110 York Street, Ottawa

Transportation Impact Assessment

Proposed Hotel Expansion
110 York Street

Transportation Impact Assessment – Addendum 1

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July 2018

Novatech File: 112142
Ref: R-2018-032

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July 10, 2018

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

Dear Mr. Dubyk:

Reference: **110 York Street**
Transportation Impact Assessment
Novatech File No. 112142

We are pleased to submit the following Transportation Impact Assessment in support of a Zoning Application for 110 York Street, for your review and signoff. The structure and format of this report is in accordance with the City of Ottawa Transportation Impact Assessment Guidelines (June 2017).

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

Yours truly,

NOVATECH

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EXECUTIVE SUMMARY

This Transportation Impact Assessment (TIA) has been prepared in support of a Zoning Application of the property located at 110 York Street. A previous Community Transportation Study/ Transportation Impact Study (combined CTS/TIS) was completed in 2013 in support of a Zoning By-Law Amendment and Site Plan application for 137-141 George Street, 321-325 Dalhousie Street and 110 York Street. The proposed development at that time included a 14-storey hotel with 187 rooms, a 22-storey residential condominium with 282 units, and approximately 11,800 ft^2 of commercial floorspace on the ground floor of the residential condominium block. This report addresses the proposed hotel expansion on 110 York Street, which will add another 128 hotel rooms.

The proposed development outlined in the previous combined CTS/TIS included a 14-storey hotel with 187 rooms, a 22-storey residential condominium with 282 units, and approximately 11,800 ft^2 of commercial floorspace on the ground floor of the residential condominium block.

This report addresses the proposed hotel expansion on 110 York Street, which will add another 128 hotel rooms. It is also noteworthy that the original hotel proposed in the previous CTS/TIS has been constructed.

Two accesses to the subject site will be provided, with one two-way access to a parking garage on George Street, and one access for loading and deliveries on Dalhousie Street. The parking garage will be expanded to include one level of parking under the hotel expansion, with a total of 60 parking spaces on the first level, and 76 parking spaces on levels 2, 3, and 4. The current site allows for hotel traffic to use the access on Dalhousie Street as well as an egress lane on York Street.

The study area for this report includes all accesses to the proposed development and the signalized intersections at York Street/Dalhousie Street, York Street/Cumberland Street, George Street/Dalhousie Street, George Street/Cumberland Street, Rideau Street/Dalhousie Street, Rideau Street/Waller Street, Rideau Street/Cumberland Street, Besserer Street/Dalhousie Street, and Besserer Street/Waller Street. The selected time periods for the analysis are the weekday AM and PM peak hours, which represent the 'worst case' combination of site-generated traffic and adjacent street traffic. The proposed development is anticipated to be constructed in a single phase in 2021.

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

Forecasting

- The net increase in trips generated by the proposed hotel expansion is approximately 87 person trips in the AM peak hour and 98 person trips in the PM peak hour, which includes an increase of 31 vehicle trips in the AM peak hour and 36 vehicle trips in the PM peak hour.

Development Design and Parking

- It is expected that garbage collection for the residential condominium block will take place at the north curb of George Street, as per Schedule B of the City's Solid Waste Management By-Law 2009-396. Occasional loading activities for the convenience market are also expected to take place at the north curb of George Street. These activities are not anticipated to have any significant disruption to traffic flow on George Street.

- Garbage collection and loading for the hotel will take place on-site, in the interior courtyard between the hotel and the residential condominium block. Vehicles for garbage collection and deliveries will be required to reverse into the loading access on Dalhousie Street.

- Approximately 136 vehicle parking spaces are proposed for the subject site at full buildout, meeting the minimum and maximum requirements of the ZBL.

- On-site bicycle parking will be provided in accordance with the minimum requirements of the ZBL, with the majority of spaces located in the underground parking garage.

Boundary Streets

- The results of the segment multi-modal level of service (MMLOS) analysis are as follows:
    - No roadways meet the pedestrian level of service (PLOS);
    - Dalhousie Street and George Street meet the bicycle level of service (BLOS), while York Street does not;
    - As the only roadway to provide service to transit, Dalhousie Street does not meet the transit level of service (TLOS);
    - As the only roadway with a target for trucks, Dalhousie Street meets the truck level of service (TkLOS);
    - York Street and George Street meet the vehicular level of service (Auto LOS), while Dalhousie Street does not.

- The PLOS of Dalhousie Street can only be improved with a reduction in the operating speed to 30 km/h or a reduction of the daily curb lane traffic volumes to 3000 vehicles per day.

- The PLOS of the north sidewalk on York Street can meet the target PLOS by implementing a sidewalk boulevard with a minimum width of 0.5m.

- The PLOS of the north sidewalk on George Street can meet the target PLOS by implementing a sidewalk width of 1.8m. Given the ROW constraints, another cross-sectional element would be required to undergo a 0.3m reduction.

- The BLOS of York Street can meet the target by implementing a wide bike lane plus parking lane of at least 4.25m, provided bike lane blockages would be infrequent. This can be accommodated through pavement marking.

- The TLOS of Dalhousie Street can meet the target by restricting on-street parking between York Street and George Street.

- The Auto LOS of Dalhousie Street does not meet the target, and requires a reduction of approximately 20 northbound and 210 southbound vehicles in the AM peak hour, and a reduction of approximately 20 northbound and 90 southbound vehicles in the PM peak hour. Traffic volumes are expected to decrease with the implementation of the Confederation Line LRT.

Access Design

- The parking garage access configuration has not changed since the previous CTS/TIS, and will therefore continue to accommodate the appropriate design vehicles.

- Section 25 (c) of the *Private Approach By-Law* identifies a maximum width requirement of 9m for two-way accesses. This requirement is met by both accesses.

- Section 107 (1)(a) of the *Zoning By-Law* identifies a minimum width requirement of 6.7m for a two-way driveway to a parking lot, and 6.0m for a two-way driveway to a parking garage. These requirements are met by both accesses.

- Section 25 (o) of the *Private Approach By-Law* identifies a minimum spacing requirement of 3m between the nearest edge of the access and the property line, as measured at the street line. The spacing between the proposed access on George Street and the property line is approximately 2.6m, and the spacing between the existing access on Dalhousie Street and the property line is approximately 2.9m. The minimum spacing requirement can be relaxed from 3m to 0.3m, provided there are no safety issues with doing so.

- The loading access on Dalhousie Street will accommodate the appropriate design vehicles. Loading vehicles will be required to reverse into the access, and drive forward to exit the access. During both manoeuvres, the loading vehicles will encroach into both travel lanes.

Transit

- The proposed development is not expected to have any measurable adverse effect on the capacity or the operation of the adjacent transit network, which will include the Confederation Line LRT.

Intersection Design

- The results of the intersection MMLOS analysis are as follows:
    - No intersections meet the pedestrian level of service (PLOS);
    - Only Besserer Street/Waller Street does not meet the bicycle level of service (BLOS);
    - Of intersections with targets, York Street/Dalhousie Street, Rideau Street/Dalhousie Street and Besserer Street/Dalhousie Street do not meet the transit level of service (TLOS);
    - Of intersections with targets, only York Street/Dalhousie Street does not meet the target truck level of service (TkLOS);
    - All intersections meet the vehicular level of service (Auto LOS).

- It is not possible for any roadway with four lanes or more to achieve the target PLOS A. Most approaches within the study area have at least four lanes, making the target PLOS unachievable without major road modifications. All intersections within the study area meet the warrant for zebra-striped crosswalks (>400,000 vehicle/pedestrian conflicts over an eight-hour period), and could be considered for intersections where they have not already been implemented.

- The BLOS of Besserer Street/Waller Street does not meet the target BLOS D due to the implementation of dual left turn and dual right turn lanes. The removal of these features would cause the traffic volumes to exceed capacity. Therefore, no improvements are recommended.

- The TLOS of York Street/Dalhousie Street and Besserer Street/Dalhousie Street can meet the target with a reduction in the average delay of five seconds or more. There are limited

opportunities to improving the TLOS without reducing vehicular traffic overall at these intersections.

- The TLOS of Rideau Street/Dalhousie Street can improve to a TLOS E with the implementation of a transit queue jump lane on northbound Dalhousie Street. There are limited opportunities to improving the TLOS given the long cycle length of this intersection, and a TLOS D may not be achievable. The Rideau Street Renewal between Sussex Drive and Dalhousie Street removed an existing eastbound bus lane to widen the sidewalks and improve streetscaping.

- The TkLOS of York Street/Dalhousie Street does not meet the target TkLOS D, which is dependent on the effective corner radius. As York Street is neither a truck route nor an arterial roadway, facilitating truck turning movements to/from York Street is not considered a priority.

- All study area intersections are currently operating under acceptable conditions during the weekday AM and PM peak hours, and are expected to continue doing so within the timeframe of this study.

- Marginal increases in delay, v/c ratios, and queue lengths are expected at all study area intersections under the projected total traffic conditions at full buildout. All study area intersections are expected to continue operating under acceptable conditions.

- Based on the Synchro analysis, the 95th percentile queue lengths are expected to extend through adjacent intersections for the following approaches:
    - Southbound York Street/Dalhousie Street (AM peak)
    - Northbound George Street/Dalhousie Street (PM peak)
    - Northbound Rideau Street/Dalhousie Street (AM and PM peaks)
    - Westbound Rideau Street/Dalhousie Street (PM peak)
    - Westbound Rideau Street/Waller Street (AM peak)
    - Northbound/Eastbound Rideau Street/Cumberland Street (PM peak)
    - Southbound Besserer Street/Dalhousie Street (AM and PM peaks)
    - Northbound Besserer Street/Waller Street (AM and PM peaks)

- Based on the Synchro analysis, the 95th percentile westbound queue at George Street/ Dalhousie Street in the AM peak and PM peak hours may extend beyond the proposed parking garage access on George Street. As such, the proposed access may occasionally experience blocking during the peak hours. The analysis also shows that the proposed parking garage access will still operate acceptably during the AM and PM peak hours.

1.0 INTRODUCTION

This Transportation Impact Assessment (TIA) has been prepared in support of a Zoning Application of the property located at 110 York Street. A previous Community Transportation Study/ Transportation Impact Study (combined CTS/TIS) was completed in 2013 in support of a Zoning By-Law Amendment and Site Plan application for 137-141 George Street, 321-325 Dalhousie Street and 110 York Street. The proposed development at that time included a 14-storey hotel with 187 rooms, a 22-storey residential condominium with 282 units, and approximately 11,800 ft^2 of commercial floorspace on the ground floor of the residential condominium block. This report addresses the proposed hotel expansion on 110 York Street, which will add another 128 hotel rooms.

The subject site is surrounded by the following:

- York Street and residential land uses of variable density to the north;
- A privately-owned parking surface to the east;
- George Street and various commercial/retail land uses to the south; and
- Dalhousie Street and the Courtyard Marriott Hotel to the west.

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

Figure 1: View of the Subject Site

2.0 PROPOSED DEVELOPMENT

The proposed development outlined in the previous combined CTS/TIS included a 14-storey hotel with 187 rooms, a 22-storey residential condominium with 282 units, and approximately 11,800 ft^2 of commercial floorspace on the ground floor of the residential condominium block.

This report addresses the proposed hotel expansion on 110 York Street, which will add another 128 hotel rooms. It is also noteworthy that the original hotel proposed in the previous CTS/TIS has been constructed.

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

3.0 SCREENING AND SCOPING

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 proposed hotel expansion satisfies all triggers for completing a TIA report, and as such, this TIA Addendum will address all relevant components of the guidelines. A copy of the TIA Screening Form is included in **Appendix B**.

3.2 Existing Conditions

As identified above, the hotel expansion is part of the redevelopment outlined in the previous combined CTS/TIS, which was prepared by Novatech in December 2012, along with a technical memorandum prepared in March 2013 in support of a Zoning By-Law Amendment and Site Plan application. This study provided a review of the existing and planned conditions in the vicinity of the subject site, and performed intersection analysis for the study area intersections. Count data used for the previous analysis of the study area intersections is summarized as follows:

- York Street/Dalhousie Street — August 19, 2010
- York Street/Cumberland Street — August 23, 2010
- George Street/Dalhousie Street — August 19, 2010
- George Street/Cumberland Street — August 23, 2010
- Rideau Street/Nicholas Street — May 25, 2006
- Rideau Street/Dalhousie Street — June 27, 2011
- Rideau Street/Waller Street — August 12, 2010
- Rideau Street/Cumberland Street — June 27, 2011
- Besserer Street/Dalhousie Street — August 12, 2010
- Besserer Street/Waller Street — June 27, 2011

More recent traffic counts were available for some of the intersections within the study area, and were requested from the City for the purposes of identifying any notable changes in the traffic patterns. The existing traffic volumes from the previous CTS/TIS are shown in **Figure 2**, while the existing traffic volumes based on the newer traffic counts are shown in **Figure 3**. A comparison of the traffic counts, using the total volumes at all intersections within the study area, is shown in **Table 1**. Peak hour summary sheets of the recent count data for the applicable intersections are included in **Appendix C**.

Figure 2: Existing Traffic – 2006-2011 Counts

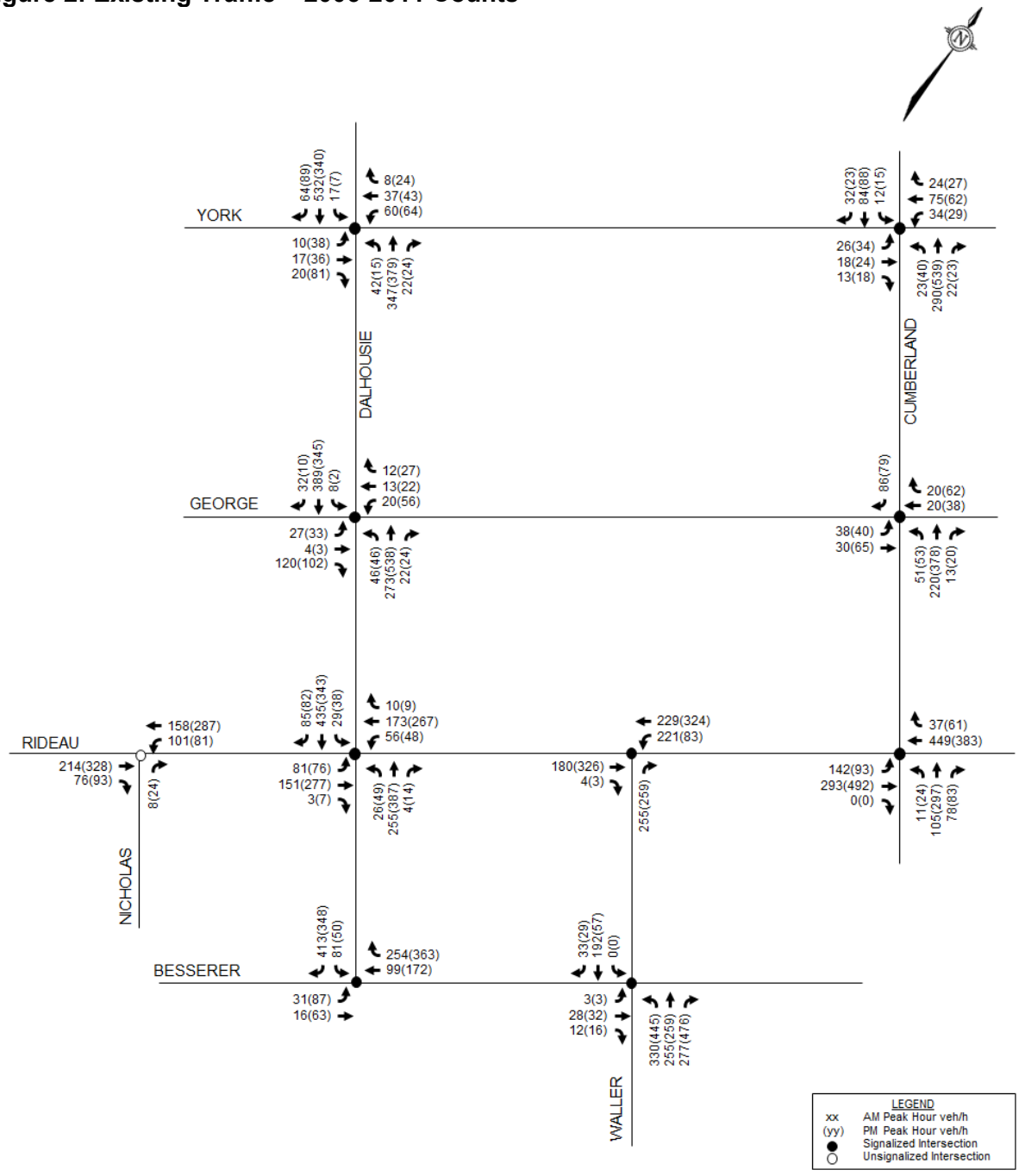


Figure 3: Existing Traffic – 2015 Counts

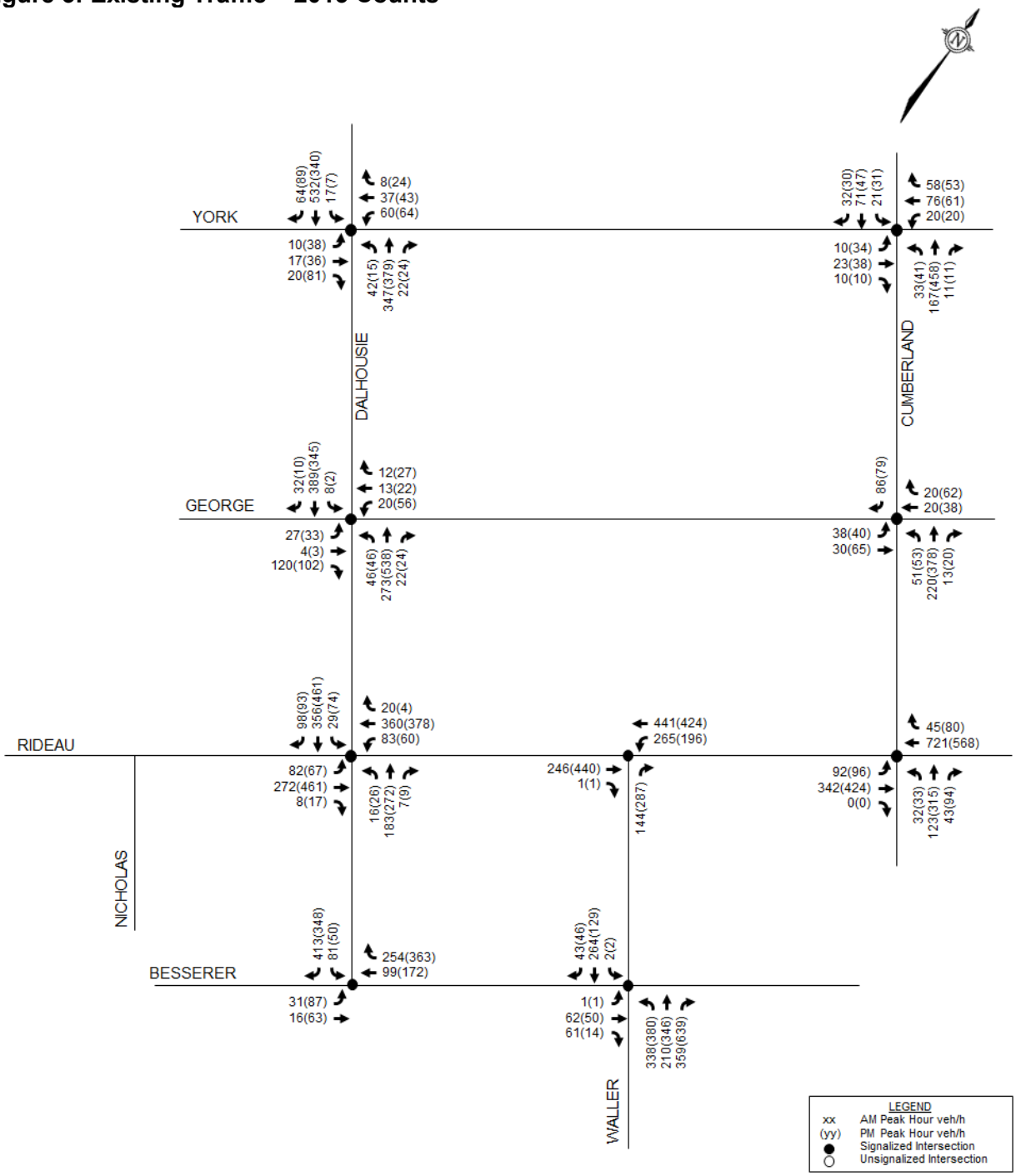


Table 1: Study Area Intersections

Intersection	Previous Count		New Count		Net Change
	AM	PM	AM	PM	
York Street/ Dalhousie Street	*August 2010*		*No new count* [1]		N/A
	1176	1140			
York Street/ Cumberland Street	*August 2010*		*April 2015*		10% to 20% decrease
	653	922	530	834	
George Street/ Dalhousie Street	*August 2010*		*No new count* [1]		N/A
	966	1208			
George Street/ Cumberland Street	*August 2010*		*No new count* [1]		N/A
	478	735			
Rideau Street/ Nicholas Street	*May 2006*		*Road closure* [2]		No traffic
	557	813			
Rideau Street/ Dalhousie Street	*June 2011*		*May 2015*		15% to 20% increase
	1308	1597	1514	1922	
Rideau Street/ Waller Street	*August 2010*		*May 2015*		20% to 30% increase
	899	995	1097	1348	
Rideau Street/ Cumberland Street	*June 2011*		*May 2015*		10% to 25% increase
	1115	1433	1398	1610	
Besserer Street/ Dalhousie Street	*August 2010*		*No new count* [3]		N/A
	894	1083			
Besserer Street/ Waller Street	*June 2011*		*April 2015*		20% to 25% increase
	1130	1317	1340	1607	

1. Traffic counts since 2010 were available, but only during the Rideau Street Renewal or LRT construction periods
2. Nicholas Street has been permanently closed to vehicular traffic between Rideau Street and Besserer Street since 2016
3. Most recent count is August 2010 for this intersection

Traffic counts conducted between 2012-2014 and since 2016 are available from the City, however construction detours were in place for either Phase 1 of the Rideau Street Renewal (2012-2014) or Confederation Line LRT tunnel (2016-2018). Additionally, major road construction along Sussex Drive between St. Patrick Street and King Edward Avenue in 2014 and 2015 affected traffic volumes within the study area, as drivers would be more likely to use Rideau Street as a detour. As such, the traffic counts from August 2010 and June 2011 provide the more representative data available. At the time of writing, construction detours remain in place, effectively ruling out the possibility of conducting new traffic counts at the necessary intersections. The existing conditions analysis can be updated in a future Site Plan submission if required, once the LRT construction is complete.

As part of Phase 2 of the Rideau Street Renewal, Nicholas Street was permanently closed to vehicular traffic in 2016 between Dalhousie Street and Besserer Street. This section has since become a pedestrian public space, called Ogilvy Square. All northbound traffic on Nicholas Street must turn right onto eastbound Besserer Street. Eastbound traffic on Rideau Street wishing to connect onto southbound Nicholas Street may do so by turning right onto either Dalhousie Street or Waller Street.

Since the submission of the previous CTS/TIS, Cumberland Street has undergone road modifications between Rideau Street and York Street. Until 2015, Cumberland Street between Rideau Street and George Street was open to northbound traffic only, with one left turn lane, one through lane, and one shared through/right turn lane. At the north approach of Cumberland Street and George Street, a pedestrian refuge island was in place to direct all southbound traffic to turn right onto westbound George Street. The modification has changed the northbound left turn lane

between Rideau Street and George Street into a southbound right turn lane, and the pedestrian refuge island at George Street has been removed. The southbound approach at George Street and Cumberland Street now consists of a single shared through/right turn lane, and signs have been installed to maintain that left turns onto eastbound George Street are not permitted. It is noteworthy that the traffic count in May 2015 for Rideau Street/Cumberland Street took place after modifications were completed, yet no vehicles performed the new turning movements at any point during the count.

3.3 Planned Conditions

Construction of the Confederation Line LRT tunnel and the Rideau LRT station are currently ongoing. Rideau Street is identified as a transit priority project in the City's Affordable Network. The all-day bus lanes between Sussex Drive and Cumberland Street, and peak period bus lanes between Cumberland Street and Charlotte Street, will be supported by transit signal priority (from Sussex Drive to Cummings Bridge). The peak periods for which bus lanes are in effect are to be extended to accommodate increasing congestion on Rideau Street outside of existing peak periods. No other planned network changes have been identified in the City's Transportation Master Plan (TMP) or Cycling Plan within the study area.

Multiple planned developments within 500m of the subject site have been proposed since the submission of the combined CTS/TIS in 2013, including:

- 245 Rideau Street (two 26-storey residential towers, one 16-storey hotel tower, with two storeys of retail)
- 256 Rideau Street (two 27-storey residential towers with ground floor retail)
- 112 Nelson Street (one 9-storey residential building)

The proposed development at 245 Rideau Street will replace a Metro grocery store with 443 dwelling units within two residential towers and 224 hotel rooms within one hotel tower, with the bottom two storeys reserved for a new grocery store and other retail space. The development proposes a two-way access on George Street, with a loading access on George Street and loading egress on Rideau Street. A road modification of Cumberland Street between Rideau Street and George Street is proposed, where one northbound lane is removed to expand pedestrian facilities. After this modification, the roadway will consist of one northbound shared left turn/through/right turn lane and one southbound right turn lane. Trips generated due to this development will be accounted for in further analysis.

The proposed development at 256 Rideau Street will replace a surface parking lot with 279 dwelling units within two residential towers, with the ground floor reserved for retail space. The development, which is anticipated to be mostly University of Ottawa students, proposes a total of four on-site vehicular parking spaces and 219 bicycle parking spaces. It is assumed that trips generated from this development are negligible, and are not accounted for in further analysis.

The proposed development at 112 Nelson Street will replace a two-storey multi-tenant warehouse with 174 dwelling units within a 9-storey midrise residential building. The development proposes a two-way access on Nelson Street. A site plan has not been developed, and therefore trips generated from the development have not been determined.

3.4 Study Area and Time Periods

The study area for this report includes all accesses to the proposed development and the intersections previously listed. The selected time periods for the analysis are the weekday AM and PM peak hours, which represent the 'worst case' combination of site-generated traffic and adjacent street traffic. The proposed development is anticipated to be constructed in a single phase in 2021.

3.5 Exemptions Review

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

Table 2: TIA Exemptions

Module	Element	Exemption Criteria	Exemption Applies
Design Review Component			
4.1 Development Design	*4.1.2* Circulation and Access	• Only required for site plans	No
	4.1.3 New Street Networks	• Only required for plans of subdivision	Yes
4.2 Parking	*4.2.1* Parking Supply	• Only required for site plans	No
	4.2.2 Spillover Parking	• Only required for site plans where parking supply is 15% below unconstrained demand	Yes
Network Impact Component			
4.5 Transportation Demand Management	*All elements*	• Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Yes
4.6 Neighbourhood Traffic Management	*4.6.1* Adjacent Neighbourhoods	• Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Yes
4.8 Network Concept	*All elements*	• Only required when proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by the established zoning	Yes

The proposed hotel expansion is not anticipated to have more than 60 employees on site at any given time, and therefore Transportation Demand Management (Module 4.5) is exempt from further analysis. As the proposed expansion is not anticipated to change the existing classification of the boundary streets (Dalhousie Street, York Street, and George Street), and will not generate more than 200 person trips in excess of the equivalent volume permitted by the established zoning, Neighbourhood Traffic Management (Module 4.6) and Network Concept (Module 4.8) are exempt from the required analysis for this report.

4.0 FORECASTING

4.1 Development-Generated Traffic

4.1.1 Trip Generation

The previous CTS/TIS assumed a three-phase development: a 158-room hotel in Phase 1 (buildout in 2014), a 156-unit condominium with 1,505 ft^2 of ground-floor commercial space in Phase 2 (buildout in 2016), and a 126-unit condominium expansion with 7,645 ft^2 of ground-floor commercial space in Phase 3 (buildout in 2017). A technical memorandum prepared in March 2013 addressed changes to the site plan, which proposed an increase of 29 hotel rooms in Phase 1, and an increase of 2,655 ft^2 of commercial space in Phase 3. This resulted in a proposed development of 187 hotel rooms in Phase 1, a 156-unit condominium with 1,505 ft^2 of commercial space in Phase 2, and a 126-unit condominium expansion with 10,300 ft^2 of commercial space in Phase 3. The hotel in Phase 1 has since been constructed, and opened in August 2016.

Trips generated by the development proposed in the previous CTS/TIS were estimated using relevant peak hour rates identified in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 9th Edition*. The specific land use of the commercial space was, and still is, unknown, and was therefore assumed to be developed as a convenience market. This land use is considered to be one of the most intensive trip generators given the available floor area, leading to a more conservative analysis.

The revised development will expand the hotel with 128 additional rooms in a tower adjacent to the existing hotel. Trips generated by this expansion have also been estimated using the ITE *Trip Generation Manual, 9th Edition*. This report assumes full buildout of the site by the year 2021. The trip generation estimates of the previous CTS/TIS, as well as the trip generation estimates of the hotel expansion, is summarized in **Table 3**.

Table 3: Person Trip Generation

Land Use	ITE Code	Units/GFA	AM Peak (PPH[1])			PM Peak (PPH)		
			IN	OUT	TOT	IN	OUT	TOT
Previous CTS/TIS[2]								
Hotel (original)	310	187 units	75	52	127	73	71	144
High-Rise Residential Condominiums	232	282 units	36	152	188	106	65	171
Convenience Market (Open 15-16 Hours)	852	11,805 ft^2	236	237	473	257	269	526
		Total	**347**	**441**	**788**	**436**	**405**	**841**
Proposed Development[3]								
Hotel (expansion)	310	128 units	51	36	87	50	48	98
		Total	**398**	**477**	**875**	**486**	**453**	**939**

1. PPH = Persons Per Hour
2. The previous CTS/TIS used an ITE Trip to Person Trip Factor of 1.35, per the 2005 TRANS O-D Survey
3. This TIA report uses an ITE Trip to Person Trip Factor of 1.28, consistent with the 2017 TIA Guidelines

From the previous table, the proposed hotel expansion is anticipated to generate an additional 87 person trips in the AM peak hour and 98 person trips in the PM peak hour.

The modal shares for the revised development are assumed to be consistent with the modal shares proposed in the previous CTS/TIS. The projected person trips by modal share for the revised development, compared to the assumed trip generation for the subject site in the previous CTS/TIS, is summarized in **Table 4**.

Table 4: Site-Generated Person Trips by Modal Share

Travel Mode	Modal Share		AM Peak			PM Peak		
	AM	PM	IN	OUT	TOT	IN	OUT	TOT
Previous TIS								
Hotel Person Trips			*75*	*52*	*127*	*73*	*71*	*144*
Auto Driver	36%	36%	27	19	46	26	26	52
Auto Passenger	9%	9%	7	5	12	7	6	13
Transit	42%	41%	32	21	53	31	30	61
Non-Auto	13%	14%	9	7	16	9	9	18
Condominium Person Trips			*36*	*152*	*188*	*106*	*65*	*171*
Auto Driver	34%	34%	12	51	63	35	22	57
Auto Passenger	9%	9%	3	12	15	9	5	14
Transit	45%	44%	17	69	86	48	30	78
Non-Auto	12%	13%	4	20	24	14	8	22
Convenience Market Person Trips			*236*	*237*	*473*	*257*	*269*	*526*
Auto Driver	16%	15%	38	38	76	39	40	79
Auto Passenger	1%	2%	3	3	6	4	6	10
Transit	7%	7%	16	16	32	18	19	37
Non-Auto	76%	76%	179	180	359	196	204	400
Auto Driver (Total)			**77**	**108**	**185**	**100**	**88**	**188**
Auto Passenger (Total)			**13**	**20**	**33**	**20**	**17**	**37**
Transit (Total)			**65**	**106**	**171**	**97**	**79**	**176**
Non-Auto (Total)			**192**	**207**	**399**	**219**	**221**	**440**
Proposed Development								
Hotel Expansion Person Trips			*51*	*36*	*87*	*50*	*48*	*98*
Auto Driver	36%	36%	18	13	31	19	17	36
Auto Passenger	9%	9%	4	3	7	3	4	7
Transit	42%	41%	22	15	37	21	20	41
Non-Auto	13%	14%	7	5	12	7	7	14
Auto Driver (Total)			**95**	**121**	**216**	**119**	**105**	**224**
Auto Passenger (Total)			**17**	**23**	**40**	**23**	**21**	**44**
Transit (Total)			**87**	**121**	**208**	**118**	**99**	**217**
Non-Auto (Total)			**199**	**212**	**411**	**226**	**228**	**454**

Based on the previous table, the proposed hotel expansion is anticipated to generate an additional 31 vehicle trips during the AM peak hour and 36 vehicle trips during the PM peak hour.

The convenience market land use is expected to generate two types of 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 an intermediate stop on the way to another destination. Peak hour pass-by trips have been estimated based on a pass-by rate of 60%. The *ITE Trip Generation Handbook* identifies this percentage as an average for the Convenience Market land use. The pass-by trips generated by the

convenience store are part of the observed background traffic, and as such do not constitute new trips on the adjacent road network. The primary and pass-by vehicle trip generation for the convenience market is summarized in **Table 5**.

Table 5: Primary and Pass-by Vehicle Trips

Travel Mode	AM Peak (VPH[1])			PM Peak (VPH)		
	IN	OUT	TOT	IN	OUT	TOT
Convenience Market						
Vehicle Trips	38	38	76	39	40	79
Pass-by	23	23	46	23	23	46
Primary	15	15	30	16	17	33

1. VPH = Vehicles Per Hour

Based on the foregoing table, the site will generate 46 pass-by vehicle trips in each of the AM and PM peak hours.

