-26, Sun,13:58	Clear	Sideswipe	Non-fatal injury	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Motorcycle	Other motor vehicle	
2016-Jul-09, Sat,20:32	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Dec-07, Wed,14:15	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2017-Sep-28, Thu,17:00	Clear	Sideswipe	P.D. only	Dry	West	Stopped	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Oct-05, Thu,17:53	Clear	Turning movement	Non-fatal injury	Dry	West	Turning right	Automobile, station wagon	Cyclist	0
					West	Going ahead	Bicycle	Other motor vehicle	
2017-Nov-28, Tue,17:54	Clear	SMV other	P.D. only	Dry	West	Going ahead	Unknown	Pole (utility, power)	0
2018-Jun-19, Tue,16:36	Clear	Sideswipe	P.D. only	Dry	North	Overtaking	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2018-Aug-17, Fri,16:29	Clear	Turning movement	Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Oct-25, Thu,16:59	Clear	Turning movement	P.D. only	Dry	North	Turning right	Unknown	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	

## **APPENDIX F**

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Excerpts from Other Study Area Developments



Module	Element	Explanation	Exempt/Required
<b>4.6 Neighbourhood Traffic Management</b>	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	Required
<b>4.8 Network Concept</b>		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Required

## 5 Development-Generated Travel Demand

### 5.1 Trip Generation and Mode Shares

This TIA has been prepared using the vehicle and person trip rates for the residential components using the TRANS Trip Generation Study Report (2009) and person trip rates for general office and the vehicle trip rates for the retail components using the ITE Trip Generation Manual (10<sup>th</sup> Edition). To estimate person trip generation for the retail component, a factor of 1.28 has been applied to the ITE rates. Table 5 summarizes the person trip rates for the proposed land uses.

Table 5: Trip Generation Person Trip Rates

Dwelling Type	Land Use Code	Peak Hour	Vehicle Trip Rate	Person Trip Rates
<b>High-rise condominiums (3+ floors)</b>	232 (TRANS)	AM	-	1.03
		PM	-	0.85
<b>General Office (Dense Multi-Use)</b>	710	AM	-	1.51
		PM	-	1.57
<b>Shopping Centre (Dense Multi-Use)</b>	820	AM	2.41	3.08
		PM	4.92	6.3

Using the above Person Trip rates, the total person trip generation has been estimates. Table 6 below illustrates the total person trip generation by dwelling type.

Table 6: Total Person Trip Generation

Land Use	Units / GFA	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
<b>High-rise condominiums</b>	745	116	368	484	314	193	507
<b>General Office</b>	206,480	243	40	283	47	244	291
<b>Shopping Centre</b>	17,894	128	78	206	94	101	195
<b>Total Person Trips</b>		<b>487</b>	<b>486</b>	<b>973</b>	<b>455</b>	<b>538</b>	<b>993</b>

As the proposed development is within a transit-oriented development zone, TOD mode shares will be applied for the development and are summarized in Table 7.

Table 7: TOD Mode Share

Travel Mode	Mode Share
<b>Auto Driver</b>	15%
<b>Auto Passenger</b>	5%
<b>Transit</b>	65%
<b>Non-Auto</b>	15%
<b>Total</b>	100%

Internal capture rates from the ITE Trip Generation Handbook 3<sup>rd</sup> Edition assigned to the development for the office and retail components for mixed-use developments. The rates summarized in Table 8 represent the percentage of trips to/from the retail or office uses based on the residential component.

*Table 8: Internal Capture Rates*

Land Use	AM		PM	
	In	Out	Total	In
<b>General Office</b>	3%	1%	57%	2%
<b>Shopping Centre</b>	17%	14%	10%	26%

Using the above mode shares, person trip rates, and the internal capture rates the person trips by mode have been projected. Table 9 summarizes the trip generation by mode.

*Table 9: Trip Generation by Mode*

Travel Mode	Mode Share	In	Out	Total	In	Out	Total
<b>Auto Driver</b>	15%	69	71	141	67	77	144
<b>Auto Passenger</b>	5%	23	23	47	22	26	48
<b>Transit</b>	65%	302	309	611	290	333	623
<b>Non-Auto Modes</b>	15%	69	71	141	67	77	144
<b>Internal Capture</b>		5	-29	-11	-40	-36	-31
<b>Total</b>	100%	465	475	940	446	512	958

As shown above, 141 AM and 144 PM peak hour two-way vehicle trips are projected as a result of the proposed development.

### 5.2 Trip Distribution

To understand the travel patterns of the subject development the OD Survey has been reviewed to determine the existing travel patterns. Table 10 below summarizes the distribution.

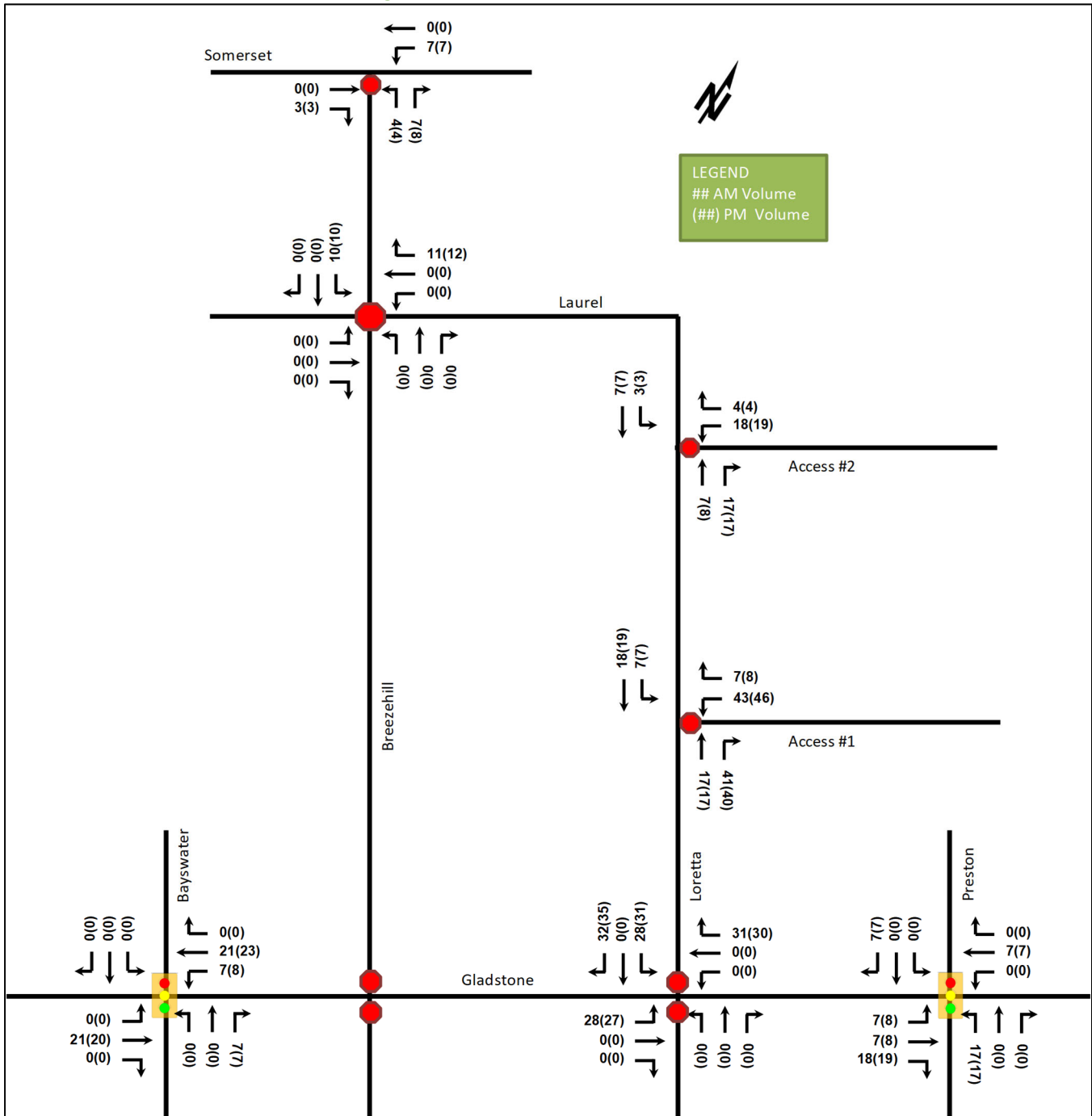
*Table 10: OD Survey Existing Mode Share – Ottawa Inner*

To/From	Percent of Trips
<b>North</b>	20%
<b>South</b>	35%
<b>East</b>	25%
<b>West</b>	20%
<b>Total</b>	100%

### 5.3 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the Study Area road network and are illustrated in Figure 9.

Figure 9: New Site Generation Auto Volumes



## 6 Background Network Travel Demands

### 6.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3.1. Beyond the opening of the Trillium LRT Gladstone Station, no addition network changes have been included the preparation of this TIA.

### 3.3 Other Planned Developments

#### 3.3.1 288 Booth Street

A residential/commercial development is currently proposed at 288 Booth Street, which is located approximately 750m east of the subject site. This development is to consist of a 7-storey condominium tower containing 54 residential units and 219m<sup>2</sup> of commercial space.

#### 3.3.2 347-357 Booth Street

A residential development is currently proposed for 347-357 Booth Street, located on the east side of the Booth Street/Poplar Street intersection. This development shall consist of four multi-attached dwelling blocks containing 20 residential units.

#### 3.3.3 Impact of Other Planned Developments

No form of traffic impact analysis was completed in support of either of the aforementioned developments, as the scope of the proposed development of both sites is below the 75-unit threshold that would typically require the production of a traffic study to support a Site Plan application. Therefore, it is concluded that the nominal 1% growth rate applied to the background traffic volumes will be sufficient to account for the traffic likely to be generated by the above developments.

### 3.4 Trip Generation

Trips generated by the proposed development have been estimated using relevant peak hour rates identified in the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 8<sup>th</sup> Edition*.

The trip generation surveys compiled in the *ITE Trip Generation Manual* only record vehicle trips, and the sites surveyed are typically located in suburban locations in the United States where non-auto modes of transportation typically have a modal share of 10% or less. For urban infill developments in downtown locations such as Somerset Street, where multiple modes of transportation are readily available, it is considered good practice to express projected trip generation volumes in terms of person trips, instead of vehicle trips. To convert ITE vehicle trip rates to person trip rates, two adjustment factors have been applied:

- Vehicle occupancy factor: **1.23** (taken from the TRANS 2005 O-D Survey Report)
- Non-auto usage factor: **1.1** (non-auto trips not counted in ITE surveys, assumed 10%)

Combining the two factors gives an overall vehicle trip to person trip adjustment factor of approximately 1.35. The conversion of vehicle trips into person trips for each distinct land use is shown in Table 2.

**Table 2: Person Trips**

Land Use	ITE Vehicle Trips		x 1.35 →	Person Trips	
	AM Peak	PM Peak		AM Peak	PM Peak
Residential Condominium/ Townhouse	88 vph <sup>1</sup> 17 in, 71 out	104 vph 64 in, 40 out		119 pph <sup>2</sup> 24 in, 95 out	140 pph 86 in, 54 out
Commercial Office	64 vph 56 in, 8 out	108 vph 18 in, 90 out		86 pph 75 in, 11 out	146 pph 24 in, 122 out
Specialty Retail	8 vph 4 in, 4 out	34 vph 15 in, 19 out		11 pph 6 in, 5 out	45 pph 20 in, 25 out
<b>Total</b>				<b>216 pph</b> <b>105 in, 111 out</b>	<b>331 pph</b> <b>130 in, 201 out</b>

1. vph = Vehicle Per Hour
2. pph = Persons Per Hour

The number of car trips that the site will generate has been estimated by categorizing the person trips by modal share. The auto-driver trip shares are based on observed percentages in the 2005 *Trans O-D Survey Report* that are specific to the region referred to as the Ottawa West District. An auto modal share of 40% is assumed for trips generated by the proposed commercial retail, based on observed trips from the TRANS O-D survey having an origin and destination within the Ottawa West District, as it is considered unlikely that specialty retail would generate a significant volume of trips with an origin destination beyond the Ottawa West district. An auto modal share of 55% is assumed for trips generated by the proposed residential units and commercial office space based on all observed trips within the Ottawa West District, including those with an origin or destination beyond that area.

A full breakdown of the projected number of trips by modal share is shown in Table 3.

**Table 3: Site-Generated Trips by Modal Share**

Travel Mode	Modal Share	AM Peak			PM Peak		
		In	Out	Total	In	Out	Total
<i>Proposed Residential Condominium/Townhouse</i>							
Total Person Trips		24	95	119	86	54	140
<b>Auto Driver</b>	<b>55%</b>	<b>14</b>	<b>52</b>	<b>66</b>	<b>47</b>	<b>30</b>	<b>77</b>
Auto Passenger	10%	2	9	11	8	5	13
Transit	25%	6	24	30	22	14	36
Non-Auto	10%	2	10	12	9	5	14
<i>Proposed Commercial Office</i>							
Total Person Trips		75	11	86	24	122	146
<b>Auto Driver</b>	<b>55%</b>	<b>41</b>	<b>6</b>	<b>47</b>	<b>13</b>	<b>67</b>	<b>80</b>
Auto Passenger	10%	7	1	8	2	12	14
Transit	25%	19	3	22	6	31	37

Travel Mode	Modal Share	AM Peak			PM Peak		
		In	Out	Total	In	Out	Total
Non-Auto	10%	8	1	9	3	12	15
<i>Proposed Specialty Retail</i>							
Total Person Trips		6	5	11	20	25	45
<b>Auto Driver</b>	<b>40%</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>8</b>	<b>10</b>	<b>18</b>
Auto Passenger	10%	1	0	1	2	2	4
Transit	10%	1	1	2	2	3	5
Non-Auto	40%	2	2	4	8	10	18
<i>Total Proposed</i>							
Total Person Trips		105	111	216	130	201	331
<b>Auto Driver</b>		<b>57</b>	<b>60</b>	<b>117</b>	<b>68</b>	<b>107</b>	<b>175</b>
Auto Passenger		10	10	20	12	19	31
Transit		26	28	54	30	48	78
Non-Auto		12	13	25	20	27	47

The specialty retail land use is the only component of the proposed development that is likely to generate a significant proportion of vehicular pass-by trips. However, due to the small volume of total vehicular trips that the specialty retail land use is likely to generate (<20vph), no adjustment has been made to account for pass-by trips. All traffic generated by the proposed development is conservatively assumed to consist of primary (i.e. new) trips only.

### 3.5 Trip Distribution

#### 3.5.1 Vehicular Trips

The distribution of residential trips is based on observed traffic patterns at the study area intersections. Specifically, the distribution of all trips departing the site is based on the prevailing AM peak hour traffic patterns, and the distribution of all trips arriving at the site is based on the prevailing PM peak hour traffic patterns. The distribution of trips generated by the proposed residential units is summarized as follows:

- 6% to/from the south via Breezehill Avenue,
- 5% to/from the west via Laurel Street,
- 35% to/from the west via Somerset Street,
- 50% to/from the east via Somerset Street,
- 4% to/from the east via Laurel Street.

The distribution of office trips is also based on observed traffic patterns at the study area intersections. Specifically, the distribution of all trips departing the site is based on the prevailing PM peak hour traffic patterns, and the distribution of all trips arriving at the site is based on the prevailing AM peak hour traffic patterns. The distribution of trips generated by the proposed offices is summarized as follows:

- 7% to/from the south via Breezehill Avenue,
- 6% to/from the west via Laurel Street,
- 50% to/from the west via Somerset Street,
- 35% to/from the east via Somerset Street,
- 2% to/from the east via Laurel Street.

The distribution of retail trips is based on the prevailing off-peak hour traffic patterns. The assumed distribution of trips generated by the proposed specialty retail is summarized as follows:

- 7% to/from the south via Breezehill Avenue,
- 4% to/from the west via Laurel Street,
- 45% to/from the west via Somerset Street,
- 40% to/from the east via Somerset Street,
- 4% to/from the east via Laurel Street.

The site-generated vehicular trip volumes for the weekday AM and PM peak hours are shown in Figure 10. Total traffic volumes for 2016 and 2021 have been calculated by adding the projected site-generated traffic to the background traffic projections, and are shown in Figures 11 and 12.

### 3.5.2 Transit Trips

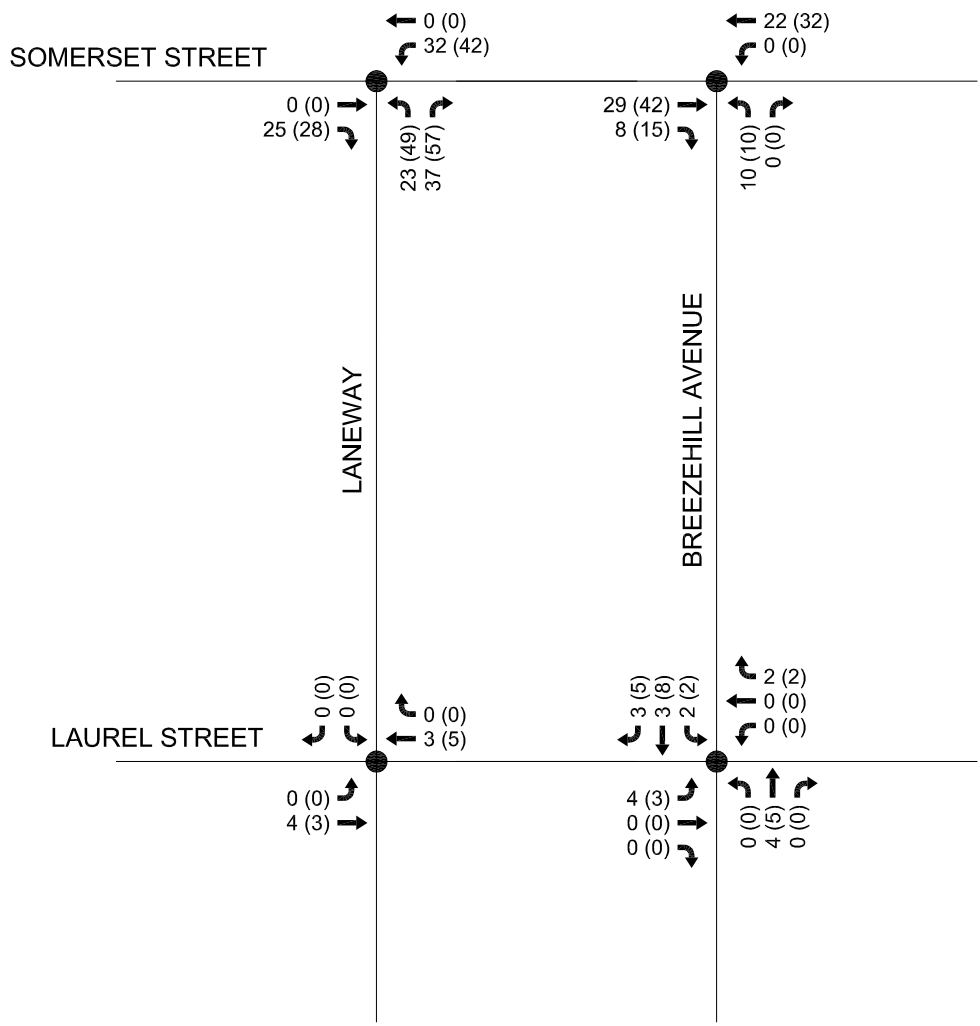
The distribution of transit trips to and from the proposed development has been derived from the data presented in Exhibits 6-2 and 6-3 of the *2005 Trans O-D Survey Report*, which are included in this report as Appendix F.

The top origins/destinations for all arriving and departing trips generated within the Ottawa West Area are summarized in Table 4.

**Table 4: Top Origins/Destinations of Ottawa West Area Trips**

	Origin of Arrivals	% Trips	Destination of Departures	% Trips
<b>AM Peak Hour</b>	Ottawa West	26%	Ottawa West	32%
	Merivale	13%	Ottawa Centre	13%
	Bayshore/Cedarview	13%	Merivale	12%
	Ottawa Inner Area	7%	Ottawa Inner Area	11%
<b>PM Peak Hour</b>	Ottawa West	38%	Ottawa West	32%
	Merivale	11%	Bayshore/Cedarview	12%
	Bayshore/Cedarview	11%	Merivale	12%
	Ottawa Inner Area	10%	Ottawa Inner Area	8%

The data presented in Table 4 indicates that approximately 30% of all trips generated by the Ottawa West Area in the AM and PM peak hours have an origin or destination within the Ottawa West Area. The top origins and destinations for all external trips generated by the Ottawa West Area are Merivale, Ottawa Centre, Ottawa Inner Area and Bayshore/Cedarview regions.



**LEGEND**

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



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1050 SOMERSET STREET  
 SITE TRAFFIC

OCT 2012 111152 FIGURE 10

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## 5 Development-Generated Travel Demand

### 5.1 Trip Generation and Mode Shares

This TIA has been prepared using the vehicle and person trip rates for the residential component using the TRANS Trip Generation Study Report (2009) and for the commercial component using the converted person trip values of the average vehicle trip rate from the ITE Trip Generation Manual 10<sup>th</sup> Edition (2017). Table 9 summarizes the person trip rates for the proposed land use.

Table 9: Trip Generation Person Trip Rates

Dwelling Type	Land Use Code	Peak Hour	Vehicle Trip Rate	Person Trip Rates
High-rise Apartments	222 (TRANS)	AM	0.24	0.65
		PM	0.27	0.68
Shopping Centre	820 (ITE)	AM	0.94	1.20
		PM	3.81	4.88

Using the above Person Trip rates, the total person trip generation has been estimated. Table 10 below illustrates the total person trip generation for the proposed land uses.

Table 10: Total Person Trip Generation

Land Use	Units / GFA	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
High-rise Apartments	283	44	140	184	119	73	192
Shopping Centre	13,618	10	6	16	32	34	66

Using the most recent National Capital Region Origin-Destination survey (OD Survey), the existing mode shares for Ottawa West have been determined and compared to various modes share breakdowns identified by City Staff as potential interpretations of the data. Table 11 summarizes these modal shares.

Table 11: Mode Shares

Travel Mode	Ottawa West (average)	Ottawa West (AM from/within)	Ottawa West (PM to/within)	Proposed w/in 600m Rapid Transit
Auto Driver	50%	45%	45%	30%
Auto Passenger	15%	10%	15%	10%
Transit	20%	25%	15%	35%
Cycling	5%	5%	5%	5%
Walking	10%	15%	20%	20%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Internal capture rates from the ITE Trip Generation Handbook 3<sup>rd</sup> Edition have been assigned to the development for the retail component for mixed-use developments. The rates summarized in Table 12 represent the percentage of trips to/from the retail use based on the residential component.

Table 12: Internal Capture Rates

Land Use	AM		PM	
	In	Out	In	Out
Residential to/from Shopping Centre	17%	14%	10%	26%

Using the above proposed mode share targets for the site given transit context and person trip rates, and accounting for internal capture, the person trips by mode have been projected. Table 13 summarizes the trip generation by mode.

*Table 13: Trip Generation by Mode*

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
<b>Auto Driver</b>	30%	15	44	59	45	30	74
<b>Auto Passenger</b>	10%	5	15	19	15	10	24
<b>Transit</b>	35%	18	51	69	52	35	86
<b>Cycling</b>	5%	2	7	10	7	5	13
<b>Walking</b>	20%	11	29	40	30	20	49
<b>Internal Capture</b>	(varies)	-2	-1	-3	-3	-9	-12
<b>Total</b>	<b>100%</b>	<b>52</b>	<b>146</b>	<b>198</b>	<b>148</b>	<b>99</b>	<b>246</b>

As shown above, 59 AM and 74 PM new peak hour two-way vehicle trips are projected as a result of the proposed development.

### 5.2 Trip Distribution

To understand the travel patterns of the subject development the OD Survey has been reviewed to determine the travel for the residential component patterns were applied based on the build-out of Ottawa West. Table 14 below summarizes the distributions.

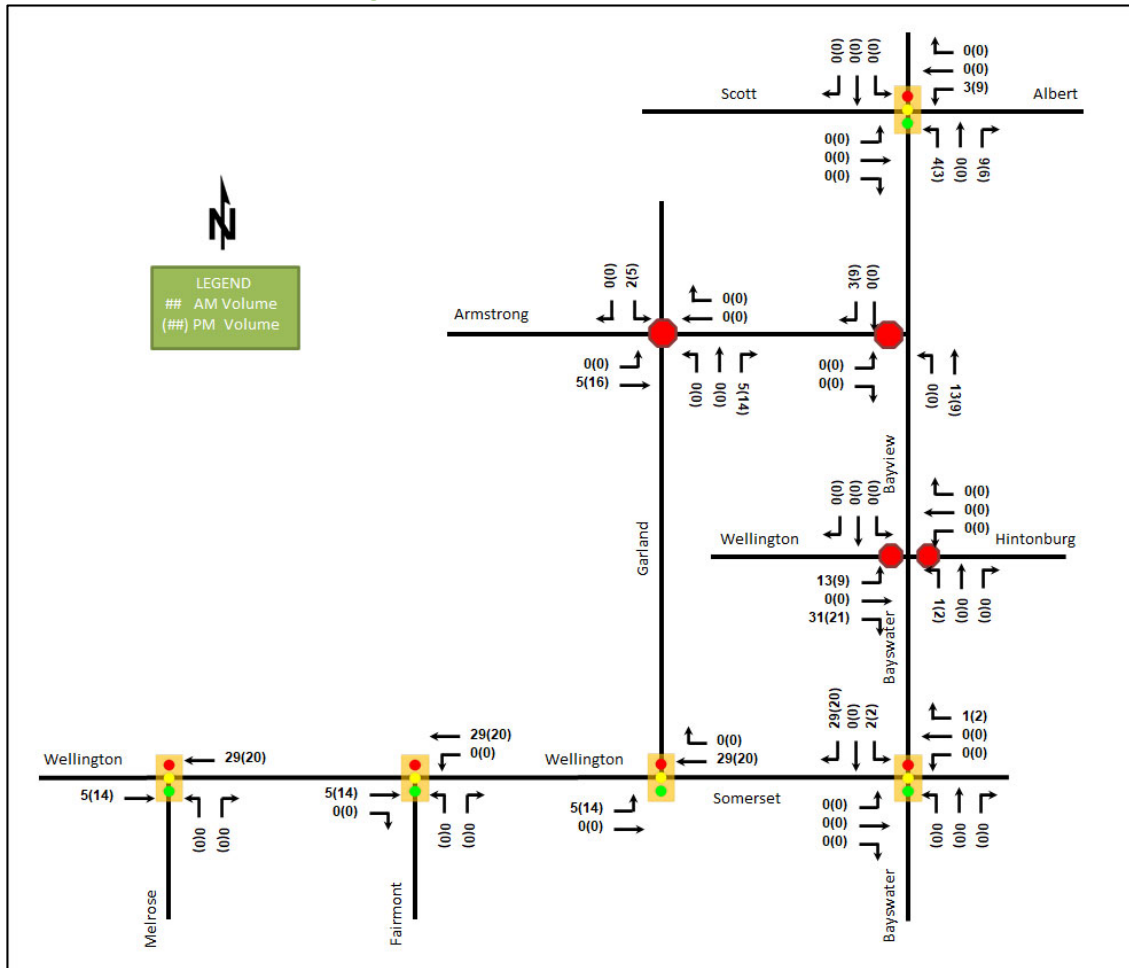
*Table 14: OD Survey Distribution – Ottawa West*

To/From	Residential % of Trips	Via
<b>North</b>	5%	Albert
<b>South</b>	30%	Armstrong/Wellington/417
<b>East</b>	30%	15% Albert, 5% Somerset, 10% Armstrong/Wellington/417
<b>West</b>	35%	10% Scott, 25% Armstrong/Wellington/417
<b>Total</b>	100%	-

### 5.3 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the Study Area road network. Figure 9 illustrates the new site generated volumes.

Figure 9: New Site Generation Auto Volumes



## 6 Background Network Travel Demands

### 6.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3. None of the listed modifications are considered to have any notable impact on the study area traffic volumes and travel patterns.

### 6.2 Background Growth

A review of the background projections from the City’s TRANS Regional Model for the 2011 and 2031 horizons was completed to determine the background growth for each of the study area roadways. Table 15 summarizes the results of the model, and the projections are provided in Appendix E.

Table 15: TRANS Regional Model Projections – Study Area Growth Rates

Street	Direction Growth Percentage	
	Eastbound	Westbound
Scott/Albert	-1.28%	1.81%
Armstrong	No volumes shown	
Wellington	2.49%	2.12%
Somerset	1.49%	-0.44%

## **APPENDIX G**

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TDM Checklists

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

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

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	✓
BASIC	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	✓
BASIC	1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	✓
<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> )	✓
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> )	✓

<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> )	✓
<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> )	✓
<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> )	✓
<b>BASIC</b>	1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	✓
<b>BASIC</b>	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	✓
<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 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> )	✓
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> )	✓
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> )	✓
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> )	✓
BETTER	2.2.2 Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	✓
<b>2.3 Bicycle repair station</b>		
BETTER	2.3.1 Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	<input type="checkbox"/>
<b>3. TRANSIT</b>		
<b>3.1 Customer amenities</b>		
BASIC	3.1.1 Provide shelters, lighting and benches at any on-site transit stops	<input type="checkbox"/>
BASIC	3.1.2 Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	<input type="checkbox"/>
BETTER	3.1.3 Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	<input type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
<b>4. RIDESHARING</b>		
<b>4.1 Pick-up &amp; drop-off facilities</b>		
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>5. CARSHARING &amp; BIKESHARING</b>		
<b>5.1 Carshare parking spaces</b>		
BETTER	5.1.1 Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses (see <i>Zoning By-law Section 94</i> )	<input type="checkbox"/>
<b>5.2 Bikeshare station location</b>		
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"/>
<b>6. PARKING</b>		
<b>6.1 Number of parking spaces</b>		
REQUIRED	6.1.1 Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	✓
BASIC	6.1.2 Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	<input type="checkbox"/>
BASIC	6.1.3 Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly (see <i>Zoning By-law Section 104</i> )	<input type="checkbox"/>
BETTER	6.1.4 Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking (see <i>Zoning By-law Section 111</i> )	<input type="checkbox"/>
<b>6.2 Separate long-term &amp; short-term parking areas</b>		
BETTER	6.2.1 Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	<input type="checkbox"/>



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

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

TDM measures: <i>Residential developments</i>		Check if proposed & add descriptions
<b>1. TDM PROGRAM MANAGEMENT</b>		
<b>1.1 Program coordinator</b>		
BASIC	★	1.1.1 Designate an internal coordinator, or contract with an external coordinator <input type="checkbox"/>
<b>1.2 Travel surveys</b>		
BETTER		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>		
BASIC		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>		
BETTER		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 checked="" type="checkbox"/>
BASIC ★	5.1.2 Unbundle parking cost from monthly rent ( <i>multi-family</i> )	<input type="checkbox"/>

TDM measures: <i>Residential developments</i>		Check if proposed & add descriptions
<b>6. TDM MARKETING &amp; COMMUNICATIONS</b>		
<b>6.1 Multimodal travel information</b>		
<b>BASIC</b> ★	6.1.1 Provide a multimodal travel option information package to new residents	<input 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 H**

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### MMLOS Calculations

## 1.0 SEGMENT MMLOS

This section provides a review of the boundary streets using complete streets principles. The Multi-Modal Level of Service (MMLOS) guidelines produced by IBI Group in 2015 were used to evaluate the LOS of the boundary roadways for each mode of transportation.

Schedule 'B' of the City of Ottawa's Official Plan indicates that Somerset Street West is a Traditional Mainstreet while Breezehill Avenue is located within the General Urban Area. Additionally, the subject site is within 300m of a school (Devonshire Public School) and within 600m of a rapid transit station (Bayview Station).

Targets for the Pedestrian Level of Service (PLOS), Bicycle Level of Service (BLOS), Transit Level of Service (TLOS), Truck Level of Service (TkLOS) and Vehicular Level of Service (Auto LOS) for the study area roadways are based on the targets for roadways within 600m of a rapid transit station and within 300m of a school, as identified in Exhibit 22 of the MMLOS guidelines.

### 1.1 Pedestrian Level of Service (PLOS)

Exhibit 4 of the MMLOS guidelines has been used to evaluate the segment PLOS of the boundary streets. Exhibit 22 of the MMLOS guidelines suggest a target PLOS A for all road classes. The results of the segment PLOS analysis are summarized in **Table 1**.