Consistent with the previous CTS/TIS, and in the interest of maintaining a conservative analysis, no deduction has been made to account for internally captured trips. All trips generated by the proposed land uses area assumed to have an origin or destination that lies beyond the subject site.

4.1.2 Trip Distribution

The trip distribution assumptions for the revised development are consistent with the previous CTS/TIS. Existing site-generated traffic volumes, indicated as Phase 1 Primary Site Traffic in the previous CTS/TIS, are shown in **Figure 4**.

4.1.3 Trip Assignment

For the residential condominium and convenience market land uses, the trip assignment assumptions for the revised development are consistent with the previous CTS/TIS. The existing hotel traffic currently uses a full-movement access on Dalhousie Street and an egress lane on York Street. The revised development will repurpose the access on Dalhousie Street to be a loading access only, and remove the egress lane on York Street. As such, all site traffic will be assigned to the proposed two-way access on George Street. The existing volumes have been reassigned to the George Street access, as shown in **Figure 5**.

Primary trips generated by the revised development, which include the existing hotel expansion and the condominium towers with ground floor convenience market, are shown in **Figure 6**. Pass-by trips generated by the convenience market have been distributed to the site accesses based on existing traffic conditions, and are shown in **Figure 7**.

Total traffic volumes generated by the subject site are shown in **Figure 8**.

Figure 4: Existing Site Traffic

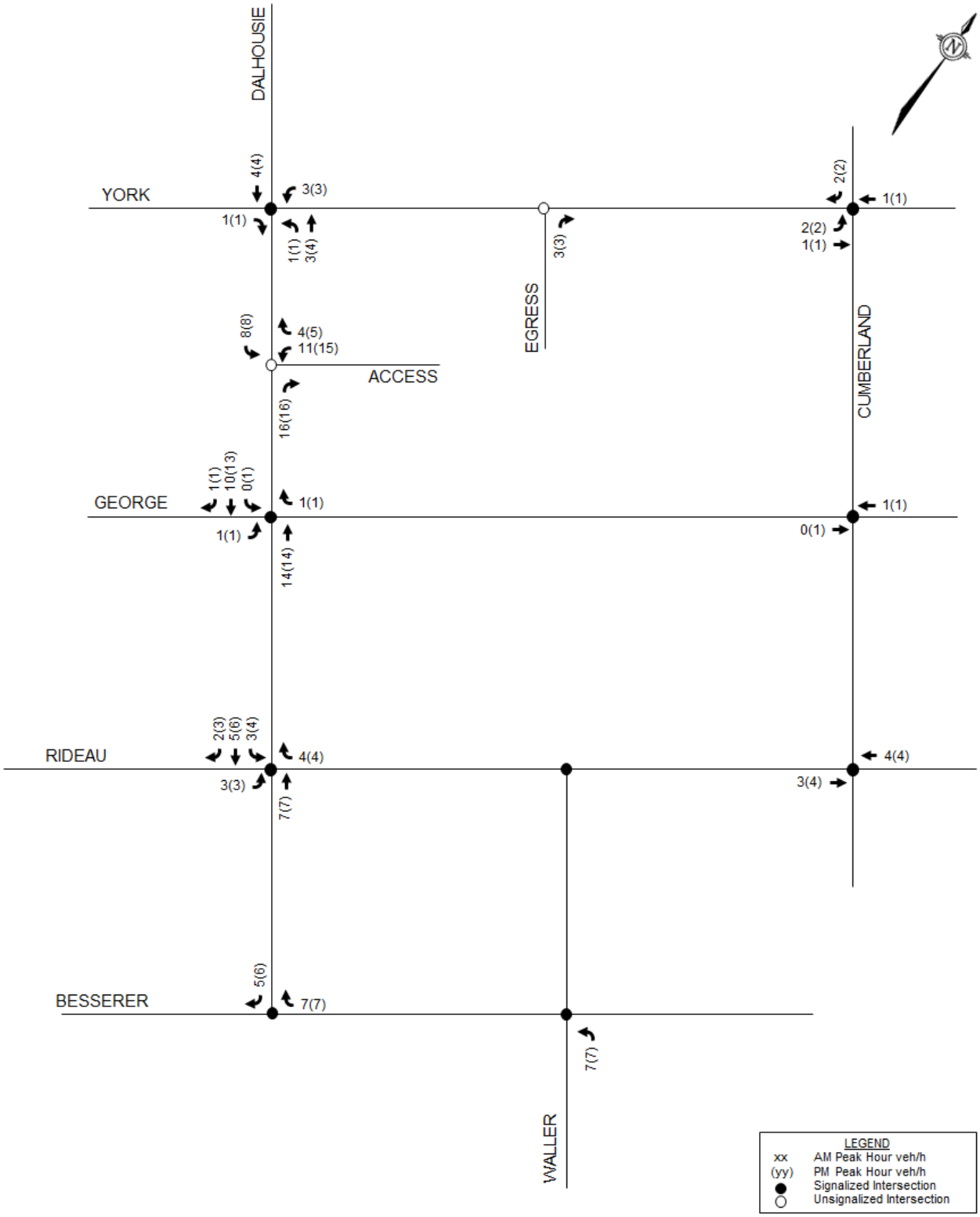


Figure 5: Reassigned Existing Site Traffic

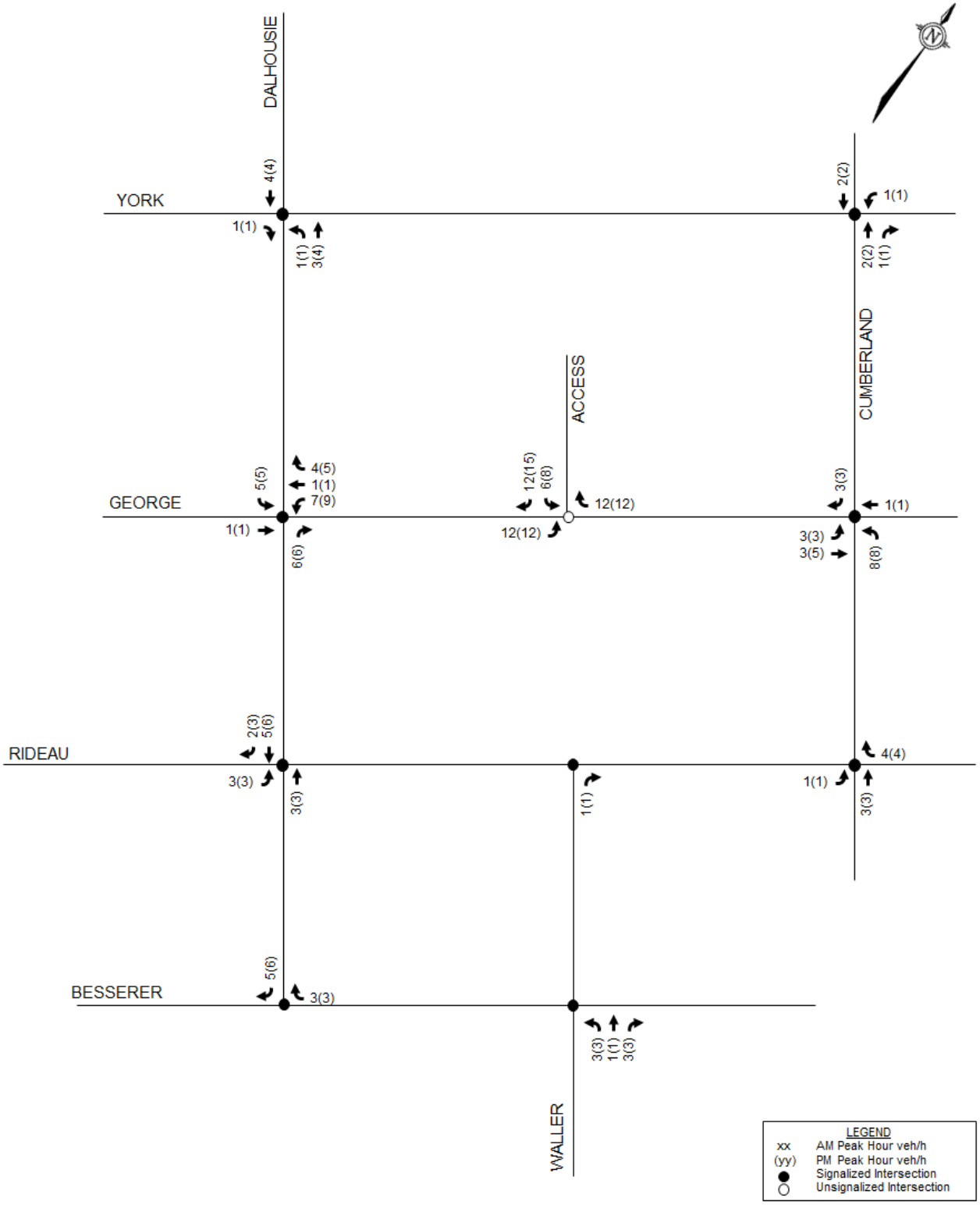


Figure 6: Site-Generated Primary Trips

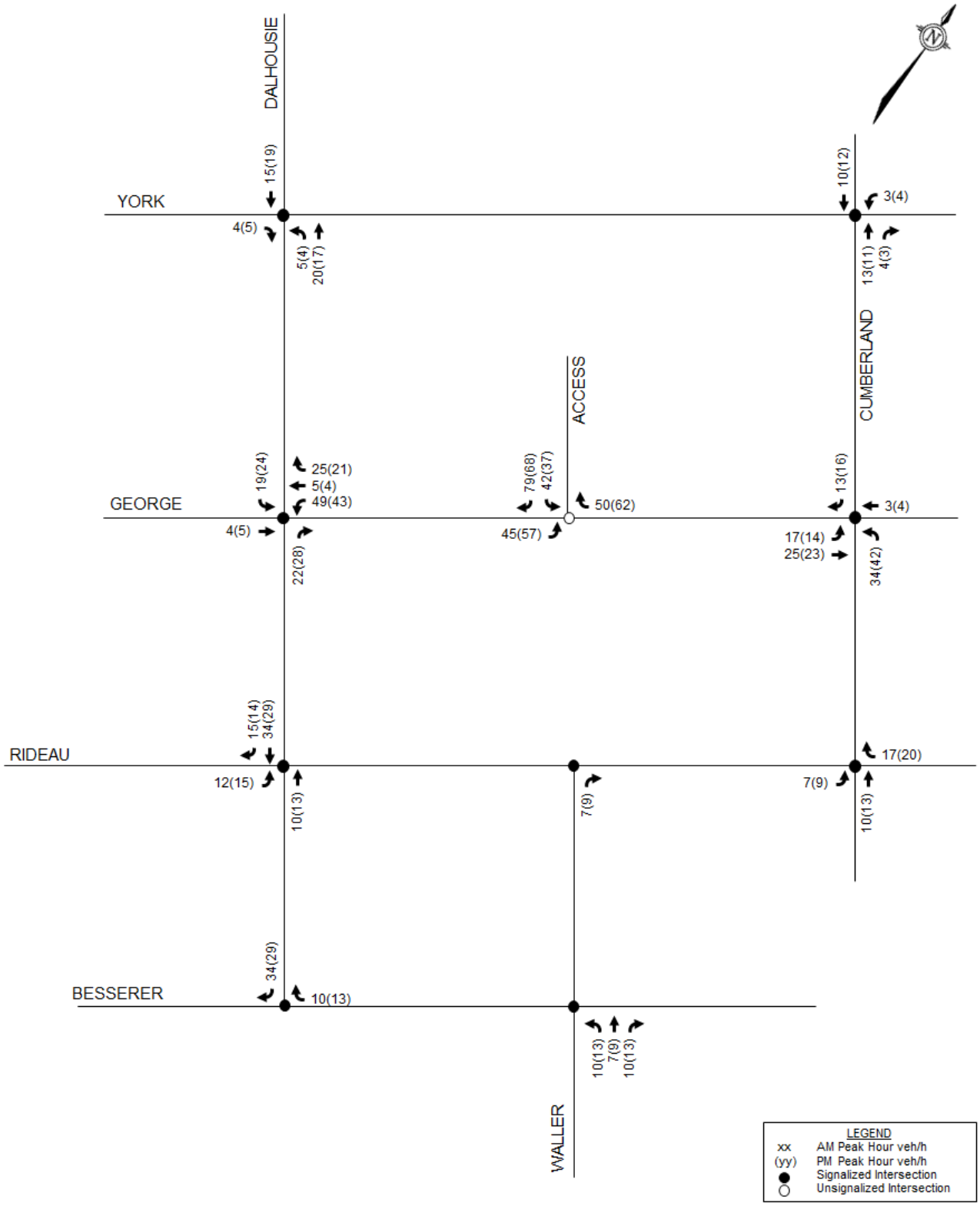


Figure 7: Site-Generated Pass-by Trips

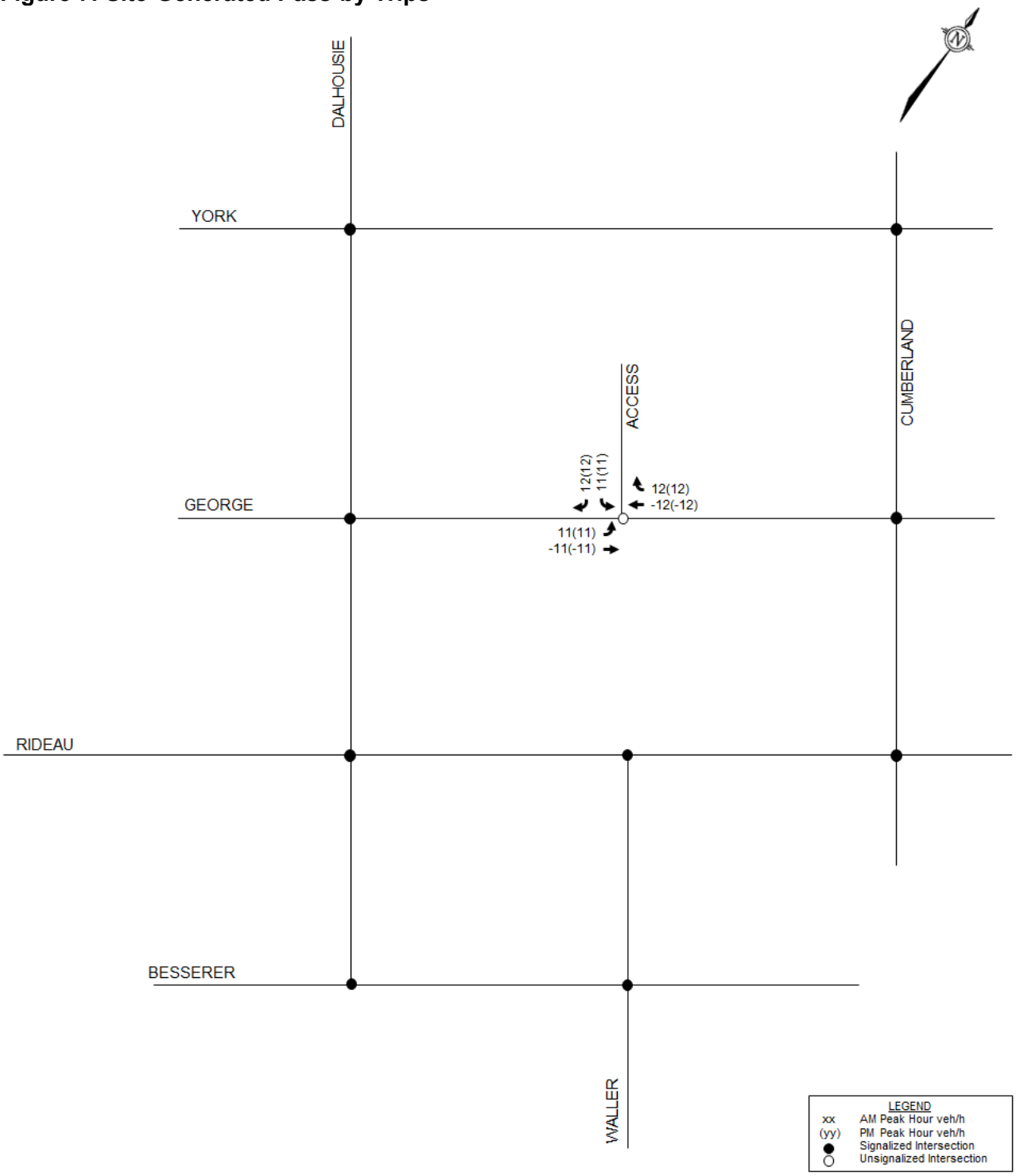
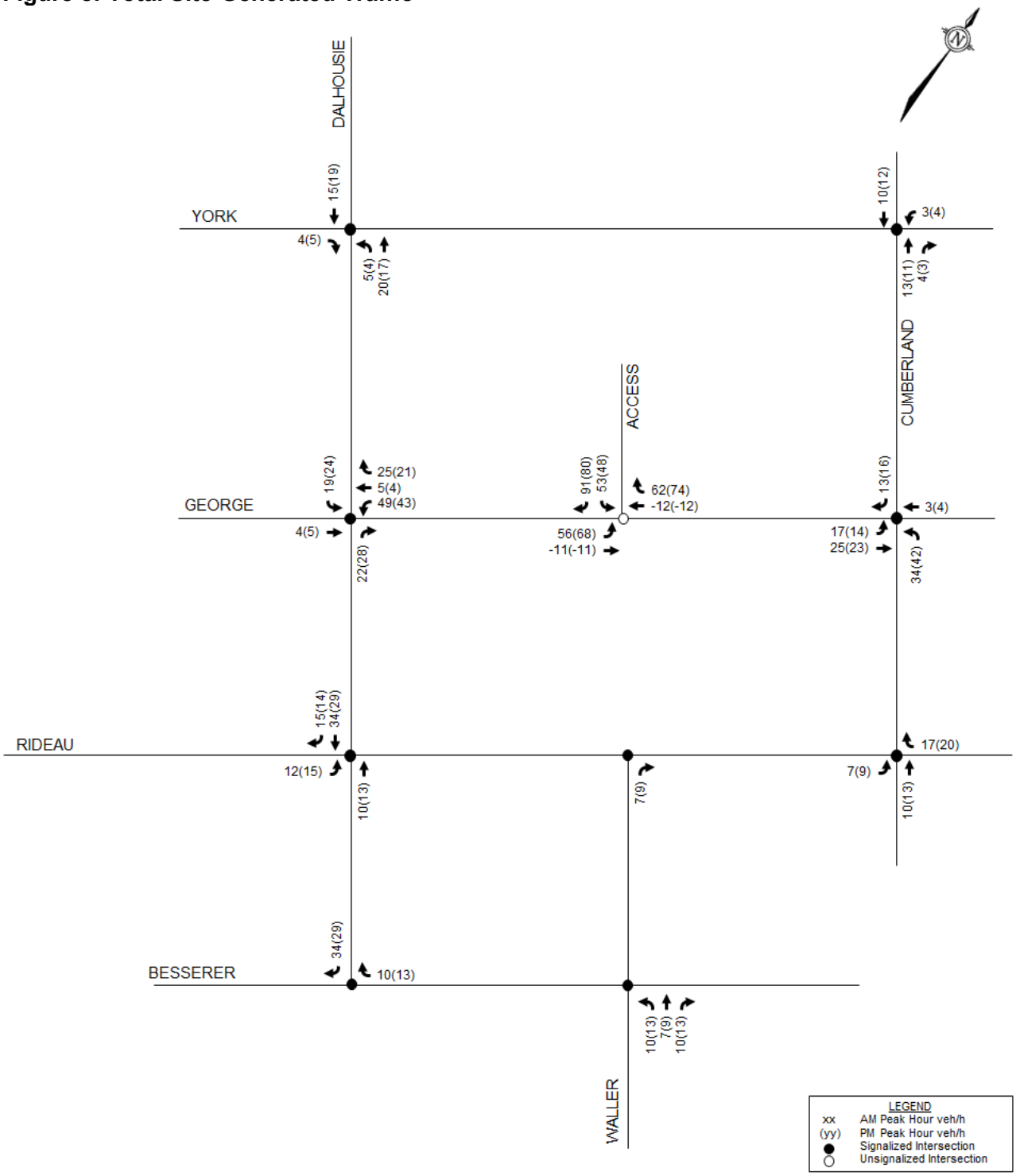


Figure 8: Total Site-Generated Traffic



4.2 Background Traffic

4.2.1 General Background Growth

No background traffic growth rates have been applied in the study area. As shown by the modal shares in **Table 4**, vehicular traffic accounts for approximately one-third of all hotel and condominium trips, and approximately one-sixth of all convenience market trips. Additionally, projects such as the Confederation Line LRT tunnel and the Rideau Street Renewal are actively prioritizing non-vehicular methods of travel throughout the study area. Consistent with the previous CTS/TIS, the background traffic at build-out is anticipated to equal the background traffic at the 5-year horizon.

4.2.2 Other Area Development

Projected traffic volumes generated by the proposed development of 245 Rideau Street are consistent with the traffic study prepared by Parsons in October 2013, and subsequently amended in May 2015 and July 2015. Relevant excerpts of this study are included in **Appendix D**. Traffic volumes generated by this site are shown in **Figure 9**.

The existing traffic volumes of the study area have been adjusted to reflect the road modifications to Cumberland Street in 2015 and the permanent closure of Nicholas Street in 2016. The City has no traffic counts available since the road modifications made to Cumberland Street. Peak hour volumes for the unaccounted movements at George Street/Cumberland Street were estimated using the Parsons traffic study referenced above. Traffic volumes on Nicholas Street have been reassigned using logical trip routing (for example, northbound right turn movements from Nicholas Street onto Rideau Street now take an eastbound left turn from Besserer Street onto Dalhousie Street, and then a northbound right turn from Dalhousie Street onto Rideau Street). The estimated existing traffic with these reassignments is shown in **Figure 10**.

Total traffic volumes for the build-out/horizon year have been estimated by summing **Figures 8**, **9**, and **10**, and are shown in **Figure 11**.

Figure 9: Traffic Volumes Generated by Other Developments

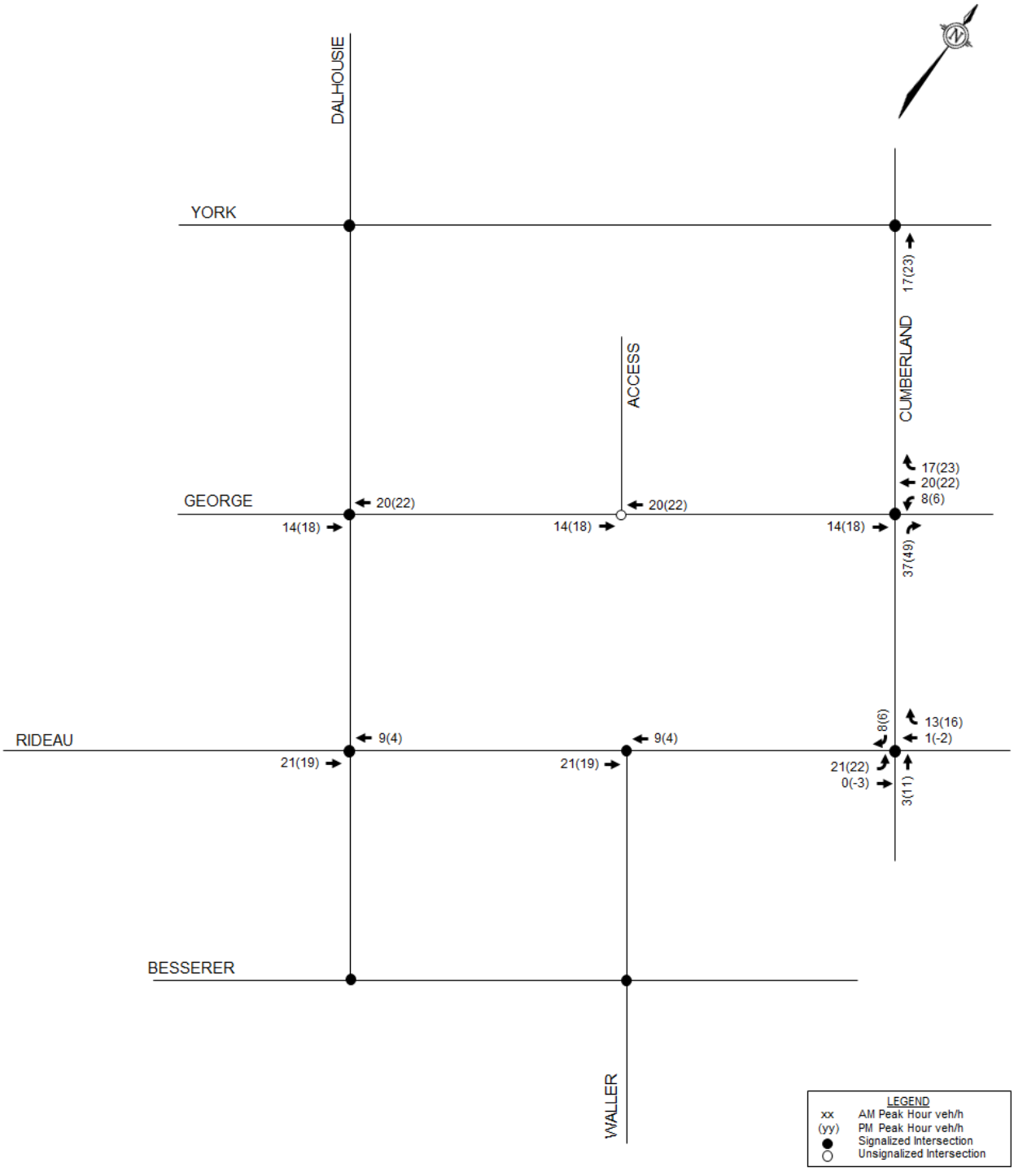


Figure 10: Reassigned Existing Traffic Volumes

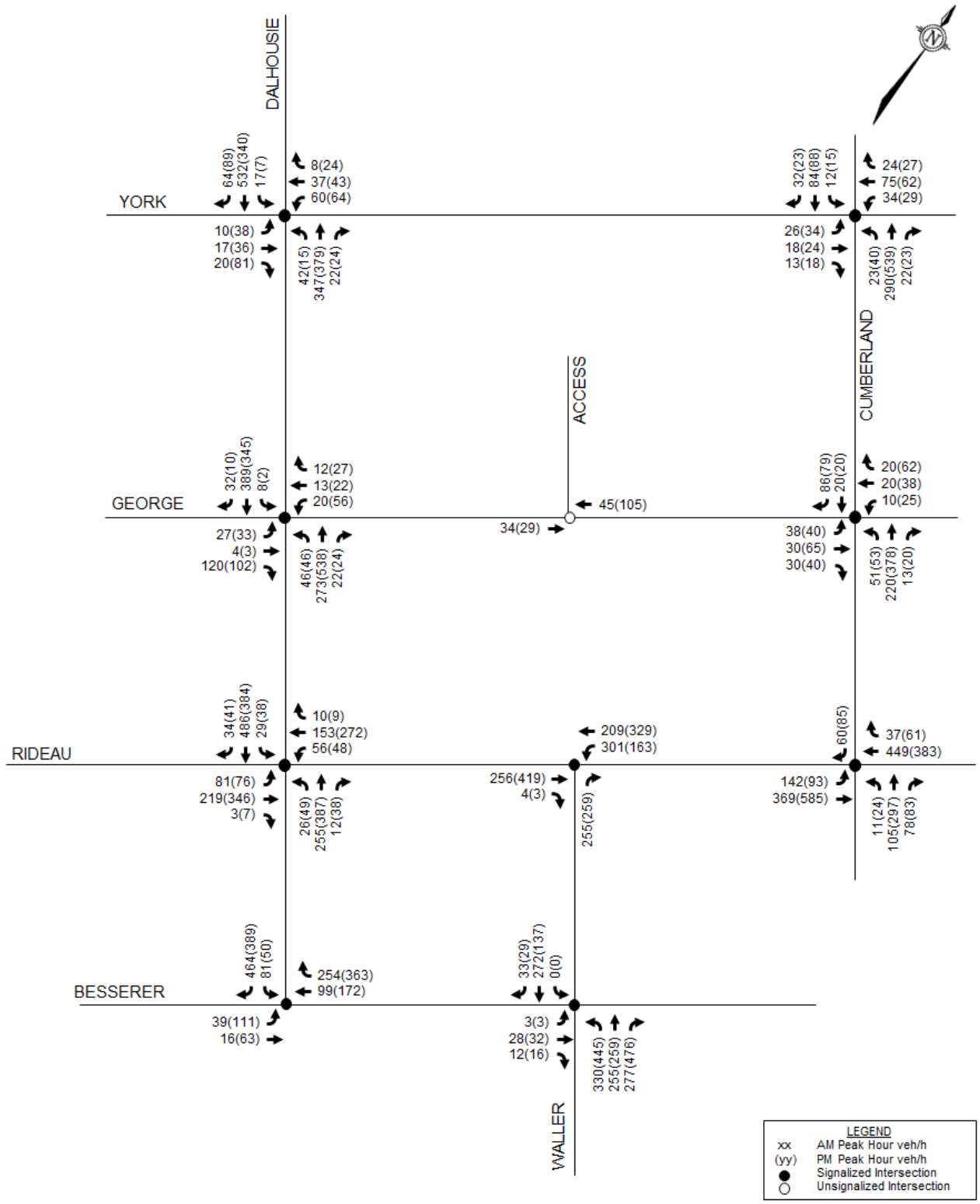
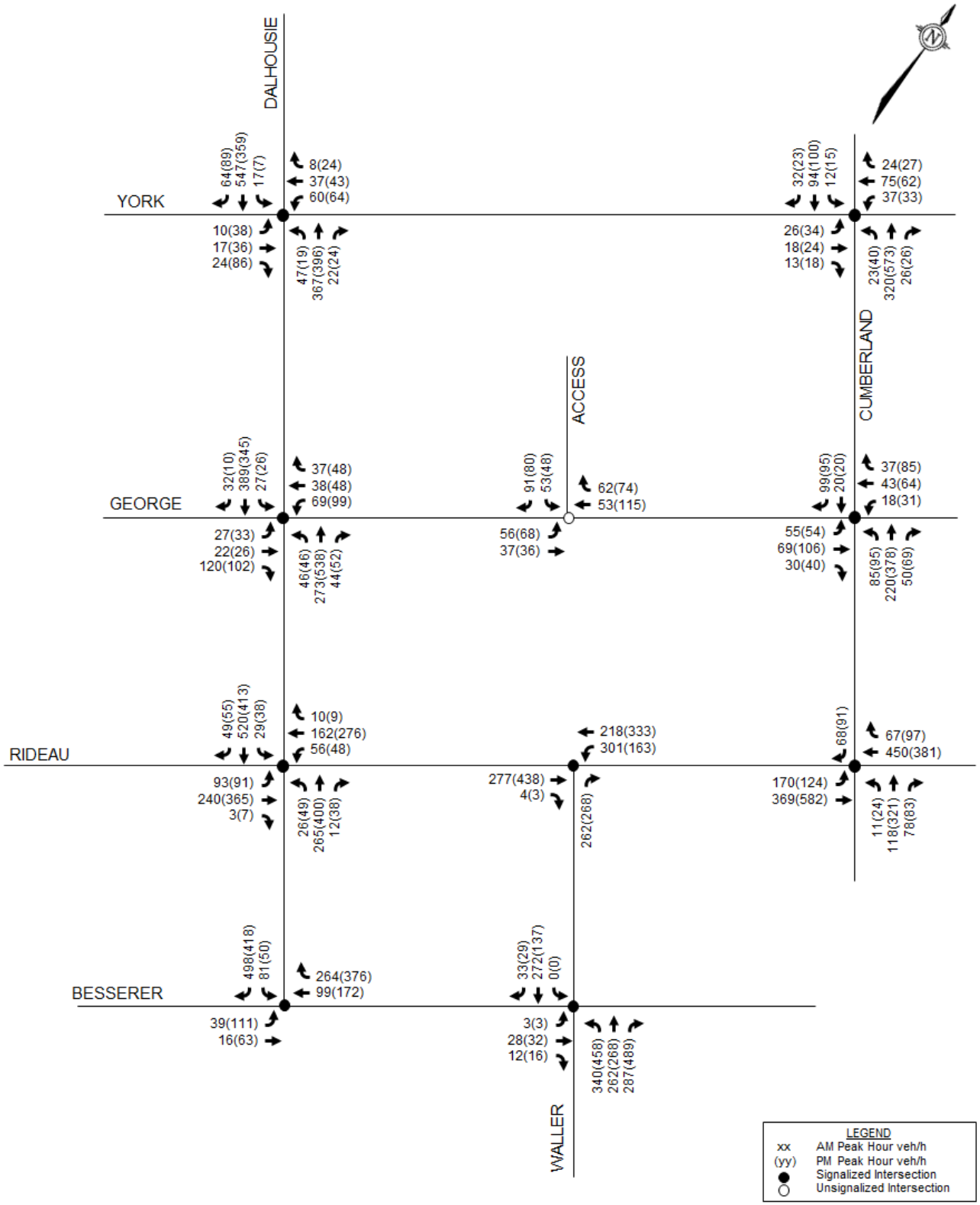


Figure 11: Total 2021/2026 Traffic



5.0 ANALYSIS

5.1 Development Design

Sidewalk connections will be provided between all entrances of the development, George Street, and York Street. Sidewalks will be depressed and continuous across the access to the parking garage on George Street, in accordance with City standards.

It is anticipated that bicycle parking will meet the requirements of the City of Ottawa's *Zoning By-Law* (ZBL). The required number of bicycle parking spaces is reviewed in Section 5.2: Parking. The proposed bicycle parking will be reviewed as part of the Site Plan Control application.

OC Transpo guidelines recommend that all developments in the vicinity of a bus route should have at least one bus stop within a walking distance of 400m, roughly a 5-minute walk.

OC Transpo stops #6837 and #6838 are located on either side of the north approach at York Street/Dalhousie Street, and stops #7576 and #7577 are located on either side of the north approach at Rideau Street/Dalhousie Street. All four stops provide service to routes 6, 9, and 602. All entrances to the subject site are within 300m of all four stops, but hotel guests may be more inclined to travel to the intersection at York Street/Dalhousie Street. Stops #6837 and #6838 are within 125m walking distance of the hotel entrances, and stops #7576 and #7577 are within 150m walking distance of the condominium entrances.

OC Transpo stop #7596 is located on the north side of the east approach at Rideau Street/Dalhousie Street, and provides service to routes 7, 12, 14, 16, 17, and 18. This stop is within 270m walking distance of all entrances to the subject site.

OC Transpo stop #3009 is located on the south side of Rideau Street at Rideau Centre. This station provides service to 15 regular routes, including all of the routes listed above, except for route 602. This stop is within 400m of all entrances to the subject site. The Confederation Line LRT is anticipated to open in late 2018, with an underground station located at Rideau Centre. Not accounting for walking distance, it is also noteworthy that the subject site is within 600m of the Mackenzie King and Laurier Stations of the Transitway.

To identify whether any transit capacity issues would arise with this development, passenger loadings were projected in the previous CTS/TIS, and no capacity issues were identified on any of the nearby bus routes or bus stops. With the implementation of the Confederation Line LRT within the study area, it is expected that overall transit volumes will increase, however it is likely that bus transit volumes will decrease as some riders will prefer to use the LRT instead.

Delivery vehicles for the hotel will be accommodated with a loading access on Dalhousie Street, between the existing hotel and existing businesses. Heavy trucks will be required to reverse into the access. All loading will be accommodated within the subject site. Further review of the access is included in Section 5.4: Access Design.

Loading zones have been constructed adjacent to the existing hotel on the subject site, on Dalhousie Street and York Street. The loading zone on Dalhousie Street also permits street parking, while the loading zone on York Street acts as a taxi stand from 5:30pm – 8:30am and a loading zone otherwise.

It is expected that garbage collection for the residential condominium will take place at the curb on the north side of George Street, as per Schedule B of the City's Solid Waste Management By-Law 2009-396. Occasional loading activities for the commercial/retail floor space are also expected to take place at the curb on George Street.

There is sufficient roadway width to accommodate garbage collection vehicles and typical loading vehicles at the curb without impeding traffic flow on George Street. However, the creation of a new loading zone along the site frontage on George Street will likely require changes to the existing parking restriction, with the potential loss of some on-street parking capacity.

Garbage collection and loading for the hotel will take place on-site. Garbage collection/delivery vehicles will enter the access in reverse on Dalhousie Street, and exit via the same access moving forward on Dalhousie Street.

5.2 Parking

The subject site is located in Area A of Schedule 1 and Area Z of Schedule 1A to the City of Ottawa's *Zoning By-Law* (ZBL). Within this area, no vehicular parking is required to be provided, except for visitors to the residences. Minimum bicycle parking rates and maximum vehicular parking rates for the proposed development are identified in the ZBL, and are summarized in **Table 6**.

Table 6: Parking Requirements

Land Use	Rate	Units/GFA	Requirement
Vehicle Parking (minimum)			
Hotel	No requirement for Area Z	315 units	0
Residential	0.1 per dwelling unit after the first 12 units for visitors, to a maximum of 30 spaces	282 units	27
Retail	No requirement for Area Z	1,100 m^2	0
		Minimum	**27**
		Provided	**136**
Vehicle Parking (maximum)			
Hotel	No requirement for hotels	315 units	0
Residential	1.5 per dwelling unit	282 units	423
Retail	1.0 per 100m^2 GFA	1,100 m^2	11
		Maximum	**434**
		Provided	**136**
Bicycle Parking (minimum)			
Hotel	1.0 per 1000m^2 GFA	9,291 m^2	9
Residential	0.50 per dwelling unit	282 units	141
Retail	1.0 per 250m^2 GFA	1,100 m^2	4
		Minimum	**154**

It is anticipated that the vehicular parking provided will meet the minimum and maximum requirements. The proposed on-site bicycle parking will be reviewed as part of the Site Plan Control application.

Although this traffic impact assessment assumes a single buildout phase, the hotel expansion may be built before the condominium towers. As part of this phase, a single level of underground parking (with 24 spaces) will be provided. The ZBL does not outline any minimum or maximum requirements for hotel vehicular parking. Part of the existing surface parking will be removed during the construction of this underground parking level.

5.3 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 October 2015 were used to evaluate the LOS of all boundary roadway segments, for each mode of transportation. Schedule E of the City of Ottawa's Official Plan identifies all boundary streets as being in the Central Area. However, given the subject site's proximity to a future LRT station, the guidelines stipulate that the 'Within 600m of a Rapid Transit Station' policy area be used to evaluate whether the MMLOS targets are being met, regardless of the land use designation outlined in the Official Plan. Dalhousie Street is classified as a collector roadway, while York Street and George Street are classified as local roadways.

5.3.1 Pedestrian Level of Service (PLOS)

Exhibit 4 of the MMLOS guidelines has been used to evaluate the segment PLOS of the boundary streets. Table 1 of the City's Addendum to the MMLOS Guidelines has been used to evaluate the segment PLOS with regards to possible pedestrian crowding. Exhibit 22 of the MMLOS guidelines suggests a target PLOS A for all classes of roadways within 600m of a rapid transit station. The results of the segment PLOS analysis are summarized in **Tables 7** and **8**.

Table 7: PLOS Segment Analysis

Sidewalk Width	Boulevard Width	Avg. Daily Curb Lane Traffic Volume	Presence of On-Street Parking	Operating Speed	Segment PLOS
Dalhousie Street (east side)					
≥ 2.0m	0m	> 3000 vpd	Yes	50 km/h	B
Dalhousie Street (west side)					
≥ 2.0m	0m	> 3000 vpd	Yes	50 km/h	B
York Street (north side)					
≥ 2.0m	0m	< 3000 vpd	Yes[1]	50 km/h	B
York Street (south side)					
≥ 2.0m	> 2.0m	< 3000 vpd	No	50 km/h	A
George Street (north side)					
1.5m	> 2.0m	< 3000 vpd	Yes	50 km/h	C
George Street (south side)					
≥ 2.0m	> 2.0m	< 3000 vpd	Yes	50 km/h	A

1. On-street parking is permitted for buses only

Table 8: PLOS Segment Analysis – Crowding

Sidewalk Width	Approximate Platoon Flow	Segment PLOS
Dalhousie Street (east side)		
3.0m	< 250 ped/h	A
Dalhousie Street (west side)		
3.0m	< 500 ped/h	B
York Street (north side)		
2.0m	< 250 ped/h	B
York Street (south side)		
2.5m	< 250 ped/h	B
George Street (north side)		
1.5m	< 250 ped/h	B
George Street (south side)		
4.5m	< 250 ped/h	A

5.3.2 Bicycle Level of Service (BLOS)

Exhibit 11 of the MMLOS guidelines has been used to evaluate the existing segment BLOS along the boundary streets. Exhibit 22 of the MMLOS guidelines suggests a target BLOS B for all roadways classified as local routes (York Street), and a target BLOS D for all roadways with no bike classification (Dalhousie Street and George Street). The results of the segment BLOS analysis are summarized in **Table 9**.

Table 9: BLOS Segment Analysis

Road Class	Bike Route	Type of Bikeway	Travel Lanes	Centerline Markings	Operating Speed	Segment BLOS
Dalhousie Street (York Street to George Street)						
Collector	No Class	Mixed Traffic	2	Yes	50 km/h	D
York Street (Dalhousie Street to Cumberland Street)						
Local	Local Route	Mixed Traffic	2	Yes	50 km/h	D
George Street (Dalhousie Street to Cumberland Street)						
Local	No Class	Mixed Traffic	2	Yes	50 km/h	D

5.3.3 Transit Level of Service (TLOS)

Exhibit 15 of the MMLOS guidelines has been used to evaluate the existing segment TLOS along the boundary streets. Exhibit 22 of the MMLOS guidelines suggests a target TLOS D for Transit Priority Corridors with isolated measures. Of the boundary streets, Dalhousie Street is the only one which meets this qualification. As such, York Street and George Street have not been evaluated for TLOS. The results of the segment TLOS analysis are summarized in **Table 10**.

Table 10: TLOS Segment Analysis

Facility Type	Level/Exposure to Congestion Delay, Friction and Incidents			Quantitative Measurement	Segment TLOS
	Congestion	Friction	Incident Potential		
Dalhousie Street (York Street to George Street)					
Mixed Traffic – Moderate Parking/ Driveway Friction	Yes	Medium	Medium	$0.4 \leq V_t/V_p \leq 0.6$	E

5.3.4 Truck Level of Service (TkLOS)

Exhibit 20 of the MMLOS guidelines has been used to evaluate the existing segment TkLOS along the boundary streets. Exhibit 22 of the MMLOS guidelines suggests a target TkLOS D for collector roadways classified as truck routes (Dalhousie Street). There is no target TkLOS for local roadways (York Street and George Street), however George Street has been evaluated due to its designation as a truck route. The results of the segment TkLOS analysis are summarized in **Table 11**.

Table 11: TkLOS Segment Analysis

Curb Lane Width	Number of Travel Lanes	Segment TkLOS
Dalhousie Street (York Street to George Street)		
$\geq$ 3.7m	2 (one in each direction)	B
George Street (Dalhousie Street to Cumberland Street)		
$\geq$ 3.7m	2 (one in each direction)	B

5.3.5 Vehicular Level of Service (Auto LOS)

Exhibit 22 of the MMLOS guidelines suggests a target Auto LOS E for all roadway classes within 600m of a rapid transit station. The typical lane capacity along the study area roadways are based on the City's guidelines for the TRANS Long-Range Transportation Model. The lane capacity along the boundary streets has been estimated based on roadway classification and general characteristics (i.e. suburban with limited access, urban with on-street parking, etc.). The results of the Auto LOS analysis are summarized in **Table 12**.

Table 12: Auto LOS Segment Analysis

Direction	Directional Capacity	Traffic Volumes		V/C Ratio and LOS			
		AM Peak	PM Peak	AM Peak		PM Peak	
				V/C	LOS	V/C	LOS
Dalhousie Street (York Street to George Street)							
Northbound	400	411	418	**1.03**	**F**	**1.04**	**F**
Southbound	400	612	485	**1.53**	**F**	**1.21**	**F**
York Street (Dalhousie Street to Cumberland Street)							
Eastbound	400	56	67	0.14	A	0.17	A
Westbound	400	105	131	0.26	A	0.33	A
George Street (Dalhousie Street to Cumberland Street)							
Eastbound	400	34	29	0.08	A	0.07	A
Westbound	400	45	105	0.11	A	0.26	A

5.3.6 Segment MMLOS Summary

A summary of the results of the segment MMLOS analysis for the boundary streets Dalhousie Street, York Street, and George Street, are provided in **Table 13**.

Table 13: Segment MMLOS Summary

	Segment	Dalhousie Street	York Street	George Street
Pedestrian	Sidewalk Width	≥ 2.0m	≥ 2.0m	1.5m
	Boulevard Width	0m	0m	> 2.0m
	Average Daily Curb Lane Traffic Volume	> 3000 vpd	< 3000 vpd	< 3000 vpd
	On-Street Parking	Yes	Yes	Yes
	Operating Speed	50 km/h	50 km/h	50 km/h
	Platoon Flow	< 500 ped/h	< 250 ped/h	< 250 ped/h
	Level of Service	B	B	C
	Target	A	A	A
Cyclist	Road Classification	Collector	Local	Local
	Bike Route Classification	No Class	Local Route	No Class
	Type of Bikeway	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Travel Lanes	2	2	2
	Centerline Markings	Yes	Yes	Yes
	Operating Speed	50 km/h	50 km/h	50 km/h
	Level of Service	D	D	D
	Target	D	B	D
Transit	Facility Type	Mixed Traffic	-	-
	Friction/Congestion/Incident Potential	Moderate	-	-
	Level of Service	E	-	-
	Target	D	-	-
Truck	Lane Width	≥ 3.7m	-	≥ 3.7m
	Travel Lanes (per direction)	1	-	1
	Level of Service	B	-	B
	Target	D	-	-
Auto	Level of Service	F	A	A
	Target	E	E	E

The results of the segment multi-modal level of service (MMLOS) analysis are as follows:

- No roadways meet the pedestrian level of service (PLOS);
- Dalhousie Street and George Street meet the bicycle level of service (BLOS), while York Street does not;
- As the only roadway to provide service to transit, Dalhousie Street does not meet the transit level of service (TLOS);
- As the only roadway with a target for trucks, Dalhousie Street meets the truck level of service (TkLOS);
- York Street and George Street meet the vehicular level of service (Auto LOS), while Dalhousie Street does not.

No roadway meets the target PLOS. Per Exhibit 4 of the MMLOS guidelines, the only factors that can improve Dalhousie Street's segment PLOS is a reduction of the operating speed to 30 km/h, or a reduction of the daily curb lane traffic volumes to 3000 vehicles per day.

The south side of York Street, which directly connects to the subject site, does meet the target PLOS. However, the north side only achieves a PLOS B due to the lack of a boulevard. The addition of a minimum 0.5m boulevard on the north side of York Street would upgrade the PLOS for this segment to PLOS A. This option could be considered by the City if they wish to address this deficiency.

The south side of George Street meets the target PLOS. The north side of George Street, which directly connects to the subject site, does not meet the target PLOS, achieving only a PLOS C. Widening the sidewalk to 1.8m would improve the PLOS for this segment to PLOS A. The ROW is constrained in this area, and another cross-sectional element would need to be reduced by 0.3m to accommodate this widening.

York Street does not meet the target BLOS. *Ontario Traffic Manual – Book 18* provides a bike facility selection tool based on the operating speed and AADT of a roadway. Given the operating speed and traffic volumes on York Street, the selection tool recommends shared lane marking or wide curb lanes. Per Exhibit 11 of the MMLOS guidelines, providing a wide bike lane plus parking lane of at least 4.25m would improve the BLOS of York Street to BLOS B, as long as blockages of the bike lane are infrequent. The adjacent section of York Street is divided with a paved width of 7.25m in each direction. A 4.25m bike lane plus parking lane and 3m travel lane could be accommodated through pavement marking. Alternatively, reducing the operating speed to 40 km/h would improve the BLOS of York Street to BLOS B. A copy of the bicycle facility selection tool for York Street are included in **Appendix E**.

Dalhousie Street does not meet the target TLOS. While the segment between York Street and George Street has only one driveway on each side of the road, street parking is permitted for virtually the entire length of the segment, increasing friction and incident potential. The TLOS for Dalhousie Street can be improved by restricting on-street parking.

Dalhousie Street does not meet the target Auto LOS. To alleviate the failing conditions during the AM peak hour, a reduction of approximately 20 northbound and 210 southbound vehicles is required. Similarly, during the PM peak hour, a reduction of approximately 20 northbound and 90 southbound vehicles is required. Traffic volumes are expected to decrease with the implementation of the Confederation Line LRT.

5.4 Access Design

The existing egress driveway on York Street will be removed as part of the proposed development, and full-height curb and sidewalks will be reinstated as per City standards.

Section 25 (c) of the *Private Approach By-Law* identifies a maximum width requirement of 9m for two-way accesses. Section 107 (1)(a) of the *Zoning By-Law* identifies a minimum width requirement of 6.7m for a two-way driveway to a parking lot, and 6.0m for a two-way driveway to a parking garage. The accesses on Dalhousie Street and George Street are both intended to accommodate two-way traffic, and each access has a width of 6.7m, thereby meeting these requirements. Depressed curb and continuous concrete sidewalks shall be provided across the full width of both accesses, in accordance with City standards.

It is noted that the subject site does not abut or lie within 46m of an arterial or major collector roadway. The nearest arterial roadway is Rideau Street, approximately 100m from the subject site, measuring from the nearest edges of the subject site and the protected ROW. Based on the foregoing, Section 25 (o) of the City's *Private Approach By-Law* identifies a requirement to provide minimum spacing of 3m between the nearest edge of the development and the property line as measured at the intersecting street line.

The spacing between the nearest edge of the proposed access on George Street and the property line is approximately 2.6m at the street line, which is 0.4m less than the minimum spacing identified in the *Private Approach By-Law*. The spacing between the nearest edge of the access on Dalhousie Street and the property line is approximately 2.9m at the street line, which is 0.1m less than the minimum spacing identified in the *Private Approach By-Law*. It should be noted that the minimum clearance distance to the property line can be relaxed from 3m to 0.3m, provided there are no safety issues with doing so.

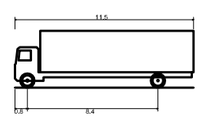
An AutoTURN analysis was performed for a Heavy Single Unit (HSU) truck entering and exiting the loading access on Dalhousie Street. Opposite the loading access, Dalhousie Street has a designated taxi stand. Trucks will reverse into the access when entering, and will encroach into both traffic lanes when entering and exiting the access. Given that the site is located in the downtown area, it is a common occurrence for loading vehicles to perform these manoeuvres, and is not a significant cause for concern. The entrance and exit manoeuvres are shown in **Figure 12** and **Figure 13**, respectively.

5.5 Transit

The previous CTS/TIS anticipated the subject site to generate approximately 159 transit trips during the AM peak hour (58 in, 101 out) and 161 transit trips during the PM peak hour (91 in, 70 out). With the hotel expansion included, the subject site is now anticipated to generate approximately 208 transit trips in the AM peak hour (87 in, 121 out) and 217 transit trips in the PM peak hour (118 in, 99 out). The difference in transit trips generated is not significant enough to warrant a new analysis of the transit component, as no capacity problems were anticipated on any of the adjacent bus routes or at any of the nearby bus stops in the previous CTS/TIS. Additionally, the completion of the Confederation Line LRT within the study area provides additional capacity for potential transit users.

HOTEL LOADING ZONE

HSU - Heavy Single Unit Truck



HSU - Heavy Single Unit Truck	
Overall Length	11.500m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.100m

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110 YORK STREET

HSU ENTRANCE

SCALE 1:250 0 2 4 6 8 10

DATE JUL 2018 | JOB 112142 | FIGURE FIGURE 12

HSU - Heavy Single Unit Truck

Overall Length	11.500m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.100m

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110 YORK STREET

HSU EXIT

SCALE 1:250 (0 2 4 6 8 10)
DATE JUL 2018
JOB 112142
FIGURE FIGURE 13

5.6 Intersection Design

5.6.1 Intersection MMLOS Analysis

This section provides a review of the study area intersections using complete streets principles. The MMLOS guidelines produced by IBI Group in October 2015 were used to evaluate the LOS of all intersections for each mode of transportation. As discussed in Section 5.3, the subject site's proximity to a future LRT station stipulate that the 'Within 600m of a Rapid Transit Station' policy area be used to evaluate whether the MMLOS targets are being met, regardless of the land use designation outlined in the Official Plan.

The full intersection MMLOS analysis is included in **Appendix F**. A summary of the results is shown in **Table 14**.

Table 14: Intersection MMLOS Summary

Intersection	PLOS		BLOS		TLOS		TkLOS		Auto LOS	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target
York Street/ Dalhousie Street	**D**	A	B	B	**E**	D	**E**	D	C	E
York Street/ Cumberland Street	**E**	A	B	B	-	-	-	-	B	E
George Street/ Dalhousie Street	**E**	A	D	D	D	D	D	D	E	E
George Street/ Cumberland Street	**E**	A	D	D	-	-	E	-	C	E
Rideau Street/ Dalhousie Street	**E**	A	**F**	D	**F**	C	D	D	D	E
Rideau Street/ Waller Street	**C**	A	D	D	B	C	D	D	B	E
Rideau Street/ Cumberland Street	**D**	A	D	D	B	C	D	D	C	E
Besserer Street/ Dalhousie Street	**D**	A	**F**	D	**E**	D	D	D	C	E
Besserer Street/ Waller Street	**D**	A	**F**	D	-	-	D	D	D	E

Based on the results of the intersection MMLOS analysis:

- No intersections meet the pedestrian level of service (PLOS);
- Rideau Street/Dalhousie Street, Besserer Street/Dalhousie Street, and Besserer Street/ Waller Street does not meet the bicycle level of service (BLOS);
- Of intersections with targets, York Street/Dalhousie Street, Rideau Street/Dalhousie Street, and Besserer Street/Dalhousie Street do not meet the transit level of service (TLOS);
- Of intersections with targets, only York Street/Dalhousie Street does not meet the truck level of service (TkLOS);
- All intersections meet the vehicular level of service (Auto LOS).

The following sections outline possible improvements to each intersection.

5.6.1.1 York Street/Dalhousie Street

York Street/Dalhousie Street does not meet the target PLOS A, TLOS D, or TkLOS D.

All approaches have wide single-lane approaches with on-street parking. Due to this configuration, it is not possible to achieve the target PLOS A without major modifications, and there are limited opportunities to improve from the current PLOS D. Without decreasing the lane widths or restricting turning movements, the level of comfort for pedestrians can be increased by implementing zebra-striped crosswalks at each approach. All approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks (greater than 400,000 vehicle/pedestrian conflicts over an eight-hour period). There is also limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles.

The north approach does not meet the target TLOS D. A decrease in the delay of five seconds or more would improve the TLOS of this intersection to a TLOS D. This can be achieved by implementing a transit queue jump lane at the north approach. On-street parking is restricted for approximately 25m immediately north of the intersection, as there is a bus stop at the stop bar of the north approach. The 2013 TMP indicates transit signal priority for Dalhousie Street between Rideau Street and Murray Street, including 'parking lane conversion in the immediate vicinity of selected intersections.'

All approaches do not meet the target TkLOS D. TkLOS is dependent on the effective corner radius. Dalhousie Street is a designated truck route, while York Street is neither a truck route nor an arterial roadway. Facilitating truck turning movements to/from York Street is not considered a priority in this case.

5.6.1.2 York Street/Cumberland Street

York Street/Cumberland Street does not meet the target PLOS A.

York Street has a four-lane divided cross-section, while Cumberland Street has a four-lane undivided cross section. Due to this configuration, it is not possible to achieve the target PLOS A without major modifications, and there are limited opportunities to improve from the current PLOS C/E. The level of comfort for pedestrians can be increased by implementing zebra-striped crosswalks at each approach. All approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks (greater than 400,000 vehicle/pedestrian conflicts over an eight-hour period). There is also limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles.

5.6.1.3 George Street/Dalhousie Street

George Street/Dalhousie Street does not meet the target PLOS A.

The north, east, and west approach have a four-lane undivided cross-section, while the south approach has a five-lane undivided cross-section. Due to this configuration, it is not possible to achieve the target PLOS A without major modifications, and there are limited opportunities to improve from the current PLOS D/E. The level of comfort for pedestrians can be increased by implementing zebra-striped crosswalks at each approach. All approaches meet the City's vehicle/pedestrian

conflict threshold for zebra-striped crosswalks (greater than 400,000 vehicle/pedestrian conflicts over an eight-hour period). There is also limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles.

5.6.1.4 George Street/Cumberland Street

George Street/Cumberland Street does not meet the target PLOS A.

All approaches have a three-lane undivided cross-section, though the south approach also includes a bike lane. Left turn movements are restricted at the north approach. Road modifications in 2015 provided a southbound shared through/right turn lane on Cumberland Street, and included the removal of a right turn channel and the addition of a curb extension at the north approach. Additional curb extensions at the other approaches would help improve the PLOS, but it would still not achieve the target PLOS A. The level of comfort for pedestrians can be increased by implementing zebra-striped crosswalks at each approach. All approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks (greater than 400,000 vehicle/pedestrian conflicts over an eight-hour period). There is also limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles.

5.6.1.5 Rideau Street/Dalhousie Street

Rideau Street/Dalhousie Street does not meet the target PLOS A, BLOS D, or TLOS D.

The north and east approaches have a five-lane undivided cross-section, while the south and west approaches have a four-lane undivided cross-section. Due to this configuration, it is not possible to achieve the target PLOS A without major modifications. As such, there are limited opportunities to improve from the current PLOS D/E. Zebra-striped crosswalks have been implemented at all approaches.

The north and east approaches do not meet the target BLOS D, based on left turn accommodation. The target BLOS D can be achieved by implementing two-stage left-turn bike boxes at the north and east approaches, while a BLOS A can be achieved by implementing two-stage left-turn bike boxes at all approaches.

The south approach (Dalhousie Street) and west approach (Rideau Street) do not meet the target TLOS D. Exhibit 16 of the MMLOS guidelines indicates that intersections with a TLOS E are typically those with 'transit signal priority and long cycle lengths.' Implementing transit queue jump lanes on Dalhousie Street will improve the TLOS, but may not achieve the target TLOS D. Rideau Street from Sussex Drive to Dalhousie Street was recently renewed to support the Confederation Line LRT's Rideau Station. The eastbound bus lane was removed as part of this renewal, in order to provide a significantly wider sidewalk and improve streetscaping.

5.6.1.6 Rideau Street/Waller Street

Rideau Street/Waller Street does not meet the target PLOS A.

The south and west approaches can be used by pedestrians, and currently achieve a PLOS C. The south approach has a three-lane undivided cross-section, while the west approach has a four-lane undivided cross-section. Both approaches have implemented curb extensions and zebra-striped

crosswalks. There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles.

5.6.1.7 Rideau Street/Cumberland Street

Rideau Street/Cumberland Street does not meet the target PLOS A.

Only the south approach achieves PLOS A. The north approach has a three-lane undivided cross-section with bike lane, the east approach has a four-lane undivided cross-section, and the west approach has a five-lane undivided cross-section. Only the north and west approaches contain conflicts with both left turn and right turn movements. All approaches currently implement zebra-striped crosswalks. It is not possible to achieve the target PLOS A without major road modifications, and there are limited opportunities to improve from the current PLOS C/D. The level of comfort for pedestrians can be somewhat improved through the implementation of raised crosswalks on Cumberland Street. There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles.

5.6.1.8 Besserer Street/Dalhousie Street

Besserer Street/Dalhousie Street does not meet the target PLOS A, BLOS D, or TLOS D.

The north and east approaches can be used by pedestrians. The north approach has a four-lane undivided cross-section, while the east approach has a three-lane undivided cross-section. Based on PETSI score, the east approach can achieve a PLOS A with the implementation of zebra-striped crosswalks. There are limited opportunities to improve the PLOS of the north approach, although the implementation of zebra-striped crosswalks can somewhat improve the level of comfort for pedestrians. Each approach meets the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks (greater than 400,000 vehicle/pedestrian conflicts over an eight-hour period). There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles.

The north approach does not meet the target BLOS D, based on right turn characteristics. There is limited opportunity in improving the BLOS at this approach, as Exhibit 12 of the MMLOS guidelines indicates a BLOS F for right turn lanes longer than 50m, regardless of operating speed or turning speed. Based on the southbound traffic volumes on Dalhousie Street, the removal of the right turn lane would cause volumes to exceed capacity. Therefore, there are no recommended improvements with regards to the intersection's BLOS.

The north approach does not meet the target TLOS D. To achieve this level of service, the delay must be reduced by five seconds or more. There is limited opportunity in improving the TLOS, without reducing vehicular traffic overall or converting a southbound travel lane to become exclusively for transit. Implementation of a bus lane at this approach will cause volumes to exceed capacity and cause blockages at upstream intersections.

5.6.1.9 Besserer Street/Waller Street

Besserer Street/Waller Street does not meet the target PLOS A or BLOS D.

The north, east, and west approaches can be used by pedestrians. The north approach has a three-lane undivided cross-section, while the east and west approaches have a four-lane undivided cross-section. It is not possible to achieve the target PLOS A for all approaches without major road modifications, and there are limited opportunities to improve the current PLOS C/D. There is also limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles.

The south approach does not meet the target BLOS D, based on both the left turn and right turn characteristics. Per Exhibit 12 of the MMLOS guidelines, the presence of dual left turn lanes equates to a BLOS F, and the presence of dual right turn lanes (shared or exclusive) equates to a BLOS F. Based on heavy peak hour turning volumes on Waller Street, the removal of the dual right turn lanes would cause volumes to exceed capacity. Therefore, there are no recommended improvements with regards to the intersection's BLOS.

5.6.2 Intersection Auto Analysis

Intersection capacity analysis has also been completed for the 2021/2026 total traffic conditions. The intersection parameters used in the analysis are consistent with the previous CTS/TIS, which selected a saturated flow rate of 1600 vphpl (vehicles per hour per lane) instead of 1800 vphpl to account for friction between adjacent parked vehicles, heavy pedestrian volumes, and the generally high conflict potential in the Byward Market area. This assumption ensures a more conservative and robust analysis within the study area.

Assumptions made regarding future traffic conditions are consistent with the previous CTS/TIS, and include:

- Despite the completion of the Confederation Line LRT, which is expected to increase the transit modal share and decrease the auto modal share, the background traffic volumes within the study area are expected to remain unchanged;
- There will be a significant increase in pedestrian volumes, but their effect on vehicular traffic is expected to be minimal due to the abundance of pedestrian crosswalks in the study area;
- The signal timings will remain unchanged, as the changes in lane geometry are relatively minor.

Additionally, the lane configuration of the road network within the study area reflects the completion of Phase 2 of the Rideau Street Renewal. The results of the analysis are summarized in **Table 15** table for the weekday AM and PM peak. Detailed reports are included in **Appendix G**.

Table 15: Intersection Analysis - 2021/2026 Total Traffic

Intersection	AM Peak			PM Peak		
	Max v/c or Delay	LOS	Movement	Max v/c or Delay	LOS	Movement
York Street/ Dalhousie Street	0.82	D	SBT	0.69	B	NBT
York Street/ Cumberland Street	0.66	B	WBT	0.62	B	NBT
George Street/ Dalhousie Street	0.66	B	SBT	0.98	E	NBT
George Street/ Cumberland Street	0.69	B	EBT	0.58	A	NBT
Rideau Street/ Dalhousie Street	0.61	B	SBT	0.94	E	EBT
Rideau Street/ Waller Street	0.49	A	WBL	0.64	B	EBT
Rideau Street/ Cumberland Street	0.65	B	WBT	0.79	C	NBT
Besserer Street/ Dalhousie Street	0.77	C	SBR	0.69	B	SBR
Besserer Street/ Waller Street	0.43	A	NBT/NBR	0.91	E	NBR
George Street/ Site Access(1)	10 sec	A	SBL/SBR	11 sec	B	SBL/SBR

1. Unsignalized intersection (stop controlled)

Following full buildout of the subject site, all intersections are expected to operate with an LOS E or better during the AM and PM peak hours. Given that the study area is designated as being within 600m of a rapid transit station, this level of service is acceptable.

Under these traffic conditions, the Synchro model identifies multiple intersections where the 95th percentile queue length may extend through the adjacent intersections. The 95th percentile queue length reflects the maximum queue length that is likely to be experienced during the peak hour, and is not anticipated to be sustained for a long period of time. During the AM peak hour, 95th percentile queues are anticipated to exceed capacity at southbound York Street/Dalhousie Street, northbound Rideau Street/Dalhousie Street, westbound Rideau Street/Waller Street, southbound Besserer Street/Dalhousie Street, and northbound Besserer Street/Waller Street. During the PM peak hour, 95th percentile queues are anticipated to exceed capacity at northbound George Street/Dalhousie Street, northbound and westbound Rideau Street/Dalhousie Street, northbound and eastbound Rideau Street/Cumberland Street, southbound Besserer Street/Dalhousie Street, and northbound Besserer Street/Waller Street.

A full-movement access is proposed along George Street, approximately 30m east of the intersection at George Street/Dalhousie Street. The access is anticipated to operate under acceptable conditions during the AM and PM peak hours. The 95th percentile westbound queue at George Street/Dalhousie

Street will be 35m in the AM peak hour and 50m in the PM peak hour. As such, the proposed access may be occasionally blocked during the AM and PM peak hours.

6.0 CONCLUSIONS AND RECOMMENDATIONS

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

Forecasting

- The net increase in trips generated by the proposed hotel expansion is approximately 87 person trips in the AM peak hour and 98 person trips in the PM peak hour, which includes an increase of 31 vehicle trips in the AM peak hour and 36 vehicle trips in the PM peak hour.

Development Design and Parking

- It is expected that garbage collection for the residential condominium block will take place at the north curb of George Street, as per Schedule B of the City's Solid Waste Management By-Law 2009-396. Occasional loading activities for the convenience market are also expected to take place at the north curb of George Street. These activities are not anticipated to have any significant disruption to traffic flow on George Street.

- Garbage collection and loading for the hotel will take place on-site, in the interior courtyard between the hotel and the residential condominium block. Vehicles for garbage collection and deliveries will be required to reverse into the loading access on Dalhousie Street.

- Approximately 136 vehicle parking spaces are proposed for the subject site at full buildout, meeting the minimum and maximum requirements of the ZBL.

- On-site bicycle parking will be provided in accordance with the minimum requirements of the ZBL, with the majority of spaces located in the underground parking garage.

Boundary Streets

- The results of the segment multi-modal level of service (MMLOS) analysis are as follows:
    - No roadways meet the pedestrian level of service (PLOS);
    - Dalhousie Street and George Street meet the bicycle level of service (BLOS), while York Street does not;
    - As the only roadway to provide service to transit, Dalhousie Street does not meet the transit level of service (TLOS);
    - As the only roadway with a target for trucks, Dalhousie Street meets the truck level of service (TkLOS);
    - York Street and George Street meet the vehicular level of service (Auto LOS), while Dalhousie Street does not.