**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>	Segment PLOS
<b>Somerset Street West (north side)</b>					
>2m	1m	> 3000 vpd	No	60 km/h	D
<b>Somerset Street West (south side)</b>					
>2m	1m	> 3000 vpd	No	60 km/h	D
<b>Breezehill Avenue (east side)</b>					
1.5m	0m	< 3000 vpd	Yes	50 km/h	E
<b>Breezehill Avenue (west side)</b>					
1.5m	0m	< 3000 vpd	No	50 km/h	E

1. Operating speed taken as the assumed posted speed limit plus 10 km/h

### 1.2 Bicycle Level of Service (BLOS)

Exhibit 11 of the MMLOS guidelines has been used to evaluate the segment BLOS of the boundary streets. Exhibit 22 of the MMLOS guidelines suggest a target BLOS C for a Spine Route on an arterial roadway and a target BLOS D for local roads with no cycling designation. The results of the segment BLOS analysis are summarized in **Table 2**.

**Table 2: BLOS Segment Analysis**

Road Class	Bike Route	Type of Bikeway	Travel Lanes (Per Direction)	Operating Speed	Segment BLOS
<b>Somerset Street West</b>					
Arterial	Spine	1.8m Bike Lane	1	60 km/h	C
<b>Breezehill Avenue</b>					
Local	No Designation	Mixed Traffic	1	50 km/h	B

### 1.3 Transit Level of Service (TLOS)

Exhibit 15 of the MMLOS guidelines has been used to evaluate the segment TLOS of the boundary streets. Exhibit 22 of the MMLOS guidelines suggest a target TLOS of D for a transit priority corridor with isolated measures. No TLOS target is suggested in Exhibit 22 of the MMLOS guidelines for Breezehill Avenue and, as such, it has not been evaluated. The results of the segment TLOS analysis are summarized in **Table 3**.

**Table 3: TLOS Segment Analysis**

Facility Type	Level/Exposure to Congestion Delay, Friction and Incidents			Segment TLOS
	Congestion	Friction	Incident Potential	
<b>Somerset Street West</b>				
Mixed Traffic	Yes	Moderate	Moderate	D

### 1.4 Truck Level of Service (TkLOS)

Exhibit 20 of the MMLOS guidelines has been used to evaluate the segment TkLOS of the boundary roadways. Exhibit 22 of the MMLOS guidelines suggest a target TkLOS D for truck routes on arterial roadway. No target TkLOS target is suggested in Exhibit 22 of the MMLOS guidelines for Breezehill Avenue and, as such, it has not been evaluated. The results of the segment TkLOS analysis are summarized in **Table 4**.

**Table 4: TkLOS Segment Analysis**

Curb Lane Width	Number of Travel Lanes per Direction	Segment TkLOS
<b>Somerset Street West</b>		
> 3.7m	1	B

## 2.0 INTERSECTION MMLOS

This section provides a review of the study area intersections using the complete streets principles.

Intersection analysis has been completed for the signalized intersections within the study area:

- a) Somerset Street West/Bayswater Avenue
- b) Somerset Street West/Preston Street

Schedule 'B' of the City of Ottawa's Official Plan indicates that Somerset Street West is a Traditional Mainstreet, the Somerset Street West/Breezehill Avenue intersection is located within the General Urban Area while the Somerset Street West/Preston Street intersection is located a Mixed-Use Center. Both intersections are also within 600m of a rapid transit station.

The MMLOS guidelines produced by IBI Group in October 2015 were used to evaluate the LOS of all study area intersections for each mode of transportation.

Target PLOS, BLOS, TLOS, TkLOS, and Auto LOS for the study area intersections are based on targets for areas within 600m of rapid transit, as identified in Exhibit 22 of the MMLOS guidelines.

### 2.1 Pedestrian Level of Service (PLOS)

Exhibit 5 of the Addendum to the MMLOS guidelines has been used to evaluate the existing PLOS at the study area intersections. 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 provided in **Tables 6 and 7**.

**Table 5: PLOS Intersection Analysis – Somerset Street West/Bayswater Avenue**

Criteria	North Approach		South Approach		East Approach		West Approach	
<b>Somerset Street West/Bayswater Avenue</b>								
<b>PETSI SCORE</b>								
<i>CROSSING DISTANCE CONDITIONS</i>								
Median > 2.4m in Width	No	88	No	105	No	88	No	88
Lanes Crossed (3.5m Lane Width)	4		3		4		4	
<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	> 3m to 5m	-4	> 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>PETSI SCORE</b>		<b>75</b>	<b>PETSI SCORE</b>		<b>57</b>
<b>LOS</b>		<b>D</b>	<b>LOS</b>		<b>B</b>	<b>LOS</b>		<b>D</b>
<b>DELAY SCORE</b>								
Cycle Length		75		75		70		70
Pedestrian Walk Time		19.1		19.1		21.5		21.5
<b>DELAY SCORE</b>		<b>20.8</b>	<b>DELAY SCORE</b>		<b>20.8</b>	<b>DELAY SCORE</b>		<b>16.8</b>
<b>LOS</b>		<b>C</b>	<b>LOS</b>		<b>C</b>	<b>LOS</b>		<b>B</b>
<b>OVERALL</b>		<b>D</b>	<b>OVERALL</b>		<b>C</b>	<b>OVERALL</b>		<b>D</b>

**Table 6: PLOS Intersection Analysis – Somerset Street West/Preston Street**

Criteria	North Approach		South Approach		East Approach		West Approach	
<b>Somerset Street West/Preston Street</b>								
<b>PETSI SCORE</b>								
<i>CROSSING DISTANCE CONDITIONS</i>								
Median > 2.4m in Width	No	88	No	72	No	88	No	88
Lanes Crossed (3.5m Lane Width)	4		5		4		4	
<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 Prohibited	0	RTOR Prohibited	0	RTOR Prohibited	0	RTOR Prohibited	0
Leading Pedestrian Interval	Yes	0	Yes	0	Yes	0	Yes	0
<i>CORNER RADIUS</i>								
Parallel Radius	> 5m to 10m	-5	> 10m to 15m	-6	> 10m to 15m	-6	> 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>62</b>	<b>PETSI SCORE</b>		<b>45</b>	<b>PETSI SCORE</b>		<b>61</b>
<b>LOS</b>		<b>C</b>	<b>LOS</b>		<b>D</b>	<b>LOS</b>		<b>C</b>
<b>DELAY SCORE</b>								
Cycle Length		70		70		70		70
Pedestrian Walk Time		16.3		16.3		13.4		13.4
<b>DELAY SCORE</b>		<b>20.6</b>	<b>DELAY SCORE</b>		<b>20.6</b>	<b>DELAY SCORE</b>		<b>22.9</b>
<b>LOS</b>		<b>C</b>	<b>LOS</b>		<b>C</b>	<b>LOS</b>		<b>C</b>
<b>OVERALL</b>		<b>C</b>	<b>OVERALL</b>		<b>D</b>	<b>OVERALL</b>		<b>C</b>



## 2.2 Bicycle Level of Service (BLOS)

Exhibit 12 of the MMLoS guidelines has been used to evaluate the existing BLOS at the study area intersections. Exhibit 22 of the MMLoS guidelines suggests a target BLOS C for Spine Routes along Arterial roads. The results of the intersection BLOS analysis are summarized in **Table 8**.

**Table 7: BLOS Intersection Analysis**

Approach	Bikeway Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
<b>Somerset Street West/Bayswater Avenue</b>				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact to LTS	A
		Left Turn Accommodation	One lane crossed, 50km/h	D
South Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact to LTS	A
		Left Turn Accommodation	No lanes crossed, 50km/h	B
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane 25m to 50m long	D
		Left Turn Accommodation	No lanes crossed, 50km/h	B
West Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane 25m to 50m long	D
		Left Turn Accommodation	No lanes crossed, 50km/h	B
<b>Somerset Street West/Preston Street</b>				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact to LTS	A
		Left Turn Accommodation	1 lane crossed; 50 km/h	D
South Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact to LTS	A
		Left Turn Accommodation	1 lane crossed; 50 km/h	D
East Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact to LTS	A
		Left Turn Accommodation	1 lane crossed; 50 km/h	D
West Approach	Mixed Traffic	Right Turn Lane Characteristics	No impact to LTS	A
		Left Turn Accommodation	1 lane crossed; 50 km/h	D

### 2.3 Transit Level of Service (TLOS)

Exhibit 16 of the MMLOS guidelines has been used to evaluate the existing TLOS the study area intersections. Exhibit 22 of the MMLOS guidelines suggests a target TLOS D for Transit Priority Corridors with isolated measures (Somerset Street West). No other roadways within the study area have a transit priority designation. The results of the intersection TLOS analysis are summarized in **Table 9**.

**Table 8: TLOS Intersection Analysis**

Approach	Delay <sup>(1)</sup>		TLOS
	AM Peak	PM Peak	
<b>Somerset Street West/Bayswater Avenue</b>			
East	5 sec.	11 sec.	C
West	10 sec.	12 sec.	C
<b>Somerset Street West/Preston Street</b>			
North	24 sec.	30 sec.	D
South	34 sec.	37 sec.	D
East	23 sec.	34 sec.	D
West	58 sec.	33 sec.	F

1. Delay based on outputs from Synchro analysis

### 2.4 Truck Level of Service (TkLOS)

Exhibit 21 of the MMLOS guidelines has been used to evaluate the existing TkLOS at the study area intersections. Exhibit 22 of the MMLOS guidelines suggests a target TkLOS D for Truck Routes along arterial roads. The results of the intersection TkLOS analysis are summarized in **Table 10**.

**Table 9: TkLOS Intersection Analysis**

Approach	Effective Corner Radius	Number of Receiving Lanes on Departure from Intersection	LOS
<b>Somerset Street West/Bayswater Avenue</b>			
North	10m to 15m	1	E
South	10m to 15m	1	E
East	10m to 15m	1	E
West	< 10m	1	F
<b>Somerset Street West/Preston Street</b>			
North	< 10m	1	F
South	10m to 15m	1	E
East	< 10m	1	F
West	10m to 15m	1	E

## 2.5 Vehicular Level of Service (Auto LOS)

Exhibit 22 of the MMLOS guidelines suggests a target Auto LOS E for all roadways within 600m of rapid transit.

Intersection capacity analysis has been completed for the existing traffic conditions. The intersection parameters used in the analysis are consistent with the City's TIA guidelines (saturation flow rate: 1800 vphpl, PHF: 0.9). The results of the analysis are summarized in **Table 11** for signalized intersections and **Table 12** for unsignalized intersections for the weekday AM and PM peak hours. Detailed reports are included in **Appendix I**.

**Table 10: Auto LOS Signalized Intersection Analysis – Existing Traffic**

Intersection	AM Peak			PM Peak		
	Max. v/c	LOS	Mvmt	Max. v/c	LOS	Mvmt
<i>Existing Traffic</i>						
Somerset Street West/Bayswater Avenue	0.66	B	SBT/R	0.92	E	NB
Somerset Street West/Preston Street	0.96	E	EBT/R	0.85	D	NBT/R

**Table 11: Auto LOS Unsignalized Intersection Analysis – Existing Traffic**

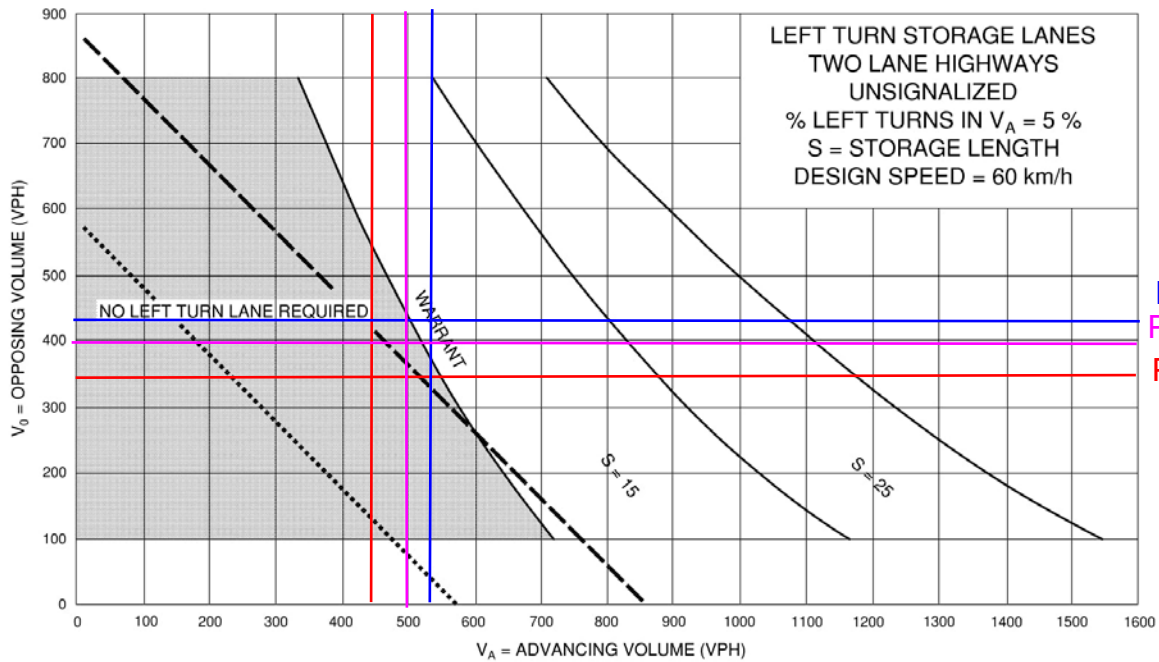
Intersection	AM Peak			PM Peak		
	Max. delay	LOS	Mvmt	Max. delay	LOS	Mvmt
<i>Existing Traffic</i>						
Somerset Street West/Breezehill Avenue	13 sec.	B	NB	16 sec.	C	NB
Breezehill Avenue/Laurel Street	8 sec.	A	EB/NB/ SB	8 sec.	A	NB
Breezehill Avenue/Gladstone Avenue	12 sec.	B	NB	19 sec.	C	SB

## **APPENDIX I**

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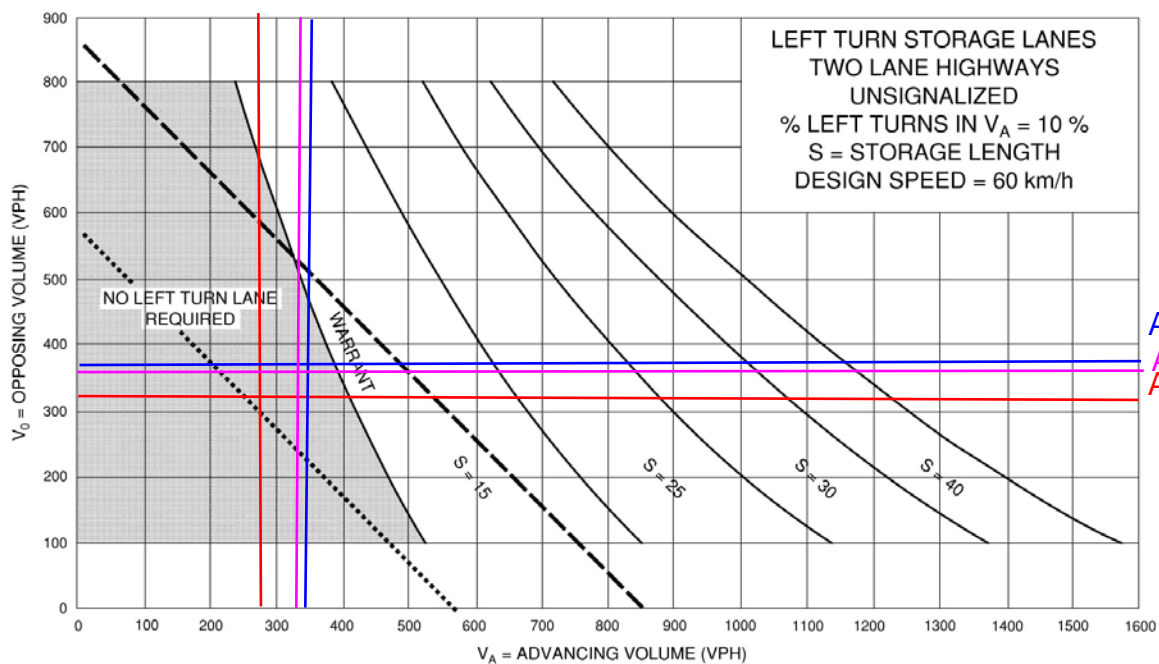
Left Turn Lane Graphs and Signal Warrants

**Exhibit 9A-6**



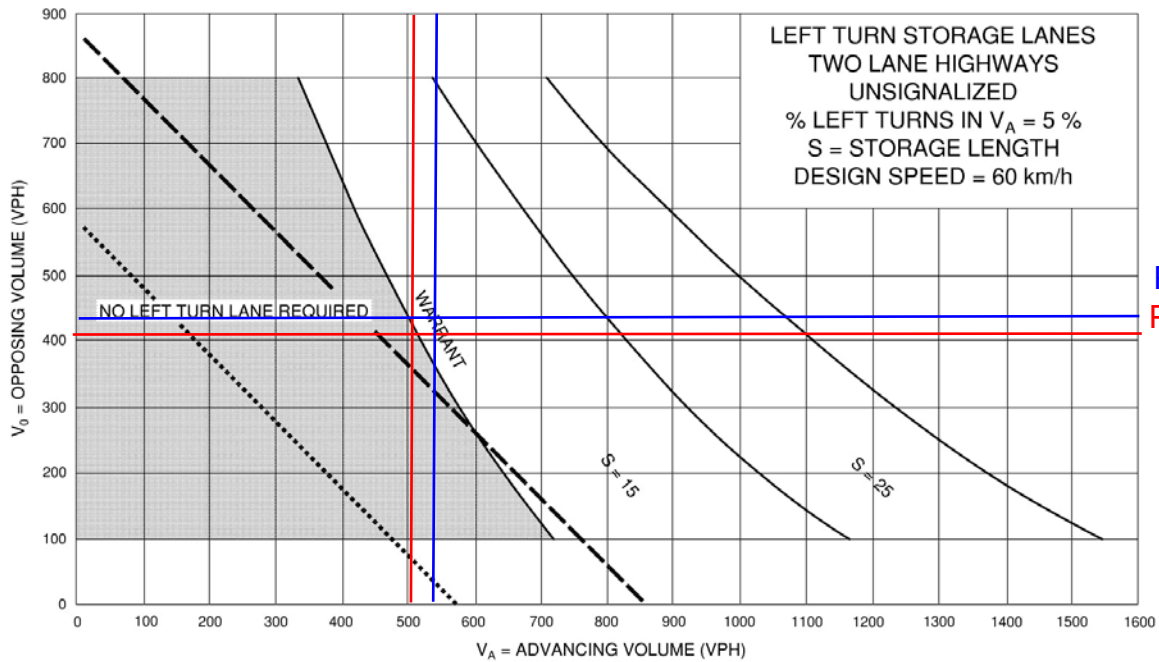
PM, 2030 BG  
PM, 2025 BG  
PM, Existing

- TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW
- ..... TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS

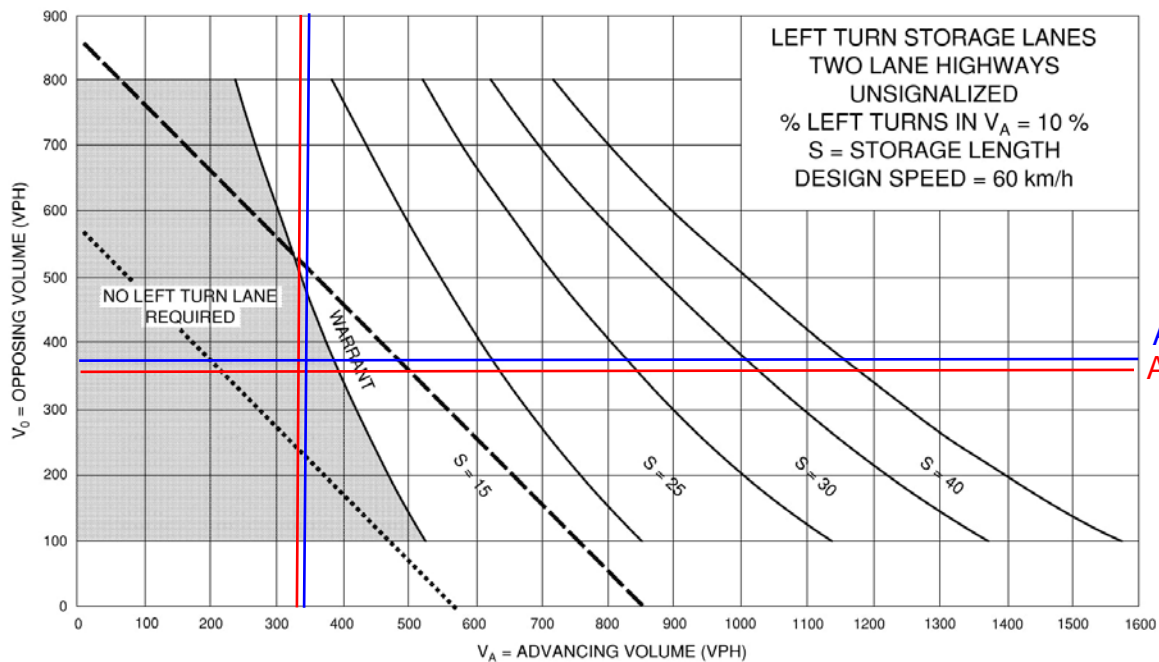


AM, 2030 BG  
AM, 2025 BG  
AM, Existing

**Exhibit 9A-6**



- TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW
- ..... TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS



## TRAFFIC SIGNAL JUSTIFICATION USING PROJECTED VOLUMES

LOCATION: Somerset at Breezehill

YEAR: 2030 total volumes

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT		COMPLIANCE		
		FREE FLOW	RESTRICTED FLOW	SECTIONAL		ENTIRE % <sup>(2)</sup>
		OPERATING SPEED ≥ 70KM/H	OPERATING SPEED < 70 KM/H	NUMERICAL	PERCENT	
<b>1. MINIMUM VEHICULAR WARRANT</b>	A. Vehicle volume, all approaches (average hour)	480 600 (2 or more lane approach)	720 900 (2 or more lane approach)	459	64%	16%
	B. Vehicle volume along minor street (average hour)	120 180 (tee intersection)	170 255 (tee intersection)	41	16%	
<b>2. DELAY TO CROSS TRAFFIC</b>	A. Vehicle volume along major street (average hour)	480 600 (2 or more lane approach)	720 900 (2 or more lane approach)	418	58%	23%
	B <sup>(1)</sup> . Combined vehicle and pedestrian volume <u>crossing</u> the major street (average hour)	50	75	18	23%	

**NOTES**

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



## **APPENDIX J**

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Synchro Reports

3: Bayswater & Somerset  
AM Peak

1040 Somerset Street  
Existing Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	206	24	16	120	51	24	178	29	118	219	50
Future Volume (vph)	37	206	24	16	120	51	24	178	29	118	219	50
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		40.0	0.0		45.0	0.0		0.0	40.0		0.0
Storage Lanes	0		1	0		1	0		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99	0.83		0.99	0.88		0.99		0.96	0.99	
Fr <sub>t</sub>			0.850			0.850		0.983			0.972	
Fl <sub>t</sub> Protected		0.992			0.994			0.995		0.950		
Satd. Flow (prot)	0	1492	1517	0	1530	1357	0	1712	0	1662	1713	0
Fl <sub>t</sub> Permitted		0.944			0.956			0.916		0.510		
Satd. Flow (perm)	0	1407	1262	0	1458	1193	0	1572	0	858	1713	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			45			57		13			20	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		88.8			108.9			142.8			114.2	
Travel Time (s)		6.4			7.8			10.3			8.2	
Confl. Peds. (#/hr)	51		81	81		51	27		39	39		27
Confl. Bikes (#/hr)			47			38			17			7
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 (%)	14%	8%	2%	2%	7%	14%	8%	2%	3%	4%	2%	2%
Parking (#/hr)		0			0							
Adj. Flow (vph)	41	229	27	18	133	57	27	198	32	131	243	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	270	27	0	151	57	0	257	0	131	299	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	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	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	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	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	30.5	30.5	30.5	30.5	30.5	30.5	28.9	28.9		28.9	28.9	
Total Split (s)	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0		35.0	35.0	
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	29.5	29.5	29.5	29.5	29.5	29.5	29.1	29.1		29.1	29.1	

3: Bayswater & Somerset  
AM Peak

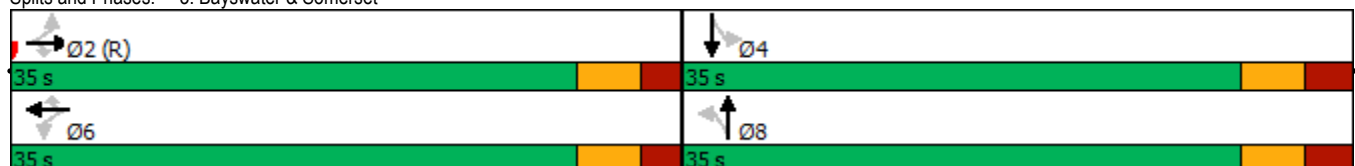
1040 Somerset Street  
Existing Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)		5.5	5.5		5.5	5.5		5.9		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	Max	Max	Max	None	None		None	None	
Walk Time (s)	17.0	17.0	17.0	17.0	17.0	17.0	13.0	13.0		13.0	13.0	
Flash Dont Walk (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	70	70	70	40	40	40	30	30		20	20	
Act Effct Green (s)		40.8	40.8		40.8	40.8		17.8		17.8	17.8	
Actuated g/C Ratio		0.58	0.58		0.58	0.58		0.25		0.25	0.25	
v/c Ratio		0.33	0.04		0.18	0.08		0.63		0.60	0.66	
Control Delay		10.5	2.0		6.3	1.5		27.9		33.3	28.2	
Queue Delay		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Delay		10.5	2.0		6.3	1.5		27.9		33.3	28.2	
LOS		B	A		A	A		C		C	C	
Approach Delay		9.8			5.0			27.9				29.7
Approach LOS		A			A			C				C
90th %ile Green (s)	33.9	33.9	33.9	33.9	33.9	33.9	24.7	24.7		24.7	24.7	
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
70th %ile Green (s)	35.6	35.6	35.6	35.6	35.6	35.6	23.0	23.0		23.0	23.0	
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Ped	Ped		Hold	Hold	
50th %ile Green (s)	41.6	41.6	41.6	41.6	41.6	41.6	17.0	17.0		17.0	17.0	
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
30th %ile Green (s)	44.4	44.4	44.4	44.4	44.4	44.4	14.2	14.2		14.2	14.2	
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
10th %ile Green (s)	48.4	48.4	48.4	48.4	48.4	48.4	10.2	10.2		10.2	10.2	
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
Stops (vph)		129	3		59	9		183		97	211	
Fuel Used(l)		7	0		3	1		12		6	13	
CO Emissions (g/hr)		129	6		63	15		227		120	251	
NOx Emissions (g/hr)		25	1		12	3		44		23	48	
VOC Emissions (g/hr)		30	1		15	3		52		28	58	
Dilemma Vehicles (#)		0	0		0	0		0		0	0	
Queue Length 50th (m)		15.8	0.0		3.4	0.0		28.8		15.3	33.3	
Queue Length 95th (m)		37.8	2.2		21.5	m2.0		43.1		27.5	48.5	
Internal Link Dist (m)		64.8			84.9			118.8			90.2	
Turn Bay Length (m)			40.0			45.0				40.0		
Base Capacity (vph)		819	753		849	718		661		356	723	
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		0.33	0.04		0.18	0.08		0.39		0.37	0.41	

**Intersection Summary**  
 Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 19 (27%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.66  
 Intersection Signal Delay: 20.0  
 Intersection LOS: C  
 Intersection Capacity Utilization 73.6%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Bayswater & Somerset



13: Preston & Somerset  
AM Peak

1040 Somerset Street  
Existing Traffic Volumes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	263	93	34	140	13	65	354	47	18	278	24
Future Volume (vph)	44	263	93	34	140	13	65	354	47	18	278	24
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.89	0.95		0.96	0.99		0.97	0.99		0.97	0.99	
Fr <sub>t</sub>		0.961			0.988			0.982			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1410	0	1679	1484	0	1647	1480	0	1503	1467	0
Flt Permitted	0.650			0.313			0.454			0.320		
Satd. Flow (perm)	1037	1410	0	529	1484	0	763	1480	0	489	1467	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		435.9			97.2			225.8			107.4	
Travel Time (s)		31.4			7.0			16.3			7.7	
Confl. Peds. (#/hr)	73		53	53		73	32		48	48		32
Confl. Bikes (#/hr)			66			21			10			4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	5%	9%	3%	8%	2%	5%	8%	2%	15%	9%	17%
Parking (#/hr)		0			0			0			0	
Adj. Flow (vph)	49	292	103	38	156	14	72	393	52	20	309	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	395	0	38	170	0	72	445	0	20	336	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.6	24.6		24.6	24.6		26.7	26.7		26.7	26.7	
Total Split (s)	26.0	26.0		26.0	26.0		34.0	34.0		34.0	34.0	
Total Split (%)	37.1%	37.1%		37.1%	37.1%		48.6%	48.6%		48.6%	48.6%	
Maximum Green (s)	20.4	20.4		20.4	20.4		28.3	28.3		28.3	28.3	

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Storage Length (m)				
Storage Lanes				
Taper Length (m)				
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 (%)				
Parking (#/hr)				
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	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	3.0	3.0	3.0	3.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Maximum Green (s)	3.0	3.0	3.0	3.0

13: Preston & Somerset  
AM Peak

1040 Somerset Street  
Existing Traffic Volumes

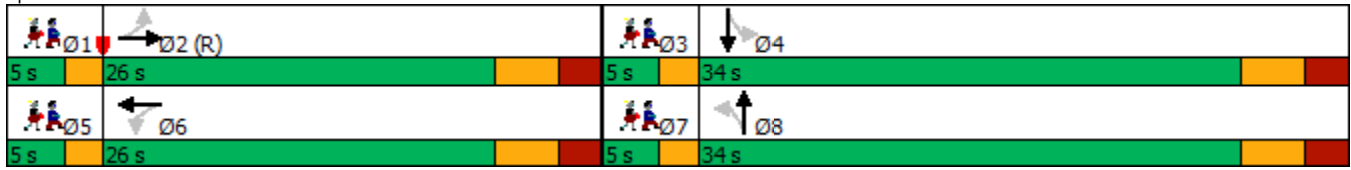


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.6		5.6	5.6		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	40	40		60	60		35	35		25	25	
Act Effct Green (s)	20.4	20.4		20.4	20.4		24.9	24.9		24.9	24.9	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.36	0.36		0.36	0.36	
v/c Ratio	0.16	0.96		0.25	0.39		0.27	0.85		0.11	0.64	
Control Delay	20.8	62.8		24.0	23.2		17.5	36.4		15.3	24.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	20.8	62.8		24.0	23.2		17.5	36.4		15.3	24.5	
LOS	C	E		C	C		B	D		B	C	
Approach Delay		58.1			23.3			33.7				24.0
Approach LOS		E			C			C				C
90th %ile Green (s)	20.4	20.4		20.4	20.4		28.3	28.3		28.3	28.3	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
70th %ile Green (s)	20.4	20.4		20.4	20.4		28.3	28.3		28.3	28.3	
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
50th %ile Green (s)	20.4	20.4		20.4	20.4		27.1	27.1		27.1	27.1	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	20.4	20.4		20.4	20.4		23.1	23.1		23.1	23.1	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	20.4	20.4		20.4	20.4		17.8	17.8		17.8	17.8	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Stops (vph)	34	288		28	120		43	343		13	239	
Fuel Used(l)	3	38		2	7		3	27		1	14	
CO Emissions (g/hr)	61	714		29	127		60	511		13	263	
NOx Emissions (g/hr)	12	138		6	25		12	99		2	51	
VOC Emissions (g/hr)	14	165		7	29		14	118		3	61	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	4.6	42.4		3.8	17.7		6.2	49.6		1.6	33.9	
Queue Length 95th (m)	13.5	#99.7		11.4	33.5		14.7	#90.9		5.8	56.7	
Internal Link Dist (m)		411.9			73.2			201.8				83.4
Turn Bay Length (m)	15.0			15.0			20.0			15.0		
Base Capacity (vph)	302	410		154	432		308	598		197	593	
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	0.16	0.96		0.25	0.39		0.23	0.74		0.10	0.57	

Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 37 (53%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.96  
 Intersection Signal Delay: 37.1  
 Intersection LOS: D  
 Intersection Capacity Utilization 80.3%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 13: Preston & Somerset