- The PLOS of Dalhousie Street can only be improved with a reduction in the operating speed to 30 km/h or a reduction of the daily curb lane traffic volumes to 3000 vehicles per day.

- The PLOS of the north sidewalk on York Street can meet the target PLOS by implementing a sidewalk boulevard with a minimum width of 0.5m.

- The PLOS of the north sidewalk on George Street can meet the target PLOS by implementing a sidewalk width of 1.8m. Given the ROW constraints, another cross-sectional element would be required to undergo a 0.3m reduction.

- The BLOS of York Street can meet the target by implementing a wide bike lane plus parking lane of at least 4.25m, provided bike lane blockages would be infrequent. This can be accommodated through pavement marking.

- The TLOS of Dalhousie Street can meet the target by restricting on-street parking between York Street and George Street.

- The Auto LOS of Dalhousie Street does not meet the target, and requires a reduction of approximately 20 northbound and 210 southbound vehicles in the AM peak hour, and a reduction of approximately 20 northbound and 90 southbound vehicles in the PM peak hour. Traffic volumes are expected to decrease with the implementation of the Confederation Line LRT.

Access Design

- The parking garage access configuration has not changed since the previous CTS/TIS, and will therefore continue to accommodate the appropriate design vehicles.

- Section 25 (c) of the *Private Approach By-Law* identifies a maximum width requirement of 9m for two-way accesses. This requirement is met by both accesses.

- Section 107 (1)(a) of the *Zoning By-Law* identifies a minimum width requirement of 6.7m for a two-way driveway to a parking lot, and 6.0m for a two-way driveway to a parking garage. These requirements are met by both accesses.

- Section 25 (o) of the *Private Approach By-Law* identifies a minimum spacing requirement of 3m between the nearest edge of the access and the property line, as measured at the street line. The spacing between the proposed access on George Street and the property line is approximately 2.6m, and the spacing between the existing access on Dalhousie Street and the property line is approximately 2.9m. The minimum spacing requirement can be relaxed from 3m to 0.3m, provided there are no safety issues with doing so.

- The loading access on Dalhousie Street will accommodate the appropriate design vehicles. Loading vehicles will be required to reverse into the access, and drive forward to exit the access. During both manoeuvres, the loading vehicles will encroach into both travel lanes.

Transit

- The proposed development is not expected to have any measurable adverse effect on the capacity or the operation of the adjacent transit network, which will include the Confederation Line LRT.

Intersection Design

- The results of the intersection MMLOS analysis are as follows:
    - No intersections meet the pedestrian level of service (PLOS);
    - Only Besserer Street/Waller Street does not meet the bicycle level of service (BLOS);

  - Of intersections with targets, York Street/Dalhousie Street, Rideau Street/Dalhousie Street and Besserer Street/Dalhousie Street do not meet the transit level of service (TLOS);
  - Of intersections with targets, only York Street/Dalhousie Street does not meet the target truck level of service (TkLOS);
  - All intersections meet the vehicular level of service (Auto LOS).

- It is not possible for any roadway with four lanes or more to achieve the target PLOS A. Most approaches within the study area have at least four lanes, making the target PLOS unachievable without major road modifications. All intersections within the study area meet the warrant for zebra-striped crosswalks (>400,000 vehicle/pedestrian conflicts over an eight-hour period), and could be considered for intersections where they have not already been implemented.

- The BLOS of Besserer Street/Waller Street does not meet the target BLOS D due to the implementation of dual left turn and dual right turn lanes. The removal of these features would cause the traffic volumes to exceed capacity. Therefore, no improvements are recommended.

- The TLOS of York Street/Dalhousie Street and Besserer Street/Dalhousie Street can meet the target with a reduction in the average delay of five seconds or more. There are limited opportunities to improving the TLOS without reducing vehicular traffic overall at these intersections.

- The TLOS of Rideau Street/Dalhousie Street can improve to a TLOS E with the implementation of a transit queue jump lane on northbound Dalhousie Street. There are limited opportunities to improving the TLOS given the long cycle length of this intersection, and a TLOS D may not be achievable. The Rideau Street Renewal between Sussex Drive and Dalhousie Street removed an existing eastbound bus lane to widen the sidewalks and improve streetscaping.

- The TkLOS of York Street/Dalhousie Street does not meet the target TkLOS D, which is dependent on the effective corner radius. As York Street is neither a truck route nor an arterial roadway, facilitating truck turning movements to/from York Street is not considered a priority.

- All study area intersections are currently operating under acceptable conditions during the weekday AM and PM peak hours, and are expected to continue doing so within the timeframe of this study.

- Marginal increases in delay, v/c ratios, and queue lengths are expected at all study area intersections under the projected total traffic conditions at full buildout. All study area intersections are expected to continue operating under acceptable conditions.

- Based on the Synchro analysis, the 95th percentile queue lengths are expected to extend through adjacent intersections for the following approaches:
  - Southbound York Street/Dalhousie Street (AM peak)
  - Northbound George Street/Dalhousie Street (PM peak)
  - Northbound Rideau Street/Dalhousie Street (AM and PM peaks)
  - Westbound Rideau Street/Dalhousie Street (PM peak)

- Westbound Rideau Street/Waller Street (AM peak)
- Northbound/Eastbound Rideau Street/Cumberland Street (PM peak)
- Southbound Besserer Street/Dalhousie Street (AM and PM peaks)
- Northbound Besserer Street/Waller Street (AM and PM peaks)

- Based on the Synchro analysis, the 95th percentile westbound queue at George Street/ Dalhousie Street in the AM peak and PM peak hours may extend beyond the proposed parking garage access on George Street. As such, the proposed access may occasionally experience blocking during the peak hours. The analysis also shows that the proposed parking garage access will still operate acceptably during the AM and PM peak hours.

NOVATECH

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APPENDIX A

Conceptual Site Plan

DALHOUSIE ST.

GEORGE ST.

YORK ST.

N

EXISTING BUILDING
3 FLOORS

EXISTING BUILDING
2 FLOORS

EXISTING BUILDING
1 FLOOR

FUTURE BUILDING
141 GEORGE ST.
22 FLOORS

ANDAZ HOTEL

EXISTING AREA TO BE MODIFIED

RECEIVING ACCESS

LOT LINE

20 446
67' - 1"

3 310
10' - 10 1/2"

4 620
15' - 2"

1 930
6' - 4"

RECEIVING

GAZ

KITCHEN

STORAGE

WC

WC

STOR.

PRE FUNCTION

GREAT ROOM

OUTLINE OF BUILDING ABOVE

LINEN CHUTE

UP

DN

101 500

100 000

6 700
22' - 0"

6 800
22' - 3 1/2"

6 700
22' - 0"

6 000
19' - 8"

6 000
19' - 8"

6 000
19' - 8"

6 000
19' - 8"

6 000
19' - 8"

16 450
53' - 11 1/2"

A B C D E F F' G

1 2 2.2 2.8 3 3.2 4

1/15

1/16

1/17

1/18

VERTICAL CIRCULATION

MECHANICAL / STORAGE

HOTEL BACK OF HOUSE

SANITARY BLOCK

RECEPTION AREA

HOTEL

EXISTING

EXISTING PARKING

GROUND FLOOR PLAN

ÉCHELLE = 1:300

APPENDIX B

TIA Screening Form

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	**110 York Street**
Description of Location	**Southeast corner of York Street and Dalhousie Street**
Land Use Classification	**Hotel (expansion)**
Development Size (units)	**128 units**
Development Size (m^2)	**-**
Number of Accesses and Locations	**One access to parking garage on George Street; one loading access on Dalhousie Street**
Phase of Development	**1**
Buildout Year	**2021**

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

2. Trip Generation Trigger

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

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

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

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

3. Location Triggers

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

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

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

4. Safety Triggers

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

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

5. Summary

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

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

APPENDIX C

2015 Traffic Counts

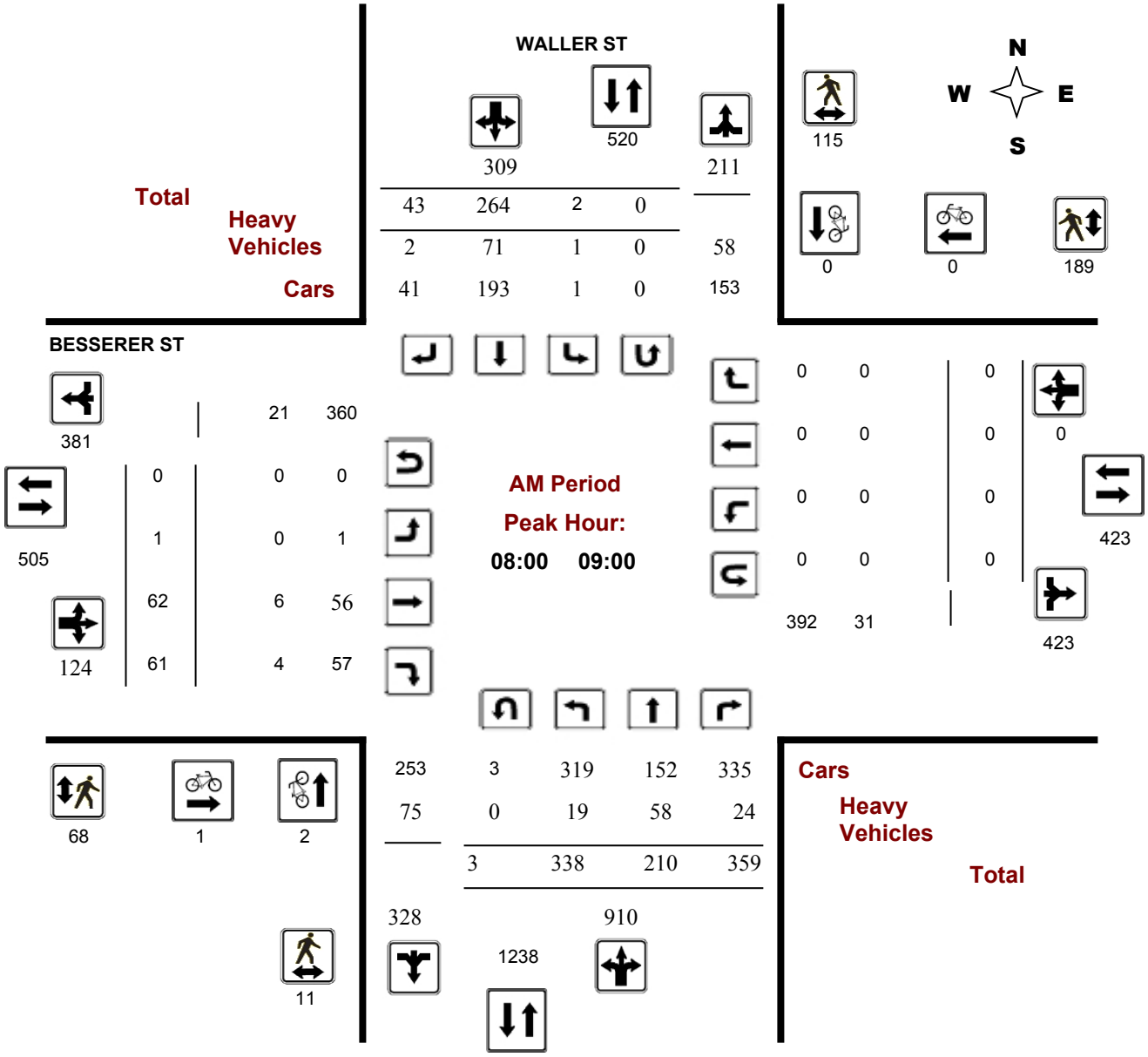
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

BESSERER ST @ WALLER ST

Survey Date: Thursday, April 09, 2015
Start Time: 07:00

WO No: 34440
Device: Miovision



Comments

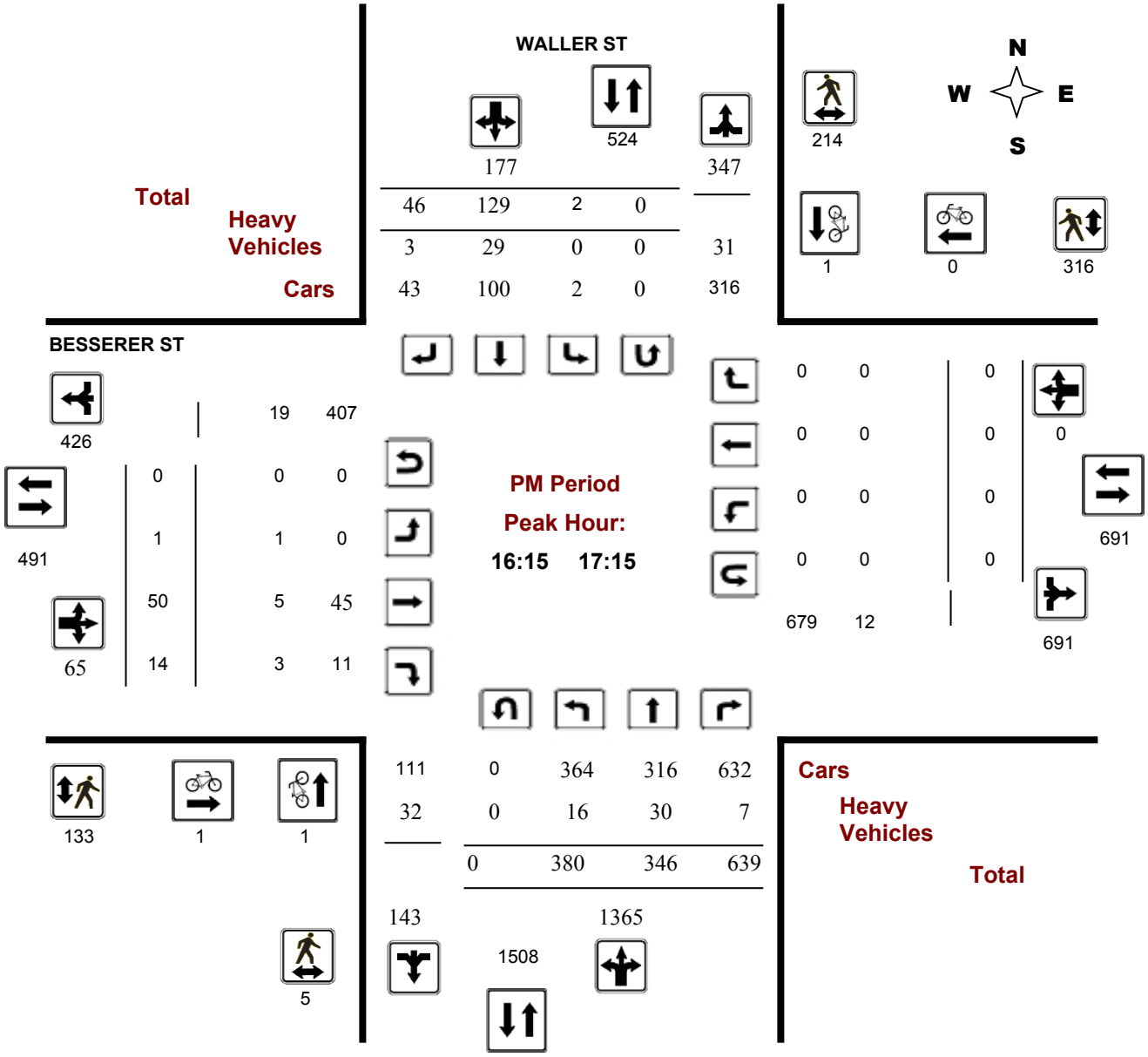
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

BESSERER ST @ WALLER ST

Survey Date: Thursday, April 09, 2015 **WO No:** 34440

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



Comments

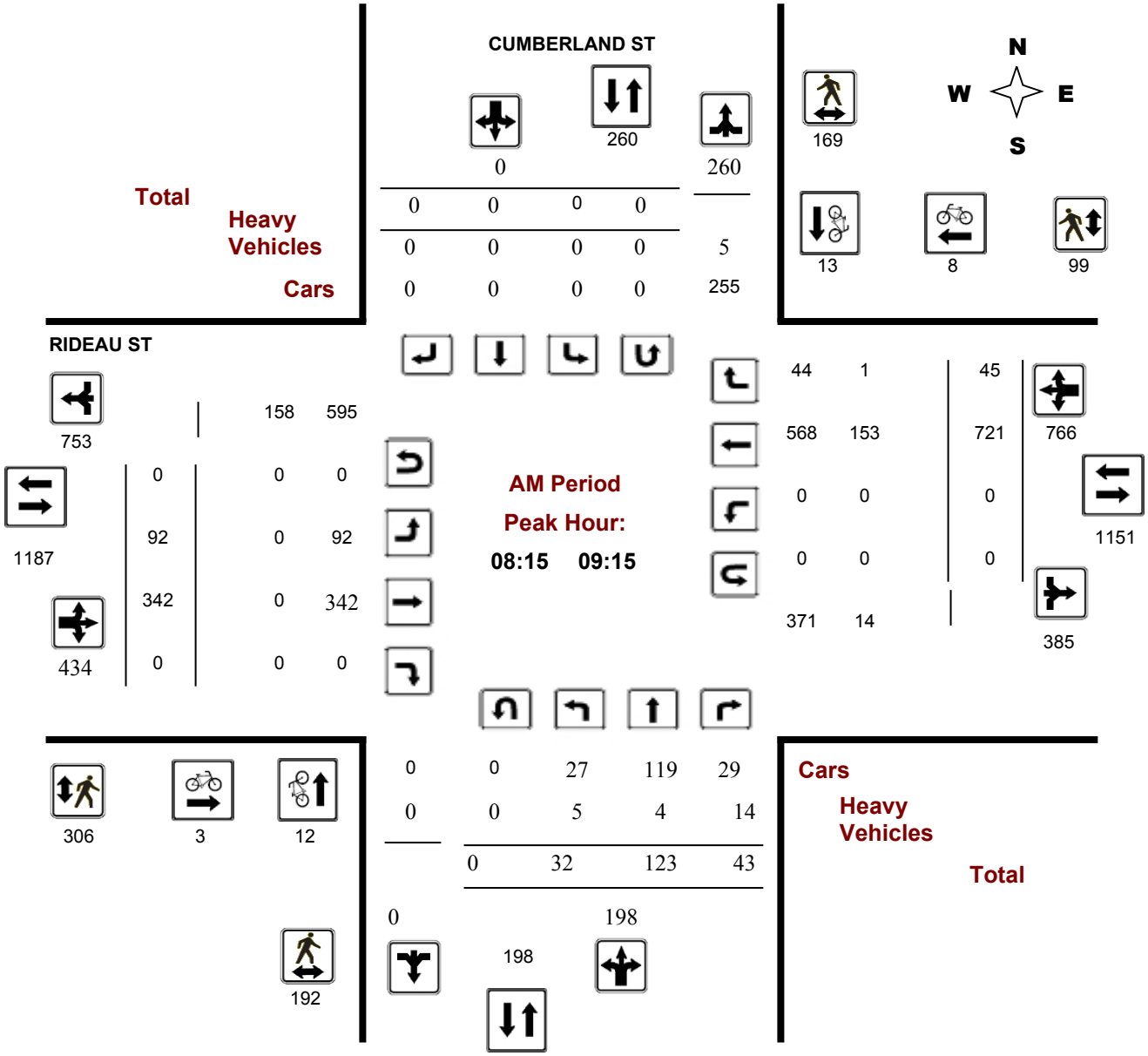
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

CUMBERLAND ST @ RIDEAU ST

Survey Date: Friday, May 29, 2015
Start Time: 07:00

WO No: 34505
Device: Jamar Technologies, Inc



Comments

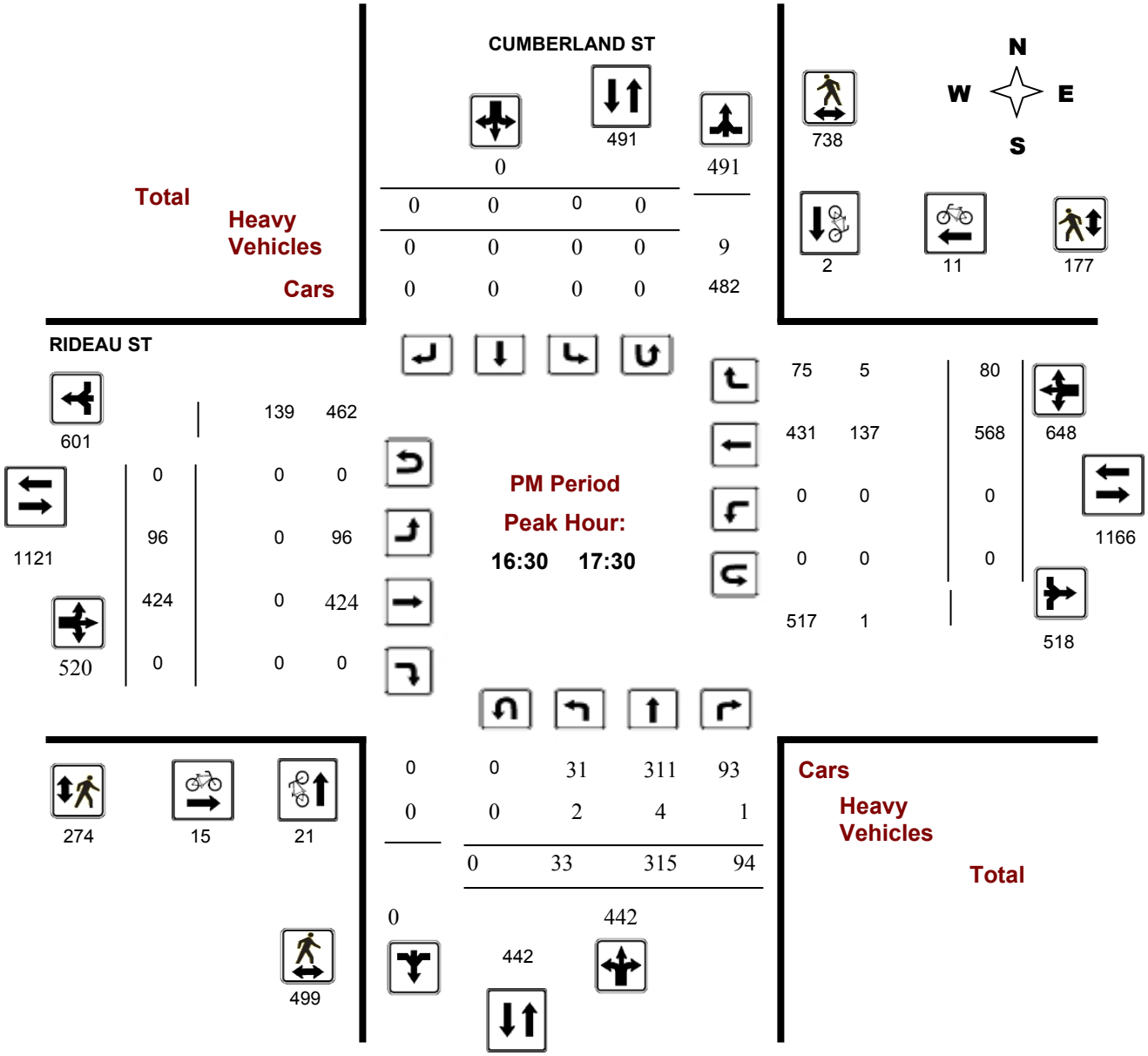
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

CUMBERLAND ST @ RIDEAU ST

Survey Date: Friday, May 29, 2015
Start Time: 07:00

WO No: 34505
Device: Jamar Technologies, Inc



Comments

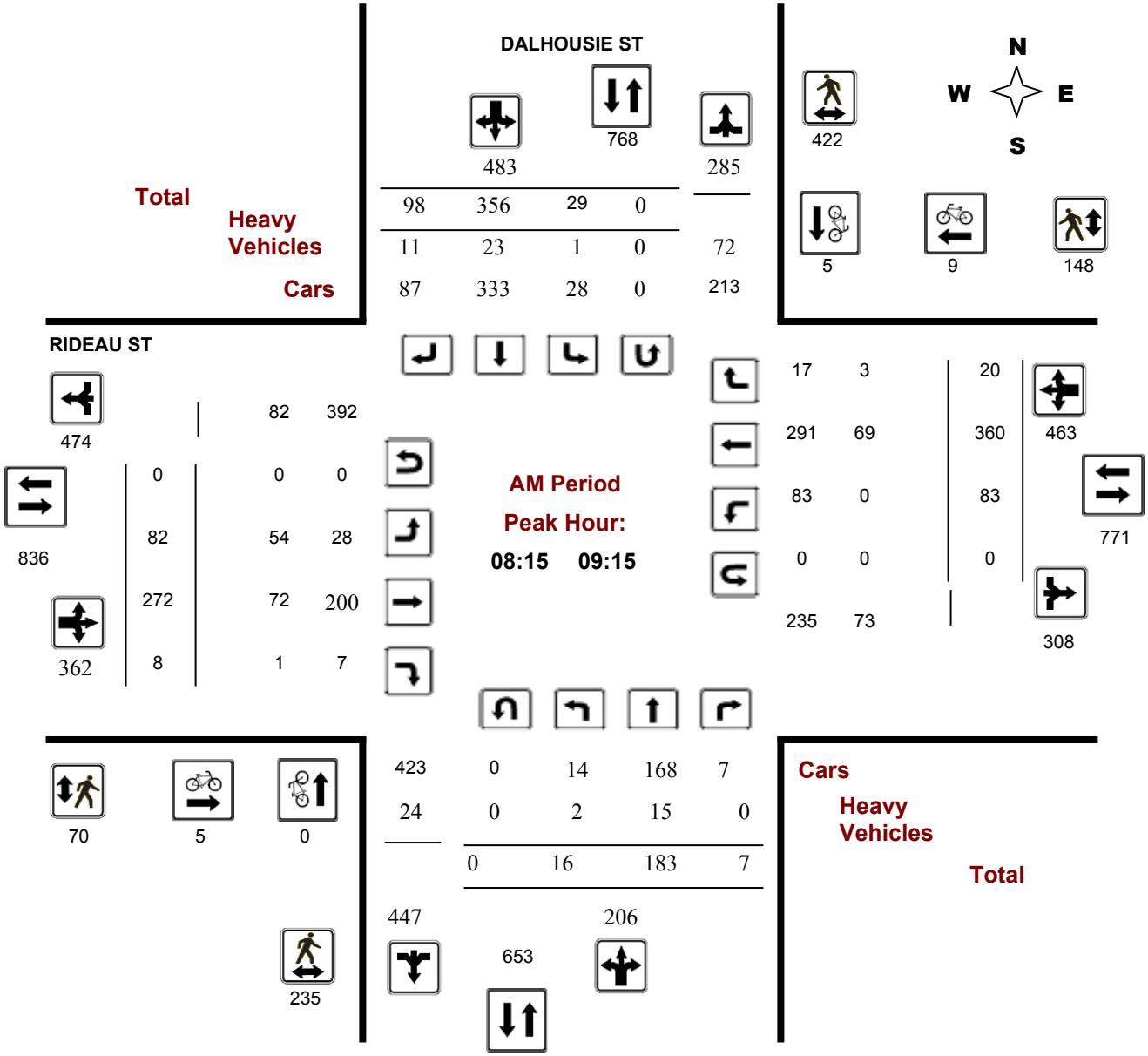
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

DALHOUSIE ST @ RIDEAU ST

Survey Date: Friday, May 29, 2015
Start Time: 07:00

WO No: 34504
Device: Jamar Technologies, Inc



Comments

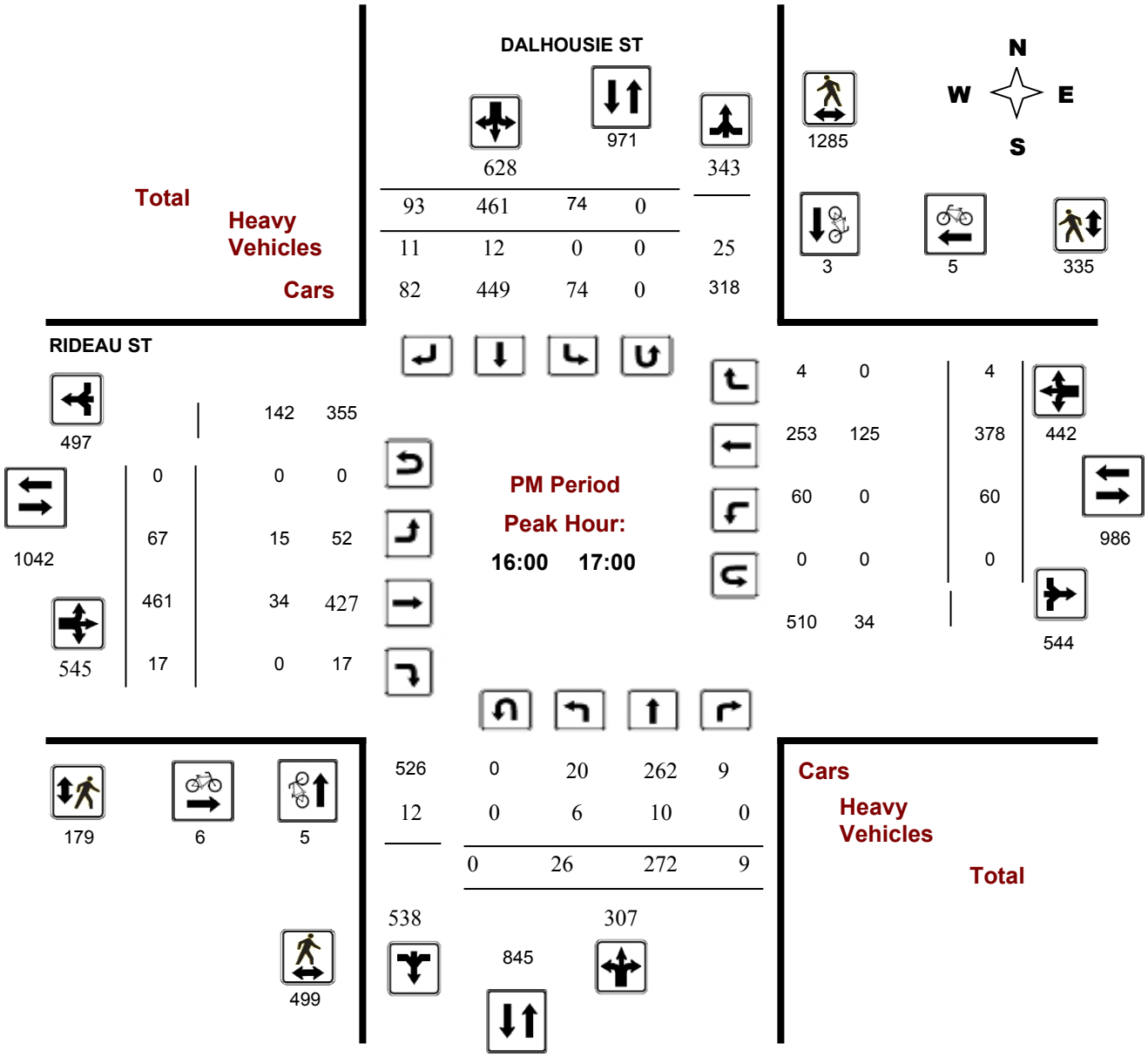
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

DALHOUSIE ST @ RIDEAU ST

Survey Date: Friday, May 29, 2015
Start Time: 07:00

WO No: 34504
Device: Jamar Technologies, Inc



Comments

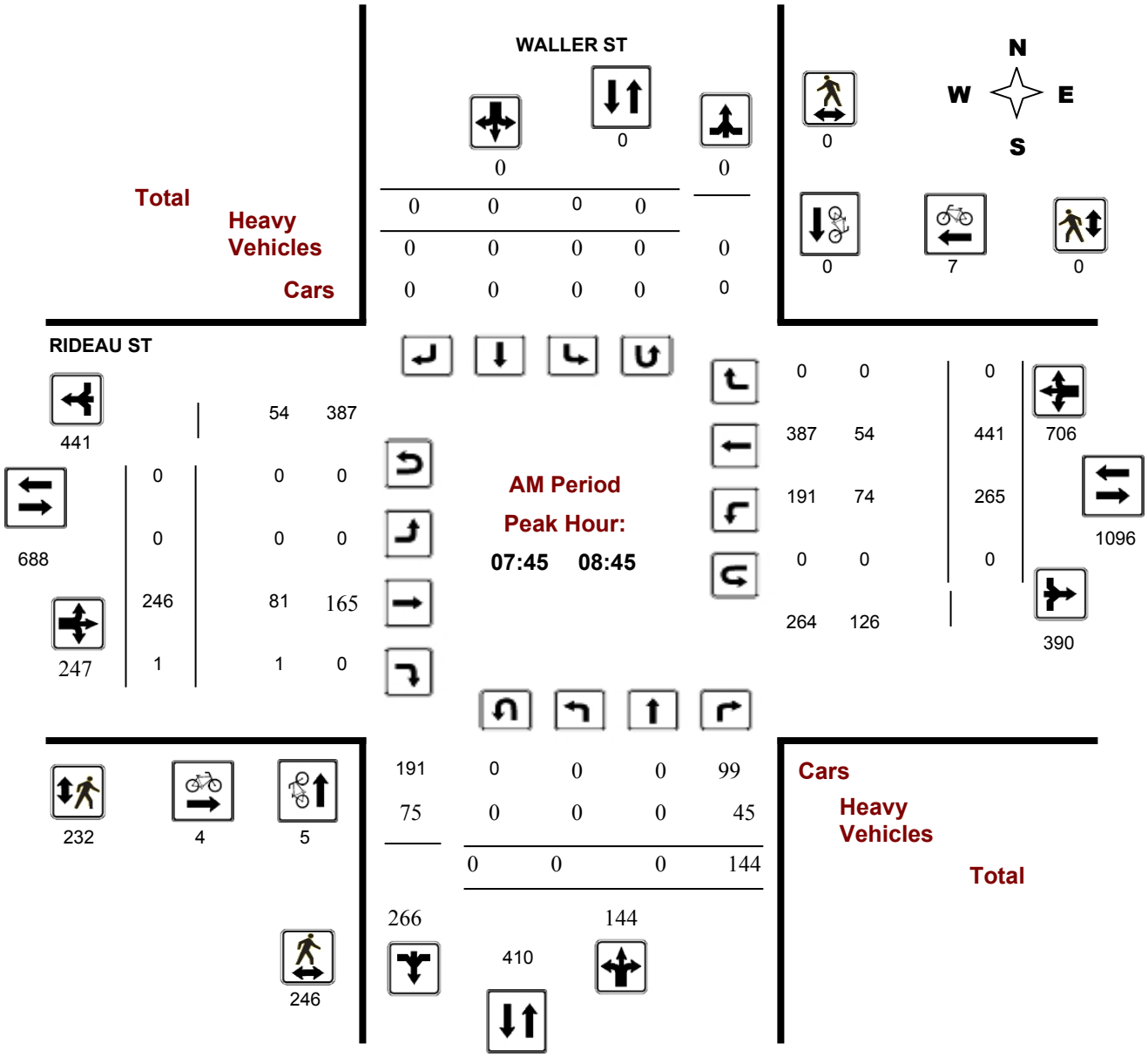
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