Lane Group	Ø1	Ø3	Ø5	Ø7
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
90th %ile Green (s)	3.0	3.0	3.0	3.0
90th %ile Term Code	MaxR	MaxR	MaxR	MaxR
70th %ile Green (s)	3.0	3.0	3.0	3.0
70th %ile Term Code	MaxR	MaxR	MaxR	MaxR
50th %ile Green (s)	4.2	3.0	4.2	3.0
50th %ile Term Code	MaxR	MaxR	MaxR	MaxR
30th %ile Green (s)	8.2	3.0	8.2	3.0
30th %ile Term Code	MaxR	MaxR	MaxR	MaxR
10th %ile Green (s)	13.5	3.0	13.5	3.0
10th %ile Term Code	MaxR	MaxR	MaxR	MaxR
Stops (vph)				
Fuel Used(l)				
CO Emissions (g/hr)				
NOx Emissions (g/hr)				
VOC Emissions (g/hr)				
Dilemma Vehicles (#)				
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				





















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	260	54	27	254	17	36
Future Volume (Veh/h)	260	54	27	254	17	36
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	289	60	30	282	19	40
Pedestrians					50	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.2	
Percent Blockage					4	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	109					
pX, platoon unblocked			0.96		0.96	0.96
vC, conflicting volume			399		711	369
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			356		680	325
tC, single (s)			4.1		6.6	6.5
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.5
p0 queue free %			97		94	93
cM capacity (veh/h)			1108		343	610
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	349	312	59			
Volume Left	0	30	19			
Volume Right	60	0	40			
cSH	1700	1108	488			
Volume to Capacity	0.21	0.03	0.12			
Queue Length 95th (m)	0.0	0.6	3.1			
Control Delay (s)	0.0	1.0	13.4			
Lane LOS		A	B			
Approach Delay (s)	0.0	1.0	13.4			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			1.6			
Intersection Capacity Utilization			47.6%	ICU Level of Service		A
Analysis Period (min)			15			

















2: Breezehill & Laurel  
AM Peak

1040 Somerset Street  
Existing Traffic Volumes

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	26	10	6	8	6	11	49	10	22	31	16
Future Volume (vph)	11	26	10	6	8	6	11	49	10	22	31	16
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	12	29	11	7	9	7	12	54	11	24	34	18
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	52	23	77	76								
Volume Left (vph)	12	7	12	24								
Volume Right (vph)	11	7	11	18								
Hadj (s)	-0.05	-0.09	-0.02	-0.04								
Departure Headway (s)	4.2	4.2	4.1	4.1								
Degree Utilization, x	0.06	0.03	0.09	0.09								
Capacity (veh/h)	822	820	846	857								
Control Delay (s)	7.5	7.3	7.5	7.5								
Approach Delay (s)	7.5	7.3	7.5	7.5								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay			7.5									
Level of Service			A									
Intersection Capacity Utilization			27.0%		ICU Level of Service				A			
Analysis Period (min)			15									

9: Breezehill & Gladstone  
AM Peak

1040 Somerset Street  
Existing Traffic Volumes

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	193	0	1	159	38	2	1	2	13	0	17
Future Volume (Veh/h)	21	193	0	1	159	38	2	1	2	13	0	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	23	214	0	1	177	42	2	1	2	14	0	19
Pedestrians		8			2			25			21	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	240			239			512	527	241	486	506	227
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	240			239			512	527	241	486	506	227
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			100	100	100	97	100	98
cM capacity (veh/h)	1303			1299			429	430	779	459	442	792
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	237	220	5	33								
Volume Left	23	1	2	14								
Volume Right	0	42	2	19								
cSH	1303	1299	523	606								
Volume to Capacity	0.02	0.00	0.01	0.05								
Queue Length 95th (m)	0.4	0.0	0.2	1.3								
Control Delay (s)	0.9	0.0	11.9	11.3								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.9	0.0	11.9	11.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			39.3%		ICU Level of Service				A			
Analysis Period (min)			15									

3: Bayswater & Somerset  
PM Peak

1040 Somerset Street  
Existing Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	203	31	31	290	120	47	287	22	92	252	59
Future Volume (vph)	37	203	31	31	290	120	47	287	22	92	252	59
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		40.0	0.0		45.0	0.0		0.0	40.0		0.0
Storage Lanes	0		1	0		1	0		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99	0.75		0.99	0.83		0.99		0.96	0.98	
Fr <sub>t</sub>			0.850			0.850		0.992			0.971	
Fl <sub>t</sub> Protected		0.992			0.995			0.993		0.950		
Satd. Flow (prot)	0	1567	1517	0	1598	1517	0	1746	0	1679	1690	0
Fl <sub>t</sub> Permitted		0.911			0.954			0.791		0.399		
Satd. Flow (perm)	0	1427	1132	0	1511	1264	0	1383	0	678	1690	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			42			133		5			18	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		88.8			108.9			142.8			114.2	
Travel Time (s)		6.4			7.8			10.3			8.2	
Confl. Peds. (#/hr)	64		140	140		64	48		50	50		48
Confl. Bikes (#/hr)			44			72			6			24
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%	4%	2%	2%	2%	2%	2%	2%	2%	3%	2%	3%
Parking (#/hr)		0			0							
Adj. Flow (vph)	41	226	34	34	322	133	52	319	24	102	280	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	267	34	0	356	133	0	395	0	102	346	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	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	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	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	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	30.5	30.5	30.5	30.5	30.5	30.5	28.9	28.9		28.9	28.9	
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	35.0	35.0		35.0	35.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%	53.3%	46.7%	46.7%		46.7%	46.7%	
Maximum Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	29.1	29.1		29.1	29.1	

3: Bayswater & Somerset  
PM Peak

1040 Somerset Street  
Existing Traffic Volumes

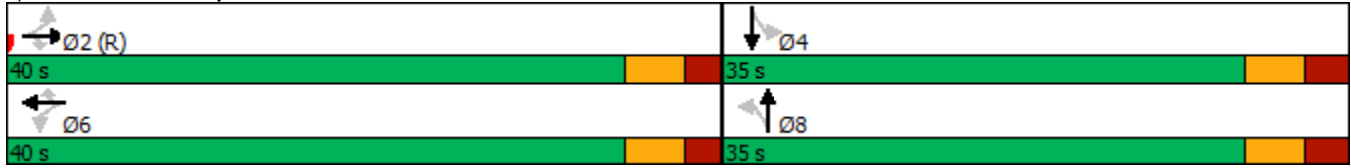


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)		5.5	5.5		5.5	5.5		5.9		5.9	5.9	
Lead/Lag												
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	Max	Max	Max	None	None		None	None	
Walk Time (s)	17.0	17.0	17.0	17.0	17.0	17.0	13.0	13.0		13.0	13.0	
Flash Dont Walk (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	100	100	100	50	50	50	40	40		30	30	
Act Effct Green (s)		40.4	40.4		40.4	40.4		23.2		23.2	23.2	
Actuated g/C Ratio		0.54	0.54		0.54	0.54		0.31		0.31	0.31	
v/c Ratio		0.35	0.05		0.44	0.18		0.92		0.49	0.65	
Control Delay		12.8	3.5		14.0	3.0		51.7		28.0	26.4	
Queue Delay		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Delay		12.8	3.5		14.0	3.0		51.7		28.0	26.4	
LOS		B	A		B	A		D		C	C	
Approach Delay		11.8			11.0			51.7			26.8	
Approach LOS		B			B			D			C	
90th %ile Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	29.1	29.1		29.1	29.1	
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Max	Max		Hold	Hold	
70th %ile Green (s)	36.7	36.7	36.7	36.7	36.7	36.7	26.9	26.9		26.9	26.9	
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
50th %ile Green (s)	39.8	39.8	39.8	39.8	39.8	39.8	23.8	23.8		23.8	23.8	
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
30th %ile Green (s)	43.1	43.1	43.1	43.1	43.1	43.1	20.5	20.5		20.5	20.5	
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
10th %ile Green (s)	48.1	48.1	48.1	48.1	48.1	48.1	15.5	15.5		15.5	15.5	
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
Stops (vph)		138	5		195	14		320		71	241	
Fuel Used(l)		7	0		11	2		26		5	15	
CO Emissions (g/hr)		139	9		207	34		487		85	281	
NOx Emissions (g/hr)		27	2		40	7		94		16	54	
VOC Emissions (g/hr)		32	2		48	8		112		20	65	
Dilemma Vehicles (#)		0	0		0	0		0		0	0	
Queue Length 50th (m)		20.3	0.0		28.8	0.0		52.1		11.5	39.1	
Queue Length 95th (m)		41.7	3.7		56.7	8.4		#86.7		23.1	57.7	
Internal Link Dist (m)		64.8			84.9			118.8			90.2	
Turn Bay Length (m)			40.0			45.0				40.0		
Base Capacity (vph)		769	629		814	742		539		263	666	
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		0.35	0.05		0.44	0.18		0.73		0.39	0.52	

Intersection Summary






















Area Type:	Other
Cycle Length:	75
Actuated Cycle Length:	75
Offset:	63 (84%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.92
Intersection Signal Delay:	25.3
Intersection LOS:	C
Intersection Capacity Utilization:	98.3%
ICU Level of Service:	F
Analysis Period (min):	15
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

Splits and Phases: 3: Bayswater & Somerset



13: Preston & Somerset  
PM Peak

1040 Somerset Street  
Existing Traffic Volumes

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	276	66	53	352	23	82	312	54	40	285	46
Future Volume (vph)	54	276	66	53	352	23	82	312	54	40	285	46
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93	0.95		0.91	0.99		0.92	0.98		0.95	0.97	
Fr <sub>t</sub>		0.971			0.991			0.978			0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1453	0	1695	1561	0	1695	1464	0	1695	1495	0
Flt Permitted	0.331			0.379			0.391			0.339		
Satd. Flow (perm)	547	1453	0	613	1561	0	644	1464	0	572	1495	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		435.9			97.2			225.8			107.4	
Travel Time (s)		31.4			7.0			16.3			7.7	
Confl. Peds. (#/hr)	93		105	105		93	89		70	70		89
Confl. Bikes (#/hr)			28			53			8			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 (%)	2%	3%	11%	2%	2%	9%	2%	8%	2%	2%	5%	2%
Parking (#/hr)		0			0			0			0	
Adj. Flow (vph)	60	307	73	59	391	26	91	347	60	44	317	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	380	0	59	417	0	91	407	0	44	368	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.6	24.6		24.6	24.6		26.7	26.7		26.7	26.7	
Total Split (s)	29.0	29.0		29.0	29.0		31.0	31.0		31.0	31.0	
Total Split (%)	41.4%	41.4%		41.4%	41.4%		44.3%	44.3%		44.3%	44.3%	
Maximum Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Storage Length (m)				
Storage Lanes				
Taper Length (m)				
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 (%)				
Parking (#/hr)				
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	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	3.0	3.0	3.0	3.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Maximum Green (s)	3.0	3.0	3.0	3.0



13: Preston & Somerset  
PM Peak

1040 Somerset Street  
Existing Traffic Volumes











Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	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		2.4	2.4		2.4	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)	5.6	5.6		5.6	5.6		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	90	90		75	75		55	55		75	75	
Act Effct Green (s)	23.4	23.4		23.4	23.4		22.9	22.9		22.9	22.9	
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.33	0.33		0.33	0.33	
v/c Ratio	0.33	0.78		0.29	0.80		0.43	0.85		0.24	0.75	
Control Delay	23.7	34.9		21.9	35.3		24.8	40.0		19.7	31.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	23.7	34.9		21.9	35.3		24.8	40.0		19.7	31.4	
LOS	C	C		C	D		C	D		B	C	
Approach Delay		33.4			33.6			37.2				30.2
Approach LOS		C			C			D				C
90th %ile Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
70th %ile Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
50th %ile Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	
50th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
30th %ile Green (s)	23.4	23.4		23.4	23.4		21.7	21.7		21.7	21.7	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	23.4	23.4		23.4	23.4		16.7	16.7		16.7	16.7	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Stops (vph)	41	286		41	315		63	315		30	283	
Fuel Used(l)	4	30		2	21		5	26		2	18	
CO Emissions (g/hr)	77	553		43	385		88	487		31	330	
NOx Emissions (g/hr)	15	107		8	74		17	94		6	64	
VOC Emissions (g/hr)	18	128		10	89		20	112		7	76	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	5.8	44.2		5.6	48.8		8.7	46.1		3.9	39.9	
Queue Length 95th (m)	15.5	#85.4		14.8	#92.3		21.0	#88.3		11.2	68.2	
Internal Link Dist (m)		411.9			73.2			201.8				83.4
Turn Bay Length (m)	15.0			15.0			20.0			15.0		
Base Capacity (vph)	182	485		204	521		232	529		206	540	
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	0.33	0.78		0.29	0.80		0.39	0.77		0.21	0.68	

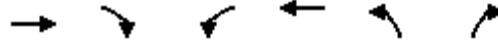
Intersection Summary

Area Type:	Other
Cycle Length:	70
Actuated Cycle Length:	70
Offset:	32 (46%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	65
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.85
Intersection Signal Delay:	33.8
Intersection Capacity Utilization:	78.4%
Analysis Period (min):	15
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

















Splits and Phases: 13: Preston & Somerset

 Ø1	 Ø2 (R)	 Ø3	 Ø4
5 s	29 s	5 s	31 s
 Ø5	 Ø6	 Ø7	 Ø8
5 s	29 s	5 s	31 s

Lane Group	Ø1	Ø3	Ø5	Ø7
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
90th %ile Green (s)	3.0	3.0	3.0	3.0
90th %ile Term Code	MaxR	MaxR	MaxR	MaxR
70th %ile Green (s)	3.0	3.0	3.0	3.0
70th %ile Term Code	MaxR	MaxR	MaxR	MaxR
50th %ile Green (s)	3.0	3.0	3.0	3.0
50th %ile Term Code	MaxR	MaxR	MaxR	MaxR
30th %ile Green (s)	6.6	3.0	6.6	3.0
30th %ile Term Code	MaxR	MaxR	MaxR	MaxR
10th %ile Green (s)	11.6	3.0	11.6	3.0
10th %ile Term Code	MaxR	MaxR	MaxR	MaxR
Stops (vph)				
Fuel Used(l)				
CO Emissions (g/hr)				
NOx Emissions (g/hr)				
VOC Emissions (g/hr)				
Dilemma Vehicles (#)				
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				



















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	316	13	21	418	16	27
Future Volume (Veh/h)	316	13	21	418	16	27
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	351	14	23	464	18	30
Pedestrians	18				100	
Lane Width (m)	3.7				3.7	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	2				9	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	109					
pX, platoon unblocked			0.93		0.93	0.93
vC, conflicting volume			465		986	458
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			384		946	376
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		92	95
cM capacity (veh/h)			996		237	568
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	365	487	48			
Volume Left	0	23	18			
Volume Right	14	0	30			
cSH	1700	996	373			
Volume to Capacity	0.21	0.02	0.13			
Queue Length 95th (m)	0.0	0.5	3.3			
Control Delay (s)	0.0	0.7	16.1			
Lane LOS		A	C			
Approach Delay (s)	0.0	0.7	16.1			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			1.2			
Intersection Capacity Utilization			51.3%	ICU Level of Service		A
Analysis Period (min)			15			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	12	8	10	4	22	6	24	22	1	3	45	32
Future Volume (vph)	12	8	10	4	22	6	24	22	1	3	45	32
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	9	11	4	24	7	27	24	1	3	50	36
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	33	35	52	89								
Volume Left (vph)	13	4	27	3								
Volume Right (vph)	11	7	1	36								
Hadj (s)	-0.09	-0.06	0.13	-0.20								
Departure Headway (s)	4.1	4.2	4.3	3.9								
Degree Utilization, x	0.04	0.04	0.06	0.10								
Capacity (veh/h)	834	831	819	902								
Control Delay (s)	7.3	7.3	7.5	7.3								
Approach Delay (s)	7.3	7.3	7.5	7.3								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay			7.4									
Level of Service			A									
Intersection Capacity Utilization			27.4%		ICU Level of Service				A			
Analysis Period (min)			15									

9: Breezehill & Gladstone  
PM Peak

1040 Somerset Street  
Existing Traffic Volumes

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	187	4	6	497	27	3	0	1	28	0	23
Future Volume (Veh/h)	17	187	4	6	497	27	3	0	1	28	0	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	208	4	7	552	30	3	0	1	31	0	26
Pedestrians		7			10			25			22	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	604			237			887	891	245	862	878	596
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	604			237			887	891	245	862	878	596
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	98			99			99	100	100	87	100	95
cM capacity (veh/h)	955			1302			232	264	770	245	268	491
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	231	589	4	57								
Volume Left	19	7	3	31								
Volume Right	4	30	1	26								
cSH	955	1302	281	318								
Volume to Capacity	0.02	0.01	0.01	0.18								
Queue Length 95th (m)	0.5	0.1	0.3	4.9								
Control Delay (s)	0.9	0.2	18.0	18.8								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.9	0.2	18.0	18.8								
Approach LOS			C	C								
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			43.8%		ICU Level of Service				A			
Analysis Period (min)			15									

3: Bayswater & Somerset  
AM Peak

1040 Somerset Street  
2025 Total Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	230	25	24	141	59	25	187	34	131	230	53
Future Volume (vph)	39	230	25	24	141	59	25	187	34	131	230	53
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		40.0	0.0		45.0	0.0		0.0	40.0		0.0
Storage Lanes	0		1	0		1	0		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99	0.83		0.99	0.88		0.98		0.96	0.99	
Fr <sub>t</sub>			0.850			0.850		0.981			0.972	
Fl <sub>t</sub> Protected		0.993			0.993			0.995		0.950		
Satd. Flow (prot)	0	1494	1517	0	1531	1357	0	1707	0	1662	1713	0
Fl <sub>t</sub> Permitted		0.945			0.942			0.939		0.519		
Satd. Flow (perm)	0	1410	1262	0	1436	1193	0	1606	0	873	1713	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			45			59		14			20	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		88.8			108.9			142.8			114.2	
Travel Time (s)		6.4			7.8			10.3			8.2	
Confl. Peds. (#/hr)	51		81	81		51	27		39	39		27
Confl. Bikes (#/hr)			47			38			17			7
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 (%)	14%	8%	2%	2%	7%	14%	8%	2%	3%	4%	2%	2%
Parking (#/hr)		0			0							
Adj. Flow (vph)	39	230	25	24	141	59	25	187	34	131	230	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	269	25	0	165	59	0	246	0	131	283	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	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	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	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	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	30.5	30.5	30.5	30.5	30.5	30.5	28.9	28.9		28.9	28.9	
Total Split (s)	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0		35.0	35.0	
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	29.5	29.5	29.5	29.5	29.5	29.5	29.1	29.1		29.1	29.1	

3: Bayswater & Somerset  
AM Peak

1040 Somerset Street  
2025 Total Traffic Volumes

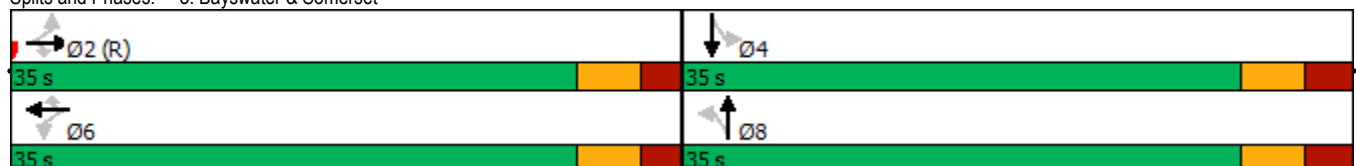


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)		5.5	5.5		5.5	5.5		5.9		5.9	5.9	
Lead/Lag												
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	Max	Max	Max	None	None		None	None	
Walk Time (s)	17.0	17.0	17.0	17.0	17.0	17.0	13.0	13.0		13.0	13.0	
Flash Dont Walk (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	70	70	70	40	40	40	30	30		20	20	
Act Effct Green (s)		41.3	41.3		41.3	41.3		17.3		17.3	17.3	
Actuated g/C Ratio		0.59	0.59		0.59	0.59		0.25		0.25	0.25	
v/c Ratio		0.32	0.03		0.20	0.08		0.60		0.61	0.65	
Control Delay		10.1	1.7		6.1	1.4		27.3		34.2	27.9	
Queue Delay		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Delay		10.1	1.7		6.1	1.4		27.3		34.2	27.9	
LOS		B	A		A	A		C		C	C	
Approach Delay		9.4			4.8			27.3				29.9
Approach LOS		A			A			C				C
90th %ile Green (s)	34.9	34.9	34.9	34.9	34.9	34.9	23.7	23.7		23.7	23.7	
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
70th %ile Green (s)	35.6	35.6	35.6	35.6	35.6	35.6	23.0	23.0		23.0	23.0	
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Ped	Ped		Hold	Hold	
50th %ile Green (s)	42.3	42.3	42.3	42.3	42.3	42.3	16.3	16.3		16.3	16.3	
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
30th %ile Green (s)	45.0	45.0	45.0	45.0	45.0	45.0	13.6	13.6		13.6	13.6	
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
10th %ile Green (s)	48.6	48.6	48.6	48.6	48.6	48.6	10.0	10.0		10.0	10.0	
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Min	Min		Min	Min	
Stops (vph)		140	2		71	9		192		109	220	
Fuel Used(l)		8	0		4	1		13		7	14	
CO Emissions (g/hr)		140	5		76	16		238		136	262	
NOx Emissions (g/hr)		27	1		15	3		46		26	51	
VOC Emissions (g/hr)		32	1		17	4		55		31	60	
Dilemma Vehicles (#)		0	0		0	0		0		0	0	
Queue Length 50th (m)		15.3	0.0		3.4	0.0		27.4		15.5	31.4	
Queue Length 95th (m)		36.2	2.0		21.0	m1.3		41.8		28.0	46.7	
Internal Link Dist (m)		64.8			84.9			118.8			90.2	
Turn Bay Length (m)			40.0			45.0				40.0		
Base Capacity (vph)		831	762		846	727		675		362	723	
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		0.32	0.03		0.20	0.08		0.36		0.36	0.39	

Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 19 (27%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.65  
 Intersection Signal Delay: 19.5  
 Intersection LOS: B  
 Intersection Capacity Utilization 96.7%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.






















Splits and Phases: 3: Bayswater & Somerset





13: Preston & Somerset  
AM Peak

1040 Somerset Street  
2025 Total Traffic Volumes

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	301	95	34	167	13	67	354	47	18	278	31
Future Volume (vph)	53	301	95	34	167	13	67	354	47	18	278	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.90	0.95		0.96	0.99		0.97	0.99		0.96	0.99	
Fr <sub>t</sub>		0.964			0.989			0.982			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1422	0	1679	1487	0	1647	1480	0	1503	1458	0
Flt Permitted	0.644			0.311			0.476			0.354		
Satd. Flow (perm)	1029	1422	0	525	1487	0	798	1480	0	538	1458	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		435.9			97.2			225.8			107.4	
Travel Time (s)		31.4			7.0			16.3			7.7	
Confl. Peds. (#/hr)	73		53	53		73	32		48	48		32
Confl. Bikes (#/hr)			66			21			10			4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	5%	9%	3%	8%	2%	5%	8%	2%	15%	9%	17%
Parking (#/hr)		0			0			0			0	
Adj. Flow (vph)	53	301	95	34	167	13	67	354	47	18	278	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	396	0	34	180	0	67	401	0	18	309	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.6	24.6		24.6	24.6		26.7	26.7		26.7	26.7	
Total Split (s)	26.0	26.0		26.0	26.0		34.0	34.0		34.0	34.0	
Total Split (%)	37.1%	37.1%		37.1%	37.1%		48.6%	48.6%		48.6%	48.6%	
Maximum Green (s)	20.4	20.4		20.4	20.4		28.3	28.3		28.3	28.3	

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Storage Length (m)				
Storage Lanes				
Taper Length (m)				
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 (%)				
Parking (#/hr)				
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	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	3.0	3.0	3.0	3.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Maximum Green (s)	3.0	3.0	3.0	3.0

13: Preston & Somerset  
AM Peak

1040 Somerset Street  
2025 Total Traffic Volumes

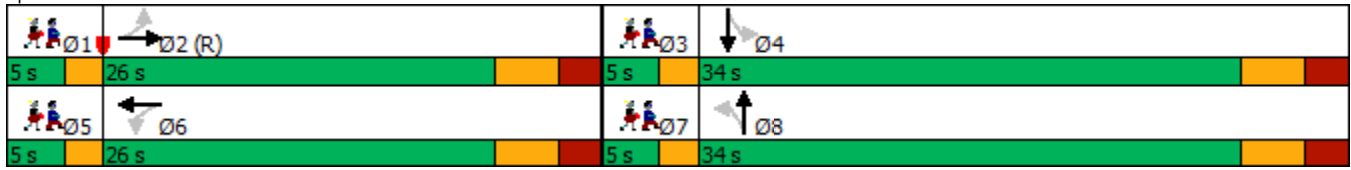


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.6		5.6	5.6		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	40	40		60	60		35	35		25	25	
Act Effct Green (s)	20.4	20.4		20.4	20.4		23.4	23.4		23.4	23.4	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.33	0.33		0.33	0.33	
v/c Ratio	0.18	0.96		0.22	0.42		0.25	0.81		0.10	0.63	
Control Delay	20.5	60.8		23.4	23.6		17.7	34.3		15.2	25.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	20.5	60.8		23.4	23.6		17.7	34.3		15.2	25.2	
LOS	C	E		C	C		B	C		B	C	
Approach Delay		56.1			23.6			31.9				24.6
Approach LOS		E			C			C				C
90th %ile Green (s)	20.4	20.4		20.4	20.4		28.3	28.3		28.3	28.3	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
70th %ile Green (s)	20.4	20.4		20.4	20.4		27.8	27.8		27.8	27.8	
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	20.4	20.4		20.4	20.4		24.3	24.3		24.3	24.3	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	20.4	20.4		20.4	20.4		20.9	20.9		20.9	20.9	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	20.4	20.4		20.4	20.4		15.7	15.7		15.7	15.7	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Stops (vph)	42	324		29	141		46	348		13	245	
Fuel Used(l)	4	42		2	8		3	27		1	15	
CO Emissions (g/hr)	74	785		29	150		63	502		13	272	
NOx Emissions (g/hr)	14	151		6	29		12	97		2	53	
VOC Emissions (g/hr)	17	181		7	35		15	116		3	63	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	5.0	42.2		3.4	18.9		6.1	46.1		1.6	32.8	
Queue Length 95th (m)	14.0	#99.0		10.4	35.2		13.7	70.6		5.2	51.3	
Internal Link Dist (m)		411.9			73.2			201.8				83.4
Turn Bay Length (m)	15.0			15.0			20.0			15.0		
Base Capacity (vph)	299	414		153	433		322	598		217	589	
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	0.18	0.96		0.22	0.42		0.21	0.67		0.08	0.52	

Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 37 (53%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.96  
 Intersection Signal Delay: 36.5  
 Intersection LOS: D  
 Intersection Capacity Utilization 82.4%  
 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.

















Splits and Phases: 13: Preston & Somerset



Lane Group	Ø1	Ø3	Ø5	Ø7
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
90th %ile Green (s)	3.0	3.0	3.0	3.0
90th %ile Term Code	MaxR	MaxR	MaxR	MaxR
70th %ile Green (s)	3.5	3.0	3.5	3.0
70th %ile Term Code	MaxR	MaxR	MaxR	MaxR
50th %ile Green (s)	7.0	3.0	7.0	3.0
50th %ile Term Code	MaxR	MaxR	MaxR	MaxR
30th %ile Green (s)	10.4	3.0	10.4	3.0
30th %ile Term Code	MaxR	MaxR	MaxR	MaxR
10th %ile Green (s)	15.6	3.0	15.6	3.0
10th %ile Term Code	MaxR	MaxR	MaxR	MaxR
Stops (vph)				
Fuel Used(l)				
CO Emissions (g/hr)				
NOx Emissions (g/hr)				
VOC Emissions (g/hr)				
Dilemma Vehicles (#)				
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				
<b>Intersection Summary</b>				



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	302	62	34	289	31	43
Future Volume (Veh/h)	302	62	34	289	31	43
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	302	62	34	289	31	43
Pedestrians					50	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.2	
Percent Blockage					4	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	109					
pX, platoon unblocked			0.95		0.95	0.95
vC, conflicting volume			414		740	383
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			353		697	320
tC, single (s)			4.1		6.6	6.5
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.5
p0 queue free %			97		91	93
cM capacity (veh/h)			1093		329	604
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	364	323	74			
Volume Left	0	34	31			
Volume Right	62	0	43			
cSH	1700	1093	447			
Volume to Capacity	0.21	0.03	0.17			
Queue Length 95th (m)	0.0	0.7	4.5			
Control Delay (s)	0.0	1.2	14.6			
Lane LOS		A	B			
Approach Delay (s)	0.0	1.2	14.6			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			1.9			
Intersection Capacity Utilization			54.1%	ICU Level of Service		A
Analysis Period (min)			15			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	26	10	6	8	19	11	53	10	34	34	19
Future Volume (vph)	15	26	10	6	8	19	11	53	10	34	34	19
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	26	10	6	8	19	11	53	10	34	34	19
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	51	33	74	87								
Volume Left (vph)	15	6	11	34								
Volume Right (vph)	10	19	10	19								
Hadj (s)	-0.02	-0.28	-0.02	-0.02								
Departure Headway (s)	4.3	4.0	4.2	4.1								
Degree Utilization, x	0.06	0.04	0.09	0.10								
Capacity (veh/h)	809	852	837	847								
Control Delay (s)	7.5	7.2	7.5	7.6								
Approach Delay (s)	7.5	7.2	7.5	7.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.5									
Level of Service			A									
Intersection Capacity Utilization			27.9%		ICU Level of Service				A			
Analysis Period (min)			15									

9: Breezehill & Gladstone  
AM Peak

1040 Somerset Street  
2025 Total Traffic Volumes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	235	0	1	203	40	2	1	2	15	0	18
Future Volume (Veh/h)	23	235	0	1	203	40	2	1	2	15	0	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	23	235	0	1	203	40	2	1	2	15	0	18
Pedestrians		8			2			25			21	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	264			260			557	572	262	532	552	252
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	264			260			557	572	262	532	552	252
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			100	100	100	96	100	98
cM capacity (veh/h)	1277			1277			400	406	759	428	416	767
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	258	244	5	33								
Volume Left	23	1	2	15								
Volume Right	0	40	2	18								
cSH	1277	1277	495	564								
Volume to Capacity	0.02	0.00	0.01	0.06								
Queue Length 95th (m)	0.4	0.0	0.2	1.4								
Control Delay (s)	0.9	0.0	12.3	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.9	0.0	12.3	11.8								
Approach LOS			B	B								
<b>Intersection Summary</b>												
Average Delay			1.3									
Intersection Capacity Utilization			43.5%		ICU Level of Service				A			
Analysis Period (min)			15									



3: Bayswater & Somerset  
PM Peak

1040 Somerset Street  
2025 Background Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	229	33	47	335	135	49	302	27	105	265	62
Future Volume (vph)	39	229	33	47	335	135	49	302	27	105	265	62
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		40.0	0.0		45.0	0.0		0.0	40.0		0.0
Storage Lanes	0		1	0		1	0		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99	0.75		0.98	0.83		0.99		0.96	0.98	
Fr <sub>t</sub>			0.850			0.850		0.990			0.972	
Fl <sub>t</sub> Protected		0.993			0.994			0.994		0.950		
Satd. Flow (prot)	0	1568	1517	0	1596	1517	0	1743	0	1679	1692	0
Fl <sub>t</sub> Permitted		0.912			0.935			0.820		0.405		
Satd. Flow (perm)	0	1430	1132	0	1476	1264	0	1429	0	687	1692	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			42			135		6			18	
Link Speed (k/h)		50			50			50		50		50
Link Distance (m)		88.8			108.9			142.8			114.2	
Travel Time (s)		6.4			7.8			10.3			8.2	
Confl. Peds. (#/hr)	64		140	140		64	48		50	50		48
Confl. Bikes (#/hr)			44			72			6			24
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%	4%	2%	2%	2%	2%	2%	2%	2%	3%	2%	3%
Parking (#/hr)		0			0							
Adj. Flow (vph)	39	229	33	47	335	135	49	302	27	105	265	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	268	33	0	382	135	0	378	0	105	327	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	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	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	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	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	30.5	30.5	30.5	30.5	30.5	30.5	28.9	28.9		28.9	28.9	
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	35.0	35.0		35.0	35.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%	53.3%	46.7%	46.7%		46.7%	46.7%	
Maximum Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	29.1	29.1		29.1	29.1	

3: Bayswater & Somerset  
PM Peak

1040 Somerset Street  
2025 Background Traffic Volumes

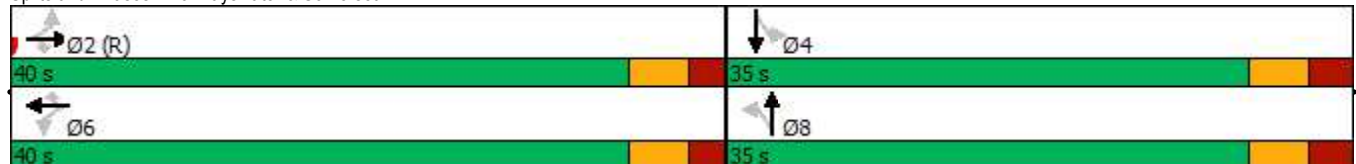


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)		5.5	5.5		5.5	5.5		5.9		5.9	5.9	
Lead/Lag												
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	Max	Max	Max	None	None		None	None	
Walk Time (s)	17.0	17.0	17.0	17.0	17.0	17.0	13.0	13.0		13.0	13.0	
Flash Dont Walk (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	100	100	100	50	50	50	40	40		30	30	
Act Effct Green (s)		41.1	41.1		41.1	41.1		22.5		22.5	22.5	
Actuated g/C Ratio		0.55	0.55		0.55	0.55		0.30		0.30	0.30	
v/c Ratio		0.34	0.05		0.47	0.18		0.87		0.51	0.63	
Control Delay		12.5	3.4		14.3	3.0		44.8		29.4	26.1	
Queue Delay		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Delay		12.5	3.4		14.3	3.0		44.8		29.4	26.1	
LOS		B	A		B	A		D		C	C	
Approach Delay		11.5			11.4			44.8				26.9
Approach LOS		B			B			D				C
90th %ile Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	29.1	29.1		29.1	29.1	
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Max	Max		Hold	Hold	
70th %ile Green (s)	37.5	37.5	37.5	37.5	37.5	37.5	26.1	26.1		26.1	26.1	
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
50th %ile Green (s)	40.6	40.6	40.6	40.6	40.6	40.6	23.0	23.0		23.0	23.0	
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
30th %ile Green (s)	44.0	44.0	44.0	44.0	44.0	44.0	19.6	19.6		19.6	19.6	
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
10th %ile Green (s)	48.8	48.8	48.8	48.8	48.8	48.8	14.8	14.8		14.8	14.8	
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
Stops (vph)		151	5		236	16		341		83	252	
Fuel Used(l)		8	0		13	2		26		5	16	
CO Emissions (g/hr)		153	9		250	38		480		100	293	
NOx Emissions (g/hr)		29	2		48	7		93		19	57	
VOC Emissions (g/hr)		35	2		58	9		111		23	68	
Dilemma Vehicles (#)		0	0		0	0		0		0	0	
Queue Length 50th (m)		19.8	0.0		30.9	0.0		49.1		12.0	36.9	
Queue Length 95th (m)		41.9	3.5		63.0	8.4		72.2		23.8	54.0	
Internal Link Dist (m)		64.8			84.9			118.8			90.2	
Turn Bay Length (m)			40.0			45.0				40.0		
Base Capacity (vph)		783	639		808	753		558		266	667	
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		0.34	0.05		0.47	0.18		0.68		0.39	0.49	

Intersection Summary

Area Type: Other  
 Cycle Length: 75  
 Actuated Cycle Length: 75  
 Offset: 63 (84%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.87  
 Intersection Signal Delay: 23.3  
 Intersection LOS: C  
 Intersection Capacity Utilization 102.3%  
 ICU Level of Service G  
 Analysis Period (min) 15

Splits and Phases: 3: Bayswater & Somerset



13: Preston & Somerset  
PM Peak

1040 Somerset Street  
2025 Background Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	326	70	53	398	23	85	312	54	40	285	54
Future Volume (vph)	64	326	70	53	398	23	85	312	54	40	285	54
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93	0.96		0.91	0.99		0.92	0.98		0.94	0.97	
Fr <sub>t</sub>		0.973			0.992			0.978			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1463	0	1695	1567	0	1695	1464	0	1695	1485	0
Flt Permitted	0.326			0.358			0.417			0.379		
Satd. Flow (perm)	539	1463	0	582	1567	0	683	1464	0	635	1485	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		435.9			97.2			225.8			107.4	
Travel Time (s)		31.4			7.0			16.3			7.7	
Confl. Peds. (#/hr)	93		105	105		93	89		70	70		89
Confl. Bikes (#/hr)			28			53			8			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 (%)	2%	3%	11%	2%	2%	9%	2%	8%	2%	2%	5%	2%
Parking (#/hr)		0			0			0			0	
Adj. Flow (vph)	64	326	70	53	398	23	85	312	54	40	285	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	396	0	53	421	0	85	366	0	40	339	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.6	24.6		24.6	24.6		26.7	26.7		26.7	26.7	
Total Split (s)	29.0	29.0		29.0	29.0		31.0	31.0		31.0	31.0	
Total Split (%)	41.4%	41.4%		41.4%	41.4%		44.3%	44.3%		44.3%	44.3%	
Maximum Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Storage Length (m)				
Storage Lanes				
Taper Length (m)				
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 (%)				
Parking (#/hr)				
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	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	3.0	3.0	3.0	3.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Maximum Green (s)	3.0	3.0	3.0	3.0

13: Preston & Somerset  
PM Peak

1040 Somerset Street  
2025 Background Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	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		2.4	2.4		2.4	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)	5.6	5.6		5.6	5.6		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	90	90		75	75		55	55		75	75	
Act Effct Green (s)	23.4	23.4		23.4	23.4		21.8	21.8		21.8	21.8	
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.31	0.31		0.31	0.31	
v/c Ratio	0.36	0.81		0.27	0.80		0.40	0.80		0.20	0.74	
Control Delay	24.6	36.9		21.8	35.6		23.9	36.1		19.0	31.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	24.6	36.9		21.8	35.6		23.9	36.1		19.0	31.2	
LOS	C	D		C	D		C	D		B	C	
Approach Delay		35.2			34.0			33.8				29.9
Approach LOS		D			C			C				C
90th %ile Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
70th %ile Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
50th %ile Green (s)	23.4	23.4		23.4	23.4		22.7	22.7		22.7	22.7	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	23.4	23.4		23.4	23.4		21.0	21.0		21.0	21.0	
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Ped	Ped	
10th %ile Green (s)	23.4	23.4		23.4	23.4		14.5	14.5		14.5	14.5	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Stops (vph)	51	332		41	353		63	320		30	289	
Fuel Used(l)	5	35		2	23		5	25		2	18	
CO Emissions (g/hr)	93	652		43	434		89	469		31	336	
NOx Emissions (g/hr)	18	126		8	84		17	90		6	65	
VOC Emissions (g/hr)	21	150		10	100		21	108		7	78	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	6.2	46.5		5.0	49.4		8.5	42.6		3.7	38.3	
Queue Length 95th (m)	16.5	#90.2		13.7	#93.5		19.2	#69.4		10.2	61.6	
Internal Link Dist (m)		411.9			73.2			201.8				83.4
Turn Bay Length (m)	15.0			15.0			20.0			15.0		
Base Capacity (vph)	180	489		194	523		246	529		229	536	
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	0.36	0.81		0.27	0.80		0.35	0.69		0.17	0.63	

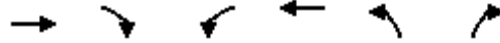
Intersection Summary

Area Type:	Other
Cycle Length:	70
Actuated Cycle Length:	70
Offset:	32 (46%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	65
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	33.4
Intersection Capacity Utilization:	80.9%
Analysis Period (min):	15
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

Splits and Phases: 13: Preston & Somerset



Lane Group	Ø1	Ø3	Ø5	Ø7
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
90th %ile Green (s)	3.0	3.0	3.0	3.0
90th %ile Term Code	MaxR	MaxR	MaxR	MaxR
70th %ile Green (s)	3.0	3.0	3.0	3.0
70th %ile Term Code	MaxR	MaxR	MaxR	MaxR
50th %ile Green (s)	5.6	3.0	5.6	3.0
50th %ile Term Code	MaxR	MaxR	MaxR	MaxR
30th %ile Green (s)	7.3	3.0	7.3	3.0
30th %ile Term Code	MaxR	MaxR	MaxR	MaxR
10th %ile Green (s)	13.8	3.0	13.8	3.0
10th %ile Term Code	MaxR	MaxR	MaxR	MaxR
Stops (vph)				
Fuel Used(l)				
CO Emissions (g/hr)				
NOx Emissions (g/hr)				
VOC Emissions (g/hr)				
Dilemma Vehicles (#)				
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				
<b>Intersection Summary</b>				



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	374	28	28	471	30	35
Future Volume (Veh/h)	374	28	28	471	30	35
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	374	28	28	471	30	35
Pedestrians	18				100	
Lane Width (m)	3.7				3.7	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	2				9	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	109					
pX, platoon unblocked			0.92		0.92	0.92
vC, conflicting volume			502		1033	488
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			420		995	405
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		86	94
cM capacity (veh/h)			963		219	546
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	402	499	65			
Volume Left	0	28	30			
Volume Right	28	0	35			
cSH	1700	963	323			
Volume to Capacity	0.24	0.03	0.20			
Queue Length 95th (m)	0.0	0.7	5.6			
Control Delay (s)	0.0	0.8	18.9			
Lane LOS		A	C			
Approach Delay (s)	0.0	0.8	18.9			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			1.7			
Intersection Capacity Utilization			61.0%	ICU Level of Service		B
Analysis Period (min)			15			





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	8	10	4	22	20	24	27	1	15	53	37
Future Volume (vph)	15	8	10	4	22	20	24	27	1	15	53	37
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	8	10	4	22	20	24	27	1	15	53	37
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	33	46	52	105								
Volume Left (vph)	15	4	24	15								
Volume Right (vph)	10	20	1	37								
Hadj (s)	-0.06	-0.21	0.11	-0.15								
Departure Headway (s)	4.2	4.1	4.3	4.0								
Degree Utilization, x	0.04	0.05	0.06	0.12								
Capacity (veh/h)	814	848	811	883								
Control Delay (s)	7.4	7.3	7.6	7.5								
Approach Delay (s)	7.4	7.3	7.6	7.5								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay			7.5									
Level of Service			A									
Intersection Capacity Utilization			27.9%		ICU Level of Service				A			
Analysis Period (min)			15									

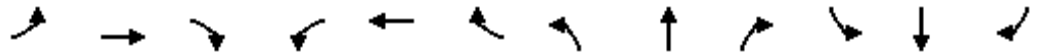
9: Breezehill & Gladstone  
PM Peak

1040 Somerset Street  
2025 Background Traffic Volumes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	20	228	4	6	569	29	3	0	1	32	0	27	
Future Volume (Veh/h)	20	228	4	6	569	29	3	0	1	32	0	27	
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly flow rate (vph)	20	228	4	6	569	29	3	0	1	32	0	27	
Pedestrians		7			10			25			22		
Lane Width (m)		3.7			3.7			3.7			3.7		
Walking Speed (m/s)		1.2			1.2			1.2			1.2		
Percent Blockage		1			1			2			2		
Right turn flare (veh)													
Median type		None			None								
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	620			257			924	927	265	898	914	612	
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	620			257			924	927	265	898	914	612	
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2	
tC, 2 stage (s)													
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3	
p0 queue free %	98			100			99	100	100	86	100	94	
cM capacity (veh/h)	942			1280			218	251	751	232	255	481	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	252	604	4	59									
Volume Left	20	6	3	32									
Volume Right	4	29	1	27									
cSH	942	1280	265	303									
Volume to Capacity	0.02	0.00	0.02	0.19									
Queue Length 95th (m)	0.5	0.1	0.3	5.4									
Control Delay (s)	0.9	0.1	18.8	19.7									
Lane LOS	A	A	C	C									
Approach Delay (s)	0.9	0.1	18.8	19.7									
Approach LOS			C	C									
Intersection Summary													
Average Delay			1.7										
Intersection Capacity Utilization			47.9%		ICU Level of Service				A				
Analysis Period (min)			15										

3: Bayswater & Somerset  
AM Peak

1040 Somerset Street  
2030 Background Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	241	26	25	147	61	26	196	36	137	241	55
Future Volume (vph)	41	241	26	25	147	61	26	196	36	137	241	55
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		40.0	0.0		45.0	0.0		0.0	40.0		0.0
Storage Lanes	0		1	0		1	0		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99	0.83		0.99	0.88		0.98		0.96	0.99	
Fr <sub>t</sub>			0.850			0.850		0.981			0.972	
Fl <sub>t</sub> Protected		0.993			0.993			0.995		0.950		
Satd. Flow (prot)	0	1494	1517	0	1531	1357	0	1707	0	1662	1713	0
Fl <sub>t</sub> Permitted		0.943			0.939			0.929		0.506		
Satd. Flow (perm)	0	1407	1262	0	1432	1193	0	1589	0	852	1713	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			45			61		14			20	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		88.8			108.9			142.8			114.2	
Travel Time (s)		6.4			7.8			10.3			8.2	
Confl. Peds. (#/hr)	51		81	81		51	27		39	39		27
Confl. Bikes (#/hr)			47			38			17			7
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 (%)	14%	8%	2%	2%	7%	14%	8%	2%	3%	4%	2%	2%
Parking (#/hr)		0			0							
Adj. Flow (vph)	41	241	26	25	147	61	26	196	36	137	241	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	282	26	0	172	61	0	258	0	137	296	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	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	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	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	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	30.5	30.5	30.5	30.5	30.5	30.5	28.9	28.9		28.9	28.9	
Total Split (s)	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0		35.0	35.0	
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	29.5	29.5	29.5	29.5	29.5	29.5	29.1	29.1		29.1	29.1	

3: Bayswater & Somerset  
AM Peak

1040 Somerset Street  
2030 Background Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)		5.5	5.5		5.5	5.5		5.9		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	Max	Max	Max	None	None		None	None	
Walk Time (s)	17.0	17.0	17.0	17.0	17.0	17.0	13.0	13.0		13.0	13.0	
Flash Dont Walk (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	70	70	70	40	40	40	30	30		20	20	
Act Effct Green (s)		40.9	40.9		40.9	40.9		17.7		17.7	17.7	
Actuated g/C Ratio		0.58	0.58		0.58	0.58		0.25		0.25	0.25	
v/c Ratio		0.34	0.03		0.21	0.08		0.63		0.64	0.66	
Control Delay		10.6	1.8		6.3	1.4		27.7		35.6	28.1	
Queue Delay		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Delay		10.6	1.8		6.3	1.4		27.7		35.6	28.1	
LOS		B	A		A	A		C		D	C	
Approach Delay		9.9			5.0			27.7				30.5
Approach LOS		A			A			C				C
90th %ile Green (s)	34.1	34.1	34.1	34.1	34.1	34.1	24.5	24.5		24.5	24.5	
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
70th %ile Green (s)	35.6	35.6	35.6	35.6	35.6	35.6	23.0	23.0		23.0	23.0	
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Ped	Ped		Hold	Hold	
50th %ile Green (s)	41.7	41.7	41.7	41.7	41.7	41.7	16.9	16.9		16.9	16.9	
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
30th %ile Green (s)	44.5	44.5	44.5	44.5	44.5	44.5	14.1	14.1		14.1	14.1	
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
10th %ile Green (s)	48.5	48.5	48.5	48.5	48.5	48.5	10.1	10.1		10.1	10.1	
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
Stops (vph)		151	3		74	10		204		116	233	
Fuel Used(l)		8	0		4	1		14		8	15	
CO Emissions (g/hr)		150	6		80	17		252		146	276	
NOx Emissions (g/hr)		29	1		15	3		49		28	53	
VOC Emissions (g/hr)		35	1		18	4		58		34	64	
Dilemma Vehicles (#)		0	0		0	0		0		0	0	
Queue Length 50th (m)		16.6	0.0		3.6	0.0		28.8		16.2	32.9	
Queue Length 95th (m)		39.4	2.1		24.2	m1.8		43.1		29.2	48.2	
Internal Link Dist (m)		64.8			84.9			118.8			90.2	
Turn Bay Length (m)			40.0			45.0				40.0		
Base Capacity (vph)		821	755		836	722		668		354	723	
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		0.34	0.03		0.21	0.08		0.39		0.39	0.41	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 19 (27%), Referenced to phase 2:EBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 19.9

Intersection LOS: B

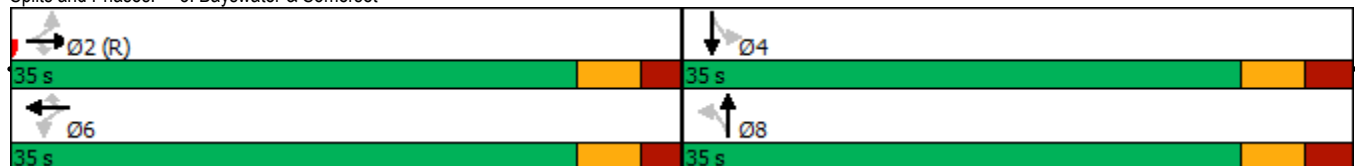
Intersection Capacity Utilization 97.2%

ICU Level of Service F

Analysis Period (min) 15






















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

Splits and Phases: 3: Bayswater & Somerset



13: Preston & Somerset  
AM Peak

1040 Somerset Street  
2030 Background Traffic Volumes

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	314	95	34	174	13	67	354	47	18	278	31
Future Volume (vph)	53	314	95	34	174	13	67	354	47	18	278	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.90	0.96		0.96	0.99		0.97	0.99		0.96	0.99	
Fr <sub>t</sub>		0.965			0.990			0.982			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1426	0	1679	1489	0	1647	1480	0	1503	1458	0
Flt Permitted	0.635			0.292			0.476			0.354		
Satd. Flow (perm)	1016	1426	0	494	1489	0	798	1480	0	538	1458	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		435.9			97.2			225.8			107.4	
Travel Time (s)		31.4			7.0			16.3			7.7	
Confl. Peds. (#/hr)	73		53	53		73	32		48	48		32
Confl. Bikes (#/hr)			66			21			10			4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	5%	9%	3%	8%	2%	5%	8%	2%	15%	9%	17%
Parking (#/hr)		0			0			0			0	
Adj. Flow (vph)	53	314	95	34	174	13	67	354	47	18	278	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	409	0	34	187	0	67	401	0	18	309	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.6	24.6		24.6	24.6		26.7	26.7		26.7	26.7	
Total Split (s)	26.0	26.0		26.0	26.0		34.0	34.0		34.0	34.0	
Total Split (%)	37.1%	37.1%		37.1%	37.1%		48.6%	48.6%		48.6%	48.6%	
Maximum Green (s)	20.4	20.4		20.4	20.4		28.3	28.3		28.3	28.3	

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Storage Length (m)				
Storage Lanes				
Taper Length (m)				
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 (%)				
Parking (#/hr)				
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	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	3.0	3.0	3.0	3.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Maximum Green (s)	3.0	3.0	3.0	3.0

13: Preston & Somerset  
AM Peak

1040 Somerset Street  
2030 Background Traffic Volumes

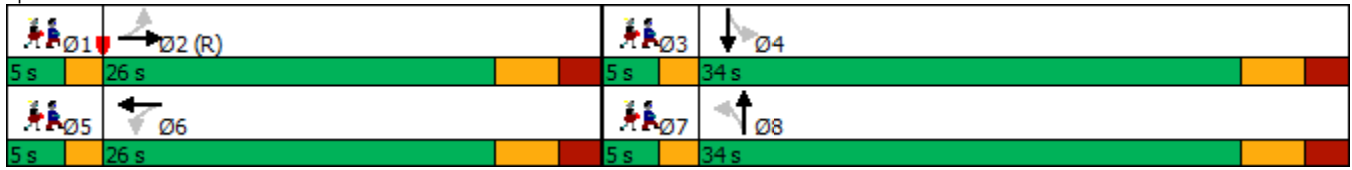


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.6		5.6	5.6		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	40	40		60	60		35	35		25	25	
Act Effct Green (s)	20.4	20.4		20.4	20.4		23.4	23.4		23.4	23.4	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.33	0.33		0.33	0.33	
v/c Ratio	0.18	0.99		0.24	0.43		0.25	0.81		0.10	0.63	
Control Delay	20.9	67.5		24.1	23.9		17.7	34.3		15.2	25.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	20.9	67.5		24.1	23.9		17.7	34.3		15.2	25.2	
LOS	C	E		C	C		B	C		B	C	
Approach Delay		62.1			23.9			31.9				24.6
Approach LOS		E			C			C				C
90th %ile Green (s)	20.4	20.4		20.4	20.4		28.3	28.3		28.3	28.3	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
70th %ile Green (s)	20.4	20.4		20.4	20.4		27.8	27.8		27.8	27.8	
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	20.4	20.4		20.4	20.4		24.3	24.3		24.3	24.3	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	20.4	20.4		20.4	20.4		20.9	20.9		20.9	20.9	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	20.4	20.4		20.4	20.4		15.7	15.7		15.7	15.7	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Stops (vph)	42	333		29	148		46	348		13	245	
Fuel Used(l)	4	46		2	8		3	27		1	15	
CO Emissions (g/hr)	74	849		30	158		63	502		13	272	
NOx Emissions (g/hr)	14	164		6	30		12	97		2	53	
VOC Emissions (g/hr)	17	196		7	36		15	116		3	63	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	5.0	43.5		3.4	19.7		6.1	46.1		1.6	32.8	
Queue Length 95th (m)	14.1	#103.8		10.6	36.5		13.7	70.6		5.2	51.3	
Internal Link Dist (m)		411.9			73.2			201.8				83.4
Turn Bay Length (m)	15.0			15.0			20.0			15.0		
Base Capacity (vph)	296	415		143	433		322	598		217	589	
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	0.18	0.99		0.24	0.43		0.21	0.67		0.08	0.52	

Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 37 (53%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 38.6  
 Intersection LOS: D  
 Intersection Capacity Utilization 83.1%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 13: Preston & Somerset





Lane Group	Ø1	Ø3	Ø5	Ø7
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
90th %ile Green (s)	3.0	3.0	3.0	3.0
90th %ile Term Code	MaxR	MaxR	MaxR	MaxR
70th %ile Green (s)	3.5	3.0	3.5	3.0
70th %ile Term Code	MaxR	MaxR	MaxR	MaxR
50th %ile Green (s)	7.0	3.0	7.0	3.0
50th %ile Term Code	MaxR	MaxR	MaxR	MaxR
30th %ile Green (s)	10.4	3.0	10.4	3.0
30th %ile Term Code	MaxR	MaxR	MaxR	MaxR
10th %ile Green (s)	15.6	3.0	15.6	3.0
10th %ile Term Code	MaxR	MaxR	MaxR	MaxR
Stops (vph)				
Fuel Used(l)				
CO Emissions (g/hr)				
NOx Emissions (g/hr)				
VOC Emissions (g/hr)				
Dilemma Vehicles (#)				
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				
<b>Intersection Summary</b>				



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	315	62	34	301	31	43
Future Volume (Veh/h)	315	62	34	301	31	43
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	315	62	34	301	31	43
Pedestrians					50	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.2	
Percent Blockage					4	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	109					
pX, platoon unblocked			0.94		0.94	0.94
vC, conflicting volume			427		765	396
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			359		719	327
tC, single (s)			4.1		6.6	6.5
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.5
p0 queue free %			97		90	93
cM capacity (veh/h)			1080		317	595
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	377	335	74			
Volume Left	0	34	31			
Volume Right	62	0	43			
cSH	1700	1080	435			
Volume to Capacity	0.22	0.03	0.17			
Queue Length 95th (m)	0.0	0.7	4.6			
Control Delay (s)	0.0	1.1	15.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	1.1	15.0			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			1.9			
Intersection Capacity Utilization			55.4%	ICU Level of Service		B
Analysis Period (min)			15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	26	10	6	8	19	11	53	10	34	34	19
Future Volume (vph)	15	26	10	6	8	19	11	53	10	34	34	19
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	26	10	6	8	19	11	53	10	34	34	19
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	51	33	74	87								
Volume Left (vph)	15	6	11	34								
Volume Right (vph)	10	19	10	19								
Hadj (s)	-0.02	-0.28	-0.02	-0.02								
Departure Headway (s)	4.3	4.0	4.2	4.1								
Degree Utilization, x	0.06	0.04	0.09	0.10								
Capacity (veh/h)	809	852	837	847								
Control Delay (s)	7.5	7.2	7.5	7.6								
Approach Delay (s)	7.5	7.2	7.5	7.6								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay			7.5									
Level of Service			A									
Intersection Capacity Utilization			27.9%		ICU Level of Service				A			
Analysis Period (min)			15									

9: Breezehill & Gladstone  
AM Peak

1040 Somerset Street  
2030 Background Traffic Volumes



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	240	0	1	207	40	2	1	2	15	0	18
Future Volume (Veh/h)	23	240	0	1	207	40	2	1	2	15	0	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	23	240	0	1	207	40	2	1	2	15	0	18
Pedestrians		8			2			25			21	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	268			265			566	581	267	540	561	256
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	268			265			566	581	267	540	561	256
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			99	100	100	96	100	98
cM capacity (veh/h)	1272			1271			395	401	754	422	412	763
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	263	248	5	33								
Volume Left	23	1	2	15								
Volume Right	0	40	2	18								
cSH	1272	1271	489	558								
Volume to Capacity	0.02	0.00	0.01	0.06								
Queue Length 95th (m)	0.4	0.0	0.2	1.4								
Control Delay (s)	0.8	0.0	12.4	11.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.8	0.0	12.4	11.9								
Approach LOS			B	B								
<b>Intersection Summary</b>												
Average Delay			1.2									
Intersection Capacity Utilization			43.8%		ICU Level of Service				A			
Analysis Period (min)			15									

3: Bayswater & Somerset  
PM Peak

1040 Somerset Street  
2030 Background Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	239	34	48	349	141	52	316	28	109	277	65
Future Volume (vph)	41	239	34	48	349	141	52	316	28	109	277	65
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		40.0	0.0		45.0	0.0		0.0	40.0		0.0
Storage Lanes	0		1	0		1	0		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99	0.75		0.98	0.83		0.99		0.96	0.98	
Fr <sub>t</sub>			0.850			0.850		0.990			0.971	
Flt Protected		0.993			0.994			0.993		0.950		
Satd. Flow (prot)	0	1568	1517	0	1596	1517	0	1741	0	1679	1691	0
Flt Permitted		0.908			0.934			0.799		0.398		
Satd. Flow (perm)	0	1424	1132	0	1475	1264	0	1393	0	676	1691	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			42			141		6			18	
Link Speed (k/h)		50			50			50		50		50
Link Distance (m)		88.8			108.9			142.8			114.2	
Travel Time (s)		6.4			7.8			10.3			8.2	
Confl. Peds. (#/hr)	64		140	140		64	48		50	50		48
Confl. Bikes (#/hr)			44			72			6			24
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%	4%	2%	2%	2%	2%	2%	2%	2%	3%	2%	3%
Parking (#/hr)		0			0							
Adj. Flow (vph)	41	239	34	48	349	141	52	316	28	109	277	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	280	34	0	397	141	0	396	0	109	342	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	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	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	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	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	30.5	30.5	30.5	30.5	30.5	30.5	28.9	28.9		28.9	28.9	
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	35.0	35.0		35.0	35.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%	53.3%	46.7%	46.7%		46.7%	46.7%	
Maximum Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	29.1	29.1		29.1	29.1	

3: Bayswater & Somerset  
PM Peak

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2030 Background Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)		5.5	5.5		5.5	5.5		5.9		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	Max	Max	Max	None	None		None	None	
Walk Time (s)	17.0	17.0	17.0	17.0	17.0	17.0	13.0	13.0		13.0	13.0	
Flash Dont Walk (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	100	100	100	50	50	50	40	40		30	30	
Act Effct Green (s)		40.4	40.4		40.4	40.4		23.2		23.2	23.2	
Actuated g/C Ratio		0.54	0.54		0.54	0.54		0.31		0.31	0.31	
v/c Ratio		0.37	0.05		0.50	0.19		0.91		0.52	0.64	
Control Delay		13.1	3.5		15.1	3.0		50.3		29.6	26.1	
Queue Delay		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Delay		13.1	3.5		15.1	3.0		50.3		29.6	26.1	
LOS		B	A		B	A		D		C	C	
Approach Delay		12.0			11.9			50.3				26.9
Approach LOS		B			B			D				C
90th %ile Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	29.1	29.1		29.1	29.1	
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Max	Max		Hold	Hold	
70th %ile Green (s)	36.7	36.7	36.7	36.7	36.7	36.7	26.9	26.9		26.9	26.9	
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
50th %ile Green (s)	39.7	39.7	39.7	39.7	39.7	39.7	23.9	23.9		23.9	23.9	
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
30th %ile Green (s)	43.1	43.1	43.1	43.1	43.1	43.1	20.5	20.5		20.5	20.5	
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
10th %ile Green (s)	48.1	48.1	48.1	48.1	48.1	48.1	15.5	15.5		15.5	15.5	
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
Stops (vph)		163	6		256	16		356		87	264	
Fuel Used(l)		9	1		14	2		29		6	16	
CO Emissions (g/hr)		164	10		269	40		534		104	307	
NOx Emissions (g/hr)		32	2		52	8		103		20	59	
VOC Emissions (g/hr)		38	2		62	9		123		24	71	
Dilemma Vehicles (#)		0	0		0	0		0		0	0	
Queue Length 50th (m)		21.6	0.0		33.7	0.0		51.7		12.4	38.4	
Queue Length 95th (m)		44.0	3.7		66.1	8.5		#86.2		24.8	57.0	
Internal Link Dist (m)		64.8			84.9			118.8			90.2	
Turn Bay Length (m)			40.0			45.0				40.0		
Base Capacity (vph)		767	629		794	746		544		262	667	
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		0.37	0.05		0.50	0.19		0.73		0.42	0.51	

Intersection Summary

Area Type:	Other
Cycle Length:	75
Actuated Cycle Length:	75
Offset:	63 (84%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.91
Intersection Signal Delay:	24.9
Intersection LOS:	C
Intersection Capacity Utilization:	105.0%
ICU Level of Service:	G
Analysis Period (min):	15
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

Splits and Phases: 3: Bayswater & Somerset



13: Preston & Somerset  
PM Peak

1040 Somerset Street  
2030 Background Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	340	70	53	415	23	85	312	54	40	285	54
Future Volume (vph)	64	340	70	53	415	23	85	312	54	40	285	54
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93	0.96		0.91	0.99		0.92	0.98		0.94	0.97	
Fr <sub>t</sub>		0.974			0.992			0.978			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1467	0	1695	1568	0	1695	1464	0	1695	1485	0
Flt Permitted	0.304			0.340			0.417			0.379		
Satd. Flow (perm)	504	1467	0	555	1568	0	683	1464	0	635	1485	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		435.9			97.2			225.8			107.4	
Travel Time (s)		31.4			7.0			16.3			7.7	
Confl. Peds. (#/hr)	93		105	105		93	89		70	70		89
Confl. Bikes (#/hr)			28			53			8			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 (%)	2%	3%	11%	2%	2%	9%	2%	8%	2%	2%	5%	2%
Parking (#/hr)		0			0			0			0	
Adj. Flow (vph)	64	340	70	53	415	23	85	312	54	40	285	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	410	0	53	438	0	85	366	0	40	339	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.6	24.6		24.6	24.6		26.7	26.7		26.7	26.7	
Total Split (s)	29.0	29.0		29.0	29.0		31.0	31.0		31.0	31.0	
Total Split (%)	41.4%	41.4%		41.4%	41.4%		44.3%	44.3%		44.3%	44.3%	
Maximum Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	



Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Storage Length (m)				
Storage Lanes				
Taper Length (m)				
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 (%)				
Parking (#/hr)				
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	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	3.0	3.0	3.0	3.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Maximum Green (s)	3.0	3.0	3.0	3.0