RIDEAU ST @ WALLER ST

Survey Date: Thursday, May 28, 2015
Start Time: 07:00

WO No: 34500
Device: Jamar Technologies, Inc



Comments

Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

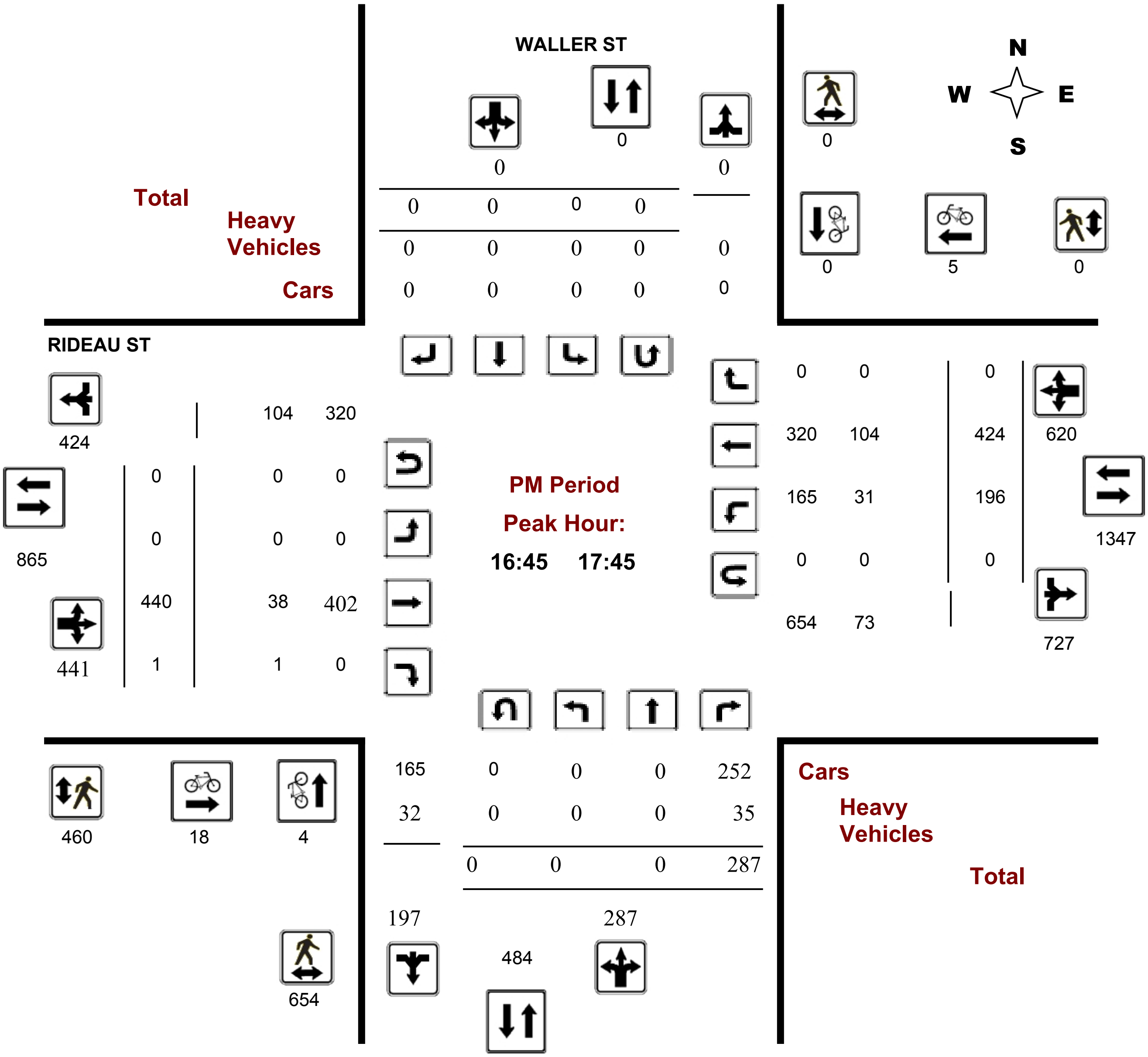
RIDEAU ST @ WALLER ST

Survey Date: Thursday, May 28, 2015

Start Time: 07:00

WO No: 34500

Device: Jamar Technologies, Inc



Comments

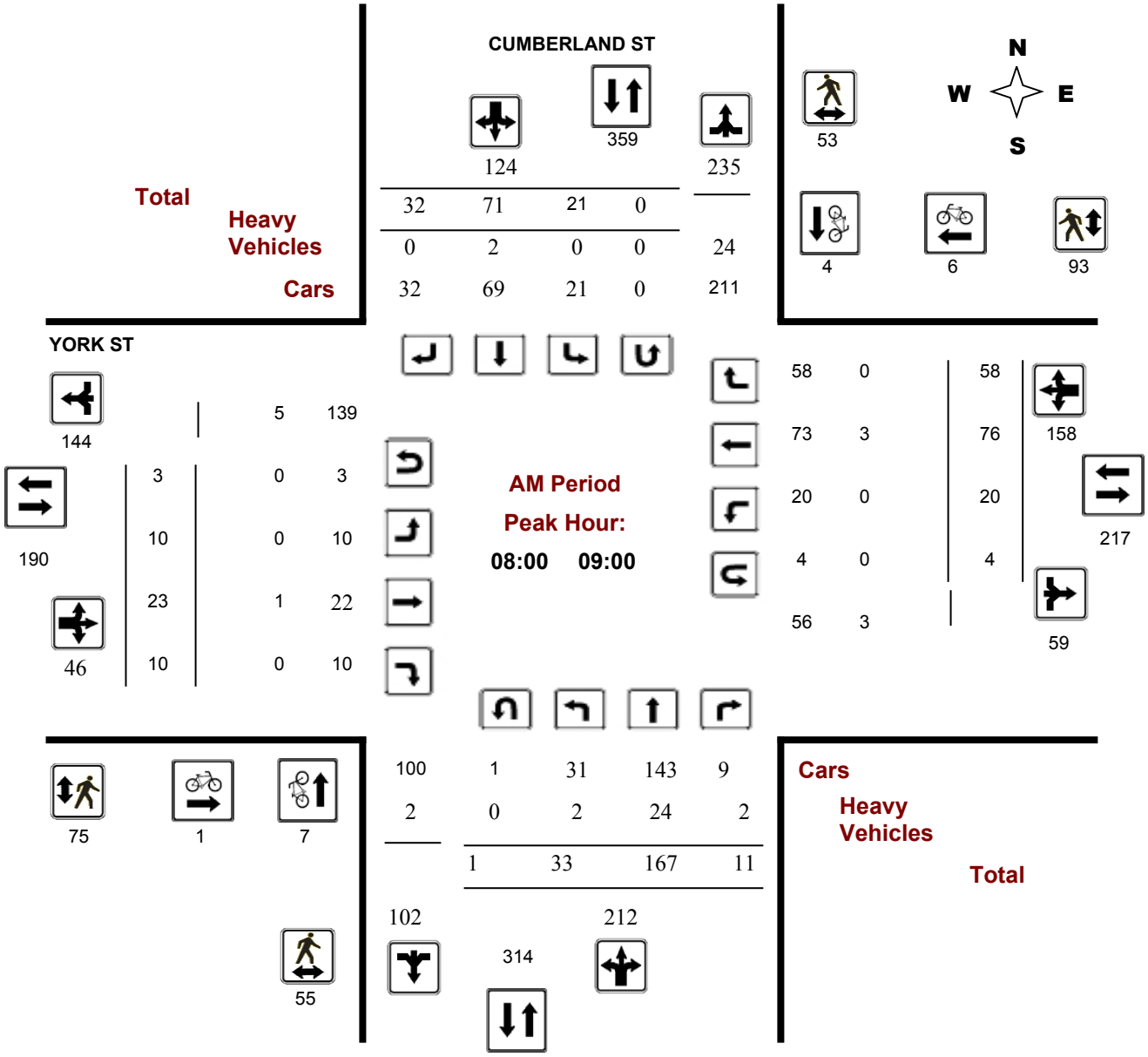
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

CUMBERLAND ST @ YORK ST

Survey Date: Thursday, April 09, 2015
Start Time: 07:00

WO No: 34441
Device: Miovision



Comments

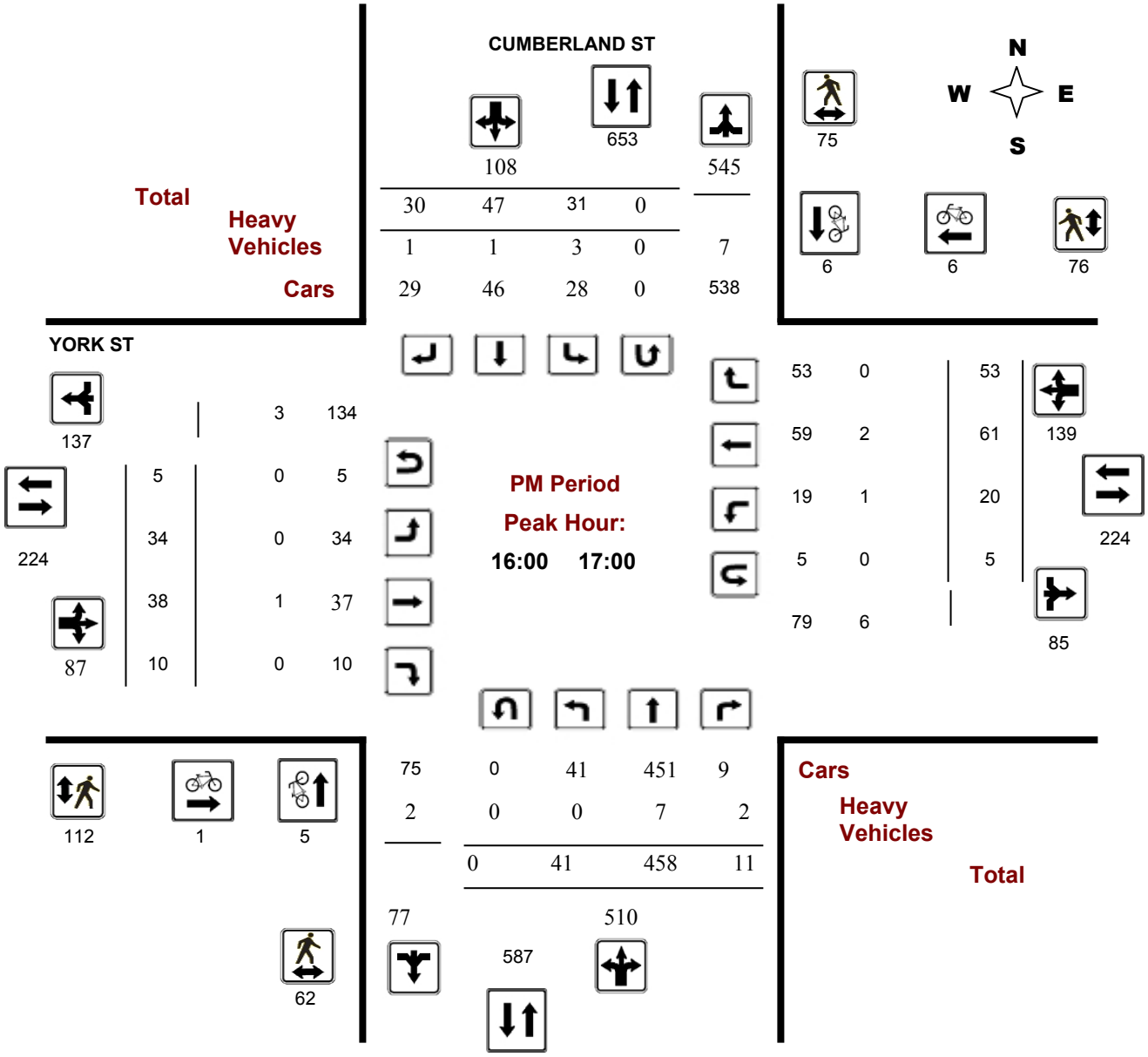
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

CUMBERLAND ST @ YORK ST

Survey Date: Thursday, April 09, 2015
Start Time: 07:00

WO No: 34441
Device: Miovision



Comments

APPENDIX D

Excerpts from 245 Rideau Street Redevelopment

PARSONS

1223 Michael Street, Suite 100 • Ottawa, Ontario K1J 7T2 • (613) 738-4160 • Fax: (613) 739-7105 • www.parsons.com

23 July 2015

OUR REF: TO3131TOV

EMAIL: neil.malhotra@claridgehomes.com

Claridge Homes
210 Gladstone Avenue
Suite 201
Ottawa, ON K2P 0Y6

Attention: Mr. Neil Malhotra

Dear Neil:

Re: 245 Rideau Street
Addendum #3 to the Transportation Brief

1. Introduction

This Addendum #3 to the above-noted Transportation Brief has been prepared to respond to the City's transportation-related comments (dated July 13, 2015) on the most recent Site Plan Application, and to address any proposed changes to the Site Plan that have occurred in the interim. The current Site Plan is shown as Figure 1.

2. Updated Peak Hour Traffic Generation

Since the submission of our 6 May, 2015 Addendum #2, the proposed on-site land uses have changed as follows:

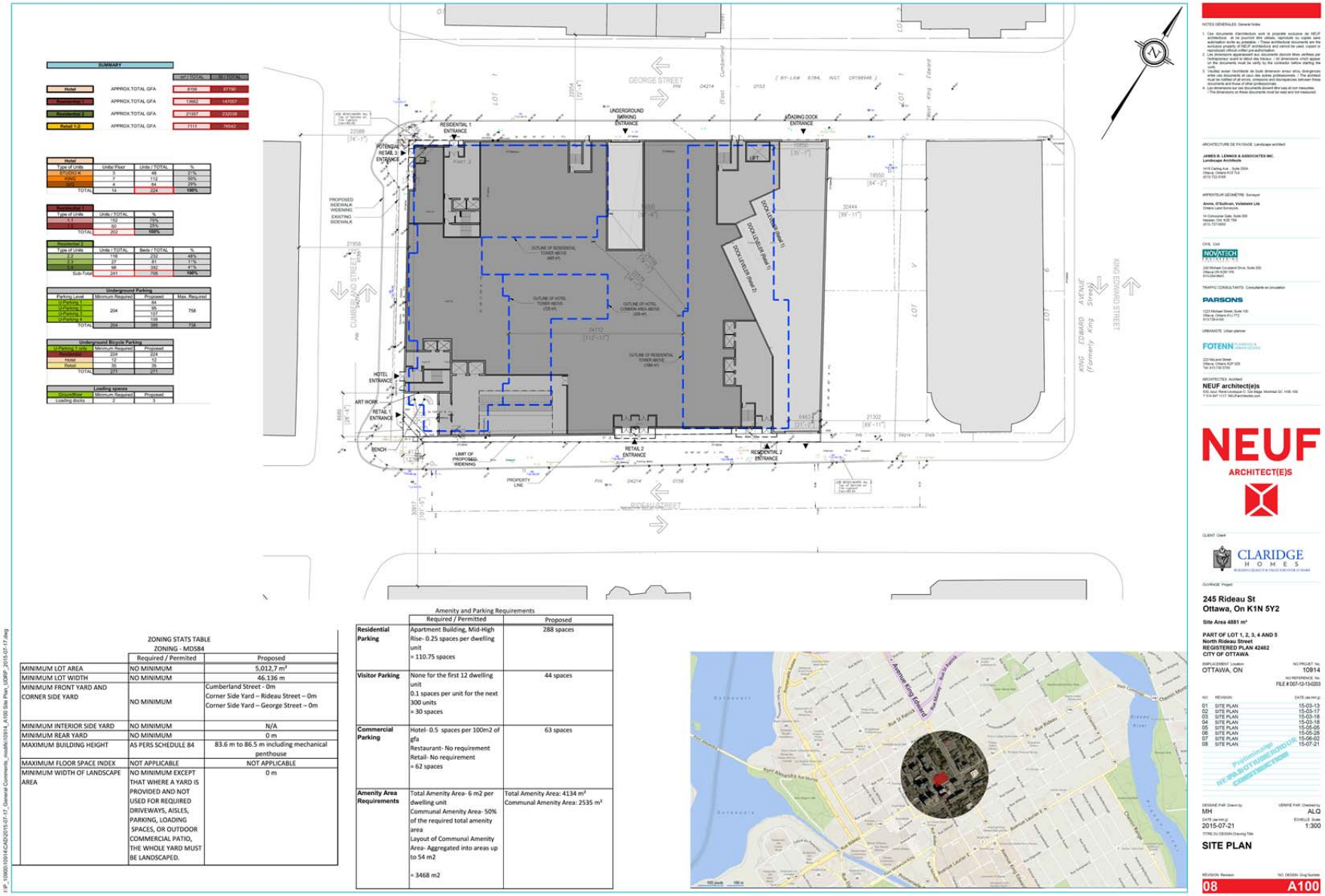
Table 1: Updated Land Use Size

Land Use	Now	Previous	Net Change
Residential Units	443	481	-38 units
Hotel Rooms	224	224	0
Retail Food Store and General Retail (GFA)	7111 m^2	8290 m^2	-1179 m^2
Car Parking	395*	471	-76 spaces
Bicycle Parking	271*	n/a	0

*Parking supply meets By-Law requirements

As can be seen from Table 1, the current Site Plan contains less parking, fewer units and less retail floor area, all of which combined will result in a reduction in the site's peak hour traffic generation assumed in previous reports and addendums. As the net site traffic generation was relatively low in these previous reports, as the study area intersections were projected to operate acceptably, and as the projected reduction in traffic would not be significant, the analysis herein is based on the previous, slightly higher, site traffic generation.

Figure 1: Site Plan



ZONING STATS TABLE
ZONING - MD5B4

	Required / Permited	Proposed
MINIMUM LOT AREA	NO MINIMUM	5,012,7 m²
MINIMUM LOT WIDTH	NO MINIMUM	46.136 m
MINIMUM FRONT YARD AND CORNER SIDE YARD	NO MINIMUM	Cumberland Street - 0m Corner Side Yard – Rideau Street – 0m Corner Side Yard – George Street – 0m
MINIMUM INTERIOR SIDE YARD	NO MINIMUM	N/A
MINIMUM REAR YARD	NO MINIMUM	0 m
MAXIMUM BUILDING HEIGHT	AS PERS SCHEDULE 84	83.6 m to 86.5 m including mechanical penthouse
MAXIMUM FLOOR SPACE INDEX	NOT APPLICABLE	NOT APPLICABLE
MINIMUM WIDTH OF LANDSCAPE AREA	NO MINIMUM EXCEPT THAT WHERE A YARD IS PROVIDED AND NOT USED FOR REQUIRED DRIVEWAYS, AISLES, PARKING, LOADING SPACES, OR OUTDOOR COMMERCIAL PATIO, THE WHOLE YARD MUST BE LANDSCAPED.	0 m

Amenity and Parking Requirements

	Required / Permitted	Proposed
Residential Parking	Apartment Building, Mid-High Rise- 0.25 spaces per dwelling unit = 110.75 spaces	288 spaces
Visitor Parking	None for the first 12 dwelling unit 0.1 spaces per unit for the next 300 units = 30 spaces	44 spaces
Commercial Parking	Hotel- 0.5 spaces per 100m2 of gfa Restaurant- No requirement Retail- No requirement = 62 spaces	63 spaces
Amenity Area Requirements	Total Amenity Area- 6 m2 per dwelling unit Communal Amenity Area- 50% of the required total amenity area Layout of Communal Amenity Area- Aggregated into areas up to 54 m2 = 3468 m2	Total Amenity Area: 4134 m² Communal Amenity Area: 2535 m²

3. Response to City Comments

TRANSPORTATION

Comment 48a: *The City has made recent changes to Cumberland Street. There is now a southbound right-turn lane on Cumberland Street between Rideau Street and George Street.*

Response 48a: With the City's recent change to make Cumberland Street a two-way street, we have reassigned existing traffic and conducted an existing conditions level of service analysis. The new lane arrangements, reassigned traffic volumes, and level of service analysis results follow, with the SYNCHRO analysis included as Appendix A.

Figure 2: New Existing Lane Configuration

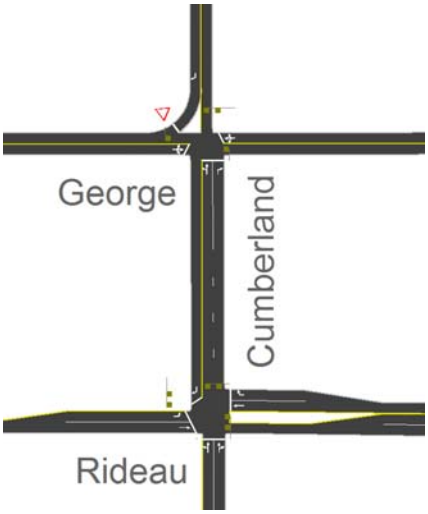


Figure 3: Existing Intersection Volumes – Assumed Volumes along Southbound Cumberland

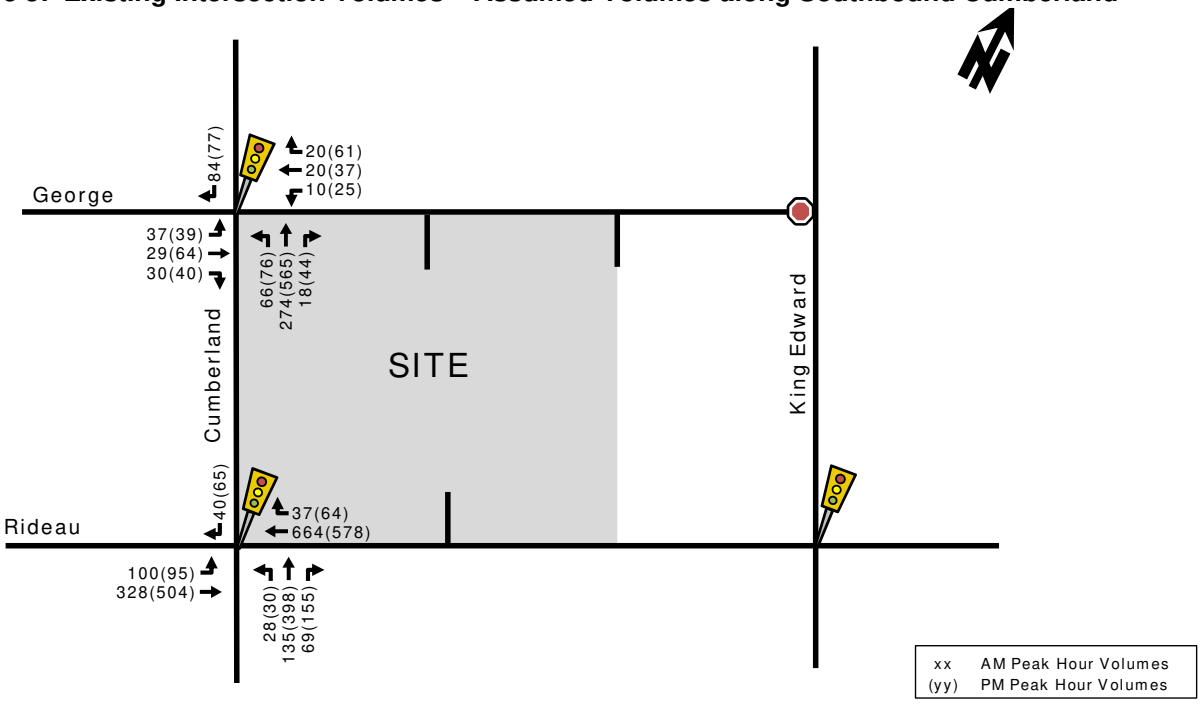


Table 2: Revised Existing Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Cumberland/George	A(B)	0.37(0.62)	EBT(EBT)	10.9(34.3)	A(A)	0.31(0.55)
Cumberland/Rideau	D(E)	0.81(0.95)	WBT(NBT)	24.1(41.6)	C(D)	0.73(0.87)
Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

As can be seen, the two key adjacent intersections currently operate in the acceptable LoS 'A' to LoS 'D' range when looked at 'as a whole'. The most critical movement is the northbound through movement at the Rideau/Cumberland intersection, which operates at LoS 'E' with a v/c of 0.95.

Comment 48b: *Any proposed roadway narrowing or the removal of the northbound right-turn lane on Cumberland Street must be detailed in the Transportation Brief or by addendum.*

Response 48b: With the City's request for a wider sidewalk along the site's Cumberland frontage, Claridge's proposed solution to accommodate this request while maintaining curb side parking is to reduce the number of adjacent northbound through lanes from two to one. The resultant proposed lane arrangements, total projected traffic volumes, and the related levels of service follow, with the SYNCHRO analysis included as Appendix B. The total projected volumes include the new existing volumes plus site-generated traffic at full site buildout.

Figure 4: Proposed Cumberland Lane Configuration

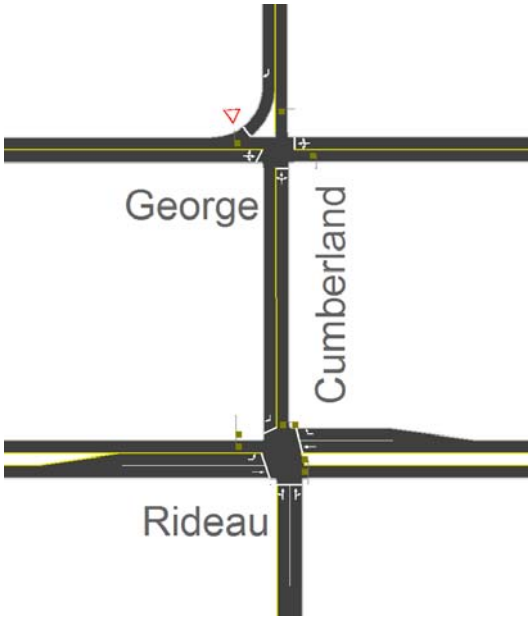


Figure 5: Total Projected Intersection Volumes (new existing plus site-generate traffic)

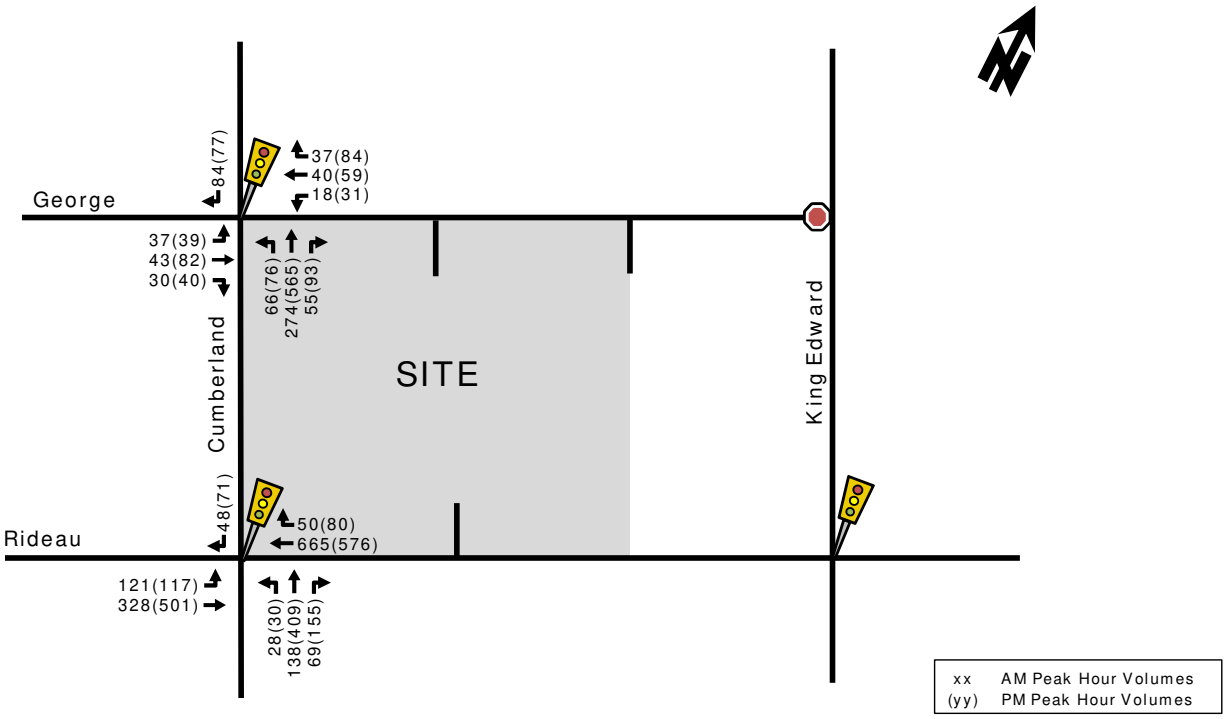


Table 3: Projected Intersection Performance (new existing plus site-generated traffic)

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Cumberland/George	A(B)	0.41(0.70)	EBT(EBT)	12.8(33.1)	A(B)	0.38(0.67)
Cumberland/Rideau	D(E)	0.89(0.95)	WBT(NBT)	28.4(46.9)	D(D)	0.81(0.90)
Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

As can be seen in Table 3, with the lane reduction and additional traffic, the key intersections continue to operate in the LoS 'A' to LoS 'D' range for the intersections 'as a whole', and the critical northbound through movement at the Rideau/Cumberland intersection continues to operate at LoS 'E', and v/c of 0.95, which is the same as existing conditions.

Comment 49: *In the SYNCHRO files, the lane configuration for Cumberland Street does not reflect existing geometry. Please update and revise.*

Response 49: The new lane configuration for Cumberland Street is included in the revised existing and projected SYNCHRO analysis provided herein (Appendices A and B).

Comment 50: *The proposed road modifications (on-street lay-by and northbound lane removal on Cumberland Street) will require the delegated authority approval from the General Management Branch. The following information must be submitted in order to initiate the Road Modification Agreement (RMA) process and, the following must be completed prior to obtaining a building permit:*

a) A conceptual cost estimate;

b) *The name, address, telephone number and e-mail address of the developer for advertising billing purposes;*
c) *A key plan for the RMA report; and*
d) *A conceptual design of the proposed modifications for the RMA Report.*

Response 50: Agreed. However, we are advised that the requested information can be provided after City approval, or not, of the proposed changes, and this requirement can be included as a Condition of Site Plan Approval.

Comment 51: *Rideau Street is designated as an arterial road within the City's Official Plan with a maximum land requirement from property abutting existing ROW of 1.75 metres. The ROW limits are to be dimensioned on all the drawings.*

Response 51: The project architect has been advised.

Comment *52:* *Please ensure all accesses have 3-5m curb returns.*

Response 52: The project architect has been advised.

Comment 53: *For unit pavers on City's right of way, the developer must sing a "Maintenance and Liability Agreement" with the City.*

Response 53: The proponent has been advised**.**

Please call is you have any questions on the foregoing. Based on the information in this Addendum, we continue to recommend Site Plan Approval from a transportation perspective.