13: Preston & Somerset  
PM Peak

1040 Somerset Street  
2030 Background Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	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		2.4	2.4		2.4	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)	5.6	5.6		5.6	5.6		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	90	90		75	75		55	55		75	75	
Act Effct Green (s)	23.4	23.4		23.4	23.4		21.8	21.8		21.8	21.8	
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.31	0.31		0.31	0.31	
v/c Ratio	0.38	0.84		0.29	0.84		0.40	0.80		0.20	0.74	
Control Delay	25.9	39.3		22.3	38.2		23.9	36.1		19.0	31.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	25.9	39.3		22.3	38.2		23.9	36.1		19.0	31.2	
LOS	C	D		C	D		C	D		B	C	
Approach Delay		37.5			36.5			33.8				29.9
Approach LOS		D			D			C				C
90th %ile Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
70th %ile Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
50th %ile Green (s)	23.4	23.4		23.4	23.4		22.7	22.7		22.7	22.7	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	23.4	23.4		23.4	23.4		21.0	21.0		21.0	21.0	
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Ped	Ped	
10th %ile Green (s)	23.4	23.4		23.4	23.4		14.5	14.5		14.5	14.5	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Stops (vph)	52	345		41	368		63	320		30	289	
Fuel Used(l)	5	37		2	25		5	25		2	18	
CO Emissions (g/hr)	95	690		43	468		89	469		31	336	
NOx Emissions (g/hr)	18	133		8	90		17	90		6	65	
VOC Emissions (g/hr)	22	159		10	108		21	108		7	78	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	6.3	48.8		5.0	52.1		8.5	42.6		3.7	38.3	
Queue Length 95th (m)	17.0	#94.5		13.9	#99.0		19.2	#69.4		10.2	61.6	
Internal Link Dist (m)		411.9			73.2			201.8				83.4
Turn Bay Length (m)	15.0			15.0			20.0			15.0		
Base Capacity (vph)	168	490		185	524		246	529		229	536	
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	0.38	0.84		0.29	0.84		0.35	0.69		0.17	0.63	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 32 (46%), Referenced to phase 2:EBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 34.7

Intersection LOS: C

Intersection Capacity Utilization 81.9%

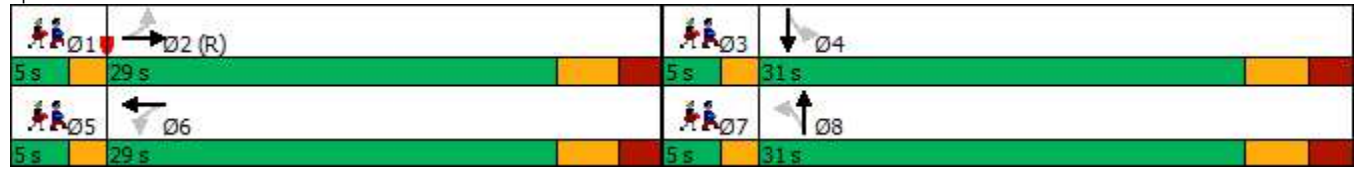
ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 13: Preston & Somerset



Lane Group	Ø1	Ø3	Ø5	Ø7
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
90th %ile Green (s)	3.0	3.0	3.0	3.0
90th %ile Term Code	MaxR	MaxR	MaxR	MaxR
70th %ile Green (s)	3.0	3.0	3.0	3.0
70th %ile Term Code	MaxR	MaxR	MaxR	MaxR
50th %ile Green (s)	5.6	3.0	5.6	3.0
50th %ile Term Code	MaxR	MaxR	MaxR	MaxR
30th %ile Green (s)	7.3	3.0	7.3	3.0
30th %ile Term Code	MaxR	MaxR	MaxR	MaxR
10th %ile Green (s)	13.8	3.0	13.8	3.0
10th %ile Term Code	MaxR	MaxR	MaxR	MaxR
Stops (vph)				
Fuel Used(l)				
CO Emissions (g/hr)				
NOx Emissions (g/hr)				
VOC Emissions (g/hr)				
Dilemma Vehicles (#)				
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				
<b>Intersection Summary</b>				



















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	390	28	28	492	30	35
Future Volume (Veh/h)	390	28	28	492	30	35
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	390	28	28	492	30	35
Pedestrians	18				100	
Lane Width (m)	3.7				3.7	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	2				9	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	109					
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			518		1070	504
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			427		1030	411
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		85	93
cM capacity (veh/h)			948		207	536
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	418	520	65			
Volume Left	0	28	30			
Volume Right	28	0	35			
cSH	1700	948	309			
Volume to Capacity	0.25	0.03	0.21			
Queue Length 95th (m)	0.0	0.7	5.9			
Control Delay (s)	0.0	0.8	19.7			
Lane LOS		A	C			
Approach Delay (s)	0.0	0.8	19.7			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			1.7			
Intersection Capacity Utilization			62.2%	ICU Level of Service		B
Analysis Period (min)			15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	8	10	4	22	20	24	27	1	15	53	37
Future Volume (vph)	15	8	10	4	22	20	24	27	1	15	53	37
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	8	10	4	22	20	24	27	1	15	53	37
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	33	46	52	105								
Volume Left (vph)	15	4	24	15								
Volume Right (vph)	10	20	1	37								
Hadj (s)	-0.06	-0.21	0.11	-0.15								
Departure Headway (s)	4.2	4.1	4.3	4.0								
Degree Utilization, x	0.04	0.05	0.06	0.12								
Capacity (veh/h)	814	848	811	883								
Control Delay (s)	7.4	7.3	7.6	7.5								
Approach Delay (s)	7.4	7.3	7.6	7.5								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay			7.5									
Level of Service			A									
Intersection Capacity Utilization			27.9%		ICU Level of Service				A			
Analysis Period (min)			15									

9: Breezehill & Gladstone  
PM Peak

1040 Somerset Street  
2030 Background Traffic Volumes

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	233	4	6	582	29	3	0	1	32	0	27
Future Volume (Veh/h)	20	233	4	6	582	29	3	0	1	32	0	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	233	4	6	582	29	3	0	1	32	0	27
Pedestrians		7			10			25			22	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	633			262			942	945	270	916	932	626
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	633			262			942	945	270	916	932	626
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	98			100			99	100	100	86	100	94
cM capacity (veh/h)	932			1274			212	245	746	225	249	472
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	257	617	4	59								
Volume Left	20	6	3	32								
Volume Right	4	29	1	27								
cSH	932	1274	258	296								
Volume to Capacity	0.02	0.00	0.02	0.20								
Queue Length 95th (m)	0.5	0.1	0.4	5.5								
Control Delay (s)	0.9	0.1	19.2	20.2								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.9	0.1	19.2	20.2								
Approach LOS			C	C								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			48.7%		ICU Level of Service				A			
Analysis Period (min)			15									

3: Bayswater & Somerset  
AM Peak

1040 Somerset Street  
2025 Total Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	217	25	19	130	59	25	187	30	124	230	82
Future Volume (vph)	39	217	25	19	130	59	25	187	30	124	230	82
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		40.0	0.0		45.0	0.0		0.0	40.0		0.0
Storage Lanes	0		1	0		1	0		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99	0.82		0.99	0.87		0.98		0.95	0.98	
Fr <sub>t</sub>			0.850			0.850		0.983			0.961	
Fit Protected		0.992			0.994			0.995		0.950		
Satd. Flow (prot)	0	1492	1517	0	1531	1357	0	1710	0	1662	1678	0
Fit Permitted		0.945			0.953			0.916		0.535		
Satd. Flow (perm)	0	1406	1242	0	1451	1175	0	1568	0	890	1678	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			45			59		12			31	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		88.8			108.9			142.8			114.2	
Travel Time (s)		6.4			7.8			10.3			8.2	
Confl. Peds. (#/hr)	61		91	91		61	37		49	49		37
Confl. Bikes (#/hr)			47			38			17			7
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 (%)	14%	8%	2%	2%	7%	14%	8%	2%	3%	4%	2%	2%
Parking (#/hr)		0			0							
Adj. Flow (vph)	39	217	25	19	130	59	25	187	30	124	230	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	256	25	0	149	59	0	242	0	124	312	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	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	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	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	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	30.5	30.5	30.5	30.5	30.5	30.5	28.9	28.9		28.9	28.9	
Total Split (s)	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0		35.0	35.0	
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	29.5	29.5	29.5	29.5	29.5	29.5	29.1	29.1		29.1	29.1	



3: Bayswater & Somerset  
AM Peak

1040 Somerset Street  
2025 Total Traffic Volumes

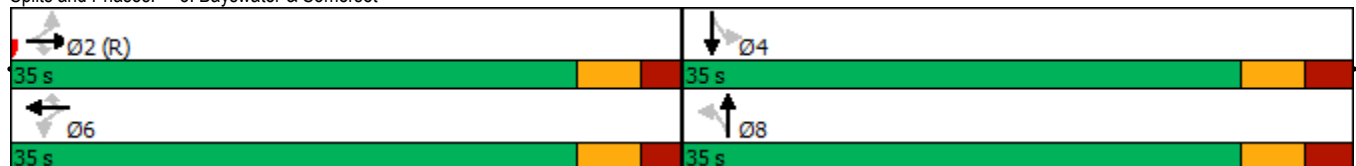


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)		5.5	5.5		5.5	5.5		5.9		5.9	5.9	
Lead/Lag												
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	Max	Max	Max	None	None		None	None	
Walk Time (s)	17.0	17.0	17.0	17.0	17.0	17.0	13.0	13.0		13.0	13.0	
Flash Dont Walk (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	75	75	75	45	45	45	35	35		25	25	
Act Effct Green (s)		40.5	40.5		40.5	40.5		18.1		18.1	18.1	
Actuated g/C Ratio		0.58	0.58		0.58	0.58		0.26		0.26	0.26	
v/c Ratio		0.32	0.03		0.18	0.08		0.58		0.54	0.68	
Control Delay		10.6	1.8		6.5	1.7		26.1		29.6	27.8	
Queue Delay		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Delay		10.6	1.8		6.5	1.7		26.1		29.6	27.8	
LOS		B	A		A	A		C		C	C	
Approach Delay		9.8			5.1			26.1				28.3
Approach LOS		A			A			C				C
90th %ile Green (s)	33.1	33.1	33.1	33.1	33.1	33.1	25.5	25.5		25.5	25.5	
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
70th %ile Green (s)	35.6	35.6	35.6	35.6	35.6	35.6	23.0	23.0		23.0	23.0	
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Ped	Ped		Hold	Hold	
50th %ile Green (s)	41.2	41.2	41.2	41.2	41.2	41.2	17.4	17.4		17.4	17.4	
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
30th %ile Green (s)	44.1	44.1	44.1	44.1	44.1	44.1	14.5	14.5		14.5	14.5	
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
10th %ile Green (s)	48.3	48.3	48.3	48.3	48.3	48.3	10.3	10.3		10.3	10.3	
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
Stops (vph)		136	3		66	12		188		101	238	
Fuel Used(l)		7	0		4	1		12		6	15	
CO Emissions (g/hr)		136	6		70	18		230		120	286	
NOx Emissions (g/hr)		26	1		14	3		44		23	55	
VOC Emissions (g/hr)		31	1		16	4		53		28	66	
Dilemma Vehicles (#)		0	0		0	0		0		0	0	
Queue Length 50th (m)		15.1	0.0		3.2	0.0		26.6		14.2	33.5	
Queue Length 95th (m)		36.6	2.1		23.9	m3.0		39.8		25.2	48.7	
Internal Link Dist (m)		64.8			84.9			118.8			90.2	
Turn Bay Length (m)			40.0			45.0				40.0		
Base Capacity (vph)		812	736		838	704		658		369	715	
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		0.32	0.03		0.18	0.08		0.37		0.34	0.44	

Intersection Summary






















Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 19 (27%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.68  
 Intersection Signal Delay: 19.3  
 Intersection LOS: B  
 Intersection Capacity Utilization 98.0%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Bayswater & Somerset



13: Preston & Somerset  
AM Peak

1040 Somerset Street  
2025 Total Traffic Volumes

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	286	97	34	154	13	66	354	47	18	278	26
Future Volume (vph)	49	286	97	34	154	13	66	354	47	18	278	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.88	0.95		0.95	0.99		0.96	0.99		0.95	0.99	
Fr <sub>t</sub>		0.962			0.988			0.982			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1408	0	1679	1482	0	1647	1478	0	1503	1462	0
Flt Permitted	0.651			0.330			0.482			0.354		
Satd. Flow (perm)	1021	1408	0	552	1482	0	800	1478	0	534	1462	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		435.9			97.2			225.8			107.4	
Travel Time (s)		31.4			7.0			16.3			7.7	
Confl. Peds. (#/hr)	83		63	63		83	42		58	58		42
Confl. Bikes (#/hr)			66			21			10			4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	5%	9%	3%	8%	2%	5%	8%	2%	15%	9%	17%
Parking (#/hr)		0			0			0			0	
Adj. Flow (vph)	49	286	97	34	154	13	66	354	47	18	278	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	383	0	34	167	0	66	401	0	18	304	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.6	24.6		24.6	24.6		26.7	26.7		26.7	26.7	
Total Split (s)	26.0	26.0		26.0	26.0		34.0	34.0		34.0	34.0	
Total Split (%)	37.1%	37.1%		37.1%	37.1%		48.6%	48.6%		48.6%	48.6%	
Maximum Green (s)	20.4	20.4		20.4	20.4		28.3	28.3		28.3	28.3	

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Storage Length (m)				
Storage Lanes				
Taper Length (m)				
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 (%)				
Parking (#/hr)				
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	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	3.0	3.0	3.0	3.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Maximum Green (s)	3.0	3.0	3.0	3.0

13: Preston & Somerset  
AM Peak

1040 Somerset Street  
2025 Total Traffic Volumes

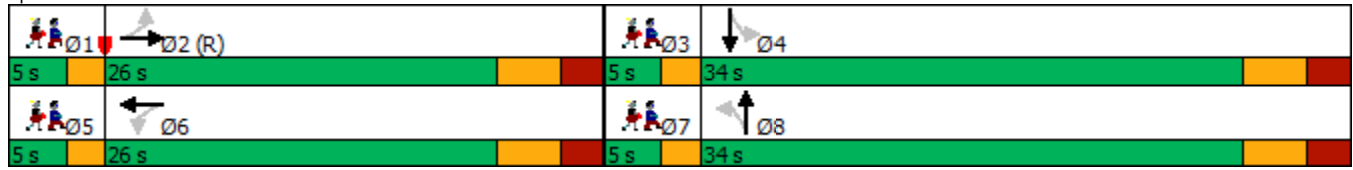


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.6		5.6	5.6		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	45	45		65	65		40	40		30	30	
Act Effct Green (s)	20.4	20.4		20.4	20.4		23.4	23.4		23.4	23.4	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.33	0.33		0.33	0.33	
v/c Ratio	0.16	0.93		0.21	0.39		0.25	0.81		0.10	0.62	
Control Delay	21.0	57.0		22.9	23.1		17.6	34.3		15.2	24.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	21.0	57.0		22.9	23.1		17.6	34.3		15.2	24.7	
LOS	C	E		C	C		B	C		B	C	
Approach Delay		52.9			23.0			31.9				24.2
Approach LOS		D			C			C				C
90th %ile Green (s)	20.4	20.4		20.4	20.4		28.3	28.3		28.3	28.3	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
70th %ile Green (s)	20.4	20.4		20.4	20.4		27.9	27.9		27.9	27.9	
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	20.4	20.4		20.4	20.4		24.3	24.3		24.3	24.3	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	20.4	20.4		20.4	20.4		20.9	20.9		20.9	20.9	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	20.4	20.4		20.4	20.4		15.7	15.7		15.7	15.7	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Stops (vph)	39	311		29	130		45	348		13	239	
Fuel Used(l)	4	40		2	7		3	27		1	14	
CO Emissions (g/hr)	69	737		29	138		62	502		13	265	
NOx Emissions (g/hr)	13	142		6	27		12	97		2	51	
VOC Emissions (g/hr)	16	170		7	32		14	116		3	61	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	4.6	41.0		3.3	17.3		6.1	46.2		1.6	32.2	
Queue Length 95th (m)	13.9	#97.0		10.3	32.8		13.5	70.6		5.2	50.4	
Internal Link Dist (m)		411.9			73.2			201.8				83.4
Turn Bay Length (m)	15.0			15.0			20.0			15.0		
Base Capacity (vph)	297	410		160	431		323	597		215	591	
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	0.16	0.93		0.21	0.39		0.20	0.67		0.08	0.51	

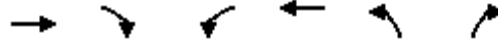
Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 37 (53%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.93  
 Intersection Signal Delay: 35.3  
 Intersection LOS: D  
 Intersection Capacity Utilization 82.0%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 13: Preston & Somerset



Lane Group	Ø1	Ø3	Ø5	Ø7
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
90th %ile Green (s)	3.0	3.0	3.0	3.0
90th %ile Term Code	MaxR	MaxR	MaxR	MaxR
70th %ile Green (s)	3.4	3.0	3.4	3.0
70th %ile Term Code	MaxR	MaxR	MaxR	MaxR
50th %ile Green (s)	7.0	3.0	7.0	3.0
50th %ile Term Code	MaxR	MaxR	MaxR	MaxR
30th %ile Green (s)	10.4	3.0	10.4	3.0
30th %ile Term Code	MaxR	MaxR	MaxR	MaxR
10th %ile Green (s)	15.6	3.0	15.6	3.0
10th %ile Term Code	MaxR	MaxR	MaxR	MaxR
Stops (vph)				
Fuel Used(l)				
CO Emissions (g/hr)				
NOx Emissions (g/hr)				
VOC Emissions (g/hr)				
Dilemma Vehicles (#)				
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				



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	275	55	36	268	27	53
Future Volume (Veh/h)	275	55	36	268	27	53
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	275	55	36	268	27	53
Pedestrians					100	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.2	
Percent Blockage					9	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	109					
pX, platoon unblocked			0.97		0.97	0.97
vC, conflicting volume			430		742	402
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			402		722	373
tC, single (s)			4.1		6.6	6.5
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.5
p0 queue free %			97		91	90
cM capacity (veh/h)			1031		311	553
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	330	304	80			
Volume Left	0	36	27			
Volume Right	55	0	53			
cSH	1700	1031	438			
Volume to Capacity	0.19	0.03	0.18			
Queue Length 95th (m)	0.0	0.8	5.0			
Control Delay (s)	0.0	1.3	15.1			
Lane LOS		A	C			
Approach Delay (s)	0.0	1.3	15.1			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			2.3			
Intersection Capacity Utilization			51.8%	ICU Level of Service		A
Analysis Period (min)			15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	26	10	6	8	19	11	54	10	34	37	19
Future Volume (vph)	15	26	10	6	8	19	11	54	10	34	37	19
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	26	10	6	8	19	11	54	10	34	37	19
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	51	33	75	90								
Volume Left (vph)	15	6	11	34								
Volume Right (vph)	10	19	10	19								
Hadj (s)	-0.02	-0.28	-0.02	-0.02								
Departure Headway (s)	4.3	4.0	4.2	4.1								
Degree Utilization, x	0.06	0.04	0.09	0.10								
Capacity (veh/h)	807	849	836	846								
Control Delay (s)	7.5	7.2	7.5	7.6								
Approach Delay (s)	7.5	7.2	7.5	7.6								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay			7.5									
Level of Service			A									
Intersection Capacity Utilization			29.0%		ICU Level of Service				A			
Analysis Period (min)			15									





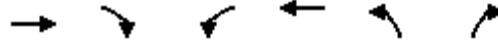
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			0	1		41	2		2	17		19
Traffic Volume (veh/h)	23	235	0	1	203	41	2	1	2	17	0	19
Future Volume (Veh/h)	23	235	0	1	203	41	2	1	2	17	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	23	235	0	1	203	41	2	1	2	17	0	19
Pedestrians		8			2			25			21	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	265			260			558	573	262	532	552	252
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	265			260			558	573	262	532	552	252
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			99	100	100	96	100	98
cM capacity (veh/h)	1276			1277			399	405	759	428	416	767
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	258	245	5	36								
Volume Left	23	1	2	17								
Volume Right	0	41	2	19								
cSH	1276	1277	494	558								
Volume to Capacity	0.02	0.00	0.01	0.06								
Queue Length 95th (m)	0.4	0.0	0.2	1.6								
Control Delay (s)	0.9	0.0	12.4	11.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.9	0.0	12.4	11.9								
Approach LOS			B	B								
<b>Intersection Summary</b>												
Average Delay			1.3									
Intersection Capacity Utilization			43.7%		ICU Level of Service				A			
Analysis Period (min)			15									



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	15	64	1	3	91
Future Volume (Veh/h)	3	15	64	1	3	91
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	3	15	64	1	3	91
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	162	64			65	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	162	64			65	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			100	
cM capacity (veh/h)	828	1000			1537	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	18	65	94			
Volume Left	3	0	3			
Volume Right	15	1	0			
cSH	966	1700	1537			
Volume to Capacity	0.02	0.04	0.00			
Queue Length 95th (m)	0.4	0.0	0.0			
Control Delay (s)	8.8	0.0	0.2			
Lane LOS	A		A			
Approach Delay (s)	8.8	0.0	0.2			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			1.0			
Intersection Capacity Utilization			17.6%		ICU Level of Service	A
Analysis Period (min)			15			



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	275	55	36	268	27	53
Future Volume (vph)	275	55	36	268	27	53
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.96			0.99	0.89	
Frt	0.977				0.911	
Flt Protected				0.994	0.983	
Satd. Flow (prot)	1471	0	0	1543	1068	0
Flt Permitted				0.939	0.983	
Satd. Flow (perm)	1471	0	0	1438	1033	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	22				53	
Link Speed (k/h)	50			50	40	
Link Distance (m)	108.9			435.9	109.2	
Travel Time (s)	7.8			31.4	9.8	
Confl. Peds. (#/hr)		100	100		50	50
Confl. Bikes (#/hr)		33				6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	8%	2%	6%	25%	27%
Parking (#/hr)	0			0	0	
Adj. Flow (vph)	275	55	36	268	27	53
Shared Lane Traffic (%)						
Lane Group Flow (vph)	330	0	0	304	80	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.21	1.06	1.06	1.21	1.21	1.06
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2		1	2		1
Detector Template	Thru		Left	Thru		Left
Leading Detector (m)	30.5		6.1	30.5		6.1
Trailing Detector (m)	0.0		0.0	0.0		0.0
Detector 1 Position(m)	0.0		0.0	0.0		0.0
Detector 1 Size(m)	1.8		6.1	1.8		6.1
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0		0.0
Detector 1 Queue (s)	0.0		0.0	0.0		0.0
Detector 1 Delay (s)	0.0		0.0	0.0		0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA		Perm	NA		Perm
Protected Phases	2			6		
Permitted Phases			6			8
Detector Phase	2		6	6		8
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0		10.0
Minimum Split (s)	23.3		25.3	25.3		25.3
Total Split (s)	42.0		42.0	42.0		28.0
Total Split (%)	60.0%		60.0%	60.0%		40.0%
Maximum Green (s)	36.7		36.7	36.7		22.7
Yellow Time (s)	3.3		3.3	3.3		3.3
All-Red Time (s)	2.0		2.0	2.0		2.0
Lost Time Adjust (s)	0.0			0.0		0.0



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Lost Time (s)	5.3			5.3	5.3	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	C-Max		C-Max	C-Max	None	
Walk Time (s)	7.0		7.0	7.0	7.0	
Flash Dont Walk (s)	11.0		13.0	13.0	11.0	
Pedestrian Calls (#/hr)	60		60	60	30	
Act Effct Green (s)	50.3			50.3	13.2	
Actuated g/C Ratio	0.72			0.72	0.19	
v/c Ratio	0.31			0.29	0.34	
Control Delay	7.6			13.8	14.6	
Queue Delay	0.0			0.0	0.0	
Total Delay	7.6			13.8	14.6	
LOS	A			B	B	
Approach Delay	7.6			13.8	14.6	
Approach LOS	A			B	B	
90th %ile Green (s)	41.4		41.4	41.4	18.0	
90th %ile Term Code	Coord		Coord	Coord	Ped	
70th %ile Green (s)	41.4		41.4	41.4	18.0	
70th %ile Term Code	Coord		Coord	Coord	Ped	
50th %ile Green (s)	49.4		49.4	49.4	10.0	
50th %ile Term Code	Coord		Coord	Coord	Min	
30th %ile Green (s)	49.4		49.4	49.4	10.0	
30th %ile Term Code	Coord		Coord	Coord	Min	
10th %ile Green (s)	64.7		64.7	64.7	0.0	
10th %ile Term Code	Coord		Coord	Coord	Skip	
Stops (vph)	143			204	32	
Fuel Used(l)	9			20	2	
CO Emissions (g/hr)	159			379	42	
NOx Emissions (g/hr)	31			73	8	
VOC Emissions (g/hr)	37			87	10	
Dilemma Vehicles (#)	0			0	0	
Queue Length 50th (m)	9.4			26.7	3.2	
Queue Length 95th (m)	21.1			54.1	12.5	
Internal Link Dist (m)	84.9			411.9	85.2	
Turn Bay Length (m)						
Base Capacity (vph)	1063			1033	370	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.31			0.29	0.22	

Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 30 (43%), Referenced to phase 2:EBT and 6:WBTL, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.34  
 Intersection Signal Delay: 11.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 63.8%  
 ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 1: Breezehill & Somerset



3: Bayswater & Somerset  
PM Peak

1040 Somerset Street  
2025 Total Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	215	33	34	308	131	49	301	25	98	265	82
Future Volume (vph)	39	215	33	34	308	131	49	301	25	98	265	82
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		40.0	0.0		45.0	0.0		0.0	40.0		0.0
Storage Lanes	0		1	0		1	0		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99	0.73		0.98	0.82		0.99		0.95	0.97	
Fr <sub>t</sub>			0.850			0.850		0.991			0.965	
Flt Protected		0.992			0.995			0.994		0.950		
Satd. Flow (prot)	0	1567	1517	0	1598	1517	0	1743	0	1679	1664	0
Flt Permitted		0.914			0.954			0.782		0.408		
Satd. Flow (perm)	0	1430	1110	0	1508	1243	0	1362	0	686	1664	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			42			131		6			24	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		88.8			108.9			142.8			114.2	
Travel Time (s)		6.4			7.8			10.3			8.2	
Confl. Peds. (#/hr)	74		150	150		74	58		60	60		58
Confl. Bikes (#/hr)			44			72			6			24
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%	4%	2%	2%	2%	2%	2%	2%	2%	3%	2%	3%
Parking (#/hr)		0			0							
Adj. Flow (vph)	39	215	33	34	308	131	49	301	25	98	265	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	254	33	0	342	131	0	375	0	98	347	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	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	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	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	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	30.5	30.5	30.5	30.5	30.5	30.5	28.9	28.9		28.9	28.9	
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	35.0	35.0		35.0	35.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%	53.3%	46.7%	46.7%		46.7%	46.7%	
Maximum Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	29.1	29.1		29.1	29.1	

3: Bayswater & Somerset  
PM Peak

1040 Somerset Street  
2025 Total Traffic Volumes

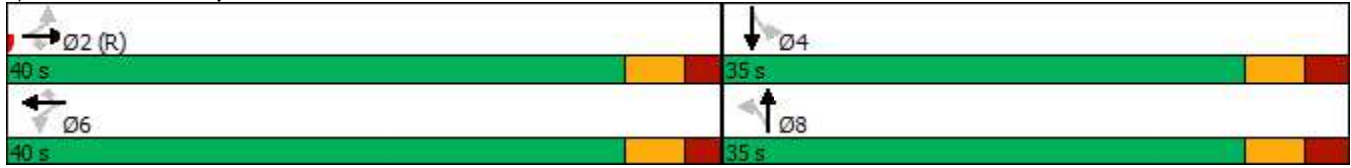


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)		5.5	5.5		5.5	5.5		5.9		5.9	5.9	
Lead/Lag												
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	Max	Max	Max	None	None		None	None	
Walk Time (s)	17.0	17.0	17.0	17.0	17.0	17.0	13.0	13.0		13.0	13.0	
Flash Dont Walk (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	105	105	105	55	55	55	45	45		35	35	
Act Effct Green (s)		41.1	41.1		41.1	41.1		22.5		22.5	22.5	
Actuated g/C Ratio		0.55	0.55		0.55	0.55		0.30		0.30	0.30	
v/c Ratio		0.32	0.05		0.41	0.18		0.91		0.48	0.67	
Control Delay		12.2	3.4		13.3	3.0		51.2		28.1	27.4	
Queue Delay		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Delay		12.2	3.4		13.3	3.0		51.2		28.1	27.4	
LOS		B	A		B	A		D		C	C	
Approach Delay		11.2			10.4			51.2				27.6
Approach LOS		B			B			D				C
90th %ile Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	29.1	29.1		29.1	29.1	
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Max	Max		Hold	Hold	
70th %ile Green (s)	37.6	37.6	37.6	37.6	37.6	37.6	26.0	26.0		26.0	26.0	
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
50th %ile Green (s)	40.6	40.6	40.6	40.6	40.6	40.6	23.0	23.0		23.0	23.0	
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Ped	Ped		Hold	Hold	
30th %ile Green (s)	44.0	44.0	44.0	44.0	44.0	44.0	19.6	19.6		19.6	19.6	
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
10th %ile Green (s)	48.9	48.9	48.9	48.9	48.9	48.9	14.7	14.7		14.7	14.7	
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
Stops (vph)		143	5		202	16		341		76	269	
Fuel Used(l)		8	0		12	2		27		5	17	
CO Emissions (g/hr)		144	9		215	38		511		91	318	
NOx Emissions (g/hr)		28	2		42	7		99		18	61	
VOC Emissions (g/hr)		33	2		50	9		118		21	73	
Dilemma Vehicles (#)		0	0		0	0		0		0	0	
Queue Length 50th (m)		18.5	0.0		26.5	0.0		49.4		11.1	39.2	
Queue Length 95th (m)		39.4	3.5		54.2	8.3		#74.6		22.1	57.4	
Internal Link Dist (m)		64.8			84.9			118.8			90.2	
Turn Bay Length (m)			40.0			45.0				40.0		
Base Capacity (vph)		783	627		826	740		532		266	660	
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		0.32	0.05		0.41	0.18		0.70		0.37	0.53	

Intersection Summary






















Area Type:	Other
Cycle Length:	75
Actuated Cycle Length:	75
Offset:	63 (84%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.91
Intersection Signal Delay:	25.1
Intersection LOS:	C
Intersection Capacity Utilization:	103.2%
ICU Level of Service:	G
Analysis Period (min):	15
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

Splits and Phases: 3: Bayswater & Somerset



13: Preston & Somerset  
PM Peak

1040 Somerset Street  
2025 Total Traffic Volumes

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	299	67	53	380	23	84	312	54	40	285	50
Future Volume (vph)	58	299	67	53	380	23	84	312	54	40	285	50
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.91	0.95		0.89	0.99		0.91	0.98		0.93	0.97	
Fr <sub>t</sub>		0.973			0.991			0.978			0.978	
Fl <sub>t</sub> Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1455	0	1695	1562	0	1695	1461	0	1695	1487	0
Fl <sub>t</sub> Permitted	0.349			0.397			0.422			0.379		
Satd. Flow (perm)	569	1455	0	633	1562	0	683	1461	0	629	1487	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		435.9			97.2			225.8			107.4	
Travel Time (s)		31.4			7.0			16.3			7.7	
Confl. Peds. (#/hr)	103		115	115		103	99		80	80		99
Confl. Bikes (#/hr)			28			53			8			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 (%)	2%	3%	11%	2%	2%	9%	2%	8%	2%	2%	5%	2%
Parking (#/hr)		0			0			0			0	
Adj. Flow (vph)	58	299	67	53	380	23	84	312	54	40	285	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	366	0	53	403	0	84	366	0	40	335	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.6	24.6		24.6	24.6		26.7	26.7		26.7	26.7	
Total Split (s)	29.0	29.0		29.0	29.0		31.0	31.0		31.0	31.0	
Total Split (%)	41.4%	41.4%		41.4%	41.4%		44.3%	44.3%		44.3%	44.3%	
Maximum Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	



Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Storage Length (m)				
Storage Lanes				
Taper Length (m)				
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 (%)				
Parking (#/hr)				
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	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	3.0	3.0	3.0	3.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Maximum Green (s)	3.0	3.0	3.0	3.0

13: Preston & Somerset  
PM Peak

1040 Somerset Street  
2025 Total Traffic Volumes

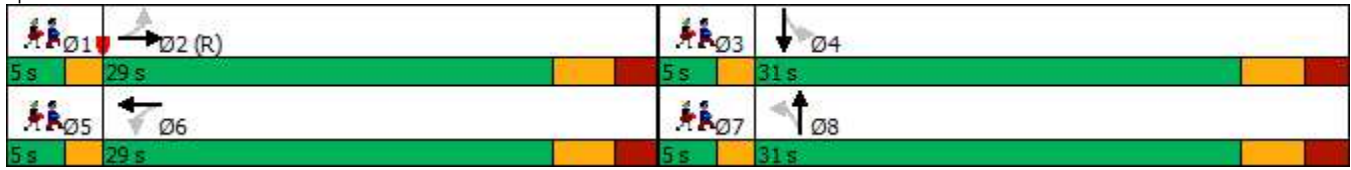


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.6		5.6	5.6		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	95	95		80	80		60	60		80	80	
Act Effct Green (s)	23.4	23.4		23.4	23.4		21.8	21.8		21.8	21.8	
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.31	0.31		0.31	0.31	
v/c Ratio	0.31	0.75		0.25	0.77		0.40	0.81		0.21	0.73	
Control Delay	22.7	32.8		20.9	33.2		23.7	36.3		19.0	30.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	22.7	32.8		20.9	33.2		23.7	36.3		19.0	30.6	
LOS	C	C		C	C		C	D		B	C	
Approach Delay		31.4			31.8			33.9				29.4
Approach LOS		C			C			C				C
90th %ile Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
70th %ile Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
50th %ile Green (s)	23.4	23.4		23.4	23.4		22.7	22.7		22.7	22.7	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	23.4	23.4		23.4	23.4		21.0	21.0		21.0	21.0	
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Ped	Ped	
10th %ile Green (s)	23.4	23.4		23.4	23.4		14.6	14.6		14.6	14.6	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Stops (vph)	46	305		39	339		63	320		30	285	
Fuel Used(l)	4	31		2	22		5	25		2	18	
CO Emissions (g/hr)	83	581		41	402		88	469		31	329	
NOx Emissions (g/hr)	16	112		8	78		17	91		6	64	
VOC Emissions (g/hr)	19	134		9	93		20	108		7	76	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	5.5	41.9		5.0	46.6		8.4	42.6		3.7	37.7	
Queue Length 95th (m)	14.9	#80.8		13.4	#87.8		18.9	#69.7		10.2	60.8	
Internal Link Dist (m)		411.9			73.2			201.8				83.4
Turn Bay Length (m)	15.0			15.0			20.0			15.0		
Base Capacity (vph)	190	486		211	522		246	528		227	537	
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	0.31	0.75		0.25	0.77		0.34	0.69		0.18	0.62	

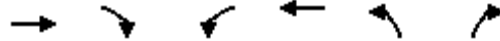
Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 32 (46%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.81  
 Intersection Signal Delay: 31.7 Intersection LOS: C  
 Intersection Capacity Utilization 80.0% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 13: Preston & Somerset



Lane Group	Ø1	Ø3	Ø5	Ø7
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
90th %ile Green (s)	3.0	3.0	3.0	3.0
90th %ile Term Code	MaxR	MaxR	MaxR	MaxR
70th %ile Green (s)	3.0	3.0	3.0	3.0
70th %ile Term Code	MaxR	MaxR	MaxR	MaxR
50th %ile Green (s)	5.6	3.0	5.6	3.0
50th %ile Term Code	MaxR	MaxR	MaxR	MaxR
30th %ile Green (s)	7.3	3.0	7.3	3.0
30th %ile Term Code	MaxR	MaxR	MaxR	MaxR
10th %ile Green (s)	13.7	3.0	13.7	3.0
10th %ile Term Code	MaxR	MaxR	MaxR	MaxR
Stops (vph)				
Fuel Used(l)				
CO Emissions (g/hr)				
NOx Emissions (g/hr)				
VOC Emissions (g/hr)				
Dilemma Vehicles (#)				
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				



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	334	18	35	441	23	39
Future Volume (Veh/h)	334	18	35	441	23	39
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	334	18	35	441	23	39
Pedestrians	18				140	
Lane Width (m)	3.7				3.7	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	2				12	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	109					
pX, platoon unblocked			0.94		0.94	0.94
vC, conflicting volume			492		1012	483
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			424		979	415
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		89	93
cM capacity (veh/h)			936		217	526
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	352	476	62			
Volume Left	0	35	23			
Volume Right	18	0	39			
cSH	1700	936	344			
Volume to Capacity	0.21	0.04	0.18			
Queue Length 95th (m)	0.0	0.9	4.9			
Control Delay (s)	0.0	1.1	17.8			
Lane LOS		A	C			
Approach Delay (s)	0.0	1.1	17.8			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			1.8			
Intersection Capacity Utilization			60.5%	ICU Level of Service		B
Analysis Period (min)			15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	8	10	4	22	20	24	29	1	15	54	37
Future Volume (vph)	15	8	10	4	22	20	24	29	1	15	54	37
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	8	10	4	22	20	24	29	1	15	54	37
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	33	46	54	106								
Volume Left (vph)	15	4	24	15								
Volume Right (vph)	10	20	1	37								
Hadj (s)	-0.06	-0.21	0.11	-0.15								
Departure Headway (s)	4.2	4.1	4.3	4.0								
Degree Utilization, x	0.04	0.05	0.06	0.12								
Capacity (veh/h)	812	846	811	882								
Control Delay (s)	7.4	7.3	7.6	7.5								
Approach Delay (s)	7.4	7.3	7.6	7.5								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay			7.5									
Level of Service			A									
Intersection Capacity Utilization			29.0%		ICU Level of Service				A			
Analysis Period (min)			15									

9: Breezehill & Gladstone  
PM Peak

1040 Somerset Street  
2025 Total Traffic Volumes



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	228	4	6	569	30	3	0	1	33	0	27
Future Volume (Veh/h)	21	228	4	6	569	30	3	0	1	33	0	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	21	228	4	6	569	30	3	0	1	33	0	27
Pedestrians		7			10			25			22	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	621			257			927	930	265	901	917	613
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	621			257			927	930	265	901	917	613
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	98			100			99	100	100	86	100	94
cM capacity (veh/h)	942			1280			217	250	751	230	254	480
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	253	605	4	60								
Volume Left	21	6	3	33								
Volume Right	4	30	1	27								
cSH	942	1280	264	301								
Volume to Capacity	0.02	0.00	0.02	0.20								
Queue Length 95th (m)	0.5	0.1	0.4	5.5								
Control Delay (s)	1.0	0.1	18.9	19.9								
Lane LOS	A	A	C	C								
Approach Delay (s)	1.0	0.1	18.9	19.9								
Approach LOS			C	C								
<b>Intersection Summary</b>												
Average Delay			1.7									
Intersection Capacity Utilization			47.9%		ICU Level of Service				A			
Analysis Period (min)			15									



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	7	65	2	12	59
Future Volume (Veh/h)	1	7	65	2	12	59
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	7	65	2	12	59
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	149	66			67	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	149	66			67	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			99	
cM capacity (veh/h)	836	998			1535	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	8	67	71			
Volume Left	1	0	12			
Volume Right	7	2	0			
cSH	974	1700	1535			
Volume to Capacity	0.01	0.04	0.01			
Queue Length 95th (m)	0.2	0.0	0.2			
Control Delay (s)	8.7	0.0	1.3			
Lane LOS	A		A			
Approach Delay (s)	8.7	0.0	1.3			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			1.1			
Intersection Capacity Utilization			20.6%	ICU Level of Service		A
Analysis Period (min)			15			





Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	334	18	35	441	23	39
Future Volume (vph)	334	18	35	441	23	39
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98			0.99	0.89	
Frt	0.993				0.915	
Flt Protected				0.996	0.982	
Satd. Flow (prot)	1555	0	0	1599	1336	0
Flt Permitted				0.960	0.982	
Satd. Flow (perm)	1555	0	0	1524	1288	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	6				39	
Link Speed (k/h)	50			50	40	
Link Distance (m)	108.9			435.9	109.2	
Travel Time (s)	7.8			31.4	9.8	
Confl. Peds. (#/hr)		140	140		50	50
Confl. Bikes (#/hr)		50				2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	2%	2%	2%	2%	2%
Parking (#/hr)	0			0	0	
Adj. Flow (vph)	334	18	35	441	23	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	352	0	0	476	62	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.21	1.06	1.06	1.21	1.21	1.06
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2		1	2		1
Detector Template	Thru		Left	Thru		Left
Leading Detector (m)	30.5		6.1	30.5		6.1
Trailing Detector (m)	0.0		0.0	0.0		0.0
Detector 1 Position(m)	0.0		0.0	0.0		0.0
Detector 1 Size(m)	1.8		6.1	1.8		6.1
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0		0.0
Detector 1 Queue (s)	0.0		0.0	0.0		0.0
Detector 1 Delay (s)	0.0		0.0	0.0		0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA		Perm	NA		Perm
Protected Phases	2			6		
Permitted Phases			6			8
Detector Phase	2		6	6		8
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0		10.0
Minimum Split (s)	23.5		25.3	25.3		25.3
Total Split (s)	44.7		44.7	44.7		25.3
Total Split (%)	63.9%		63.9%	63.9%		36.1%
Maximum Green (s)	39.2		39.4	39.4		20.0
Yellow Time (s)	3.5		3.3	3.3		3.3
All-Red Time (s)	2.0		2.0	2.0		2.0
Lost Time Adjust (s)	0.0			0.0		0.0



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Lost Time (s)	5.5			5.3	5.3	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	C-Max		C-Max	C-Max	None	
Walk Time (s)	7.0		7.0	7.0	7.0	
Flash Dont Walk (s)	11.0		13.0	13.0	11.0	
Pedestrian Calls (#/hr)	80		80	80	30	
Act Effct Green (s)	54.3			54.4	13.2	
Actuated g/C Ratio	0.78			0.78	0.19	
v/c Ratio	0.29			0.40	0.23	
Control Delay	5.9			4.2	13.3	
Queue Delay	0.3			0.0	0.0	
Total Delay	6.2			4.2	13.3	
LOS	A			A	B	
Approach Delay	6.2			4.2	13.3	
Approach LOS	A			A	B	
90th %ile Green (s)	41.2		41.4	41.4	18.0	
90th %ile Term Code	Coord		Coord	Coord	Ped	
70th %ile Green (s)	41.2		41.4	41.4	18.0	
70th %ile Term Code	Coord		Coord	Coord	Ped	
50th %ile Green (s)	49.2		49.4	49.4	10.0	
50th %ile Term Code	Coord		Coord	Coord	Min	
30th %ile Green (s)	64.5		64.7	64.7	0.0	
30th %ile Term Code	Coord		Coord	Coord	Skip	
10th %ile Green (s)	64.5		64.7	64.7	0.0	
10th %ile Term Code	Coord		Coord	Coord	Skip	
Stops (vph)	123			201	27	
Fuel Used(l)	8			26	2	
CO Emissions (g/hr)	149			479	32	
NOx Emissions (g/hr)	29			92	6	
VOC Emissions (g/hr)	34			110	7	
Dilemma Vehicles (#)	0			0	0	
Queue Length 50th (m)	13.9			6.6	2.7	
Queue Length 95th (m)	36.6			m15.4	10.7	
Internal Link Dist (m)	84.9			411.9	85.2	
Turn Bay Length (m)						
Base Capacity (vph)	1208			1185	395	
Starvation Cap Reductn	349			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.41			0.40	0.16	

Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 26 (37%), Referenced to phase 2:EBT and 6:WBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.40  
 Intersection Signal Delay: 5.6  
 Intersection LOS: A  
 Intersection Capacity Utilization 73.8%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Breezehill & Somerset



3: Bayswater & Somerset  
AM Peak

1040 Somerset Street  
2030 Total Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	242	26	27	149	64	26	196	36	137	241	84
Future Volume (vph)	41	242	26	27	149	64	26	196	36	137	241	84
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		40.0	0.0		45.0	0.0		0.0	40.0		0.0
Storage Lanes	0		1	0		1	0		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99	0.82		0.99	0.87		0.98		0.95	0.98	
Fr <sub>t</sub>			0.850			0.850		0.981			0.961	
Fl <sub>t</sub> Protected		0.993			0.992			0.995		0.950		
Satd. Flow (prot)	0	1494	1517	0	1530	1357	0	1703	0	1662	1679	0
Fl <sub>t</sub> Permitted		0.942			0.934			0.902		0.517		
Satd. Flow (perm)	0	1404	1242	0	1422	1175	0	1539	0	861	1679	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			45			64		14			31	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		88.8			108.9			142.8			114.2	
Travel Time (s)		6.4			7.8			10.3			8.2	
Confl. Peds. (#/hr)	61		91	91		61	37		49	49		37
Confl. Bikes (#/hr)			47			38			17			7
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 (%)	14%	8%	2%	2%	7%	14%	8%	2%	3%	4%	2%	2%
Parking (#/hr)		0			0							
Adj. Flow (vph)	41	242	26	27	149	64	26	196	36	137	241	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	283	26	0	176	64	0	258	0	137	325	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	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	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	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	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	30.5	30.5	30.5	30.5	30.5	30.5	28.9	28.9		28.9	28.9	
Total Split (s)	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0		35.0	35.0	
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	29.5	29.5	29.5	29.5	29.5	29.5	29.1	29.1		29.1	29.1	

3: Bayswater & Somerset  
AM Peak

1040 Somerset Street  
2030 Total Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)		5.5	5.5		5.5	5.5		5.9		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	Max	Max	Max	None	None		None	None	
Walk Time (s)	17.0	17.0	17.0	17.0	17.0	17.0	13.0	13.0		13.0	13.0	
Flash Dont Walk (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	75	75	75	45	45	45	35	35		25	25	
Act Effct Green (s)		40.0	40.0		40.0	40.0		18.6		18.6	18.6	
Actuated g/C Ratio		0.57	0.57		0.57	0.57		0.27		0.27	0.27	
v/c Ratio		0.35	0.04		0.22	0.09		0.62		0.60	0.70	
Control Delay		11.3	2.0		7.0	1.7		26.8		32.4	28.1	
Queue Delay		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Delay		11.3	2.0		7.0	1.7		26.8		32.4	28.1	
LOS		B	A		A	A		C		C	C	
Approach Delay		10.5			5.6			26.8				29.3
Approach LOS		B			A			C				C
90th %ile Green (s)	32.5	32.5	32.5	32.5	32.5	32.5	26.1	26.1		26.1	26.1	
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
70th %ile Green (s)	35.6	35.6	35.6	35.6	35.6	35.6	23.0	23.0		23.0	23.0	
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Ped	Ped		Hold	Hold	
50th %ile Green (s)	40.6	40.6	40.6	40.6	40.6	40.6	18.0	18.0		18.0	18.0	
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
30th %ile Green (s)	43.6	43.6	43.6	43.6	43.6	43.6	15.0	15.0		15.0	15.0	
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
10th %ile Green (s)	47.9	47.9	47.9	47.9	47.9	47.9	10.7	10.7		10.7	10.7	
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
Stops (vph)		157	3		81	12		200		114	249	
Fuel Used(l)		8	0		5	1		13		7	16	
CO Emissions (g/hr)		156	6		85	19		247		139	300	
NOx Emissions (g/hr)		30	1		16	4		48		27	58	
VOC Emissions (g/hr)		36	1		20	4		57		32	69	
Dilemma Vehicles (#)		0	0		0	0		0		0	0	
Queue Length 50th (m)		17.6	0.0		3.9	0.0		28.3		15.8	34.9	
Queue Length 95th (m)		41.7	2.2		29.7	m3.2		41.8		27.9	50.4	
Internal Link Dist (m)		64.8			84.9			118.8			90.2	
Turn Bay Length (m)			40.0			45.0				40.0		
Base Capacity (vph)		803	729		813	699		647		357	716	
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		0.35	0.04		0.22	0.09		0.40		0.38	0.45	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 19 (27%), Referenced to phase 2:EBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 19.7

Intersection LOS: B

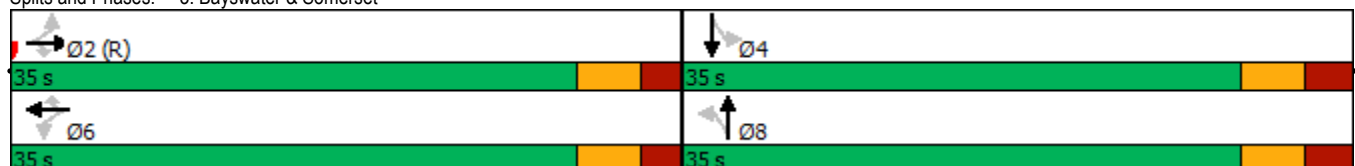
Intersection Capacity Utilization 98.7%

ICU Level of Service F

Analysis Period (min) 15






















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

Splits and Phases: 3: Bayswater & Somerset



13: Preston & Somerset  
AM Peak

1040 Somerset Street  
2030 Total Traffic Volumes

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	319	99	34	176	13	68	354	47	18	278	31
Future Volume (vph)	56	319	99	34	176	13	68	354	47	18	278	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.88	0.95		0.95	0.99		0.96	0.99		0.95	0.99	
Fr <sub>t</sub>		0.964			0.990			0.982			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1417	0	1679	1487	0	1647	1478	0	1503	1456	0
Flt Permitted	0.632			0.279			0.476			0.354		
Satd. Flow (perm)	996	1417	0	469	1487	0	790	1478	0	534	1456	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		435.9			97.2			225.8			107.4	
Travel Time (s)		31.4			7.0			16.3			7.7	
Confl. Peds. (#/hr)	83		63	63		83	42		58	58		42
Confl. Bikes (#/hr)			66			21			10			4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	5%	9%	3%	8%	2%	5%	8%	2%	15%	9%	17%
Parking (#/hr)		0			0			0			0	
Adj. Flow (vph)	56	319	99	34	176	13	68	354	47	18	278	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	418	0	34	189	0	68	401	0	18	309	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.6	24.6		24.6	24.6		26.7	26.7		26.7	26.7	
Total Split (s)	26.0	26.0		26.0	26.0		34.0	34.0		34.0	34.0	
Total Split (%)	37.1%	37.1%		37.1%	37.1%		48.6%	48.6%		48.6%	48.6%	
Maximum Green (s)	20.4	20.4		20.4	20.4		28.3	28.3		28.3	28.3	

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Storage Length (m)				
Storage Lanes				
Taper Length (m)				
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 (%)				
Parking (#/hr)				
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	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	3.0	3.0	3.0	3.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Maximum Green (s)	3.0	3.0	3.0	3.0

13: Preston & Somerset  
AM Peak

1040 Somerset Street  
2030 Total Traffic Volumes

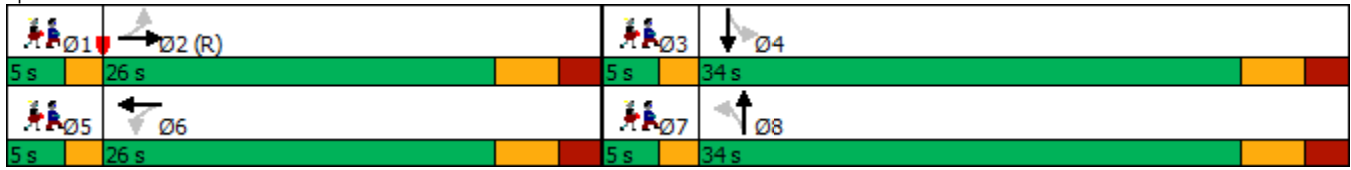


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.6		5.6	5.6		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	45	45		65	65		40	40		30	30	
Act Effct Green (s)	20.4	20.4		20.4	20.4		23.4	23.4		23.4	23.4	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.33	0.33		0.33	0.33	
v/c Ratio	0.19	1.01		0.25	0.44		0.26	0.81		0.10	0.63	
Control Delay	21.7	75.2		24.8	24.0		17.9	34.3		15.2	25.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	21.7	75.2		24.8	24.0		17.9	34.3		15.2	25.2	
LOS	C	E		C	C		B	C		B	C	
Approach Delay		68.9			24.1			31.9				24.6
Approach LOS		E			C			C				C
90th %ile Green (s)	20.4	20.4		20.4	20.4		28.3	28.3		28.3	28.3	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
70th %ile Green (s)	20.4	20.4		20.4	20.4		27.9	27.9		27.9	27.9	
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	20.4	20.4		20.4	20.4		24.3	24.3		24.3	24.3	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	20.4	20.4		20.4	20.4		20.9	20.9		20.9	20.9	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	20.4	20.4		20.4	20.4		15.7	15.7		15.7	15.7	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Stops (vph)	45	337		29	149		46	348		13	245	
Fuel Used(l)	4	49		2	9		3	27		1	15	
CO Emissions (g/hr)	79	912		30	159		64	502		13	272	
NOx Emissions (g/hr)	15	176		6	31		12	97		2	53	
VOC Emissions (g/hr)	18	210		7	37		15	116		3	63	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	5.3	~45.7		3.4	19.9		6.2	46.2		1.6	32.9	
Queue Length 95th (m)	15.7	#109.0		10.7	36.9		13.8	70.6		5.2	51.4	
Internal Link Dist (m)		411.9			73.2			201.8				83.4
Turn Bay Length (m)	15.0			15.0			20.0			15.0		
Base Capacity (vph)	290	412		136	433		319	597		215	588	
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	0.19	1.01		0.25	0.44		0.21	0.67		0.08	0.53	

Intersection Summary

Area Type:	Other
Cycle Length:	70
Actuated Cycle Length:	70
Offset:	37 (53%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.01
Intersection Signal Delay:	40.9
Intersection Capacity Utilization:	83.9%
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: 13: Preston & Somerset





Lane Group	Ø1	Ø3	Ø5	Ø7
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
90th %ile Green (s)	3.0	3.0	3.0	3.0
90th %ile Term Code	MaxR	MaxR	MaxR	MaxR
70th %ile Green (s)	3.4	3.0	3.4	3.0
70th %ile Term Code	MaxR	MaxR	MaxR	MaxR
50th %ile Green (s)	7.0	3.0	7.0	3.0
50th %ile Term Code	MaxR	MaxR	MaxR	MaxR
30th %ile Green (s)	10.4	3.0	10.4	3.0
30th %ile Term Code	MaxR	MaxR	MaxR	MaxR
10th %ile Green (s)	15.6	3.0	15.6	3.0
10th %ile Term Code	MaxR	MaxR	MaxR	MaxR
Stops (vph)				
Fuel Used(l)				
CO Emissions (g/hr)				
NOx Emissions (g/hr)				
VOC Emissions (g/hr)				
Dilemma Vehicles (#)				
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				



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	317	63	36	302	37	53
Future Volume (Veh/h)	317	63	36	302	37	53
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	317	63	36	302	37	53
Pedestrians					100	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.2	
Percent Blockage					9	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	109					
pX, platoon unblocked			0.94		0.94	0.94
vC, conflicting volume			480		822	448
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			410		776	377
tC, single (s)			4.1		6.6	6.5
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.5
p0 queue free %			96		87	90
cM capacity (veh/h)			983		276	529
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	380	338	90			
Volume Left	0	36	37			
Volume Right	63	0	53			
cSH	1700	983	384			
Volume to Capacity	0.22	0.04	0.23			
Queue Length 95th (m)	0.0	0.9	6.8			
Control Delay (s)	0.0	1.3	17.2			
Lane LOS		A	C			
Approach Delay (s)	0.0	1.3	17.2			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			2.5			
Intersection Capacity Utilization			57.1%	ICU Level of Service		B
Analysis Period (min)			15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	26	10	6	8	19	11	54	10	34	37	19
Future Volume (vph)	15	26	10	6	8	19	11	54	10	34	37	19
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	26	10	6	8	19	11	54	10	34	37	19
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	51	33	75	90								
Volume Left (vph)	15	6	11	34								
Volume Right (vph)	10	19	10	19								
Hadj (s)	-0.02	-0.28	-0.02	-0.02								
Departure Headway (s)	4.3	4.0	4.2	4.1								
Degree Utilization, x	0.06	0.04	0.09	0.10								
Capacity (veh/h)	807	849	836	846								
Control Delay (s)	7.5	7.2	7.5	7.6								
Approach Delay (s)	7.5	7.2	7.5	7.6								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay			7.5									
Level of Service			A									
Intersection Capacity Utilization			29.0%		ICU Level of Service				A			
Analysis Period (min)			15									

9: Breezehill & Gladstone  
AM Peak

1040 Somerset Street  
2030 Total Traffic Volumes
























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			0	1		41	2		2	17		19
Traffic Volume (veh/h)	23	240	0	1	207	41	2	1	2	17	0	19
Future Volume (Veh/h)	23	240	0	1	207	41	2	1	2	17	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	23	240	0	1	207	41	2	1	2	17	0	19
Pedestrians		8			2			25			21	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	269			265			568	582	267	541	562	256
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	269			265			568	582	267	541	562	256
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			99	100	100	96	100	98
cM capacity (veh/h)	1271			1271			393	400	754	422	411	763
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	263	249	5	36								
Volume Left	23	1	2	17								
Volume Right	0	41	2	19								
cSH	1271	1271	488	552								
Volume to Capacity	0.02	0.00	0.01	0.07								
Queue Length 95th (m)	0.4	0.0	0.2	1.6								
Control Delay (s)	0.8	0.0	12.4	12.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.8	0.0	12.4	12.0								
Approach LOS			B	B								
<b>Intersection Summary</b>												
Average Delay			1.3									
Intersection Capacity Utilization			44.0%		ICU Level of Service				A			
Analysis Period (min)			15									



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	15	74	1	3	99
Future Volume (Veh/h)	3	15	74	1	3	99
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	3	15	74	1	3	99
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	180	74			75	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	180	74			75	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			100	
cM capacity (veh/h)	808	987			1524	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	18	75	102			
Volume Left	3	0	3			
Volume Right	15	1	0			
cSH	952	1700	1524			
Volume to Capacity	0.02	0.04	0.00			
Queue Length 95th (m)	0.4	0.0	0.0			
Control Delay (s)	8.9	0.0	0.2			
Lane LOS	A		A			
Approach Delay (s)	8.9	0.0	0.2			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.9			
Intersection Capacity Utilization			18.1%		ICU Level of Service	A
Analysis Period (min)			15			

13: Preston & Somerset  
AM Peak

1040 Somerset Street  
2030 Total Traffic Volumes, Optimized Timing at Preston

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	319	99	34	176	13	68	354	47	18	278	31
Future Volume (vph)	56	319	99	34	176	13	68	354	47	18	278	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.88	0.95		0.95	0.99		0.96	0.99		0.95	0.99	
Fr <sub>t</sub>		0.964			0.990			0.982			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1422	0	1679	1488	0	1647	1477	0	1503	1456	0
Flt Permitted	0.639			0.357			0.458			0.327		
Satd. Flow (perm)	1006	1422	0	598	1488	0	761	1477	0	494	1456	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		435.9			97.2			225.8			107.4	
Travel Time (s)		31.4			7.0			16.3			7.7	
Confl. Peds. (#/hr)	83		63	63		83	42		58	58		42
Confl. Bikes (#/hr)			66			21			10			4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	5%	9%	3%	8%	2%	5%	8%	2%	15%	9%	17%
Parking (#/hr)		0			0			0			0	
Adj. Flow (vph)	56	319	99	34	176	13	68	354	47	18	278	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	418	0	34	189	0	68	401	0	18	309	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.6	24.6		24.6	24.6		26.7	26.7		26.7	26.7	
Total Split (s)	31.0	31.0		31.0	31.0		29.0	29.0		29.0	29.0	
Total Split (%)	44.3%	44.3%		44.3%	44.3%		41.4%	41.4%		41.4%	41.4%	
Maximum Green (s)	25.4	25.4		25.4	25.4		23.3	23.3		23.3	23.3	

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Storage Length (m)				
Storage Lanes				
Taper Length (m)				
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 (%)				
Parking (#/hr)				
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	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	3.0	3.0	3.0	3.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Maximum Green (s)	3.0	3.0	3.0	3.0

13: Preston & Somerset  
AM Peak

1040 Somerset Street  
2030 Total Traffic Volumes, Optimized Timing at Preston



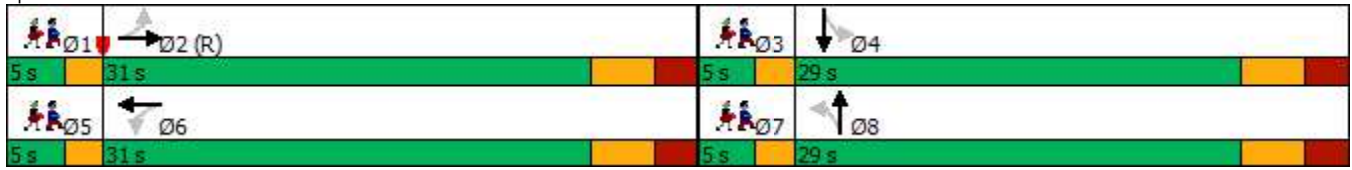
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.6		5.6	5.6		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	45	45		65	65		40	40		30	30	
Act Effct Green (s)	25.4	25.4		25.4	25.4		21.6	21.6		21.6	21.6	
Actuated g/C Ratio	0.36	0.36		0.36	0.36		0.31	0.31		0.31	0.31	
v/c Ratio	0.15	0.81		0.16	0.35		0.29	0.88		0.12	0.69	
Control Delay	15.2	32.8		17.5	18.6		21.3	45.1		18.7	29.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.2	32.8		17.5	18.6		21.3	45.1		18.7	29.7	
LOS	B	C		B	B		C	D		B	C	
Approach Delay		30.7			18.4			41.7				29.1
Approach LOS		C			B			D				C
90th %ile Green (s)	25.4	25.4		25.4	25.4		23.3	23.3		23.3	23.3	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
70th %ile Green (s)	25.4	25.4		25.4	25.4		23.3	23.3		23.3	23.3	
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
50th %ile Green (s)	25.4	25.4		25.4	25.4		23.3	23.3		23.3	23.3	
50th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
30th %ile Green (s)	25.4	25.4		25.4	25.4		21.6	21.6		21.6	21.6	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	25.4	25.4		25.4	25.4		16.7	16.7		16.7	16.7	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Stops (vph)	37	330		24	134		50	345		15	263	
Fuel Used(l)	4	35		1	7		4	30		1	16	
CO Emissions (g/hr)	71	656		24	139		69	563		14	299	
NOx Emissions (g/hr)	14	127		5	27		13	109		3	58	
VOC Emissions (g/hr)	16	151		6	32		16	130		3	69	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	4.9	41.3		2.9	17.7		6.4	47.4		1.6	33.7	
Queue Length 95th (m)	12.4	#91.3		9.0	32.7		15.9	#91.3		6.0	58.5	
Internal Link Dist (m)		411.9			73.2			201.8				83.4
Turn Bay Length (m)	15.0			15.0			20.0			15.0		
Base Capacity (vph)	365	515		216	539		253	491		164	484	
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	0.15	0.81		0.16	0.35		0.27	0.82		0.11	0.64	

Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 37 (53%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 32.0 Intersection LOS: C  
 Intersection Capacity Utilization 83.9% ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.