Sincerely,

Ronald M. Jack, P.Eng.
Vice President Transportation
Manager Ottawa Operations

Attachments

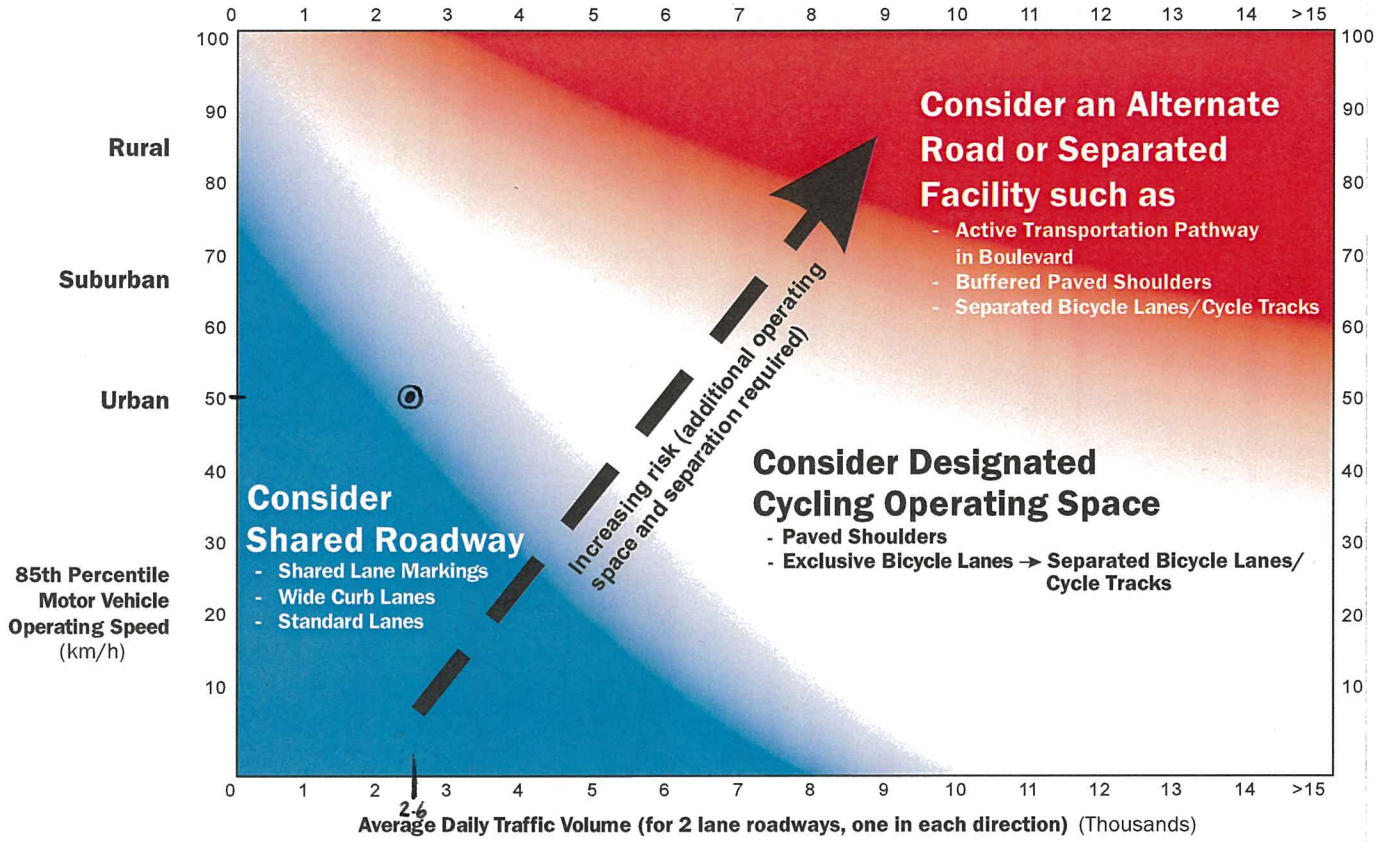
APPENDIX E

Bicycle Facility Selection Tool

York Street

Source: MMM, 2013

STEP 1 of 3
Desirable Cycling Facility Pre-selection Nomograph



Footnotes:
- This nomograph is the **first of a three step bicycle facility selection process,**, and should not be used by itself as the justification for facility selection (see Steps 2 and 3). The nomograph simply helps practitioners pre-select a desirable cycling facility type, however the context of the situation governs the final decision.
- The nomograph has been adapted for the North American context and is based on international examples and research for two lane roadways. It is, however, still applicable for multi-lane roadways. For these situations, designers should consider the operating speed, total combined traffic volume and traffic mix of the vehicles traveling in the lanes immediately adjacent to the cycling facilities.
- Consider a Separated Facility or an Alternate Road for roadways with an AADT greater than 15,000 vehicles and an operating speed of greater then 50 km/h.
- For rural and suburban locations this nomograph assumes good sightlines are provided for all road users. In urban areas, there are typically more frequent conflict points at driveways, midblock crossings and intersections (especially on multi-lane roads), as well as on road segments with on-street parking. This needs to be considered when assessing risk exposure in urban environments since it will influence the selection of a suitable facility type.

Figure 3.3 – Desirable Bicycle Facility Pre-Selection Nomograph

APPENDIX F

Intersection MMLOS

Intersection MMLOS Analysis

Pedestrian Level of Service (PLOS)

Exhibit 5 of the Addendum to the MMLOS guidelines has been used to evaluate the existing PLOS at all intersections within the study area. Exhibit 22 of the MMLOS guidelines suggests a target PLOS A for all roadways within 600m of a rapid transit station. The results of the intersection PLOS analysis are summarized as follows:

- Intersections at York Street: **Tables 1** and **2**;
- Intersections at George Street: **Tables 3** and **4**;
- Intersections at Rideau Street: **Tables 5**, **6**, and **7**;
- Intersections at Besserer Street: **Tables 8** and **9**.

Bicycle Level of Service (BLOS)

Exhibit 12 of the MMLOS guidelines has been used to evaluate the existing BLOS at all intersections within the study area. Within 600m of a rapid transit station, Exhibit 22 of the MMLOS guidelines suggests a target BLOS B for all roadways designated as local cycling routes (York Street), and a target BLOS D for all roadways with no bike classification (Dalhousie Street, Cumberland Street, George Street, Rideau Street, Waller Street, and Besserer Street). The results of the intersection BLOS analysis are summarized as follows:

- Intersections at York Street: **Table 10**;
- Intersections at George Street: **Table 11**;
- Intersections at Rideau Street: **Table 12**;
- Intersections at Besserer Street: **Table 13**.

Transit Level of Service (TLOS)

Exhibit 16 of the MMLOS guidelines has been used to evaluate the existing TLOS at relevant intersections within the study area. Within 600m of a rapid transit station, Exhibit 22 of the MMLOS guidelines suggests a target TLOS C for all roadways designated as Transit Priority Corridors with Continuous Lanes (Rideau Street), and a target TLOS D for all roadways designated as Transit Priority Corridors with Isolated Measures (Dalhousie Street). All other roadways in the study area (York Street, Cumberland Street, George Street, Waller Street, and Besserer Street) have no transit designation. Therefore, only intersections involving Dalhousie Street and/or Rideau Street have been evaluated for TLOS.

- The results of the intersection TLOS analysis are summarized in **Table 14**.

Truck Level of Service (TkLOS)

Exhibit 21 of the MMLOS guidelines has been used to evaluate the existing TkLOS at relevant intersections within the study area. Within 600m of a rapid transit station, Exhibit 22 of the MMLOS guidelines suggests a target TkLOS D for collector and arterial roadways designated as truck routes (Dalhousie Street, Waller Street, Besserer Street, and Rideau Street east of the intersection with Waller Street), and a target TkLOS E for arterial roadways not designated as truck routes (Rideau

Street west of the intersection with Waller Street). While there is no target TkLOS set for local roadways in this policy area, George Street and Cumberland Street (between Rideau Street and George Street) have still been evaluated due to their designation as truck routes.

- The results of the intersection TkLOS analysis are summarized in **Table 15**.

Vehicular Level of Service (Auto LOS)

Exhibit 22 of the MMLOS guidelines suggests a target Auto LOS E for all roadways within 600m of a rapid transit station. The results of the Synchro analysis, for both the AM and PM peak hours, are summarized in **Table 16**. Detailed reports are included in **Appendix H**.

- The results of the intersection Auto LOS analysis are summarized in **Table 16**.

Intersection MMLOS Summary

A summary of the results of the existing intersection MMLOS analysis is provided in the following tables:

- Intersections at York Street: **Table 17**;
- Intersections at George Street: **Table 18**;
- Intersections at Rideau Street: **Table 19**;
- Intersections at Besserer Street: **Table 20**.

Table 1: PLOS Intersection Analysis – York Street/Dalhousie Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	88	No	88	No	88	No	88
Lanes Crossed (3.5m Lane Width)	4		4		4		4	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Permissive	-8	Permissive	-8	Permissive	-8	Permissive	-8
Right Turn Conflict	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	> 5m to 10m	-5	> 5m to 10m	-5	> 3m to 5m	-4	> 5m to 10m	-5
Parallel Right Turn Channel	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Standard	-7	Standard	-7	Standard	-7	Standard	-7
PETSI SCORE		**54**		**54**		**55**		**54**
LOS		**D**		**D**		**D**		**D**
DELAY SCORE								
Cycle Length		100		100		100		100
Pedestrian Walk Time		19.6		19.6		50.3		50.3
DELAY SCORE		**32.3**		**32.3**		**12.4**		**12.4**
LOS		**D**		**D**		**B**		**B**
OVERALL		**D**		**D**		**D**		**D**

Table 2: PLOS Intersection Analysis – York Street/Cumberland Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	88	No	88	Yes	75	Yes	75
Lanes Crossed (3.5m Lane Width)	4		4		5		5	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Protected	0	Protected	0	Permissive	-8	Permissive	-8
Right Turn Conflict	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	> 3m to 5m	-4	> 3m to 5m	-4	> 3m to 5m	-4	> 3m to 5m	-4
Parallel Right Turn Channel	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Standard	-7	Standard	-7	Standard	-7	Standard	-7
PETSI SCORE		**63**		**63**		**42**		**42**
LOS		**C**		**C**		**E**		**E**
DELAY SCORE								
Cycle Length		100		100		100		100
Pedestrian Walk Time		10.6		14.6		41.8		41.8
DELAY SCORE		**40**		**36.5**		**16.9**		**16.9**
LOS		**D**		**D**		**B**		**B**
OVERALL		**D**		**D**		**E**		**E**

Table 3: PLOS Intersection Analysis – George Street/Dalhousie Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	88	No	72	No	88	No	88
Lanes Crossed (3.5m Lane Width)	4		5		4		4	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Permissive	-8	Permissive	-8	Permissive	-8	Permissive	-8
Right Turn Conflict	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	> 3m to 5m	-4	> 3m to 5m	-4	> 5m to 10m	-5	> 3m to 5m	-4
Parallel Right Turn Channel	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Standard	-7	Standard	-7	Standard	-7	Standard	-7
PETSI SCORE		**55**		**39**		**54**		**55**
LOS		**D**		**E**		**D**		**D**
DELAY SCORE								
Cycle Length		100		100		100		100
Pedestrian Walk Time		20.3		20.3		48.6		48.6
DELAY SCORE		**31.8**		**31.8**		**13.2**		**13.2**
LOS		**D**		**D**		**B**		**B**
OVERALL		**D**		**E**		**D**		**D**

Table 4: PLOS Intersection Analysis – George Street/Cumberland Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	88	No	88	No	88	No	105
Lanes Crossed (3.5m Lane Width)	4		4		4		3	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Permissive	-8	Permissive	-8	No Left Turn/Prohibited	0	Permissive	-8
Right Turn Conflict	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	> 5m to 10m	-5	> 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
CROSSING TREATMENT								
Treatment	Standard	-7	Standard	-7	Standard	-7	Standard	-7
PETSI SCORE		**54**		**55**		**62**		**71**
LOS		**D**		**D**		**C**		**C**
DELAY SCORE								
Cycle Length		100		100		100		100
Pedestrian Walk Time		8.2		8.2		55.9		55.9
DELAY SCORE		**42.1**		**42.1**		**9.7**		**9.7**
LOS		**E**		**E**		**A**		**A**
OVERALL		**E**		**E**		**C**		**C**

Table 5: PLOS Intersection Analysis – Rideau Street/Dalhousie Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	72	No	88	No	72	No	72
Lanes Crossed (3.5m Lane Width)	5		4		5		5	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Perm + Prot	-8	Perm + Prot	-8	Permissive	-8	Permissive	-8
Right Turn Conflict	No Right Turn/Prohibited	0	No Right Turn/Prohibited	0	Permissive or Yield	-5	Permissive or Yield	-5
Right Turn on Red	RTOR Prohibited	0	RTOR Prohibited	0	RTOR Allowed	-3	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	No Right Turn	0	No Right Turn	0	> 3m to 5m	-4	> 3m to 5m	-4
Parallel Right Turn Channel	No Right Turn	0	No Right Turn	0	No Right Turn Channel	-4	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Zebra Stripe	-4	Zebra Stripe	-4	Zebra Stripe	-4	Zebra Stripe	-4
PETSI SCORE		**58**		**74**		**42**		**42**
LOS		**D**		**C**		**E**		**E**
DELAY SCORE								
Cycle Length		100		100		100		100
Pedestrian Walk Time		17		17		31		31
DELAY SCORE		**34.4**		**34.4**		**23.8**		**23.8**
LOS		**D**		**D**		**C**		**C**
OVERALL		**D**		**D**		**E**		**E**

Table 6: PLOS Intersection Analysis – Rideau Street/Waller Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	N/A	N/A	No	88	N/A	N/A	No	88
Lanes Crossed (3.5m Lane Width)	N/A		4		N/A		4	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	N/A	0	Protected	0	N/A	0	No Left Turn/Prohibited	0
Right Turn Conflict	N/A	0	No Right Turn/Prohibited	0	N/A	0	No Right Turn/Prohibited	0
Right Turn on Red	N/A	0	RTOR Prohibited	0	N/A	0	RTOR Prohibited	0
Leading Pedestrian Interval	N/A	0	No	-2	N/A	0	No	-2
CORNER RADIUS								
Parallel Radius	N/A	0	No Right Turn	0	N/A	0	No Right Turn	0
Parallel Right Turn Channel	N/A	0	No Right Turn	0	N/A	0	No Right Turn	0
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	N/A	0	Zebra Stripe	-4	N/A	0	Zebra Stripe	-4
PETSI SCORE		**N/A**		**82**		**N/A**		**82**
LOS		**N/A**		**B**		**N/A**		**B**
DELAY SCORE								
Cycle Length		N/A		100		N/A		100
Pedestrian Walk Time		N/A		38.6		N/A		31.6
DELAY SCORE		**N/A**		**18.8**		**N/A**		**23.4**
LOS		**N/A**		**B**		**N/A**		**C**
OVERALL		**N/A**		**B**		**N/A**		**C**

Table 7: PLOS Intersection Analysis – Rideau Street/Cumberland Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	105	No	105	No	88	No	72
Lanes Crossed (3.5m Lane Width)	3		3		4		5	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Perm + Prot	-8	No Left Turn/Prohibited	0	No Left Turn/Prohibited	0	Permissive	-8
Right Turn Conflict	Permissive or Yield	-5	No Right Turn/Prohibited	0	Permissive or Yield	-5	Permissive or Yield	-5
Right Turn on Red	RTOR Allowed	-3	RTOR Prohibited	0	RTOR Prohibited	0	RTOR Prohibited	0
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	> 5m to 10m	-5	No Right Turn	0	> 10m to 15m	-6	> 3m to 5m	-4
Parallel Right Turn Channel	No Right Turn Channel	-4	No Right Turn	0	No Right Turn Channel	-4	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Zebra Stripe	-4	Zebra Stripe	-4	Zebra Stripe	-4	Zebra Stripe	-4
PETSI SCORE		**74**		**99**		**67**		**45**
LOS		**C**		**A**		**C**		**D**
DELAY SCORE								
Cycle Length		100		100		100		100
Pedestrian Walk Time		44.8		56.8		12.1		12.1
DELAY SCORE		**15.2**		**9.3**		**38.6**		**38.6**
LOS		**B**		**A**		**D**		**D**
OVERALL		**C**		**A**		**D**		**D**

Table 8: PLOS Intersection Analysis – Besserer Street/Dalhousie Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	88	N/A	N/A	No	105	N/A	N/A
Lanes Crossed (3.5m Lane Width)	4		N/A		3		N/A	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Permissive	-8	N/A	0	Permissive	-8	N/A	0
Right Turn Conflict	Permissive or Yield	-5	N/A	0	No Right Turn/Prohibited	0	N/A	0
Right Turn on Red	RTOR Allowed	-3	N/A	0	RTOR Prohibited	0	N/A	0
Leading Pedestrian Interval	No	-2	N/A	0	No	-2	N/A	0
CORNER RADIUS								
Parallel Radius	> 3m to 5m	-4	N/A	0	No Right Turn	0	N/A	0
Parallel Right Turn Channel	No Right Turn Channel	-4	N/A	0	No Right Turn	0	N/A	0
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Standard	-7	N/A	0	Standard	-7	N/A	0
PETSI SCORE		**55**		**N/A**		**88**		**N/A**
LOS		**D**		**N/A**		**B**		**N/A**
DELAY SCORE								
Cycle Length		100		N/A		100		N/A
Pedestrian Walk Time		40.6		N/A		30.8		N/A
DELAY SCORE		**17.6**		**N/A**		**23.9**		**N/A**
LOS		**B**		**N/A**		**C**		**N/A**
OVERALL		**D**		**N/A**		**C**		**N/A**

Table 9: PLOS Intersection Analysis – Besserer Street/Waller Street

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	88	N/A	N/A	No	88	No	88
Lanes Crossed (3.5m Lane Width)	4		N/A		4		4	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Permissive	-8	N/A	0	No Left Turn/Prohibited	0	Protected	0
Right Turn Conflict	No Right Turn/Prohibited	0	N/A	0	Permissive or Yield	-5	Permissive or Yield	-5
Right Turn on Red	N/A	0	N/A	0	RTOR Prohibited	0	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	N/A	0	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	No Right Turn	0	N/A	0	> 10m to 15m	-6	> 3m to 5m	-4
Parallel Right Turn Channel	No Right Turn	0	N/A	0	No Right Turn Channel	-4	No Right Turn Channel	-4
Perpendicular Radius	N/A	0	N/A	0	N/A	0	N/A	0
Perpendicular Right Turn Channel	N/A	0	N/A	0	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Zebra Stripe	-4	N/A	0	Zebra Stripe	-4	Zebra Stripe	-4
	PETSI SCORE	**74**		**N/A**		**67**		**66**
	LOS	**C**		**N/A**		**C**		**C**
DELAY SCORE								
Cycle Length		100		N/A		100		100
Pedestrian Walk Time		20.2		N/A		38.9		21.9
	DELAY SCORE	**31.8**		**N/A**		**18.7**		**30.5**
	LOS	**D**		**N/A**		**B**		**D**
	OVERALL	**D**		**N/A**		**C**		**D**

Table 10: BLOS Intersection Analysis – York Street

Approach	Bikeway Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
York Street/Dalhousie Street				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No lane crossed; ≤ 50 km/h	B
South Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No lane crossed; ≤ 50 km/h	B
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No lane crossed; ≤ 50 km/h	B
West Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No lane crossed; ≤ 50 km/h	B
York Street/Cumberland Street				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No lane crossed; ≤ 50 km/h	B
South Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No lane crossed; ≤ 50 km/h	B
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No lane crossed; ≤ 50 km/h	B
West Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No lane crossed; ≤ 50 km/h	B

Table 11: BLOS Intersection Analysis – George Street

Approach	Bikeway Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
George Street/Dalhousie Street				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Right-turn lane < 50m; turning speed < 25 km/h	D
		Left Turn Accommodation	No lane crossed; ≤ 50 km/h	B
South Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	One lane crossed; 50 km/h	D
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No lane crossed; ≤ 50 km/h	B
West Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No lane crossed; ≤ 50 km/h	B
George Street/Cumberland Street				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No lane crossed; ≤ 50 km/h	B
South Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	One lane crossed; 50 km/h	D
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No lane crossed; ≤ 50 km/h	B
West Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No lane crossed; ≤ 50 km/h	B

Table 12: BLOS Intersection Analysis – Rideau Street

Approach	Bikeway Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
Rideau Street/Dalhousie Street				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	Two lanes crossed; ≥ 50 km/h	F
South Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	One lane crossed; 50 km/h	D
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	Two lanes crossed; ≥ 50 km/h	F
West Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	One lane crossed; 50 km/h	D
Rideau Street/Waller Street				
South Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No left turn	-
East Approach	Mixed Traffic	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	One lane crossed; 50 km/h	D
West Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No left turn	-
Rideau Street/Cumberland Street				
North Approach	Bike Lane	Right Turn Lane Characteristics	Lane remains to the right of the right-turn lane, no impact on LTS[(1)]	C
		Left Turn Accommodation	No left turn	-
South Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	One lane crossed; 50 km/h	D
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane < 50m; turning speed ≤ 25 km/h	D
		Left Turn Accommodation	No left turn	-
West Approach	Mixed Traffic	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	One lane crossed; 50 km/h	D

1. LTS = Level of Traffic Stress. Based on Exhibit 8 of the MMLOS guidelines, this approach most closely resembles LTS 3 (exclusive lane adjacent to moderate-speed traffic – comfortable to most experienced cyclists), which corresponds to LOS C

Table 13: BLOS Intersection Analysis – Besserer Street

Approach	Bikeway Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
Besserer Street/Dalhousie Street				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane > 50m	F
		Left Turn Accommodation	No lanes crossed; ≤ 50 km/h	B
East Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No left turn	-
West Approach	Mixed Traffic	Right Turn Lane Characteristics	No right turn	-
		Left Turn Accommodation	No lane crossed; ≤ 50 km/h	B
Besserer Street/Waller Street				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	One lane crossed; 50 km/h(2)	D
South Approach	Mixed Traffic	Right Turn Lane Characteristics	Dual right turn lanes (shared)	F
		Left Turn Accommodation	Dual left turn lanes	F
West Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No lane crossed; ≤ 50 km/h	B

2. Only buses and bicycles may turn left from this approach

Table 14: TLOS Intersection Analysis

Approach	Delay[1]	TLOS
York Street/Dalhousie Street		
North	35 s	E
South	15 s	C
George Street/Dalhousie Street		
North	15 s	C
South	25 s	D
Rideau Street/Dalhousie Street		
North	20 s	C
South	75 s	F
East[2]	10 s	B
West	55 s	F
Rideau Street/Waller Street		
East[2]	10 s	B
West[2]	10 s	B
Rideau Street/Cumberland Street		
East[2]	10 s	B
West[2]	10 s	B
Besserer Street/Dalhousie Street		
North	35 s	E

1. Delay based on existing traffic outputs from Synchro analysis
2. Approach has a dedicated bus lane (high level TSP), and has been assigned a delay of 10 seconds

Table 15: TkLOS Intersection Analysis

Approach	Effective Corner Radius	Number of Receiving Lanes on Departure from Intersection	LOS
York Street/Dalhousie Street			
North	10m to 15m	1	E
South	10m to 15m	1	E
East	10m to 15m	1	E
West	10m to 15m	1	E
George Street/Dalhousie Street			
North	< 10m	2	D
South	> 15m	1	C
East	< 10m	2	B
West	< 10m	2	D
George Street/Cumberland Street			
North	10m to 15m	1	E
South	10m to 15m	1	E
East	10m to 15m	1	E
West	10m to 15m	1	E
Rideau Street/Dalhousie Street			
North	> 15m	1	C
South	> 15m	1	C
East	< 10m	2	D
West	<10m	2	D
Rideau Street/Waller Street			
South	> 15m	1	C
West	< 10m	2	D
Rideau Street/Cumberland Street			
North	> 15m	1	C
South	> 15m	1	C
East	< 10m	2	D
Besserer Street/Dalhousie Street			
North	< 10m	2	D
East	< 10m	2	D
Besserer Street/Waller Street			
North	< 10m	2	D
South	> 15m	2	A
West	10m to 15m	2	B

Table 16: Auto LOS Intersection Analysis – Existing

Intersection	AM Peak			PM Peak		
	Max v/c	LOS	Movement	Max v/c	LOS	Movement
York Street/ Dalhousie Street	0.79	C	SBT	0.65	B	NBT
York Street/ Cumberland Street	0.64	B	WBT	0.60	A	WBT
George Street/ Dalhousie Street	0.62	B	SBT	0.91	E	NBT
George Street/ Cumberland Street	0.50	A	EBT	0.76	C	EBT
Rideau Street/ Dalhousie Street	0.56	A	SBT	0.89	D	EBT
Rideau Street/ Waller Street	0.49	A	WBL	0.62	B	WBT
Rideau Street/ Cumberland Street	0.65	B	WBT	0.75	C	NBT
Besserer Street/ Dalhousie Street	0.73	C	SBR	0.66	B	SBR
Besserer Street/ Waller Street	0.41	A	SBT/SBR	0.88	D	NBR

Table 17: Intersection MMLOS Summary – York Street

	Intersection	York Street/Dalhousie Street				York Street/Cumberland Street			
		North	South	East	West	North	South	East	West
Pedestrian	Island Refuge	No	No	No	No	No	No	Yes	Yes
	Lanes	4	4	4	4	4	4	5	5
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive	Protected	Protected	Permissive	Permissive
	Conflicting Right Turns	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield
	Right Turn on Red	RTOR Allowed	RTOR Allowed	RTOR Allowed	RTOR Allowed	RTOR Allowed	RTOR Allowed	RTOR Allowed	RTOR Allowed
	Ped Leading Interval	No	No	No	No	No	No	No	No
	Parallel Radius	> 5m to 10m	> 5m to 10m	> 3m to 5m	> 5m to 10m	> 3m to 5m	> 3m to 5m	> 3m to 5m	> 3m to 5m
	Parallel Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel
	Perpendicular Radius	-	-	-	-	-	-	-	-
	Perpendicular Channel	-	-	-	-	-	-	-	-
	Crosswalk Type	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
	PETSI Score	54	54	55	54	63	63	42	42
	Delay Score	32.3	32.3	12.4	12.4	10.6	14.6	16.9	16.9
	Level of Service	D	D	D	D	D	D	D	D
		D				D			
	Target	A				A			
Cyclist	Type of Bikeway	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Turning Speed	Slow	Slow	Slow	Slow	Slow	Slow	Slow	Slow
	Right Turn Storage	-	-	-	-	-	-	-	-
	Dual Right Turn Lanes	No	No	No	No	No	No	No	No
	Shared Through-Right Lane	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Bike Box	No	No	No	No	No	No	No	No
	Lanes Crossed for Left Turns	0	0	0	0	0	0	0	0
	Dual Left Turn Lanes	No	No	No	No	No	No	No	No
	Approach Speed	50 km/h	50 km/h	50 km/h	50 km/h	50 km/h	50 km/h	50 km/h	50 km/h
	Level of Service	B	B	B	B	B	B	B	B
		B				B			
	Target	B				B			
Transit	Average Signal Delay	35 s	15 s	-	-	-	-	-	-
	Level of Service	E	C	-	-	-	-	-	-
		E				-			
	Target	D				-			
Truck	Turning Radius	10m to 15m	10m to 15m	10m to 15m	10m to 15m	-	-	-	-
	Receiving Lanes	1	1	1	1	-	-	-	-
	Level of Service	E	E	E	E	-	-	-	-
		E				-			
	Target	D				-			
Auto	Level of Service	C				B			
	Target	E				E			

Table 18: Intersection MMLOS Summary – George Street

	Intersection	George Street/Dalhousie Street North	South	East	West	George Street/Cumberland Street North	South	East	West
Pedestrian	Island Refuge	No	No	No	No	No	No	No	No
	Lanes	4	5	4	4	4	4	4	3
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	No Left Turn	Permissive
	Conflicting Right Turns	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield	Permissive/Yield
	Right Turn on Red	RTOR Allowed	RTOR Allowed	RTOR Allowed	RTOR Allowed	RTOR Allowed	RTOR Allowed	RTOR Allowed	RTOR Allowed
	Ped Leading Interval	No	No	No	No	No	No	No	No
	Parallel Radius	> 3m to 5m	> 3m to 5m	> 5m to 10m	> 3m to 5m	> 5m to 10m	> 3m to 5m	> 5m to 10m	> 5m to 10m
	Parallel Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel
	Perpendicular Radius	-	-	-	-	-	-	-	-
	Perpendicular Channel	-	-	-	-	-	-	-	-
	Crosswalk Type	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
	PETSI Score	55	39	54	55	54	55	62	71
	Delay Score	31.8	31.8	13.2	13.2	42.1	42.1	9.7	9.7
	Level of Service	D	E	D	D	E	E	C	C
	Target	E				E			
Cyclist	Type of Bikeway	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Turning Speed	Slow	Slow	Slow	Slow	Slow	Slow	Slow	Slow
	Right Turn Storage	< 50m	-	-	-	-	-	-	-
	Dual Right Turn Lanes	No	No	No	No	No	No	No	No
	Shared Through-Right Lane	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Bike Box	No	No	No	No	No	No	No	No
	Lanes Crossed for Left Turns	0	1	0	0	0	1	0	0
	Dual Left Turn Lanes	No	No	No	No	No	No	No	No
	Approach Speed	50 km/h	50 km/h	50 km/h	50 km/h	50 km/h	50 km/h	50 km/h	50 km/h
	Level of Service	D	D	B	B	B	D	B	B
	Target	D				D			
Transit	Average Signal Delay	15 s	25 s	-	-	-	-	-	-
	Level of Service	C	D	-	-	-	-	-	-
	Target	D				-			
Truck	Turning Radius	< 10m	> 15m	< 10m	< 10m	10m to 15m	10m to 15m	10m to 15m	10m to 15m
	Receiving Lanes	2	1	2	2	1	1	1	1
	Level of Service	D	C	B	D	E	E	E	E
	Target	D				E			
Auto	Level of Service	E				C			
	Target	E				E			

Table 19: Intersection MMLOS Summary – Rideau Street

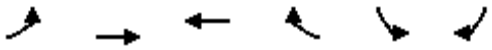
	Intersection	Rideau Street/Dalhousie Street				Rideau Street/Waller Street				Rideau Street/Cumberland Street			
		North	South	East	West	North	South	East	West	North	South	East	West
Pedestrian	Island Refuge	No	No	No	No	-	No	-	No	No	No	No	No
	Lanes	5	4	5	4	-	4	-	4	3	3	4	5
	Conflicting Left Turns	Perm + Prot	Perm + Prot	Permissive	Permissive	-	Protected	-	No Left Turn	Perm + Prot	No Left Turn	No Left Turn	Permissive
	Conflicting Right Turns	No Right Turn	No Right Turn	Permissive/Yield	Permissive/Yield	-	No Right Turn	-	No Right Turn	Permissive/Yield	No Right Turn	Permissive/Yield	Permissive/Yield
	Right Turn on Red	No Right Turn	No Right Turn	RTOR Allowed	RTOR Allowed	-	No Right Turn	-	No Right Turn	RTOR Allowed	No Right Turn	RTOR Prohibited	RTOR Prohibited
	Ped Leading Interval	No	No	No	No	-	No	-	No	No	No	No	No
	Parallel Radius	-	-	> 3m to 5m	> 3m to 5m	-	-	-	-	> 5m to 10m	-	> 10m to 15m	> 3m to 5m
	Parallel Channel	-	-	No Channel	No Channel	-	-	-	-	No Channel	-	No Channel	No Channel
	Perpendicular Radius	-	-	-	-	-	-	-	-	-	-	-	-
	Perpendicular Channel	-	-	-	-	-	-	-	-	-	-	-	-
	Crosswalk Type	Zebra Stripe	Zebra Stripe	Zebra Stripe	Zebra Stripe	-	Zebra Stripe	-	Zebra Stripe	Zebra Stripe	Zebra Stripe	Zebra Stripe	Zebra Stripe
	PETSI Score	58	74	42	42	-	82	-	82	74	99	67	45
	Delay Score	34.4	34.4	23.8	23.8	-	18.8	-	23.4	15.2	9.3	38.6	38.6
	Level of Service	D	D	E	E	-	B	-	C	C	A	D	D
		E				C				D			
	Target	A				A				A			
Cyclist	Type of Bikeway	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	-	Mixed Traffic	Mixed Traffic	Mixed Traffic	Bike Lane	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Turning Speed	Slow	Slow	Slow	Slow	-	Slow	Slow	Slow	Slow	Slow	Slow	Slow
	Right Turn Storage	-	-	-	-	-	-	-	-	> 50m	-	< 50m	-
	Dual Right Turn Lanes	No	No	No	No	-	No	-	No	No	No	No	-
	Shared Through-Right Lane	Yes	Yes	Yes	Yes	-	Yes	-	Yes	Right Turns Only	Yes	No	-
	Bike Box	No	No	No	No	-	-	No	-	-	No	-	No
	Lanes Crossed for Left Turns	2	1	2	1	-	-	1	-	-	1	-	1
	Dual Left Turn Lanes	No	No	No	No	-	-	No	-	-	No	-	No
	Approach Speed	50 km/h	50 km/h	50 km/h	50 km/h	-	50 km/h	50 km/h	50 km/h	50 km/h	50 km/h	50 km/h	50 km/h
	Level of Service	F	D	F	D	-	A	D	A	C	D	D	D
		F				D				D			
	Target	D				D				D			
Transit	Average Signal Delay	20 s	75 s	10 s	55 s	-	-	10 s	10 s	-	-	10 s	10 s
	Level of Service	C	F	B	F	-	-	B	B	-	-	B	B
		F				B				B			
	Target	C				C				C			
Truck	Turning Radius	> 15m	> 15m	< 10m	< 10m	-	> 15m	-	< 10m	> 15m	> 15m	< 10m	-
	Receiving Lanes	1	1	2	2	-	1	-	2	1	1	2	-
	Level of Service	C	C	D	D	-	C	-	D	C	C	D	-
		D				D				D			
	Target	D				D				D			
Auto	Level of Service	D				B				C			
	Target	E				E				E			

Table 20: Intersection MMLOS Summary – Besserer Street

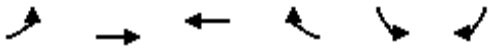
	Intersection	Besserer Street/Dalhousie Street North	South	East	West	Besserer Street/Waller Street North	South	East	West
Pedestrian	Island Refuge	No	-	No	-	No	-	No	No
	Lanes	4	-	3	-	4	-	4	4
	Conflicting Left Turns	Permissive	-	Permissive	-	Permissive	-	Permissive	Protected
	Conflicting Right Turns	Permissive/Yield	-	No Right Turn	-	No Right Turn	-	Permissive/Yield	Permissive/Yield
	Right Turn on Red	RTOR Allowed	-	No Right Turn	-	-	-	RTOR Prohibited	RTOR Allowed
	Ped Leading Interval	No	-	No	-	No	-	No	No
	Parallel Radius	> 3m to 5m	-	-	-	-	-	> 10m to 15m	> 3m to 5m
	Parallel Channel	No Channel	-	-	-	-	-	No Channel	No Channel
	Perpendicular Radius	-	-	-	-	-	-	-	-
	Perpendicular Channel	-	-	-	-	-	-	-	-
	Crosswalk Type	Standard	-	Standard	-	Zebra Stripe	-	Zebra Stripe	Zebra Stripe
	PETSI Score	55	-	88	-	74	-	59	66
	Delay Score	17.6	-	23.9	-	31.8	-	18.7	30.5
	Level of Service	D	-	C	-	D	-	D	D
	Target	D				D			
Cyclist	Type of Bikeway	Mixed Traffic	-	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	-	Mixed Traffic
	Turning Speed	Slow	-	Slow	Slow	Slow	Slow	-	Slow
	Right Turn Storage	> 50m	-	-	-	-	> 50m	-	-
	Dual Right Turn Lanes	No	-	No	-	No	No	-	No
	Shared Through-Right Lane	No	-	No	-	Yes	No	-	Yes
	Bike Box	No	-	-	No	No	No	-	No
	Lanes Crossed for Left Turns	0	-	-	0	1	2	-	0
	Dual Left Turn Lanes	No	-	-	No	No	Yes	-	No
	Approach Speed	50 km/h	-	50 km/h	50 km/h	50 km/h	50 km/h	-	50 km/h
	Level of Service	F	-	A	B	D	F	-	B
	Target	D				F			
		D				D			
Transit	Average Signal Delay	35 s	-	-	-	-	-	-	-
	Level of Service	E	-	-	-	-	-	-	-
	Target	E				-			
		D				-			
Truck	Turning Radius	< 10m	-	< 10m	-	< 10m	> 15m	-	10m to 15m
	Receiving Lanes	2	-	2	-	2	2	-	2
	Level of Service	D	-	D	-	D	A	-	B
	Target	D				D			
		D				D			
Auto	Level of Service	C				D			
	Target	E				E			

APPENDIX G

Synchro Analysis



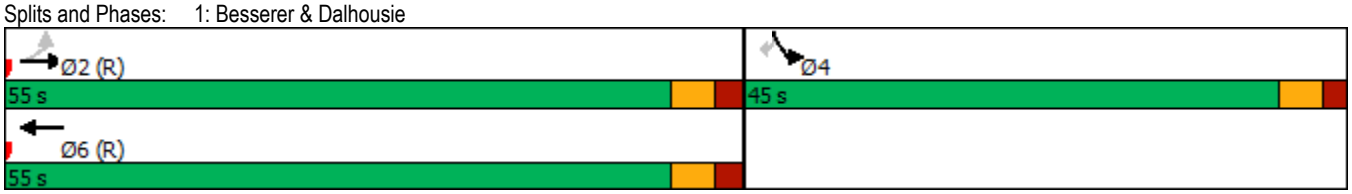
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	39	16	99	254	81	464
Future Volume (vph)	39	16	99	254	81	464
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt			0.892		0.894	0.850
Flt Protected		0.966			0.986	
Satd. Flow (prot)	0	1379	2419	0	1258	1009
Flt Permitted		0.685			0.986	
Satd. Flow (perm)	0	978	2419	0	1258	1009
Right Turn on Red				Yes		No
Satd. Flow (RTOR)			276			
Link Speed (k/h)		50	50		50	
Link Distance (m)		126.9	71.6		86.3	
Travel Time (s)		9.1	5.2		6.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)				1		5
Adj. Flow (vph)	42	17	108	276	88	504
Shared Lane Traffic (%)						42%
Lane Group Flow (vph)	0	59	384	0	300	292
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.40	1.40	1.40	1.40	1.40	1.64
Turning Speed (k/h)	24			14	24	14
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Minimum Split (s)	33.4	33.4	31.4		26.2	26.2
Total Split (s)	55.0	55.0	55.0		45.0	45.0
Total Split (%)	55.0%	55.0%	55.0%		45.0%	45.0%
Maximum Green (s)	49.6	49.6	49.6		39.8	39.8
Yellow Time (s)	3.3	3.3	3.3		3.3	3.3
All-Red Time (s)	2.1	2.1	2.1		1.9	1.9
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.4	5.4		5.2	5.2
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	17.0	17.0	17.0		10.0	10.0
Flash Dont Walk (s)	9.0	9.0	9.0		6.0	6.0
Pedestrian Calls (#/hr)	40	40	40		40	40
Act Effct Green (s)		49.6	49.6		39.8	39.8
Actuated g/C Ratio		0.50	0.50		0.40	0.40
v/c Ratio		0.12	0.29		0.60	0.73
Control Delay		14.4	1.3		21.2	29.3
Queue Delay		0.0	0.1		14.1	17.3
Total Delay		14.5	1.5		35.3	46.6
LOS		B	A		D	D
Approach Delay		14.5	1.5		40.9	
Approach LOS		B	A		D	
Queue Length 50th (m)		5.9	0.1		54.0	61.4

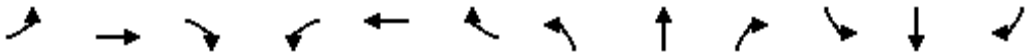


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 95th (m)		13.1	3.6		88.0	#95.2
Internal Link Dist (m)		102.9	47.6		62.3	
Turn Bay Length (m)						
Base Capacity (vph)		485	1338		500	401
Starvation Cap Reductn		0	282		179	98
Spillback Cap Reductn		16	39		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.13	0.36		0.93	0.96

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 14 (14%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 24.8		Intersection LOS: C	
Intersection Capacity Utilization 65.1%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Besserer & Dalhousie



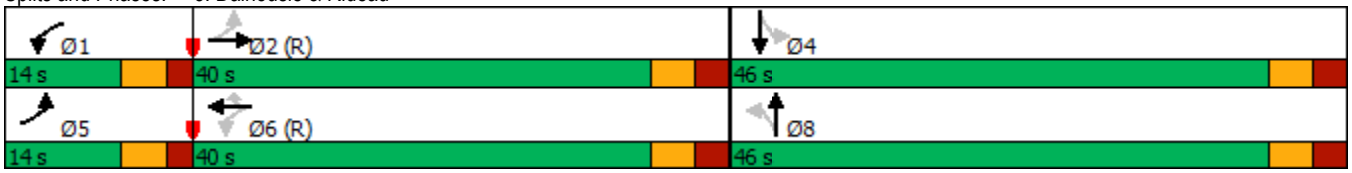


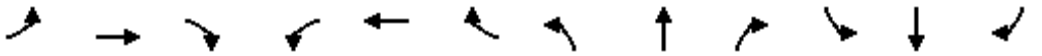
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	219	3	56	153	10	26	255	12	29	486	34
Future Volume (vph)	81	219	3	56	153	10	26	255	12	29	486	34
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	45.0		25.0	35.0		0.0	0.0		0.0	25.0		30.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	20.0			30.0			2.5			14.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.998				0.850		0.993			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1356	1425	0	1356	1427	1213	1356	1417	0	1356	2517	0
Flt Permitted	0.636			0.551			0.375			0.502		
Satd. Flow (perm)	908	1425	0	787	1427	1213	535	1417	0	717	2517	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				91		3			9	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		120.1			86.0			86.3			100.4	
Travel Time (s)		8.6			6.2			6.2			7.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)											5	5
Adj. Flow (vph)	88	238	3	61	166	11	28	277	13	32	528	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	241	0	61	166	11	28	290	0	32	565	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			-1.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.51	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.3	26.2		10.5	26.0	26.0	22.0	22.0		22.0	22.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	14.0	40.0		14.0	40.0	40.0	46.0	46.0		46.0	46.0	
Total Split (%)	14.0%	40.0%		14.0%	40.0%	40.0%	46.0%	46.0%		46.0%	46.0%	
Maximum Green (s)	8.7	34.0		8.7	34.0	34.0	40.0	40.0		40.0	40.0	
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.7		2.0	2.7	2.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	6.0		5.3	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	Max	Max		Max	Max	
Walk Time (s)		7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		10.0			10.0	10.0	9.0	9.0		9.0	9.0	
Pedestrian Calls (#/hr)		40			40	40	40	40		40	40	
Act Effct Green (s)	44.8	37.3		44.1	37.0	37.0	40.0	40.0		40.0	40.0	
Actuated g/C Ratio	0.45	0.37		0.44	0.37	0.37	0.40	0.40		0.40	0.40	
v/c Ratio	0.20	0.45		0.16	0.31	0.02	0.13	0.51		0.11	0.56	
Control Delay	15.5	28.3		6.9	10.3	0.1	7.4	13.4		19.2	20.4	
Queue Delay	0.0	0.0		0.0	0.3	0.0	0.0	8.2		0.0	0.5	
Total Delay	15.5	28.3		6.9	10.6	0.1	7.4	21.6		19.2	20.9	
LOS	B	C		A	B	A	A	C		B	C	
Approach Delay		24.9			9.2			20.4			20.8	
Approach LOS		C			A			C			C	
Queue Length 50th (m)	9.0	36.1		1.2	3.6	0.0	0.9	48.7		2.6	25.4	
Queue Length 95th (m)	17.7	59.7		4.2	12.0	m0.0	2.5	77.8		m6.1	40.2	
Internal Link Dist (m)		96.1			62.0			62.3			76.4	
Turn Bay Length (m)	45.0			35.0						25.0		
Base Capacity (vph)	447	532		401	528	506	214	568		286	1012	
Starvation Cap Reductn	0	0		0	95	0	0	234		0	147	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	87	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.20	0.45		0.15	0.38	0.02	0.13	0.87		0.11	0.65	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 7 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 19.7		Intersection LOS: B	
Intersection Capacity Utilization 68.8%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Dalhousie & Rideau





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	369	0	0	449	37	11	105	78	0	0	60
Future Volume (vph)	142	369	0	0	449	37	11	105	78	0	0	60
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	30.0		0.0	0.0		15.0	0.0		0.0	20.0		0.0
Storage Lanes	1		0	0		1	0		0	0		1
Taper Length (m)	30.0			2.5			2.5			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt						0.850		0.940				0.865
Flt Protected	0.950							0.997				
Satd. Flow (prot)	1356	1427	0	0	1427	1213	0	2542	0	0	0	1235
Flt Permitted	0.338							0.997				
Satd. Flow (perm)	482	1427	0	0	1427	1213	0	2542	0	0	0	1235
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						89						415
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		105.3			159.5			67.1			99.5	
Travel Time (s)		7.6			11.5			4.8			7.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)									5			
Adj. Flow (vph)	154	401	0	0	488	40	12	114	85	0	0	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	401	0	0	488	40	0	211	0	0	0	65
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			0.0			0.0	
Link Offset(m)		0.0			0.0			2.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	pm+pt	NA			NA	Perm	Perm	NA				Perm
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8					4
Minimum Split (s)	10.3	31.2			26.2	26.2	25.9	25.9				21.9
Total Split (s)	12.0	70.0			58.0	58.0	30.0	30.0				30.0
Total Split (%)	12.0%	70.0%			58.0%	58.0%	30.0%	30.0%				30.0%
Maximum Green (s)	6.7	64.8			52.8	52.8	24.1	24.1				24.1
Yellow Time (s)	3.3	3.3			3.3	3.3	3.3	3.3				3.3
All-Red Time (s)	2.0	1.9			1.9	1.9	2.6	2.6				2.6
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0				0.0
Total Lost Time (s)	5.3	5.2			5.2	5.2		5.9				5.9
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Walk Time (s)		15.0			15.0	15.0	8.0	8.0				5.0
Flash Dont Walk (s)		6.0			6.0	6.0	12.0	12.0				11.0
Pedestrian Calls (#/hr)		40			40	40	40	40				0
Act Effct Green (s)	64.7	64.8			52.8	52.8		24.1				24.1
Actuated g/C Ratio	0.65	0.65			0.53	0.53		0.24				0.24
v/c Ratio	0.42	0.43			0.65	0.06		0.34				0.11
Control Delay	6.5	5.9			22.0	0.2		33.3				0.3
Queue Delay	0.0	0.3			0.6	0.0		0.1				0.0
Total Delay	6.5	6.2			22.6	0.2		33.4				0.4
LOS	A	A			C	A		C				A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		6.3			20.9			33.4			0.4	
Approach LOS		A			C			C			A	
Queue Length 50th (m)	10.0	29.1			64.6	0.0		17.8				0.0
Queue Length 95th (m)	11.8	41.2			99.5	0.3		28.3				0.0
Internal Link Dist (m)		81.3			135.5			43.1			75.5	
Turn Bay Length (m)	30.0					15.0						
Base Capacity (vph)	370	924			753	682		612				612
Starvation Cap Reductn	0	151			0	0		0				0
Spillback Cap Reductn	0	0			70	0		26				53
Storage Cap Reductn	0	0			0	0		0				0
Reduced v/c Ratio	0.42	0.52			0.71	0.06		0.36				0.12

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Pretimed			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 15.9		Intersection LOS: B	
Intersection Capacity Utilization 63.6%		ICU Level of Service B	
Analysis Period (min) 15			

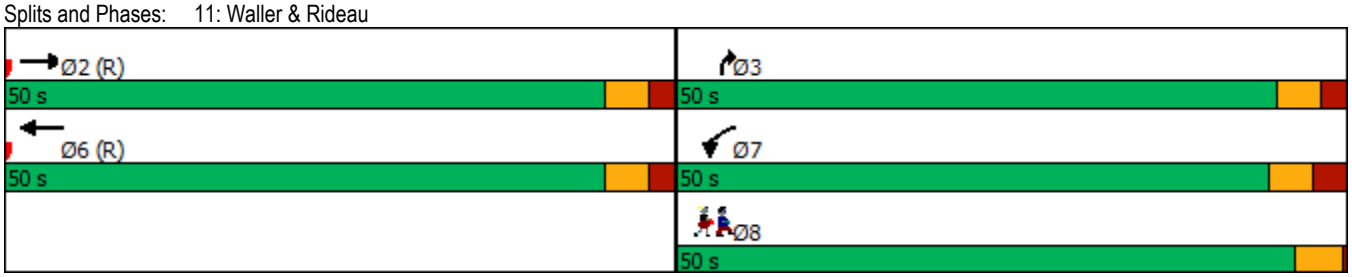
Splits and Phases: 6: Cumberland & Rideau

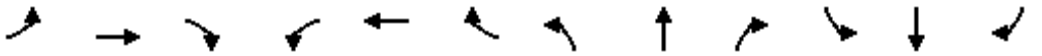
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations							
Traffic Volume (vph)	256	4	301	209	0	255	
Future Volume (vph)	256	4	301	209	0	255	
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	
Storage Length (m)		0.0	30.0		0.0	0.0	
Storage Lanes		0	1		0	1	
Taper Length (m)			30.0		2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	0.998					0.865	
Flt Protected			0.950				
Satd. Flow (prot)	1583	0	1507	1586	0	1372	
Flt Permitted			0.950				
Satd. Flow (perm)	1583	0	1507	1586	0	1372	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	1					490	
Link Speed (k/h)	50			50	50		
Link Distance (m)	86.0			105.3	83.8		
Travel Time (s)	6.2			7.6	6.0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	278	4	327	227	0	277	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	282	0	327	227	0	277	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	0.0		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	1.6			1.6	1.6		
Two way Left Turn Lane							
Headway Factor	1.23	1.23	1.23	1.23	1.23	1.23	
Turning Speed (k/h)		14	24		24	14	
Turn Type	NA		Prot	NA		Prot	
Protected Phases	2		7	6		3	8
Permitted Phases							
Minimum Split (s)	35.4		16.0	25.4		15.4	22.0
Total Split (s)	50.0		50.0	50.0		50.0	50.0
Total Split (%)	50.0%		50.0%	50.0%		50.0%	50%
Maximum Green (s)	44.6		44.0	44.6		44.6	46.0
Yellow Time (s)	3.3		3.3	3.3		3.3	3.5
All-Red Time (s)	2.1		2.7	2.1		2.1	0.5
Lost Time Adjust (s)	0.0		0.0	0.0		0.0	
Total Lost Time (s)	5.4		6.0	5.4		5.4	
Lead/Lag							
Lead-Lag Optimize?							
Walk Time (s)	18.0						7.0
Flash Dont Walk (s)	6.0						10.0
Pedestrian Calls (#/hr)	40						40
Act Effct Green (s)	44.6		44.0	44.6		44.6	
Actuated g/C Ratio	0.45		0.44	0.45		0.45	
v/c Ratio	0.40		0.49	0.32		0.31	
Control Delay	8.8		31.6	11.9		0.9	
Queue Delay	0.1		5.1	0.5		0.3	
Total Delay	8.9		36.7	12.5		1.2	
LOS	A		D	B		A	
Approach Delay	8.9			26.8	1.2		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Approach LOS	A			C	A		
Queue Length 50th (m)	11.9		65.4	11.3		0.0	
Queue Length 95th (m)	16.9		92.6	20.9		0.0	
Internal Link Dist (m)	62.0			81.3	59.8		
Turn Bay Length (m)			30.0				
Base Capacity (vph)	706		663	707		883	
Starvation Cap Reductn	58		266	209		226	
Spillback Cap Reductn	0		0	0		0	
Storage Cap Reductn	0		0	0		0	
Reduced v/c Ratio	0.44		0.82	0.46		0.42	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 98 (98%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 15.9		Intersection LOS: B	
Intersection Capacity Utilization 45.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 11: Waller & Rideau





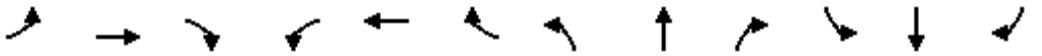
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	17	20	60	37	8	42	347	22	17	532	64
Future Volume (vph)	10	17	20	60	37	8	42	347	22	17	532	64
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		10.0
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (m)	2.5			2.5			2.5			2.5		
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
Frt		0.942			0.989			0.993				0.850
Flt Protected		0.989			0.972			0.995			0.998	
Satd. Flow (prot)	0	1164	0	0	1201	0	0	1234	0	0	1247	1062
Flt Permitted		0.943			0.814			0.901			0.982	
Satd. Flow (perm)	0	1110	0	0	1006	0	0	1117	0	0	1227	1062
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			4			5				26
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		139.4			47.2			64.3			241.5	
Travel Time (s)		10.0			3.4			4.6			17.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)		5			5			5			5	5
Adj. Flow (vph)	11	18	22	65	40	9	46	377	24	18	578	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	51	0	0	114	0	0	447	0	0	596	70
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.64	1.40	1.40	1.64	1.40	1.40	1.64	1.40	1.40	1.64	1.64
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Minimum Split (s)	26.4	26.4		26.4	26.4		26.7	26.7		26.7	26.7	26.7
Total Split (s)	33.0	33.0		33.0	33.0		67.0	67.0		67.0	67.0	67.0
Total Split (%)	33.0%	33.0%		33.0%	33.0%		67.0%	67.0%		67.0%	67.0%	67.0%
Maximum Green (s)	27.6	27.6		27.6	27.6		61.3	61.3		61.3	61.3	61.3
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.1	2.1		2.1	2.1		2.4	2.4		2.4	2.4	2.4
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	0.0
Total Lost Time (s)		5.4			5.4			5.7			5.7	5.7
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		9.0	9.0		9.0	9.0	9.0
Pedestrian Calls (#/hr)	40	40		40	40		40	40		40	40	40
Act Effct Green (s)		27.6			27.6			61.3			61.3	61.3
Actuated g/C Ratio		0.28			0.28			0.61			0.61	0.61
v/c Ratio		0.16			0.41			0.65			0.79	0.11
Control Delay		19.4			33.8			12.4			24.4	5.9
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		19.4			33.8			12.4			24.4	5.9
LOS		B			C			B			C	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		19.4			33.8			12.4			22.4	
Approach LOS		B			C			B			C	
Queue Length 50th (m)		4.2			17.3			25.3			80.1	3.2
Queue Length 95th (m)		13.2			33.6			35.5			#135.0	8.7
Internal Link Dist (m)		115.4			23.2			40.3			217.5	
Turn Bay Length (m)												10.0
Base Capacity (vph)		322			280			686			752	661
Starvation Cap Reductn		0			0			0			0	0
Spillback Cap Reductn		0			0			0			0	0
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.16			0.41			0.65			0.79	0.11

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 42 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Pretimed
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 19.8 Intersection LOS: B
Intersection Capacity Utilization 95.4% 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: 13: Dalhousie & York

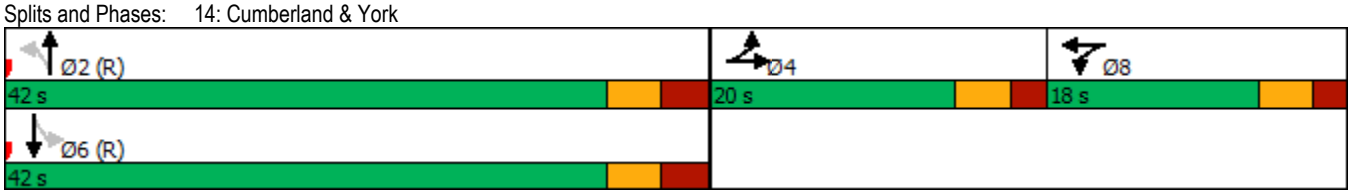


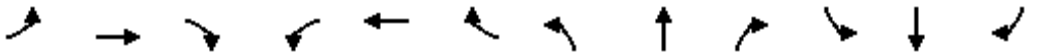
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	18	13	34	75	24	23	290	22	12	84	32
Future Volume (vph)	26	18	13	34	75	24	23	290	22	12	84	32
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.970			0.976			0.991			0.966	
Flt Protected		0.978			0.987			0.997			0.995	
Satd. Flow (prot)	0	1185	0	0	1375	0	0	1410	0	0	1372	0
Flt Permitted		0.978			0.987			0.976			0.957	
Satd. Flow (perm)	0	1185	0	0	1375	0	0	1381	0	0	1320	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			12			6			27	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		150.5			149.4			82.1			179.1	
Travel Time (s)		10.8			10.8			5.9			12.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)		5							5			5
Adj. Flow (vph)	28	20	14	37	82	26	25	315	24	13	91	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	62	0	0	145	0	0	364	0	0	139	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.5			7.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.64	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		8	8			2			6	
Permitted Phases							2			6		
Minimum Split (s)	18.4	18.4		17.4	17.4		37.2	37.2		37.2	37.2	
Total Split (s)	20.0	20.0		18.0	18.0		42.0	42.0		42.0	42.0	
Total Split (%)	25.0%	25.0%		22.5%	22.5%		52.5%	52.5%		52.5%	52.5%	
Maximum Green (s)	14.6	14.6		12.6	12.6		35.8	35.8		35.8	35.8	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.9	2.9		2.9	2.9	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.4			5.4			6.2			6.2	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		20.0	20.0		20.0	20.0	
Flash Dont Walk (s)	6.0	6.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	30	30		30	30		30	30		30	30	
Act Effct Green (s)		14.6			12.6			35.8			35.8	
Actuated g/C Ratio		0.18			0.16			0.45			0.45	
v/c Ratio		0.27			0.64			0.59			0.23	
Control Delay		26.6			43.6			20.1			12.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		26.6			43.6			20.1			12.1	
LOS		C			D			C			B	
Approach Delay		26.6			43.6			20.1			12.1	
Approach LOS		C			D			C			B	
Queue Length 50th (m)		6.3			19.1			42.7			9.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)		16.8			#42.4			70.4			20.9	
Internal Link Dist (m)		126.5			125.4			58.1			155.1	
Turn Bay Length (m)												
Base Capacity (vph)		227			226			621			605	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.27			0.64			0.59			0.23	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 20 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Pretimed			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 23.9		Intersection LOS: C	
Intersection Capacity Utilization 49.1%		ICU Level of Service A	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 14: Cumberland & York



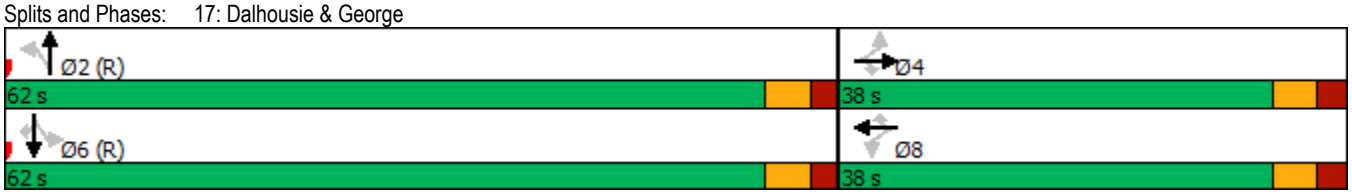


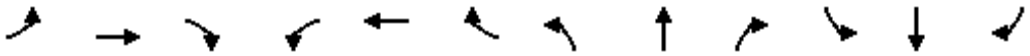
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	4	120	20	13	12	46	273	22	8	389	32
Future Volume (vph)	27	4	120	20	13	12	46	273	22	8	389	32
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	0.0		10.0	0.0		10.0	35.0		0.0	0.0		20.0
Storage Lanes	0		1	0		1	1		0	0		1
Taper Length (m)	2.5			2.5			14.0			2.5		
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
Frt			0.850			0.850		0.989				0.850
Flt Protected		0.958			0.970		0.950				0.999	
Satd. Flow (prot)	0	1197	1062	0	1212	1062	1356	1235	0	0	1248	1019
Flt Permitted		0.807			0.867		0.436				0.993	
Satd. Flow (perm)	0	1008	1062	0	1083	1062	622	1235	0	0	1240	1019
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			130			26		7				29
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		136.0			46.3			100.4			58.8	
Travel Time (s)		9.8			3.3			7.2			4.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	10
Parking (#/hr)		5	5		5	5		5			5	5
Adj. Flow (vph)	29	4	130	22	14	13	50	297	24	9	423	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	33	130	0	36	13	50	321	0	0	432	35
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)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.64	1.64	1.40	1.64	1.64	1.40	1.64	1.40	1.40	1.64	1.72
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Minimum Split (s)	24.7	24.7	24.7	24.7	24.7	24.7	31.4	31.4		31.4	31.4	31.4
Total Split (s)	38.0	38.0	38.0	38.0	38.0	38.0	62.0	62.0		62.0	62.0	62.0
Total Split (%)	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	62.0%	62.0%		62.0%	62.0%	62.0%
Maximum Green (s)	32.3	32.3	32.3	32.3	32.3	32.3	56.6	56.6		56.6	56.6	56.6
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.1	2.1		2.1	2.1	2.1
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)		5.7	5.7		5.7	5.7	5.4	5.4			5.4	5.4
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	12.0	7.0	7.0		7.0	7.0	7.0
Pedestrian Calls (#/hr)	40	40	40	40	40	40	40	40		40	40	40
Act Effct Green (s)		32.3	32.3		32.3	32.3	56.6	56.6			56.6	56.6
Actuated g/C Ratio		0.32	0.32		0.32	0.32	0.57	0.57			0.57	0.57
v/c Ratio		0.10	0.30		0.10	0.04	0.14	0.46			0.62	0.06
Control Delay		24.9	6.5		24.8	4.5	3.8	4.8			9.4	1.5
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.6			0.8	0.0
Total Delay		24.9	6.5		24.8	4.5	3.8	5.4			10.2	1.5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		C	A		C	A	A	A			B	A
Approach Delay		10.2			19.4			5.2			9.6	
Approach LOS		B			B			A			A	
Queue Length 50th (m)		4.4	0.0		4.9	0.0	1.2	7.8			15.4	0.1
Queue Length 95th (m)		11.5	12.7		12.2	2.4	m2.7	11.9			m33.6	m0.0
Internal Link Dist (m)		112.0			22.3			76.4			34.8	
Turn Bay Length (m)			10.0			10.0	35.0					20.0
Base Capacity (vph)		325	431		349	360	352	702			701	589
Starvation Cap Reductn		0	0		0	0	0	137			86	0
Spillback Cap Reductn		0	0		0	0	0	0			0	0
Storage Cap Reductn		0	0		0	0	0	0			0	0
Reduced v/c Ratio		0.10	0.30		0.10	0.04	0.14	0.57			0.70	0.06

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 50 (50%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 8.6		Intersection LOS: A	
Intersection Capacity Utilization 68.7%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 17: Dalhousie & George



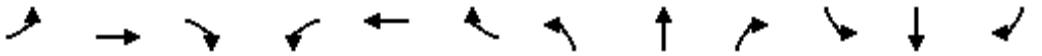


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	30	30	10	20	20	51	220	13	0	20	86
Future Volume (vph)	38	30	30	10	20	20	51	220	13	0	20	86
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.958			0.946			0.993			0.891	
Flt Protected		0.981			0.990			0.991				
Satd. Flow (prot)	0	1174	0	0	1337	0	0	2669	0	0	1272	0
Flt Permitted		0.857			0.932			0.887				
Satd. Flow (perm)	0	1025	0	0	1259	0	0	2389	0	0	1272	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			22			13			93	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		147.6			100.5			99.5			49.6	
Travel Time (s)		10.6			7.2			7.2			3.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)		5							5			
Adj. Flow (vph)	41	33	33	11	22	22	55	239	14	0	22	93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	107	0	0	55	0	0	308	0	0	115	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)		1.5			1.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			-2.0	
Crosswalk Width(m)		5.0			3.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.64	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2					
Minimum Split (s)	21.0	21.0		21.0	21.0		29.0	29.0			29.0	
Total Split (s)	21.0	21.0		21.0	21.0		59.0	59.0			59.0	
Total Split (%)	26.3%	26.3%		26.3%	26.3%		73.8%	73.8%			73.8%	
Maximum Green (s)	15.0	15.0		15.0	15.0		53.0	53.0			53.0	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)	2.7	2.7		2.7	2.7		2.7	2.7			2.7	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		17.0	17.0			12.0	
Pedestrian Calls (#/hr)	30	30		30	30		30	30			30	
Act Effct Green (s)		15.0			15.0			53.0			53.0	
Actuated g/C Ratio		0.19			0.19			0.66			0.66	
v/c Ratio		0.50			0.22			0.19			0.13	
Control Delay		31.9			21.3			5.3			0.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		31.9			21.3			5.3			0.7	
LOS		C			C			A			A	
Approach Delay		31.9			21.3			5.3			0.7	
Approach LOS		C			C			A			A	
Queue Length 50th (m)		11.1			4.2			7.8			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)		26.5			13.7			12.5			m0.6	
Internal Link Dist (m)		123.6			76.5			75.5			25.6	
Turn Bay Length (m)												
Base Capacity (vph)		212			253			1587			874	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.50			0.22			0.19			0.13	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.50			
Intersection Signal Delay: 10.8		Intersection LOS: B	
Intersection Capacity Utilization 39.9%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 19: Cumberland & George



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	28	12	0	0	0	330	255	277	0	272	33
Future Volume (vph)	3	28	12	0	0	0	330	255	277	0	272	33
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1800	1800	1800	1600	1600	1600
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	0.95	1.00	0.95	0.95
Frt		0.962						0.984	0.850		0.984	
Flt Protected		0.997					0.950					
Satd. Flow (prot)	0	1369	0	0	0	0	2960	1501	1297	0	2669	0
Flt Permitted		0.997					0.950					
Satd. Flow (perm)	0	1369	0	0	0	0	2960	1501	1297	0	2669	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		13									15	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		71.6			53.3			73.1			83.8	
Travel Time (s)		5.2			3.8			5.3			6.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	30	13	0	0	0	359	277	301	0	296	36
Shared Lane Traffic (%)									11%			
Lane Group Flow (vph)	0	46	0	0	0	0	359	310	268	0	332	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			8.9			7.4	
Link Offset(m)		0.0			6.0			2.0			1.0	
Crosswalk Width(m)		5.0			4.0			8.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.40	1.40	1.40	1.40	1.40	1.21	1.21	1.21	1.40	1.40	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA					Prot	NA	Perm		NA	
Protected Phases		4					5	2			6	
Permitted Phases	4								2		6	
Minimum Split (s)	16.7	16.7					21.8	56.0	56.0		43.0	
Total Split (s)	18.0	18.0					39.0	56.0	56.0		43.0	
Total Split (%)	18.0%	18.0%					39.0%	56.0%	56.0%		43.0%	
Maximum Green (s)	11.3	11.3					33.2	49.9	49.9		36.9	
Yellow Time (s)	3.3	3.3					3.3	3.3	3.3		3.3	
All-Red Time (s)	3.4	3.4					2.5	2.8	2.8		2.8	
Lost Time Adjust (s)		0.0					0.0	0.0	0.0		0.0	
Total Lost Time (s)		6.7					5.8	6.1	6.1		6.1	
Lead/Lag							Lead	Lag	Lag		Lag	
Lead-Lag Optimize?							Yes	Yes	Yes		Yes	
Walk Time (s)							5.0	7.0	7.0		7.0	
Flash Dont Walk (s)							11.0	11.0	11.0		11.0	
Pedestrian Calls (#/hr)							50	50	50		50	
Act Effct Green (s)		11.3					33.2	49.9	49.9		36.9	
Actuated g/C Ratio		0.11					0.33	0.50	0.50		0.37	
v/c Ratio		0.28					0.37	0.41	0.41		0.33	
Control Delay		25.5					26.7	18.0	18.3		13.2	
Queue Delay		0.0					0.0	0.0	0.0		0.7	
Total Delay		25.5					26.7	18.0	18.3		13.9	
LOS		C					C	B	B		B	
Approach Delay		25.5						21.4			13.9	
Approach LOS		C						C			B	
Queue Length 50th (m)		6.4					27.0	38.3	33.1		35.1	
Queue Length 95th (m)		m12.8					38.9	60.3	54.1		43.1	