Splits and Phases: 13: Preston & Somerset



Lane Group	Ø1	Ø3	Ø5	Ø7
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
90th %ile Green (s)	3.0	3.0	3.0	3.0
90th %ile Term Code	MaxR	MaxR	MaxR	MaxR
70th %ile Green (s)	3.0	3.0	3.0	3.0
70th %ile Term Code	MaxR	MaxR	MaxR	MaxR
50th %ile Green (s)	3.0	3.0	3.0	3.0
50th %ile Term Code	MaxR	MaxR	MaxR	MaxR
30th %ile Green (s)	4.7	3.0	4.7	3.0
30th %ile Term Code	MaxR	MaxR	MaxR	MaxR
10th %ile Green (s)	9.6	3.0	9.6	3.0
10th %ile Term Code	MaxR	MaxR	MaxR	MaxR
Stops (vph)				
Fuel Used(l)				
CO Emissions (g/hr)				
NOx Emissions (g/hr)				
VOC Emissions (g/hr)				
Dilemma Vehicles (#)				
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				



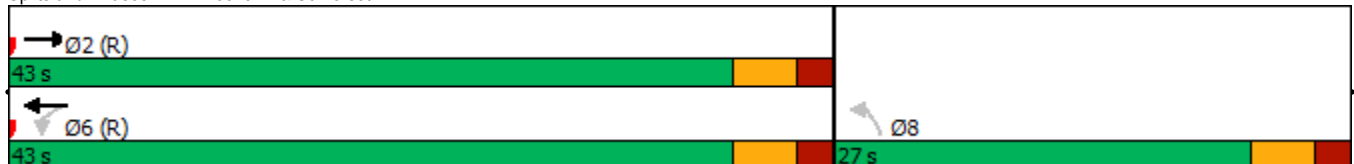
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	317	63	36	302	37	53
Future Volume (vph)	317	63	36	302	37	53
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	15.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			45.0		30.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.96			0.99	0.89	
Frt	0.978				0.920	
Flt Protected				0.995	0.980	
Satd. Flow (prot)	1473	0	0	1544	1087	0
Flt Permitted				0.939	0.980	
Satd. Flow (perm)	1473	0	0	1441	1043	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	22				53	
Link Speed (k/h)	50			50	40	
Link Distance (m)	108.9			435.9	109.2	
Travel Time (s)	7.8			31.4	9.8	
Confl. Peds. (#/hr)		100	100		50	50
Confl. Bikes (#/hr)		33				6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	8%	2%	6%	25%	27%
Parking (#/hr)	0			0	0	
Adj. Flow (vph)	317	63	36	302	37	53
Shared Lane Traffic (%)						
Lane Group Flow (vph)	380	0	0	338	90	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.21	1.06	1.06	1.21	1.21	1.06
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2		1	2	1	
Detector Template	Thru		Left	Thru	Left	
Leading Detector (m)	30.5		6.1	30.5	6.1	
Trailing Detector (m)	0.0		0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	
Detector 1 Size(m)	1.8		6.1	1.8	6.1	
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	CI+Ex			CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA		Perm	NA	Perm	
Protected Phases	2			6		
Permitted Phases			6		8	
Detector Phase	2		6	6	8	
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	
Minimum Split (s)	23.3		25.3	25.3	25.3	
Total Split (s)	43.0		43.0	43.0	27.0	
Total Split (%)	61.4%		61.4%	61.4%	38.6%	
Maximum Green (s)	37.7		37.7	37.7	21.7	



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Yellow Time (s)	3.3		3.3	3.3	3.3	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	5.3			5.3	5.3	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	C-Max		C-Max	C-Max	None	
Walk Time (s)	7.0		7.0	7.0	7.0	
Flash Dont Walk (s)	11.0		13.0	13.0	11.0	
Pedestrian Calls (#/hr)	60		60	60	30	
Act Effct Green (s)	50.3			50.3	13.2	
Actuated g/C Ratio	0.72			0.72	0.19	
v/c Ratio	0.36			0.33	0.38	
Control Delay	8.2			14.5	16.2	
Queue Delay	0.3			0.0	0.0	
Total Delay	8.5			14.5	16.2	
LOS	A			B	B	
Approach Delay	8.5			14.5	16.2	
Approach LOS	A			B	B	
90th %ile Green (s)	41.4		41.4	41.4	18.0	
90th %ile Term Code	Coord		Coord	Coord	Ped	
70th %ile Green (s)	41.4		41.4	41.4	18.0	
70th %ile Term Code	Coord		Coord	Coord	Ped	
50th %ile Green (s)	49.4		49.4	49.4	10.0	
50th %ile Term Code	Coord		Coord	Coord	Min	
30th %ile Green (s)	49.4		49.4	49.4	10.0	
30th %ile Term Code	Coord		Coord	Coord	Min	
10th %ile Green (s)	64.7		64.7	64.7	0.0	
10th %ile Term Code	Coord		Coord	Coord	Skip	
Stops (vph)	185			229	37	
Fuel Used(l)	10			23	3	
CO Emissions (g/hr)	195			426	50	
NOx Emissions (g/hr)	38			82	10	
VOC Emissions (g/hr)	45			98	12	
Dilemma Vehicles (#)	0			0	0	
Queue Length 50th (m)	19.9			29.2	4.4	
Queue Length 95th (m)	22.8			61.6	14.4	
Internal Link Dist (m)	84.9			411.9	85.2	
Turn Bay Length (m)						
Base Capacity (vph)	1065			1035	359	
Starvation Cap Reductn	251			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.47			0.33	0.25	

**Intersection Summary**  
 Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 30 (43%), Referenced to phase 2:EBT and 6:WBTL, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.38  
 Intersection Signal Delay: 11.8  
 Intersection LOS: B  
 Intersection Capacity Utilization 68.5%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 1: Breezehill & Somerset



3: Bayswater & Somerset  
PM Peak

1040 Somerset Street  
2030 Total Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	241	31	49	350	144	52	316	30	110	277	85
Future Volume (vph)	41	241	31	49	350	144	52	316	30	110	277	85
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		40.0	0.0		45.0	0.0		0.0	40.0		0.0
Storage Lanes	0		1	0		1	0		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99	0.73		0.98	0.82		0.98		0.95	0.97	
Fr <sub>t</sub>			0.850			0.850		0.990			0.965	
Flt Protected		0.993			0.994			0.994		0.950		
Satd. Flow (prot)	0	1568	1517	0	1596	1517	0	1740	0	1679	1664	0
Flt Permitted		0.908			0.932			0.766		0.397		
Satd. Flow (perm)	0	1422	1110	0	1470	1243	0	1332	0	670	1664	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			42			144		6			24	
Link Speed (k/h)		50			50			50		50		50
Link Distance (m)		88.8			108.9			142.8			114.2	
Travel Time (s)		6.4			7.8			10.3			8.2	
Confl. Peds. (#/hr)	74		150	150		74	58		60	60		58
Confl. Bikes (#/hr)			44			72			6			24
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%	4%	2%	2%	2%	2%	2%	2%	2%	3%	2%	3%
Parking (#/hr)		0			0							
Adj. Flow (vph)	41	241	31	49	350	144	52	316	30	110	277	85
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	282	31	0	399	144	0	398	0	110	362	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	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	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	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	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	30.5	30.5	30.5	30.5	30.5	30.5	28.9	28.9		28.9	28.9	
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	35.0	35.0		35.0	35.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%	53.3%	46.7%	46.7%		46.7%	46.7%	
Maximum Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	29.1	29.1		29.1	29.1	

3: Bayswater & Somerset  
PM Peak

1040 Somerset Street  
2030 Total Traffic Volumes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)		5.5	5.5		5.5	5.5		5.9		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	Max	Max	Max	None	None		None	None	
Walk Time (s)	17.0	17.0	17.0	17.0	17.0	17.0	13.0	13.0		13.0	13.0	
Flash Dont Walk (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	105	105	105	55	55	55	45	45		35	35	
Act Effct Green (s)		40.3	40.3		40.3	40.3		23.3		23.3	23.3	
Actuated g/C Ratio		0.54	0.54		0.54	0.54		0.31		0.31	0.31	
v/c Ratio		0.37	0.05		0.51	0.20		0.95		0.53	0.68	
Control Delay		13.2	3.2		15.3	3.0		59.0		29.8	27.1	
Queue Delay		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Delay		13.2	3.2		15.3	3.0		59.0		29.8	27.1	
LOS		B	A		B	A		E		C	C	
Approach Delay		12.2			12.0			59.0				27.8
Approach LOS		B			B			E				C
90th %ile Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	29.1	29.1		29.1	29.1	
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Max	Max		Max	Max	
70th %ile Green (s)	36.5	36.5	36.5	36.5	36.5	36.5	27.1	27.1		27.1	27.1	
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
50th %ile Green (s)	39.6	39.6	39.6	39.6	39.6	39.6	24.0	24.0		24.0	24.0	
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
30th %ile Green (s)	43.0	43.0	43.0	43.0	43.0	43.0	20.6	20.6		20.6	20.6	
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
10th %ile Green (s)	48.0	48.0	48.0	48.0	48.0	48.0	15.6	15.6		15.6	15.6	
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
Stops (vph)	164	5			258	16		360		88	281	
Fuel Used(l)	9	0			15	2		32		6	18	
CO Emissions (g/hr)	166	8			272	41		587		106	331	
NOx Emissions (g/hr)	32	2			52	8		113		20	64	
VOC Emissions (g/hr)	38	2			63	9		135		24	76	
Dilemma Vehicles (#)		0	0		0	0		0		0	0	
Queue Length 50th (m)		21.8	0.0		34.0	0.0		53.0		12.5	40.7	
Queue Length 95th (m)		44.4	3.3		66.7	8.7		#90.6		25.3	60.5	
Internal Link Dist (m)		64.8			84.9			118.8			90.2	
Turn Bay Length (m)			40.0			45.0				40.0		
Base Capacity (vph)		764	616		790	734		520		259	660	
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		0.37	0.05		0.51	0.20		0.77		0.42	0.55	

**Intersection Summary**

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 63 (84%), Referenced to phase 2:EBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 27.2

Intersection LOS: C

Intersection Capacity Utilization 106.9%

ICU Level of Service G

Analysis Period (min) 15






















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

Splits and Phases: 3: Bayswater & Somerset



13: Preston & Somerset  
PM Peak

1040 Somerset Street  
2030 Total Traffic Volumes

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	344	71	53	420	23	87	312	54	40	285	56
Future Volume (vph)	65	344	71	53	420	23	87	312	54	40	285	56
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.92	0.96		0.91	0.99		0.91	0.98		0.93	0.97	
Fr t		0.974			0.992			0.978			0.975	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1463	0	1695	1566	0	1695	1461	0	1695	1479	0
Flt Permitted	0.298			0.334			0.414			0.379		
Satd. Flow (perm)	491	1463	0	541	1566	0	671	1461	0	629	1479	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		435.9			97.2			225.8			107.4	
Travel Time (s)		31.4			7.0			16.3			7.7	
Confl. Peds. (#/hr)	103		115	115		103	99		80	80		99
Confl. Bikes (#/hr)			28			53			8			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 (%)	2%	3%	11%	2%	2%	9%	2%	8%	2%	2%	5%	2%
Parking (#/hr)		0			0			0			0	
Adj. Flow (vph)	65	344	71	53	420	23	87	312	54	40	285	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	415	0	53	443	0	87	366	0	40	341	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.6	24.6		24.6	24.6		26.7	26.7		26.7	26.7	
Total Split (s)	29.0	29.0		29.0	29.0		31.0	31.0		31.0	31.0	
Total Split (%)	41.4%	41.4%		41.4%	41.4%		44.3%	44.3%		44.3%	44.3%	
Maximum Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	



Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Storage Length (m)				
Storage Lanes				
Taper Length (m)				
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 (%)				
Parking (#/hr)				
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	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	3.0	3.0	3.0	3.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Maximum Green (s)	3.0	3.0	3.0	3.0

13: Preston & Somerset  
PM Peak

1040 Somerset Street  
2030 Total Traffic Volumes

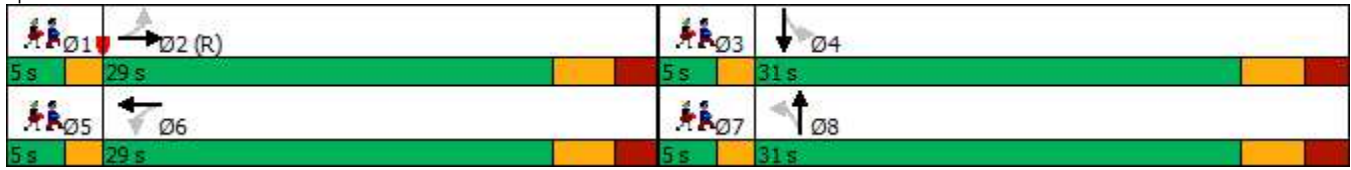


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.6		5.6	5.6		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	95	95		80	80		60	60		80	80	
Act Effct Green (s)	23.4	23.4		23.4	23.4		21.8	21.8		21.8	21.8	
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.31	0.31		0.31	0.31	
v/c Ratio	0.40	0.85		0.29	0.85		0.42	0.81		0.21	0.74	
Control Delay	26.7	40.5		22.7	39.3		24.5	36.3		19.0	31.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	26.7	40.5		22.7	39.3		24.5	36.3		19.0	31.6	
LOS	C	D		C	D		C	D		B	C	
Approach Delay		38.7			37.5			34.0				30.3
Approach LOS		D			D			C				C
90th %ile Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
70th %ile Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
50th %ile Green (s)	23.4	23.4		23.4	23.4		22.7	22.7		22.7	22.7	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	23.4	23.4		23.4	23.4		21.0	21.0		21.0	21.0	
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Ped	Ped	
10th %ile Green (s)	23.4	23.4		23.4	23.4		14.6	14.6		14.6	14.6	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Stops (vph)	53	349		41	373		66	320		30	292	
Fuel Used(l)	5	38		2	26		5	25		2	18	
CO Emissions (g/hr)	97	706		43	481		93	469		31	341	
NOx Emissions (g/hr)	19	136		8	93		18	91		6	66	
VOC Emissions (g/hr)	22	163		10	111		21	108		7	79	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	6.4	49.6		5.1	53.0		8.7	42.6		3.7	38.6	
Queue Length 95th (m)	17.5	#96.4		14.0	#100.5		19.7	#69.7		10.2	62.3	
Internal Link Dist (m)		411.9			73.2			201.8				83.4
Turn Bay Length (m)	15.0			15.0			20.0			15.0		
Base Capacity (vph)	164	489		180	523		242	528		227	534	
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	0.40	0.85		0.29	0.85		0.36	0.69		0.18	0.64	

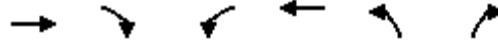
Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 32 (46%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.85  
 Intersection Signal Delay: 35.4  
 Intersection LOS: D  
 Intersection Capacity Utilization 82.2%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 13: Preston & Somerset



Lane Group	Ø1	Ø3	Ø5	Ø7
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
90th %ile Green (s)	3.0	3.0	3.0	3.0
90th %ile Term Code	MaxR	MaxR	MaxR	MaxR
70th %ile Green (s)	3.0	3.0	3.0	3.0
70th %ile Term Code	MaxR	MaxR	MaxR	MaxR
50th %ile Green (s)	5.6	3.0	5.6	3.0
50th %ile Term Code	MaxR	MaxR	MaxR	MaxR
30th %ile Green (s)	7.3	3.0	7.3	3.0
30th %ile Term Code	MaxR	MaxR	MaxR	MaxR
10th %ile Green (s)	13.7	3.0	13.7	3.0
10th %ile Term Code	MaxR	MaxR	MaxR	MaxR
Stops (vph)				
Fuel Used(l)				
CO Emissions (g/hr)				
NOx Emissions (g/hr)				
VOC Emissions (g/hr)				
Dilemma Vehicles (#)				
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				
<b>Intersection Summary</b>				



















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	392	33	35	494	33	39
Future Volume (Veh/h)	392	33	35	494	33	39
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	392	33	35	494	33	39
Pedestrians	18				140	
Lane Width (m)	3.7				3.7	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	2				12	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	109					
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			565		1130	548
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			476		1095	458
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		82	92
cM capacity (veh/h)			873		179	485
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	425	529	72			
Volume Left	0	35	33			
Volume Right	33	0	39			
cSH	1700	873	272			
Volume to Capacity	0.25	0.04	0.26			
Queue Length 95th (m)	0.0	1.0	7.9			
Control Delay (s)	0.0	1.1	22.9			
Lane LOS		A	C			
Approach Delay (s)	0.0	1.1	22.9			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			2.2			
Intersection Capacity Utilization			68.4%	ICU Level of Service		C
Analysis Period (min)			15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	8	10	4	22	20	24	29	1	15	54	37
Future Volume (vph)	15	8	10	4	22	20	24	29	1	15	54	37
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	8	10	4	22	20	24	29	1	15	54	37
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	33	46	54	106								
Volume Left (vph)	15	4	24	15								
Volume Right (vph)	10	20	1	37								
Hadj (s)	-0.06	-0.21	0.11	-0.15								
Departure Headway (s)	4.2	4.1	4.3	4.0								
Degree Utilization, x	0.04	0.05	0.06	0.12								
Capacity (veh/h)	812	846	811	882								
Control Delay (s)	7.4	7.3	7.6	7.5								
Approach Delay (s)	7.4	7.3	7.6	7.5								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay			7.5									
Level of Service			A									
Intersection Capacity Utilization			29.0%		ICU Level of Service				A			
Analysis Period (min)			15									

9: Breezehill & Gladstone  
PM Peak

1040 Somerset Street  
2030 Total Traffic Volumes

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	233	4	6	582	30	3	0	1	33	0	27
Future Volume (Veh/h)	21	233	4	6	582	30	3	0	1	33	0	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	21	233	4	6	582	30	3	0	1	33	0	27
Pedestrians		7			10			25			22	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	634			262			945	948	270	919	935	626
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	634			262			945	948	270	919	935	626
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	98			100			99	100	100	85	100	94
cM capacity (veh/h)	931			1274			211	244	746	224	248	472
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	258	618	4	60								
Volume Left	21	6	3	33								
Volume Right	4	30	1	27								
cSH	931	1274	257	293								
Volume to Capacity	0.02	0.00	0.02	0.20								
Queue Length 95th (m)	0.5	0.1	0.4	5.7								
Control Delay (s)	0.9	0.1	19.2	20.4								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.9	0.1	19.2	20.4								
Approach LOS			C	C								
<b>Intersection Summary</b>												
Average Delay			1.7									
Intersection Capacity Utilization			48.7%		ICU Level of Service				A			
Analysis Period (min)			15									



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	7	65	2	12	59
Future Volume (Veh/h)	1	7	65	2	12	59
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	7	65	2	12	59
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	149	66			67	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	149	66			67	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			99	
cM capacity (veh/h)	836	998			1535	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	8	67	71			
Volume Left	1	0	12			
Volume Right	7	2	0			
cSH	974	1700	1535			
Volume to Capacity	0.01	0.04	0.01			
Queue Length 95th (m)	0.2	0.0	0.2			
Control Delay (s)	8.7	0.0	1.3			
Lane LOS	A		A			
Approach Delay (s)	8.7	0.0	1.3			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			1.1			
Intersection Capacity Utilization			20.6%	ICU Level of Service		A
Analysis Period (min)			15			





Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	392	33	35	494	33	39
Future Volume (vph)	392	33	35	494	33	39
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	15.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			45.0		30.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98			0.99	0.89	
Frt	0.990				0.927	
Flt Protected				0.997	0.978	
Satd. Flow (prot)	1538	0	0	1601	1363	0
Flt Permitted				0.958	0.978	
Satd. Flow (perm)	1538	0	0	1525	1302	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	10				39	
Link Speed (k/h)	50			50	40	
Link Distance (m)	108.9			435.9	109.2	
Travel Time (s)	7.8			31.4	9.8	
Confl. Peds. (#/hr)		140	140		50	50
Confl. Bikes (#/hr)		50				2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	2%	2%	2%	2%	2%
Parking (#/hr)	0			0	0	
Adj. Flow (vph)	392	33	35	494	33	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	425	0	0	529	72	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.21	1.06	1.06	1.21	1.21	1.06
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2		1	2	1	
Detector Template	Thru		Left	Thru	Left	
Leading Detector (m)	30.5		6.1	30.5	6.1	
Trailing Detector (m)	0.0		0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	
Detector 1 Size(m)	1.8		6.1	1.8	6.1	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA		Perm	NA	Perm	
Protected Phases	2			6		
Permitted Phases			6		8	
Detector Phase	2		6	6	8	
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	
Minimum Split (s)	23.5		25.3	25.3	25.3	
Total Split (s)	44.7		44.7	44.7	25.3	
Total Split (%)	63.9%		63.9%	63.9%	36.1%	
Maximum Green (s)	39.2		39.4	39.4	20.0	

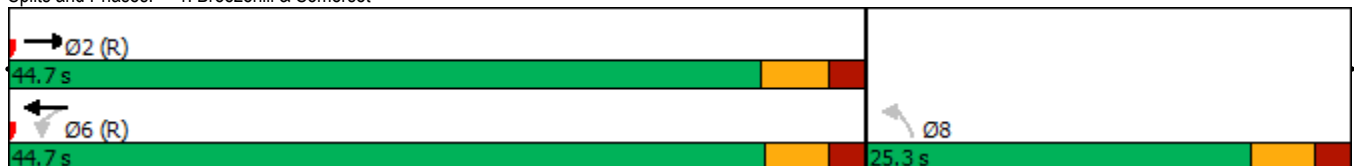


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Yellow Time (s)	3.5		3.3	3.3	3.3	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	5.5			5.3	5.3	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	C-Max		C-Max	C-Max	None	
Walk Time (s)	7.0		7.0	7.0	7.0	
Flash Dont Walk (s)	11.0		13.0	13.0	11.0	
Pedestrian Calls (#/hr)	80		80	80	30	
Act Effct Green (s)	50.2			50.3	13.2	
Actuated g/C Ratio	0.72			0.72	0.19	
v/c Ratio	0.38			0.48	0.26	
Control Delay	7.3			5.1	14.8	
Queue Delay	0.5			0.0	0.0	
Total Delay	7.8			5.1	14.8	
LOS	A			A	B	
Approach Delay	7.8			5.1	14.8	
Approach LOS	A			A	B	
90th %ile Green (s)	41.2		41.4	41.4	18.0	
90th %ile Term Code	Coord		Coord	Coord	Ped	
70th %ile Green (s)	41.2		41.4	41.4	18.0	
70th %ile Term Code	Coord		Coord	Coord	Ped	
50th %ile Green (s)	49.2		49.4	49.4	10.0	
50th %ile Term Code	Coord		Coord	Coord	Min	
30th %ile Green (s)	49.2		49.4	49.4	10.0	
30th %ile Term Code	Coord		Coord	Coord	Min	
10th %ile Green (s)	64.5		64.7	64.7	0.0	
10th %ile Term Code	Coord		Coord	Coord	Skip	
Stops (vph)	179			247	33	
Fuel Used(l)	11			30	2	
CO Emissions (g/hr)	201			549	40	
NOx Emissions (g/hr)	39			106	8	
VOC Emissions (g/hr)	46			127	9	
Dilemma Vehicles (#)	0			0	0	
Queue Length 50th (m)	17.7			7.2	3.9	
Queue Length 95th (m)	46.5			m16.0	12.4	
Internal Link Dist (m)	84.9			411.9	85.2	
Turn Bay Length (m)						
Base Capacity (vph)	1104			1096	399	
Starvation Cap Reductn	317			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.54			0.48	0.18	

Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 26 (37%), Referenced to phase 2:EBT and 6:WBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.48  
 Intersection Signal Delay: 6.9  
 Intersection LOS: A  
 Intersection Capacity Utilization 80.4%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Breezehill & Somerset



3: Bayswater & Somerset  
AM Peak

1040 Somerset Street  
2030 Total Traffic Volumes - Sensitivity Analysis



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	243	26	31	153	70	26	196	38	141	241	84
Future Volume (vph)	41	243	26	31	153	70	26	196	38	141	241	84
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		40.0	0.0		45.0	0.0		0.0	40.0		0.0
Storage Lanes	0		1	0		1	0		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99	0.82		0.99	0.87		0.98		0.95	0.98	
Fr <sub>t</sub>			0.850			0.850		0.980			0.961	
Fit Protected		0.993			0.992			0.995		0.950		
Satd. Flow (prot)	0	1494	1517	0	1531	1357	0	1700	0	1662	1679	0
Fit Permitted		0.941			0.924			0.902		0.514		
Satd. Flow (perm)	0	1402	1242	0	1406	1175	0	1536	0	857	1679	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			45			70		15			31	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		88.8			108.9			142.8			114.2	
Travel Time (s)		6.4			7.8			10.3			8.2	
Confl. Peds. (#/hr)	61		91	91		61	37		49	49		37
Confl. Bikes (#/hr)			47			38			17			7
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 (%)	14%	8%	2%	2%	7%	14%	8%	2%	3%	4%	2%	2%
Parking (#/hr)		0			0							
Adj. Flow (vph)	41	243	26	31	153	70	26	196	38	141	241	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	284	26	0	184	70	0	260	0	141	325	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	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	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	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	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	30.5	30.5	30.5	30.5	30.5	30.5	28.9	28.9		28.9	28.9	
Total Split (s)	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0		35.0	35.0	
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	29.5	29.5	29.5	29.5	29.5	29.5	29.1	29.1		29.1	29.1	

3: Bayswater & Somerset  
AM Peak

1040 Somerset Street  
2030 Total Traffic Volumes - Sensitivity Analysis



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)		5.5	5.5		5.5	5.5		5.9		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	Max	Max	Max	None	None		None	None	
Walk Time (s)	17.0	17.0	17.0	17.0	17.0	17.0	13.0	13.0		13.0	13.0	
Flash Dont Walk (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	75	75	75	45	45	45	35	35		25	25	
Act Effct Green (s)		40.0	40.0		40.0	40.0		18.6		18.6	18.6	
Actuated g/C Ratio		0.57	0.57		0.57	0.57		0.27		0.27	0.27	
v/c Ratio		0.35	0.04		0.23	0.10		0.62		0.62	0.70	
Control Delay		11.3	2.0		7.3	1.7		26.9		33.5	28.1	
Queue Delay		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Delay		11.3	2.0		7.3	1.7		26.9		33.5	28.1	
LOS		B	A		A	A		C		C	C	
Approach Delay		10.5			5.7			26.9				29.7
Approach LOS		B			A			C				C
90th %ile Green (s)	32.5	32.5	32.5	32.5	32.5	32.5	26.1	26.1		26.1	26.1	
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
70th %ile Green (s)	35.6	35.6	35.6	35.6	35.6	35.6	23.0	23.0		23.0	23.0	
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Ped	Ped		Hold	Hold	
50th %ile Green (s)	40.6	40.6	40.6	40.6	40.6	40.6	18.0	18.0		18.0	18.0	
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
30th %ile Green (s)	43.6	43.6	43.6	43.6	43.6	43.6	15.0	15.0		15.0	15.0	
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
10th %ile Green (s)	47.9	47.9	47.9	47.9	47.9	47.9	10.7	10.7		10.7	10.7	
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Hold	Hold		Gap	Gap	
Stops (vph)		158	3		88	12		201		117	249	
Fuel Used(l)		8	0		5	1		13		8	16	
CO Emissions (g/hr)		156	6		91	20		249		145	300	
NOx Emissions (g/hr)		30	1		18	4		48		28	58	
VOC Emissions (g/hr)		36	1		21	5		58		33	69	
Dilemma Vehicles (#)		0	0		0	0		0		0	0	
Queue Length 50th (m)		17.6	0.0		4.4	0.0		28.4		16.4	34.9	
Queue Length 95th (m)		41.9	2.2		30.4	m3.5		42.2		28.7	50.4	
Internal Link Dist (m)		64.8			84.9			118.8			90.2	
Turn Bay Length (m)			40.0			45.0				40.0		
Base Capacity (vph)		802	729		804	702		647		356	716	
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		0.35	0.04		0.23	0.10		0.40		0.40	0.45	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 19 (27%), Referenced to phase 2:EBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 19.8

Intersection LOS: B

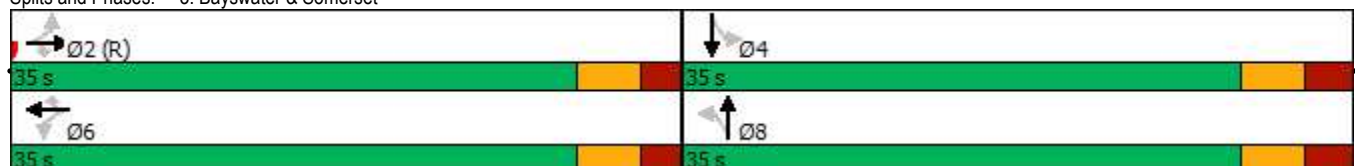
Intersection Capacity Utilization 98.7%

ICU Level of Service F

Analysis Period (min) 15






















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

Splits and Phases: 3: Bayswater & Somerset



13: Preston & Somerset  
AM Peak

1040 Somerset Street  
2030 Total Traffic Volumes - Sensitivity Analysis

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	325	107	34	178	13	71	354	47	18	278	34
Future Volume (vph)	62	325	107	34	178	13	71	354	47	18	278	34
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.88	0.95		0.95	0.99		0.96	0.99		0.95	0.99	
Fr <sub>t</sub>		0.963			0.990			0.982			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1412	0	1679	1487	0	1647	1478	0	1503	1452	0
Flt Permitted	0.628			0.259			0.471			0.354		
Satd. Flow (perm)	990	1412	0	436	1487	0	782	1478	0	534	1452	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		435.9			97.2			225.8			107.4	
Travel Time (s)		31.4			7.0			16.3			7.7	
Confl. Peds. (#/hr)	83		63	63		83	42		58	58		42
Confl. Bikes (#/hr)			66			21			10			4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	5%	9%	3%	8%	2%	5%	8%	2%	15%	9%	17%
Parking (#/hr)		0			0			0			0	
Adj. Flow (vph)	62	325	107	34	178	13	71	354	47	18	278	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	432	0	34	191	0	71	401	0	18	312	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.6	24.6		24.6	24.6		26.7	26.7		26.7	26.7	
Total Split (s)	26.0	26.0		26.0	26.0		34.0	34.0		34.0	34.0	
Total Split (%)	37.1%	37.1%		37.1%	37.1%		48.6%	48.6%		48.6%	48.6%	
Maximum Green (s)	20.4	20.4		20.4	20.4		28.3	28.3		28.3	28.3	

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Storage Length (m)				
Storage Lanes				
Taper Length (m)				
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 (%)				
Parking (#/hr)				
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	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	3.0	3.0	3.0	3.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Maximum Green (s)	3.0	3.0	3.0	3.0

13: Preston & Somerset  
AM Peak

1040 Somerset Street  
2030 Total Traffic Volumes - Sensitivity Analysis



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	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		2.4	2.4		2.4	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)	5.6	5.6		5.6	5.6		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	45	45		65	65		40	40		30	30	
Act Effct Green (s)	20.4	20.4		20.4	20.4		23.4	23.4		23.4	23.4	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.33	0.33		0.33	0.33	
v/c Ratio	0.22	1.05		0.27	0.44		0.27	0.81		0.10	0.64	
Control Delay	21.8	85.3		25.8	24.1		18.2	34.3		15.2	25.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	21.8	85.3		25.8	24.1		18.2	34.3		15.2	25.5	
LOS	C	F		C	C		B	C		B	C	
Approach Delay		77.3			24.3			31.9				24.9
Approach LOS		E			C			C				C
90th %ile Green (s)	20.4	20.4		20.4	20.4		28.3	28.3		28.3	28.3	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
70th %ile Green (s)	20.4	20.4		20.4	20.4		27.9	27.9		27.9	27.9	
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	20.4	20.4		20.4	20.4		24.3	24.3		24.3	24.3	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	20.4	20.4		20.4	20.4		20.9	20.9		20.9	20.9	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	20.4	20.4		20.4	20.4		15.7	15.7		15.7	15.7	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Stops (vph)	49	347		31	151		48	348		13	249	
Fuel Used(l)	5	54		2	9		4	27		1	15	
CO Emissions (g/hr)	88	1005		31	162		67	502		13	277	
NOx Emissions (g/hr)	17	194		6	31		13	97		2	53	
VOC Emissions (g/hr)	20	232		7	37		15	116		3	64	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	5.8	~63.1		3.4	20.2		6.6	46.2		1.6	33.4	
Queue Length 95th (m)	16.8	#114.0		10.9	37.4		14.4	70.6		5.2	52.1	
Internal Link Dist (m)		411.9			73.2			201.8				83.4
Turn Bay Length (m)	15.0			15.0			20.0			15.0		
Base Capacity (vph)	288	411		127	433		316	597		215	587	
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	0.22	1.05		0.27	0.44		0.22	0.67		0.08	0.53	

**Intersection Summary**

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 37 (53%), Referenced to phase 2:EBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 44.0

Intersection LOS: D

Intersection Capacity Utilization 84.8%

ICU Level of Service E

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: 13: Preston & Somerset





Lane Group	Ø1	Ø3	Ø5	Ø7
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
90th %ile Green (s)	3.0	3.0	3.0	3.0
90th %ile Term Code	MaxR	MaxR	MaxR	MaxR
70th %ile Green (s)	3.4	3.0	3.4	3.0
70th %ile Term Code	MaxR	MaxR	MaxR	MaxR
50th %ile Green (s)	7.0	3.0	7.0	3.0
50th %ile Term Code	MaxR	MaxR	MaxR	MaxR
30th %ile Green (s)	10.4	3.0	10.4	3.0
30th %ile Term Code	MaxR	MaxR	MaxR	MaxR
10th %ile Green (s)	15.6	3.0	15.6	3.0
10th %ile Term Code	MaxR	MaxR	MaxR	MaxR
Stops (vph)				
Fuel Used(l)				
CO Emissions (g/hr)				
NOx Emissions (g/hr)				
VOC Emissions (g/hr)				
Dilemma Vehicles (#)				
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				



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	317	68	44	302	51	73
Future Volume (Veh/h)	317	68	44	302	51	73
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	317	68	44	302	51	73
Pedestrians					70	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.2	
Percent Blockage					6	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	109					
pX, platoon unblocked			0.93		0.93	0.93
vC, conflicting volume			455		811	421
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			381		762	345
tC, single (s)			4.1		6.6	6.5
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.5
p0 queue free %			96		82	87
cM capacity (veh/h)			1034		287	566
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	385	346	124			
Volume Left	0	44	51			
Volume Right	68	0	73			
cSH	1700	1034	405			
Volume to Capacity	0.23	0.04	0.31			
Queue Length 95th (m)	0.0	1.0	9.7			
Control Delay (s)	0.0	1.5	17.8			
Lane LOS		A	C			
Approach Delay (s)	0.0	1.5	17.8			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			3.2			
Intersection Capacity Utilization			59.9%	ICU Level of Service		B
Analysis Period (min)			15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	26	10	6	8	19	11	56	10	34	43	19
Future Volume (vph)	15	26	10	6	8	19	11	56	10	34	43	19
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	26	10	6	8	19	11	56	10	34	43	19
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	51	33	77	96								
Volume Left (vph)	15	6	11	34								
Volume Right (vph)	10	19	10	19								
Hadj (s)	-0.02	-0.28	-0.02	-0.01								
Departure Headway (s)	4.3	4.1	4.2	4.1								
Degree Utilization, x	0.06	0.04	0.09	0.11								
Capacity (veh/h)	802	844	835	845								
Control Delay (s)	7.6	7.2	7.6	7.7								
Approach Delay (s)	7.6	7.2	7.6	7.7								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			29.0%		ICU Level of Service				A			
Analysis Period (min)			15									

9: Breezehill & Gladstone  
AM Peak

1040 Somerset Street  
2030 Total Traffic Volumes - Sensitivity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	240	0	1	207	42	2	1	2	21	0	21
Future Volume (Veh/h)	24	240	0	1	207	42	2	1	2	21	0	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	24	240	0	1	207	42	2	1	2	21	0	21
Pedestrians		8			2			25			21	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC1, conflicting volume	270			265			572	585	267	544	564	257
vC2, stage 1 conf vol												
vCu, unblocked vol	270			265			572	585	267	544	564	257
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			99	100	100	95	100	97
cM capacity (veh/h)	1270			1271			389	398	754	420	410	762
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	264	250	5	42								
Volume Left	24	1	2	21								
Volume Right	0	42	2	21								
cSH	1270	1271	485	542								
Volume to Capacity	0.02	0.00	0.01	0.08								
Queue Length 95th (m)	0.4	0.0	0.2	1.9								
Control Delay (s)	0.9	0.0	12.5	12.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.9	0.0	12.5	12.2								
Approach LOS			B	B								
<b>Intersection Summary</b>												
Average Delay			1.5									
Intersection Capacity Utilization			45.2%		ICU Level of Service				A			
Analysis Period (min)			15									

17: Breezehill & Access  
AM Peak






















1040 Somerset Street  
2030 Total Traffic Volumes - Sensitivity Analysis



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	49	74	3	15	99
Future Volume (Veh/h)	9	49	74	3	15	99
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	49	74	3	15	99
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	204	76			77	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	204	76			77	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	95			99	
cM capacity (veh/h)	776	986			1522	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	58	77	114			
Volume Left	9	0	15			
Volume Right	49	3	0			
cSH	946	1700	1522			
Volume to Capacity	0.06	0.05	0.01			
Queue Length 95th (m)	1.5	0.0	0.2			
Control Delay (s)	9.1	0.0	1.0			
Lane LOS	A		A			
Approach Delay (s)	9.1	0.0	1.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			2.6			
Intersection Capacity Utilization			23.4%		ICU Level of Service	A
Analysis Period (min)			15			

13: Preston & Somerset  
AM Peak

1040 Somerset Street  
2030 Total Traffic Volumes - Sensitivity Analysis, Optimized Timing

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	325	107	34	178	13	71	354	47	18	278	34
Future Volume (vph)	62	325	107	34	178	13	71	354	47	18	278	34
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.88	0.95		0.95	0.99		0.96	0.99		0.96	0.99	
Fr <sub>t</sub>		0.963			0.990			0.982			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1418	0	1679	1488	0	1647	1477	0	1503	1452	0
Flt Permitted	0.637			0.353			0.450			0.322		
Satd. Flow (perm)	1003	1418	0	593	1488	0	748	1477	0	487	1452	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		435.9			97.2			225.8			107.4	
Travel Time (s)		31.4			7.0			16.3			7.7	
Confl. Peds. (#/hr)	83		63	63		83	42		58	58		42
Confl. Bikes (#/hr)			66			21			10			4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	5%	9%	3%	8%	2%	5%	8%	2%	15%	9%	17%
Parking (#/hr)		0			0			0			0	
Adj. Flow (vph)	62	325	107	34	178	13	71	354	47	18	278	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	432	0	34	191	0	71	401	0	18	312	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.6	24.6		24.6	24.6		26.7	26.7		26.7	26.7	
Total Split (s)	32.0	32.0		32.0	32.0		28.0	28.0		28.0	28.0	
Total Split (%)	45.7%	45.7%		45.7%	45.7%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	26.4	26.4		26.4	26.4		22.3	22.3		22.3	22.3	

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Storage Length (m)				
Storage Lanes				
Taper Length (m)				
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 (%)				
Parking (#/hr)				
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	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	3.0	3.0	3.0	3.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Maximum Green (s)	3.0	3.0	3.0	3.0

13: Preston & Somerset  
AM Peak

1040 Somerset Street  
2030 Total Traffic Volumes - Sensitivity Analysis, Optimized Timing



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	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		2.4	2.4		2.4	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)	5.6	5.6		5.6	5.6		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	45	45		65	65		40	40		30	30	
Act Effct Green (s)	26.4	26.4		26.4	26.4		21.3	21.3		21.3	21.3	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.30	0.30		0.30	0.30	
v/c Ratio	0.16	0.81		0.15	0.34		0.31	0.89		0.12	0.71	
Control Delay	14.8	31.7		16.7	17.8		22.6	47.9		19.5	31.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	14.8	31.7		16.7	17.8		22.6	47.9		19.5	31.4	
LOS	B	C		B	B		C	D		B	C	
Approach Delay		29.6			17.6			44.1				30.8
Approach LOS		C			B			D				C
90th %ile Green (s)	26.4	26.4		26.4	26.4		22.3	22.3		22.3	22.3	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
70th %ile Green (s)	26.4	26.4		26.4	26.4		22.3	22.3		22.3	22.3	
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
50th %ile Green (s)	26.4	26.4		26.4	26.4		22.3	22.3		22.3	22.3	
50th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
30th %ile Green (s)	26.4	26.4		26.4	26.4		22.2	22.2		22.2	22.2	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	26.4	26.4		26.4	26.4		17.4	17.4		17.4	17.4	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Stops (vph)	41	338		24	132		54	343		15	268	
Fuel Used(l)	4	36		1	7		4	31		1	17	
CO Emissions (g/hr)	78	670		24	136		74	578		15	311	
NOx Emissions (g/hr)	15	129		5	26		14	112		3	60	
VOC Emissions (g/hr)	18	154		6	31		17	133		3	72	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	5.3	42.6		2.9	17.4		6.9	48.5		1.6	35.0	
Queue Length 95th (m)	13.4	#93.1		8.8	32.2		17.0	#94.2		6.1	#61.9	
Internal Link Dist (m)		411.9			73.2			201.8				83.4
Turn Bay Length (m)	15.0			15.0			20.0			15.0		
Base Capacity (vph)	378	534		223	561		238	470		155	462	
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	0.16	0.81		0.15	0.34		0.30	0.85		0.12	0.68	

Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 37 (53%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 32.6  
 Intersection LOS: C  
 Intersection Capacity Utilization 84.8%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.



Splits and Phases: 13: Preston & Somerset



Lane Group	Ø1	Ø3	Ø5	Ø7
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
90th %ile Green (s)	3.0	3.0	3.0	3.0
90th %ile Term Code	MaxR	MaxR	MaxR	MaxR
70th %ile Green (s)	3.0	3.0	3.0	3.0
70th %ile Term Code	MaxR	MaxR	MaxR	MaxR
50th %ile Green (s)	3.0	3.0	3.0	3.0
50th %ile Term Code	MaxR	MaxR	MaxR	MaxR
30th %ile Green (s)	3.1	3.0	3.1	3.0
30th %ile Term Code	MaxR	MaxR	MaxR	MaxR
10th %ile Green (s)	7.9	3.0	7.9	3.0
10th %ile Term Code	MaxR	MaxR	MaxR	MaxR
Stops (vph)				
Fuel Used(l)				
CO Emissions (g/hr)				
NOx Emissions (g/hr)				
VOC Emissions (g/hr)				
Dilemma Vehicles (#)				
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	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	317	68	44	302	51	73
Future Volume (vph)	317	68	44	302	51	73
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	15.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			45.0		30.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98			0.99	0.89	
Frt	0.976				0.921	
Flt Protected				0.994	0.980	
Satd. Flow (prot)	1490	0	0	1543	1088	0
Flt Permitted				0.923	0.980	
Satd. Flow (perm)	1490	0	0	1424	1044	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	23				73	
Link Speed (k/h)	50			50	40	
Link Distance (m)	108.9			435.9	109.2	
Travel Time (s)	7.8			31.4	9.8	
Confl. Peds. (#/hr)		50	50		50	50
Confl. Bikes (#/hr)		33				6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	8%	2%	6%	25%	27%
Parking (#/hr)	0			0	0	
Adj. Flow (vph)	317	68	44	302	51	73
Shared Lane Traffic (%)						
Lane Group Flow (vph)	385	0	0	346	124	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.21	1.06	1.06	1.21	1.21	1.06
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2		1	2	1	
Detector Template	Thru		Left	Thru	Left	
Leading Detector (m)	30.5		6.1	30.5	6.1	
Trailing Detector (m)	0.0		0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	
Detector 1 Size(m)	1.8		6.1	1.8	6.1	
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	CI+Ex			CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA		Perm	NA	Perm	
Protected Phases	2			6		
Permitted Phases			6		8	
Detector Phase	2		6	6	8	
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	
Minimum Split (s)	23.3		25.3	25.3	25.3	
Total Split (s)	42.0		42.0	42.0	28.0	
Total Split (%)	60.0%		60.0%	60.0%	40.0%	
Maximum Green (s)	36.7		36.7	36.7	22.7	

1: Breezehill & Somerset  
AM Peak

1040 Somerset Street  
2030 Total Traffic Volumes - Sensitivity analysis

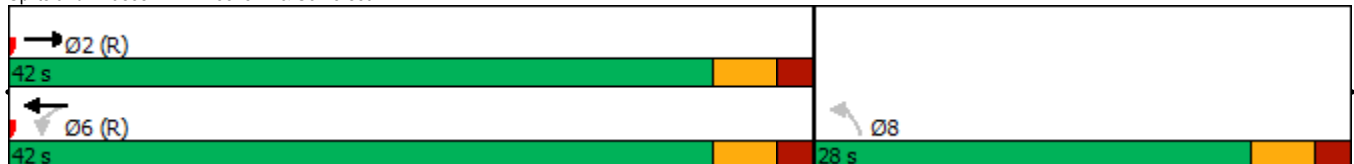


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Yellow Time (s)	3.3		3.3	3.3	3.3	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	5.3			5.3	5.3	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	C-Max		C-Max	C-Max	None	
Walk Time (s)	7.0		7.0	7.0	7.0	
Flash Dont Walk (s)	11.0		13.0	13.0	11.0	
Pedestrian Calls (#/hr)	30		30	30	30	
Act Effct Green (s)	50.3			50.3	13.2	
Actuated g/C Ratio	0.72			0.72	0.19	
v/c Ratio	0.36			0.34	0.49	
Control Delay	8.8			13.9	17.9	
Queue Delay	0.3			0.0	0.0	
Total Delay	9.1			13.9	17.9	
LOS	A			B	B	
Approach Delay	9.1			13.9	17.9	
Approach LOS	A			B	B	
90th %ile Green (s)	41.4		41.4	41.4	18.0	
90th %ile Term Code	Coord		Coord	Coord	Ped	
70th %ile Green (s)	41.4		41.4	41.4	18.0	
70th %ile Term Code	Coord		Coord	Coord	Ped	
50th %ile Green (s)	49.4		49.4	49.4	10.0	
50th %ile Term Code	Coord		Coord	Coord	Min	
30th %ile Green (s)	49.4		49.4	49.4	10.0	
30th %ile Term Code	Coord		Coord	Coord	Min	
10th %ile Green (s)	64.7		64.7	64.7	0.0	
10th %ile Term Code	Coord		Coord	Coord	Skip	
Stops (vph)	210			233	53	
Fuel Used(l)	11			23	4	
CO Emissions (g/hr)	210			433	73	
NOx Emissions (g/hr)	41			84	14	
VOC Emissions (g/hr)	48			100	17	
Dilemma Vehicles (#)	0			0	0	
Queue Length 50th (m)	20.5			29.7	6.1	
Queue Length 95th (m)	25.2			62.3	18.4	
Internal Link Dist (m)	84.9			411.9	85.2	
Turn Bay Length (m)						
Base Capacity (vph)	1077			1023	387	
Starvation Cap Reductn	260			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.47			0.34	0.32	

Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 30 (43%), Referenced to phase 2:EBT and 6:WBTL, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.49  
 Intersection Signal Delay: 12.3  
 Intersection LOS: B  
 Intersection Capacity Utilization 69.3%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 1: Breezehill & Somerset



3: Bayswater & Somerset  
PM Peak

1040 Somerset Street  
2030 Total Traffic Volumes - Sensitivity Analysis



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	244	31	51	352	147	52	316	33	118	277	85
Future Volume (vph)	41	244	31	51	352	147	52	316	33	118	277	85
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		40.0	0.0		45.0	0.0		0.0	40.0		0.0
Storage Lanes	0		1	0		1	0		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99	0.73		0.98	0.82		0.98		0.95	0.97	
Frt			0.850			0.850		0.989			0.965	
Flt Protected		0.993			0.994			0.994		0.950		
Satd. Flow (prot)	0	1568	1517	0	1596	1517	0	1737	0	1679	1664	0
Flt Permitted		0.908			0.929			0.769		0.396		
Satd. Flow (perm)	0	1423	1110	0	1464	1243	0	1335	0	668	1664	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			42			147		7			24	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		88.8			108.9			142.8			114.2	
Travel Time (s)		6.4			7.8			10.3			8.2	
Confl. Peds. (#/hr)	74		150	150		74	58		60	60		58
Confl. Bikes (#/hr)			44			72			6			24
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%	4%	2%	2%	2%	2%	2%	2%	2%	3%	2%	3%
Parking (#/hr)		0			0							
Adj. Flow (vph)	41	244	31	51	352	147	52	316	33	118	277	85
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	285	31	0	403	147	0	401	0	118	362	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	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	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	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	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	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	30.5	30.5	30.5	30.5	30.5	30.5	28.9	28.9		28.9	28.9	
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	35.0	35.0		35.0	35.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%	53.3%	46.7%	46.7%		46.7%	46.7%	
Maximum Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	29.1	29.1		29.1	29.1	

3: Bayswater & Somerset  
PM Peak

1040 Somerset Street  
2030 Total Traffic Volumes - Sensitivity Analysis

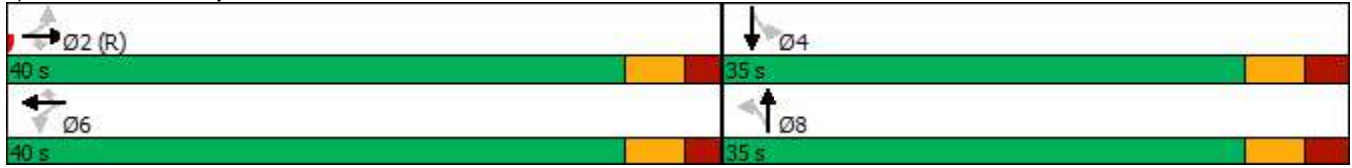


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)		5.5	5.5		5.5	5.5		5.9		5.9	5.9	
Lead/Lag												
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	Max	Max	Max	None	None		None	None	
Walk Time (s)	17.0	17.0	17.0	17.0	17.0	17.0	13.0	13.0		13.0	13.0	
Flash Dont Walk (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	105	105	105	55	55	55	45	45		35	35	
Act Effct Green (s)		40.2	40.2		40.2	40.2		23.4		23.4	23.4	
Actuated g/C Ratio		0.54	0.54		0.54	0.54		0.31		0.31	0.31	
v/c Ratio		0.37	0.05		0.51	0.20		0.95		0.57	0.68	
Control Delay		13.3	3.2		15.6	3.0		58.3		31.5	26.9	
Queue Delay		0.0	0.0		0.0	0.0		0.0		0.0	0.0	
Total Delay		13.3	3.2		15.6	3.0		58.3		31.5	26.9	
LOS		B	A		B	A		E		C	C	
Approach Delay		12.3			12.2			58.3				28.0
Approach LOS		B			B			E				C
90th %ile Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	29.1	29.1		29.1	29.1	
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Max	Max		Max	Max	
70th %ile Green (s)	36.3	36.3	36.3	36.3	36.3	36.3	27.3	27.3		27.3	27.3	
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
50th %ile Green (s)	39.4	39.4	39.4	39.4	39.4	39.4	24.2	24.2		24.2	24.2	
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
30th %ile Green (s)	42.8	42.8	42.8	42.8	42.8	42.8	20.8	20.8		20.8	20.8	
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
10th %ile Green (s)	47.9	47.9	47.9	47.9	47.9	47.9	15.7	15.7		15.7	15.7	
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap		Hold	Hold	
Stops (vph)		169	5		263	17		360		95	279	
Fuel Used(l)		9	0		15	2		32		6	18	
CO Emissions (g/hr)		170	8		277	42		586		117	329	
NOx Emissions (g/hr)		33	2		53	8		113		23	63	
VOC Emissions (g/hr)		39	2		64	10		135		27	76	
Dilemma Vehicles (#)		0	0		0	0		0		0	0	
Queue Length 50th (m)		22.3	0.0		34.8	0.0		53.2		13.5	40.5	
Queue Length 95th (m)		44.7	3.3		67.8	8.8		#91.2		27.3	60.5	
Internal Link Dist (m)		64.8			84.9			118.8			90.2	
Turn Bay Length (m)			40.0			45.0				40.0		
Base Capacity (vph)		762	614		784	734		522		259	660	
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		0.37	0.05		0.51	0.20		0.77		0.46	0.55	

Intersection Summary

Area Type:	Other
Cycle Length:	75
Actuated Cycle Length:	75
Offset:	63 (84%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.95
Intersection Signal Delay:	27.2
Intersection LOS:	C
Intersection Capacity Utilization:	107.3%
ICU Level of Service:	G
Analysis Period (min):	15
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

Splits and Phases: 3: Bayswater & Somerset



13: Preston & Somerset  
PM Peak

1040 Somerset Street  
2030 Total Traffic Volumes - Sensitivity Analysis



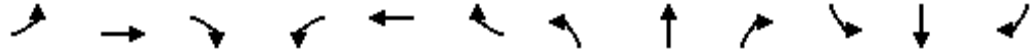
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	347	76	53	425	23	94	312	54	40	285	62
Future Volume (vph)	69	347	76	53	425	23	94	312	54	40	285	62
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	15.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			30.0			30.0			30.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.92	0.95		0.91	0.99		0.91	0.98		0.93	0.96	
Fr <sub>t</sub>		0.973			0.992			0.978			0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1457	0	1695	1567	0	1695	1461	0	1695	1472	0
Flt Permitted	0.292			0.323			0.405			0.379		
Satd. Flow (perm)	482	1457	0	524	1567	0	658	1461	0	629	1472	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		435.9			97.2			225.8			107.4	
Travel Time (s)		31.4			7.0			16.3			7.7	
Confl. Peds. (#/hr)	103		115	115		103	99		80	80		99
Confl. Bikes (#/hr)			28			53			8			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 (%)	2%	3%	11%	2%	2%	9%	2%	8%	2%	2%	5%	2%
Parking (#/hr)		0			0			0			0	
Adj. Flow (vph)	69	347	76	53	425	23	94	312	54	40	285	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	69	423	0	53	448	0	94	366	0	40	347	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06	1.06	1.21	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	24.6	24.6		24.6	24.6		26.7	26.7		26.7	26.7	
Total Split (s)	29.0	29.0		29.0	29.0		31.0	31.0		31.0	31.0	
Total Split (%)	41.4%	41.4%		41.4%	41.4%		44.3%	44.3%		44.3%	44.3%	
Maximum Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	



Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Storage Length (m)				
Storage Lanes				
Taper Length (m)				
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 (%)				
Parking (#/hr)				
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	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	3.0	3.0	3.0	3.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Maximum Green (s)	3.0	3.0	3.0	3.0

13: Preston & Somerset  
PM Peak

1040 Somerset Street  
2030 Total Traffic Volumes - Sensitivity Analysis

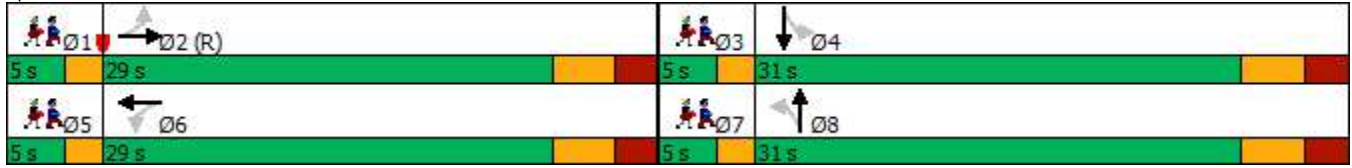


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.4	2.4		2.4	2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.6		5.6	5.6		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	95	95		80	80		60	60		80	80	
Act Effct Green (s)	23.4	23.4		23.4	23.4		21.8	21.8		21.8	21.8	
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.31	0.31		0.31	0.31	
v/c Ratio	0.43	0.87		0.30	0.86		0.46	0.81		0.21	0.76	
Control Delay	28.2	43.0		23.1	40.4		26.2	36.3		19.0	32.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	28.2	43.0		23.1	40.4		26.2	36.3		19.0	32.6	
LOS	C	D		C	D		C	D		B	C	
Approach Delay		40.9			38.5			34.2				31.2
Approach LOS		D			D			C				C
90th %ile Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
70th %ile Green (s)	23.4	23.4		23.4	23.4		25.3	25.3		25.3	25.3	
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
50th %ile Green (s)	23.4	23.4		23.4	23.4		22.7	22.7		22.7	22.7	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	23.4	23.4		23.4	23.4		21.0	21.0		21.0	21.0	
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Ped	Ped	
10th %ile Green (s)	23.4	23.4		23.4	23.4		14.6	14.6		14.6	14.6	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Stops (vph)	57	354		41	377		73	320		30	299	
Fuel Used(l)	6	39		2	27		6	25		2	19	
CO Emissions (g/hr)	105	733		44	493		103	469		31	352	
NOx Emissions (g/hr)	20	142		8	95		20	91		6	68	
VOC Emissions (g/hr)	24	169		10	114		24	108		7	81	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (m)	6.9	51.1		5.1	53.8		9.6	42.6		3.7	39.6	
Queue Length 95th (m)	18.7	#99.1		14.1	#102.1		21.3	#69.7		10.2	63.7	
Internal Link Dist (m)		411.9			73.2			201.8				83.4
Turn Bay Length (m)	15.0			15.0			20.0			15.0		
Base Capacity (vph)	161	487		175	523		237	528		227	532	
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	0.43	0.87		0.30	0.86		0.40	0.69		0.18	0.65	

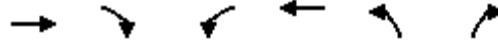
Intersection Summary

Area Type:	Other
Cycle Length:	70
Actuated Cycle Length:	70
Offset:	32 (46%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	65
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.87
Intersection Signal Delay:	36.5
Intersection LOS:	D
Intersection Capacity Utilization:	82.5%
ICU Level of Service:	E
Analysis Period (min):	15
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

Splits and Phases: 13: Preston & Somerset



Lane Group	Ø1	Ø3	Ø5	Ø7
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
90th %ile Green (s)	3.0	3.0	3.0	3.0
90th %ile Term Code	MaxR	MaxR	MaxR	MaxR
70th %ile Green (s)	3.0	3.0	3.0	3.0
70th %ile Term Code	MaxR	MaxR	MaxR	MaxR
50th %ile Green (s)	5.6	3.0	5.6	3.0
50th %ile Term Code	MaxR	MaxR	MaxR	MaxR
30th %ile Green (s)	7.3	3.0	7.3	3.0
30th %ile Term Code	MaxR	MaxR	MaxR	MaxR
10th %ile Green (s)	13.7	3.0	13.7	3.0
10th %ile Term Code	MaxR	MaxR	MaxR	MaxR
Stops (vph)				
Fuel Used(l)				
CO Emissions (g/hr)				
NOx Emissions (g/hr)				
VOC Emissions (g/hr)				
Dilemma Vehicles (#)				
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				



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	392	45	53	494	40	51
Future Volume (Veh/h)	392	45	53	494	40	51
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	392	45	53	494	40	51
Pedestrians	18				120	
Lane Width (m)	3.7				3.7	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	2				10	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	109					
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			557		1152	534
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			459		1116	434
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		77	90
cM capacity (veh/h)			896		173	505
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	437	547	91			
Volume Left	0	53	40			
Volume Right	45	0	51			
cSH	1700	896	274			
Volume to Capacity	0.26	0.06	0.33			
Queue Length 95th (m)	0.0	1.4	10.7			
Control Delay (s)	0.0	1.6	24.6			
Lane LOS		A	C			
Approach Delay (s)	0.0	1.6	24.6			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			2.9			
Intersection Capacity Utilization			71.5%	ICU Level of Service		C
Analysis Period (min)			15			

2: Breezehill & Laurel  
PM Peak

















1040 Somerset Street  
2030 Total Traffic Volumes - Sensitivity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	8	10	4	22	20	24	35	1	15	58	37
Future Volume (vph)	15	8	10	4	22	20	24	35	1	15	58	37
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	8	10	4	22	20	24	35	1	15	58	37
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	33	46	60	110								
Volume Left (vph)	15	4	24	15								
Volume Right (vph)	10	20	1	37								
Hadj (s)	-0.06	-0.21	0.10	-0.14								
Departure Headway (s)	4.3	4.1	4.3	4.0								
Degree Utilization, x	0.04	0.05	0.07	0.12								
Capacity (veh/h)	806	840	812	879								
Control Delay (s)	7.4	7.3	7.6	7.5								
Approach Delay (s)	7.4	7.3	7.6	7.5								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				7.5								
Level of Service				A								
Intersection Capacity Utilization			29.1%		ICU Level of Service				A			
Analysis Period (min)			15									

9: Breezehill & Gladstone  
PM Peak

1040 Somerset Street  
2030 Total Traffic Volumes - Sensitivity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	233	4	6	582	34	3	0	1	35	0	29
Future Volume (Veh/h)	23	233	4	6	582	34	3	0	1	35	0	29
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	23	233	4	6	582	34	3	0	1	35	0	29
Pedestrians		7			10			25			22	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	638			262			953	956	270	925	941	628
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	638			262			953	956	270	925	941	628
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	98			100			99	100	100	84	100	94
cM capacity (veh/h)	928			1274			207	240	746	221	245	471
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	260	622	4	64								
Volume Left	23	6	3	35								
Volume Right	4	34	1	29								
cSH	928	1274	252	291								
Volume to Capacity	0.02	0.00	0.02	0.22								
Queue Length 95th (m)	0.6	0.1	0.4	6.2								
Control Delay (s)	1.0	0.1	19.5	20.8								
Lane LOS	A	A	C	C								
Approach Delay (s)	1.0	0.1	19.5	20.8								
Approach LOS			C	C								
<b>Intersection Summary</b>												
Average Delay			1.9									
Intersection Capacity Utilization			48.9%		ICU Level of Service				A			
Analysis Period (min)			15									

17: Breezehill & Access  
PM Peak

1040 Somerset Street  
2030 Total Traffic Volumes - Sensitivity Analysis



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	26	65	8	42	59
Future Volume (Veh/h)	5	26	65	8	42	59
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	26	65	8	42	59
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	212	69			73	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	212	69			73	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	97			97	
cM capacity (veh/h)	755	994			1527	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	31	73	101			
Volume Left	5	0	42			
Volume Right	26	8	0			
cSH	946	1700	1527			
Volume to Capacity	0.03	0.04	0.03			
Queue Length 95th (m)	0.8	0.0	0.6			
Control Delay (s)	8.9	0.0	3.2			
Lane LOS	A		A			
Approach Delay (s)	8.9	0.0	3.2			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			2.9			
Intersection Capacity Utilization			22.4%		ICU Level of Service	A
Analysis Period (min)			15			





Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	392	45	53	494	40	51
Future Volume (vph)	392	45	53	494	40	51
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	15.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			45.0		30.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98			0.99	0.89	
Frt	0.986				0.924	
Flt Protected				0.995	0.978	
Satd. Flow (prot)	1531	0	0	1598	1356	0
Flt Permitted				0.930	0.978	
Satd. Flow (perm)	1531	0	0	1480	1298	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	13				51	
Link Speed (k/h)	50			50	40	
Link Distance (m)	108.9			435.9	109.2	
Travel Time (s)	7.8			31.4	9.8	
Confl. Peds. (#/hr)		100	100		50	50
Confl. Bikes (#/hr)		50				2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	2%	2%	2%	2%	2%
Parking (#/hr)	0			0	0	
Adj. Flow (vph)	392	45	53	494	40	51
Shared Lane Traffic (%)						
Lane Group Flow (vph)	437	0	0	547	91	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.21	1.06	1.06	1.21	1.21	1.06
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2		1	2	1	
Detector Template	Thru		Left	Thru	Left	
Leading Detector (m)	30.5		6.1	30.5	6.1	
Trailing Detector (m)	0.0		0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	
Detector 1 Size(m)	1.8		6.1	1.8	6.1	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA		Perm	NA	Perm	
Protected Phases	2			6		
Permitted Phases			6		8	
Detector Phase	2		6	6	8	
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	
Minimum Split (s)	23.5		25.3	25.3	25.3	
Total Split (s)	44.7		44.7	44.7	25.3	
Total Split (%)	63.9%		63.9%	63.9%	36.1%	
Maximum Green (s)	39.2		39.4	39.4	20.0	

1: Breezehill & Somerset  
PM Peak

1040 Somerset Street  
2030 Total Traffic Volumes - Sensitivity Analysis



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Yellow Time (s)	3.5		3.3	3.3	3.3	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	5.5			5.3	5.3	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	C-Max		C-Max	C-Max	None	
Walk Time (s)	7.0		7.0	7.0	7.0	
Flash Dont Walk (s)	11.0		13.0	13.0	11.0	
Pedestrian Calls (#/hr)	80		30	30	30	
Act Effct Green (s)	50.2			50.3	13.2	
Actuated g/C Ratio	0.72			0.72	0.19	
v/c Ratio	0.40			0.51	0.32	
Control Delay	7.4			5.9	15.0	
Queue Delay	0.5			0.0	0.0	
Total Delay	7.9			5.9	15.0	
LOS	A			A	B	
Approach Delay	7.9			5.9	15.0	
Approach LOS	A			A	B	
90th %ile Green (s)	41.2		41.4	41.4	18.0	
90th %ile Term Code	Coord		Coord	Coord	Ped	
70th %ile Green (s)	41.2		41.4	41.4	18.0	
70th %ile Term Code	Coord		Coord	Coord	Ped	
50th %ile Green (s)	49.2		49.4	49.4	10.0	
50th %ile Term Code	Coord		Coord	Coord	Min	
30th %ile Green (s)	49.2		49.4	49.4	10.0	
30th %ile Term Code	Coord		Coord	Coord	Min	
10th %ile Green (s)	64.5		64.7	64.7	0.0	
10th %ile Term Code	Coord		Coord	Coord	Skip	
Stops (vph)	186			267	39	
Fuel Used(l)	11			31	3	
CO Emissions (g/hr)	208			579	49	
NOx Emissions (g/hr)	40			112	10	
VOC Emissions (g/hr)	48			134	11	
Dilemma Vehicles (#)	0			0	0	
Queue Length 50th (m)	18.4			8.8	4.7	
Queue Length 95th (m)	48.3			m17.8	14.4	
Internal Link Dist (m)	84.9			411.9	85.2	
Turn Bay Length (m)						
Base Capacity (vph)	1100			1064	407	
Starvation Cap Reductn	308			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.55			0.51	0.22	

Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 26 (37%), Referenced to phase 2:EBT and 6:WBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.51  
 Intersection Signal Delay: 7.5  
 Intersection Capacity Utilization 83.0%  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: A  
 ICU Level of Service E

Splits and Phases: 1: Breezehill & Somerset