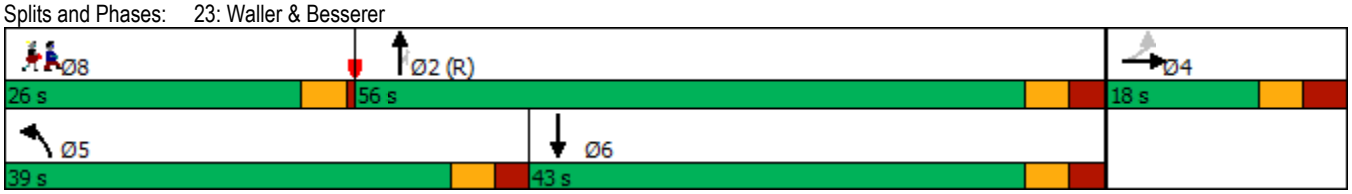
Lane Group	Ø8
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Peak Hour Factor	
Adj. 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)	
Turn Type	
Protected Phases	8
Permitted Phases	
Minimum Split (s)	20.0
Total Split (s)	26.0
Total Split (%)	26%
Maximum Green (s)	22.0
Yellow Time (s)	3.5
All-Red Time (s)	0.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	50
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (m)		47.6			29.3			49.1			59.8	
Turn Bay Length (m)												
Base Capacity (vph)		166					982	748	647		994	
Starvation Cap Reductn		0					0	0	0		374	
Spillback Cap Reductn		0					0	0	0		0	
Storage Cap Reductn		0					0	0	0		0	
Reduced v/c Ratio		0.28					0.37	0.41	0.41		0.54	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 59 (59%), Referenced to phase 2:NBT, Start of Green			
Natural Cycle: 95			
Control Type: Pretimed			
Maximum v/c Ratio: 0.41			
Intersection Signal Delay: 19.7		Intersection LOS: B	
Intersection Capacity Utilization 46.2%		ICU Level of Service A	
Analysis Period (min) 15			

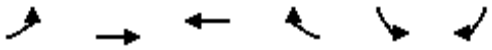
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: Waller & Besserer



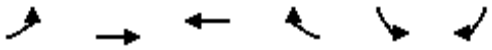
Lane Group	Ø8
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

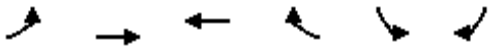


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	34	45	0	0	0
Future Volume (vph)	0	34	45	0	0	0
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1586	1586	0	1586	0
Flt Permitted						
Satd. Flow (perm)	0	1586	1586	0	1586	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		46.3	147.6		32.5	
Travel Time (s)		3.3	10.6		2.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	37	49	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	37	49	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.23	1.23	1.23	1.23
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 6.7%		ICU Level of Service A	
Analysis Period (min) 15			



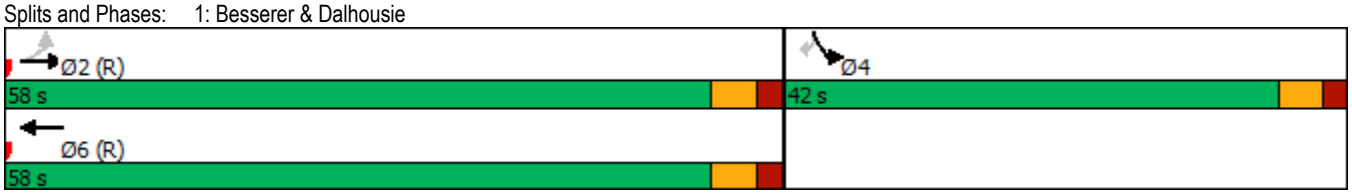
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	111	63	172	363	50	389
Future Volume (vph)	111	63	172	363	50	389
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.93	0.82		0.89	0.97
Frt			0.898		0.884	0.850
Flt Protected		0.969			0.989	
Satd. Flow (prot)	0	1295	1951	0	1226	1009
Flt Permitted		0.514			0.989	
Satd. Flow (perm)	0	640	1951	0	1119	980
Right Turn on Red				Yes		No
Satd. Flow (RTOR)			395			
Link Speed (k/h)		50	50		50	
Link Distance (m)		301.3	71.6		86.3	
Travel Time (s)		21.7	5.2		6.2	
Confl. Peds. (#/hr)	228			228	124	8
Confl. Bikes (#/hr)						3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	0%	4%	4%	0%	2%
Parking (#/hr)				1		5
Adj. Flow (vph)	121	68	187	395	54	423
Shared Lane Traffic (%)						44%
Lane Group Flow (vph)	0	189	582	0	240	237
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.40	1.40	1.40	1.40	1.40	1.64
Turning Speed (k/h)	24			14	24	14
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Minimum Split (s)	33.4	33.4	31.4		26.2	26.2
Total Split (s)	58.0	58.0	58.0		42.0	42.0
Total Split (%)	58.0%	58.0%	58.0%		42.0%	42.0%
Maximum Green (s)	52.6	52.6	52.6		36.8	36.8
Yellow Time (s)	3.3	3.3	3.3		3.3	3.3
All-Red Time (s)	2.1	2.1	2.1		1.9	1.9
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.4	5.4		5.2	5.2
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	17.0	17.0	17.0		10.0	10.0
Flash Dont Walk (s)	9.0	9.0	9.0		6.0	6.0
Pedestrian Calls (#/hr)	40	40	40		40	40
Act Effct Green (s)		52.6	52.6		36.8	36.8
Actuated g/C Ratio		0.53	0.53		0.37	0.37
v/c Ratio		0.56	0.48		0.53	0.66
Control Delay		24.1	5.0		20.5	27.2
Queue Delay		1.5	0.2		1.4	2.3
Total Delay		25.6	5.2		21.8	29.5

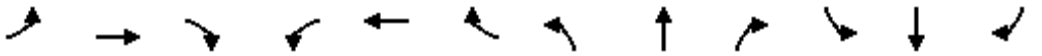


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
LOS		C	A		C	C
Approach Delay		25.6	5.2		25.6	
Approach LOS		C	A		C	
Queue Length 50th (m)		23.5	14.9		40.1	46.2
Queue Length 95th (m)		47.3	20.2		m64.2	m74.2
Internal Link Dist (m)		277.3	47.6		62.3	
Turn Bay Length (m)						
Base Capacity (vph)		336	1213		451	360
Starvation Cap Reductn		0	104		83	47
Spillback Cap Reductn		49	150		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.66	0.55		0.65	0.76

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 62 (62%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 16.1		Intersection LOS: B	
Intersection Capacity Utilization 73.9%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Besserer & Dalhousie





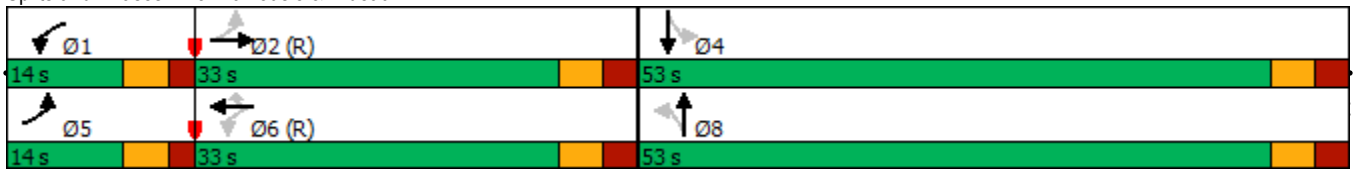
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	346	7	48	272	9	49	387	38	38	384	41
Future Volume (vph)	76	346	7	48	272	9	49	387	38	38	384	41
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	45.0		25.0	35.0		0.0	0.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	20.0			30.0			2.5			14.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor	0.67	0.99		0.88		0.33	0.69	0.94		0.79	0.94	
Frt		0.997				0.850		0.987			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1182	1413	0	1383	1427	1115	954	1294	0	1343	2315	0
Flt Permitted	0.411			0.299			0.463			0.367		
Satd. Flow (perm)	344	1413	0	383	1427	373	320	1294	0	411	2315	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				91		7			15	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		309.9			86.0			86.3			100.4	
Travel Time (s)		22.3			6.2			6.2			7.2	
Confl. Peds. (#/hr)	431		289	289		431	382		389	389		382
Confl. Bikes (#/hr)			18			11			22			13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	17%	2%	0%	0%	2%	11%	45%	5%	0%	3%	2%	16%
Parking (#/hr)											5	5
Adj. Flow (vph)	83	376	8	52	296	10	53	421	41	41	417	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	384	0	52	296	10	53	462	0	41	462	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			-1.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.51	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8			4		

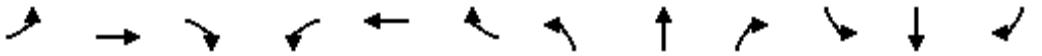
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.3	26.2		10.5	26.0	26.0	22.0	22.0		22.0	22.0	
Total Split (s)	14.0	33.0		14.0	33.0	33.0	53.0	53.0		53.0	53.0	
Total Split (%)	14.0%	33.0%		14.0%	33.0%	33.0%	53.0%	53.0%		53.0%	53.0%	
Maximum Green (s)	8.7	27.0		8.7	27.0	27.0	47.0	47.0		47.0	47.0	
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.7		2.0	2.7	2.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	6.0		5.3	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	Max	Max		Max	Max	
Walk Time (s)		7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		10.0			10.0	10.0	9.0	9.0		9.0	9.0	
Pedestrian Calls (#/hr)		40			40	40	40	40		40	40	
Act Effct Green (s)	38.0	30.4		37.0	29.9	29.9	47.0	47.0		47.0	47.0	
Actuated g/C Ratio	0.38	0.30		0.37	0.30	0.30	0.47	0.47		0.47	0.47	
v/c Ratio	0.42	0.89		0.24	0.69	0.06	0.35	0.76		0.21	0.42	
Control Delay	25.4	59.9		8.2	20.7	0.4	17.0	24.0		12.7	11.2	
Queue Delay	0.0	0.0		0.0	1.0	0.0	0.0	55.5		0.0	0.1	
Total Delay	25.4	59.9		8.2	21.7	0.4	17.0	79.5		12.7	11.3	
LOS	C	E		A	C	A	B	E		B	B	
Approach Delay		53.7			19.2			73.1			11.4	
Approach LOS		D			B			E			B	
Queue Length 50th (m)	9.9	73.3		0.6	26.6	0.0	4.8	87.6		2.2	12.6	
Queue Length 95th (m)	19.9	#134.0		m2.5	#88.9	m0.0	m20.6	123.5		m5.1	22.8	
Internal Link Dist (m)		285.9			62.0			62.3			76.4	
Turn Bay Length (m)	45.0			35.0						25.0		
Base Capacity (vph)	204	430		230	426	175	150	611		193	1096	
Starvation Cap Reductn	0	0		0	29	0	0	262		0	0	
Spillback Cap Reductn	0	0		0	0	2	0	43		0	59	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.41	0.89		0.23	0.75	0.06	0.35	1.32		0.21	0.45	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 66 (66%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 40.9 Intersection LOS: D
Intersection Capacity Utilization 87.4% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Dalhousie & Rideau





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	585	0	0	383	61	24	297	83	0	0	85
Future Volume (vph)	93	585	0	0	383	61	24	297	83	0	0	85
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	30.0		0.0	0.0		15.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		1	0		0	0		1
Taper Length (m)	32.0			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.88					0.67		0.86				0.97
Frt						0.850		0.969				0.865
Flt Protected	0.950							0.997				
Satd. Flow (prot)	1281	1427	0	0	1427	1058	0	2308	0	0	0	1259
Flt Permitted	0.381							0.997				
Satd. Flow (perm)	454	1427	0	0	1427	706	0	2238	0	0	0	1225
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						89						199
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		105.3			142.8			104.9			99.5	
Travel Time (s)		7.6			10.3			7.6			7.2	
Confl. Peds. (#/hr)	288			166		288	215		258			
Confl. Bikes (#/hr)			3			24			19			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	2%	0%	0%	2%	17%	4%	2%	5%	0%	0%	0%
Parking (#/hr)									5			
Adj. Flow (vph)	101	636	0	0	416	66	26	323	90	0	0	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	101	636	0	0	416	66	0	439	0	0	0	92
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			0.0			0.0	
Link Offset(m)		0.0			0.0			2.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	pm+pt	NA			NA	Perm	Perm	NA				Perm
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8					4
Minimum Split (s)	10.3	31.2			26.2	26.2	25.9	25.9				21.9
Total Split (s)	12.0	68.0			56.0	56.0	32.0	32.0				32.0
Total Split (%)	12.0%	68.0%			56.0%	56.0%	32.0%	32.0%				32.0%
Maximum Green (s)	6.7	62.8			50.8	50.8	26.1	26.1				26.1
Yellow Time (s)	3.3	3.3			3.3	3.3	3.3	3.3				3.3
All-Red Time (s)	2.0	1.9			1.9	1.9	2.6	2.6				2.6
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0				0.0
Total Lost Time (s)	5.3	5.2			5.2	5.2		5.9				5.9
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Walk Time (s)		15.0			15.0	15.0	8.0	8.0				5.0
Flash Dont Walk (s)		6.0			6.0	6.0	12.0	12.0				11.0
Pedestrian Calls (#/hr)		40			40	40	40	40				0
Act Effct Green (s)	62.7	62.8			50.8	50.8		26.1				26.1
Actuated g/C Ratio	0.63	0.63			0.51	0.51		0.26				0.26
v/c Ratio	0.30	0.71			0.57	0.16		0.75				0.20

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	8.3	14.1			21.1	2.5		43.3				6.0
Queue Delay	0.0	0.9			0.0	0.0		0.0				0.0
Total Delay	8.3	15.1			21.1	2.5		43.3				6.0
LOS	A	B			C	A		D				A
Approach Delay		14.1			18.5			43.3			6.0	
Approach LOS		B			B			D			A	
Queue Length 50th (m)	5.9	49.0			53.6	0.0		41.2				5.3
Queue Length 95th (m)	m11.4	107.9			82.9	4.1		59.2				m13.2
Internal Link Dist (m)		81.3			118.8			80.9			75.5	
Turn Bay Length (m)	30.0					15.0						
Base Capacity (vph)	340	896			724	402		584				466
Starvation Cap Reductn	0	87			0	0		0				0
Spillback Cap Reductn	0	0			0	0		0				0
Storage Cap Reductn	0	0			0	0		0				0
Reduced v/c Ratio	0.30	0.79			0.57	0.16		0.75				0.20

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 56 (56%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 65
Control Type: Pretimed
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 22.2 Intersection LOS: C
Intersection Capacity Utilization 66.8% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

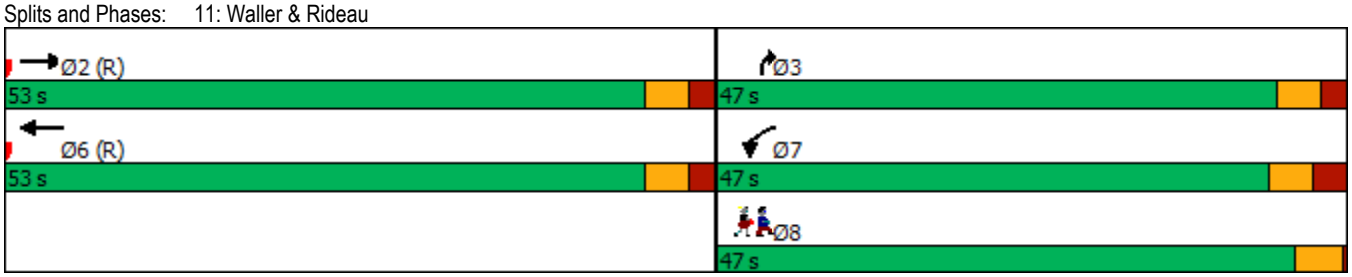
Splits and Phases: 6: Cumberland & Rideau

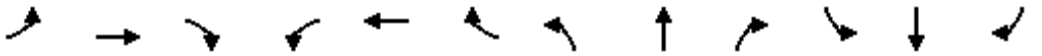
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations							
Traffic Volume (vph)	419	3	163	329	0	259	
Future Volume (vph)	419	3	163	329	0	259	
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	
Storage Length (m)		0.0	32.0		0.0	0.0	
Storage Lanes		0	1		0	1	
Taper Length (m)			30.0		2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	1.00		0.82				
Frt	0.999					0.865	
Flt Protected			0.950				
Satd. Flow (prot)	1581	0	1507	1207	0	1249	
Flt Permitted			0.950				
Satd. Flow (perm)	1581	0	1230	1207	0	1249	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)						26	
Link Speed (k/h)	50			50	50		
Link Distance (m)	86.0			105.3	83.8		
Travel Time (s)	6.2			7.6	6.0		
Confl. Peds. (#/hr)		429	429			3	
Confl. Bikes (#/hr)						23	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Heavy Vehicles (%)	2%	0%	2%	34%	0%	12%	
Adj. Flow (vph)	455	3	177	358	0	282	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	458	0	177	358	0	282	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	0.0		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	1.6			1.6	1.6		
Two way Left Turn Lane							
Headway Factor	1.23	1.23	1.23	1.23	1.23	1.23	
Turning Speed (k/h)		14	24		24	14	
Turn Type	NA		Prot	NA		Prot	
Protected Phases	2		7	6		3	8
Permitted Phases							
Minimum Split (s)	35.4		16.0	25.4		15.4	22.0
Total Split (s)	53.0		47.0	53.0		47.0	47.0
Total Split (%)	53.0%		47.0%	53.0%		47.0%	47%
Maximum Green (s)	47.6		41.0	47.6		41.6	43.0
Yellow Time (s)	3.3		3.3	3.3		3.3	3.5
All-Red Time (s)	2.1		2.7	2.1		2.1	0.5
Lost Time Adjust (s)	0.0		0.0	0.0		0.0	
Total Lost Time (s)	5.4		6.0	5.4		5.4	
Lead/Lag							
Lead-Lag Optimize?							
Walk Time (s)	18.0						7.0
Flash Dont Walk (s)	6.0						10.0
Pedestrian Calls (#/hr)	40						40
Act Effct Green (s)	47.6		41.0	47.6		41.6	
Actuated g/C Ratio	0.48		0.41	0.48		0.42	
v/c Ratio	0.61		0.29	0.62		0.53	
Control Delay	15.4		20.8	18.5		16.2	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Queue Delay	1.6		0.0	0.4		1.2	
Total Delay	17.0		20.8	18.9		17.4	
LOS	B		C	B		B	
Approach Delay	17.0			19.6	17.4		
Approach LOS	B			B	B		
Queue Length 50th (m)	28.1		27.4	26.8		10.4	
Queue Length 95th (m)	m36.9		m45.8	m39.6		m33.1	
Internal Link Dist (m)	62.0			81.3	59.8		
Turn Bay Length (m)			32.0				
Base Capacity (vph)	752		617	574		534	
Starvation Cap Reductn	147		0	34		100	
Spillback Cap Reductn	55		0	19		0	
Storage Cap Reductn	0		0	0		0	
Reduced v/c Ratio	0.76		0.29	0.66		0.65	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 47 (47%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 18.1		Intersection LOS: B	
Intersection Capacity Utilization 63.4%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 11: Waller & Rideau





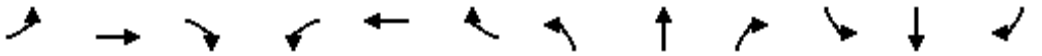
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	36	81	64	43	24	15	379	24	7	340	89
Future Volume (vph)	38	36	81	64	43	24	15	379	24	7	340	89
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		10.0
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (m)	2.5			2.5			2.5			2.5		
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		0.86			0.90			0.97			1.00	0.45
Frt		0.929			0.975			0.992				0.850
Flt Protected		0.988			0.976			0.998			0.999	
Satd. Flow (prot)	0	1038	0	0	1129	0	0	1199	0	0	1163	1062
Flt Permitted		0.899			0.789			0.982			0.991	
Satd. Flow (perm)	0	906	0	0	865	0	0	1169	0	0	1150	482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		56			11			5				53
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		306.1			47.2			64.3			276.6	
Travel Time (s)		22.0			3.4			4.6			19.9	
Confl. Peds. (#/hr)	84		57	57		84	259		133	133		259
Confl. Bikes (#/hr)			14			12			9			1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	0%	0%	7%	0%	7%	3%	0%	29%	9%	2%
Parking (#/hr)		5			5			5			5	5
Adj. Flow (vph)	41	39	88	70	47	26	16	412	26	8	370	97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	168	0	0	143	0	0	454	0	0	378	97
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.64	1.40	1.40	1.64	1.40	1.40	1.64	1.40	1.40	1.64	1.64
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Minimum Split (s)	26.4	26.4		26.4	26.4		26.7	26.7		26.7	26.7	26.7
Total Split (s)	35.0	35.0		35.0	35.0		65.0	65.0		65.0	65.0	65.0
Total Split (%)	35.0%	35.0%		35.0%	35.0%		65.0%	65.0%		65.0%	65.0%	65.0%
Maximum Green (s)	29.6	29.6		29.6	29.6		59.3	59.3		59.3	59.3	59.3
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.1	2.1		2.1	2.1		2.4	2.4		2.4	2.4	2.4
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	0.0
Total Lost Time (s)		5.4			5.4			5.7			5.7	5.7
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		9.0	9.0		9.0	9.0	9.0
Pedestrian Calls (#/hr)	40	40		40	40		40	40		40	40	40
Act Effct Green (s)		29.6			29.6			59.3			59.3	59.3
Actuated g/C Ratio		0.30			0.30			0.59			0.59	0.59
v/c Ratio		0.55			0.54			0.65			0.56	0.32

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		27.1			50.1			5.5			16.3	8.1
Queue Delay		0.0			0.0			0.8			0.0	0.0
Total Delay		27.1			50.1			6.3			16.3	8.1
LOS		C			D			A			B	A
Approach Delay		27.1			50.1			6.3			14.6	
Approach LOS		C			D			A			B	
Queue Length 50th (m)		17.8			27.8			7.6			41.3	3.6
Queue Length 95th (m)		39.5			47.5			m13.0			67.9	13.0
Internal Link Dist (m)		282.1			23.2			40.3			252.6	
Turn Bay Length (m)												10.0
Base Capacity (vph)		307			263			695			681	307
Starvation Cap Reductn		0			0			68			0	0
Spillback Cap Reductn		0			0			0			0	0
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.55			0.54			0.72			0.56	0.32

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 95 (95%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 17.3 Intersection LOS: B
Intersection Capacity Utilization 75.4% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Dalhousie & York



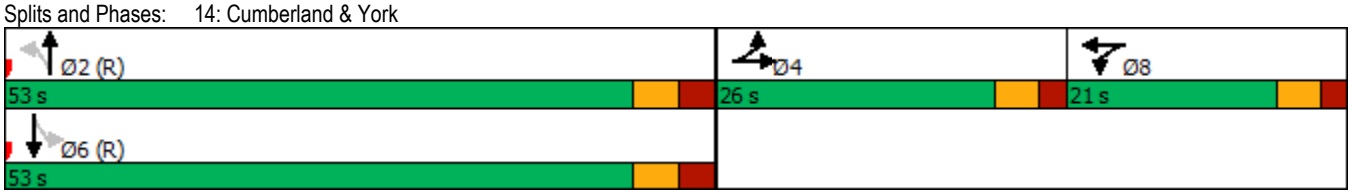
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	24	18	29	62	27	40	539	23	15	88	23
Future Volume (vph)	34	24	18	29	62	27	40	539	23	15	88	23
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		30.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		0.89			0.92			0.98			0.94	
Frt		0.967			0.969			0.994			0.975	
Flt Protected		0.978			0.988			0.997			0.994	
Satd. Flow (prot)	0	1094	0	0	1314	0	0	2623	0	0	1218	0
Flt Permitted		0.978			0.988			0.924			0.908	
Satd. Flow (perm)	0	1033	0	0	1256	0	0	2400	0	0	1103	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			12			5			15	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		150.5			165.1			42.0			166.8	
Travel Time (s)		10.8			11.9			3.0			12.0	
Confl. Peds. (#/hr)	59		51	51		59	121		113	113		121
Confl. Bikes (#/hr)			18			30			9			6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	8%	0%	0%	3%	0%	0%	3%	22%	20%	8%	13%
Parking (#/hr)		5							5			5
Adj. Flow (vph)	37	26	20	32	67	29	43	586	25	16	96	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	83	0	0	128	0	0	654	0	0	137	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.5			7.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.64	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		8	8			2			6	
Permitted Phases							2			6		
Minimum Split (s)	18.4	18.4		17.4	17.4		37.2	37.2		37.2	37.2	
Total Split (s)	26.0	26.0		21.0	21.0		53.0	53.0		53.0	53.0	
Total Split (%)	26.0%	26.0%		21.0%	21.0%		53.0%	53.0%		53.0%	53.0%	
Maximum Green (s)	20.6	20.6		15.6	15.6		46.8	46.8		46.8	46.8	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.9	2.9		2.9	2.9	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.4			5.4			6.2			6.2	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		20.0	20.0		20.0	20.0	
Flash Dont Walk (s)	6.0	6.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	30	30		30	30		30	30		30	30	
Act Effct Green (s)		20.6			15.6			46.8			46.8	
Actuated g/C Ratio		0.21			0.16			0.47			0.47	
v/c Ratio		0.35			0.60			0.58			0.26	

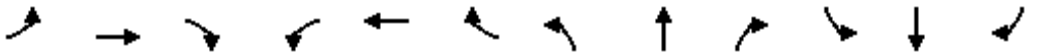
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		34.9			48.0			13.1			15.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		34.9			48.0			13.1			15.9	
LOS		C			D			B			B	
Approach Delay		34.9			48.0			13.1			15.9	
Approach LOS		C			D			B			B	
Queue Length 50th (m)		10.9			21.1			27.0			13.7	
Queue Length 95th (m)		m23.5			#40.5			39.3			26.6	
Internal Link Dist (m)		126.5			141.1			18.0			142.8	
Turn Bay Length (m)												
Base Capacity (vph)		236			215			1125			524	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.35			0.60			0.58			0.26	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 6 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Pretimed
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 19.8 Intersection LOS: B
Intersection Capacity Utilization 46.7% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Cumberland & York





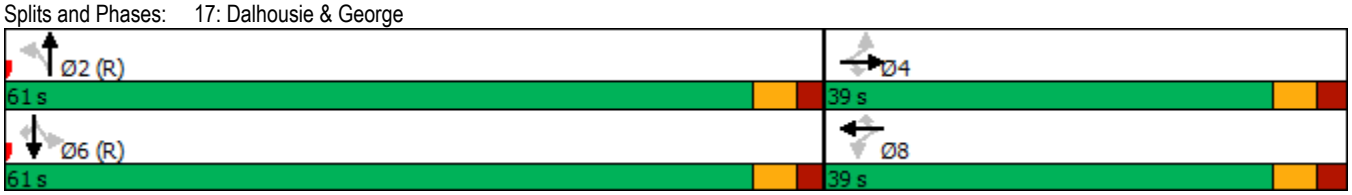
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	3	102	56	22	27	46	538	24	2	345	10
Future Volume (vph)	33	3	102	56	22	27	46	538	24	2	345	10
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	0.0		10.0	0.0		10.0	35.0		0.0	0.0		20.0
Storage Lanes	0		1	0		1	1		0	0		1
Taper Length (m)	2.5			2.5			14.0			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98	0.85		0.91	0.95	0.82	0.98			1.00	0.62
Frt			0.850			0.850		0.994				0.850
Flt Protected		0.956			0.965		0.950					
Satd. Flow (prot)	0	1218	1083	0	1229	1083	1383	1201	0	0	1234	1040
Flt Permitted		0.762			0.794		0.476				0.998	
Satd. Flow (perm)	0	948	924	0	918	1029	568	1201	0	0	1231	648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			111			29		4				29
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		304.0			58.1			100.4			58.8	
Travel Time (s)		21.9			4.2			7.2			4.2	
Confl. Peds. (#/hr)	11		86	86		11	157		150	150		157
Confl. Bikes (#/hr)			3			1			6			16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	50%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	10
Parking (#/hr)		5	5		5	5		5			5	5
Adj. Flow (vph)	36	3	111	61	24	29	50	585	26	2	375	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	39	111	0	85	29	50	611	0	0	377	11
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)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.64	1.64	1.40	1.64	1.64	1.40	1.64	1.40	1.40	1.64	1.72
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Minimum Split (s)	24.7	24.7	24.7	24.7	24.7	24.7	31.4	31.4		31.4	31.4	31.4
Total Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	61.0	61.0		61.0	61.0	61.0
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	61.0%	61.0%		61.0%	61.0%	61.0%
Maximum Green (s)	33.3	33.3	33.3	33.3	33.3	33.3	55.6	55.6		55.6	55.6	55.6
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.1	2.1		2.1	2.1	2.1
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)		5.7	5.7		5.7	5.7	5.4	5.4			5.4	5.4
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	12.0	7.0	7.0		7.0	7.0	7.0
Pedestrian Calls (#/hr)	40	40	40	40	40	40	40	40		40	40	40
Act Effct Green (s)		33.3	33.3		33.3	33.3	55.6	55.6			55.6	55.6
Actuated g/C Ratio		0.33	0.33		0.33	0.33	0.56	0.56			0.56	0.56

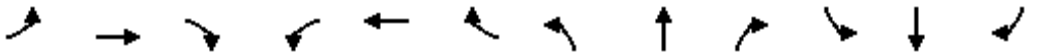
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.12	0.29		0.28	0.08	0.16	0.91			0.55	0.03
Control Delay		24.6	6.9		28.4	10.7	8.3	28.6			13.1	0.5
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0			0.4	0.0
Total Delay		24.6	6.9		28.4	10.7	8.3	28.6			13.5	0.5
LOS		C	A		C	B	A	C			B	A
Approach Delay		11.5			23.9			27.1			13.1	
Approach LOS		B			C			C			B	
Queue Length 50th (m)		5.2	0.0		14.6	1.3	2.3	34.9			29.8	0.0
Queue Length 95th (m)		12.9	11.7		m29.3	m7.2	m5.1	#173.7			42.1	m0.0
Internal Link Dist (m)		280.0			34.1			76.4			34.8	
Turn Bay Length (m)			10.0			10.0	35.0					20.0
Base Capacity (vph)		315	381		305	362	315	669			684	373
Starvation Cap Reductn		0	0		0	0	0	0			71	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		0.12	0.29		0.28	0.08	0.16	0.91			0.62	0.03

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 92 (92%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Pretimed
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 20.9 Intersection LOS: C
Intersection Capacity Utilization 87.5% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 17: Dalhousie & George



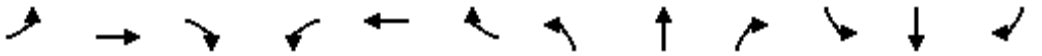


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	65	40	25	38	62	53	378	20	0	20	79
Future Volume (vph)	40	65	40	25	38	62	53	378	20	0	20	79
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		0.97			0.94			0.97			0.98	
Frt		0.963			0.933			0.993			0.892	
Flt Protected		0.986			0.990			0.994				
Satd. Flow (prot)	0	1176	0	0	1210	0	0	2638	0	0	1244	0
Flt Permitted		0.869			0.915			0.904				
Satd. Flow (perm)	0	1017	0	0	1118	0	0	2349	0	0	1244	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			44			11			86	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		135.8			100.5			99.5			46.0	
Travel Time (s)		9.8			7.2			7.2			3.3	
Confl. Peds. (#/hr)	50					50	95		74	95		
Confl. Bikes (#/hr)			10			13			15			8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	0%	3%	7%	3%	2%	14%	0%	0%	3%
Parking (#/hr)		5							5			
Adj. Flow (vph)	43	71	43	27	41	67	58	411	22	0	22	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	157	0	0	135	0	0	491	0	0	108	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)		1.5			1.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			-2.0	
Crosswalk Width(m)		5.0			3.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.64	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2					
Minimum Split (s)	21.0	21.0		21.0	21.0		32.0	32.0			32.0	
Total Split (s)	25.0	25.0		25.0	25.0		75.0	75.0			75.0	
Total Split (%)	25.0%	25.0%		25.0%	25.0%		75.0%	75.0%			75.0%	
Maximum Green (s)	19.0	19.0		19.0	19.0		69.0	69.0			69.0	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)	2.7	2.7		2.7	2.7		2.7	2.7			2.7	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		15.0	15.0			15.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	30	30		30	30		30	30			30	
Act Effct Green (s)		19.0			19.0			69.0			69.0	
Actuated g/C Ratio		0.19			0.19			0.69			0.69	
v/c Ratio		0.76			0.54			0.30			0.12	
Control Delay		61.8			33.6			2.3			1.5	
Queue Delay		0.0			0.0			0.5			0.0	
Total Delay		61.8			33.6			2.8			1.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		E			C			A			A	
Approach Delay		61.8			33.6			2.8			1.5	
Approach LOS		E			C			A			A	
Queue Length 50th (m)		26.8			15.7			6.1			0.9	
Queue Length 95th (m)		m#52.8			35.2			6.9			m4.1	
Internal Link Dist (m)		111.8			76.5			75.5			22.0	
Turn Bay Length (m)												
Base Capacity (vph)		207			248			1624			885	
Starvation Cap Reductn		0			0			706			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.76			0.54			0.53			0.12	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 10 (10%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 55			
Control Type: Pretimed			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 17.7		Intersection LOS: B	
Intersection Capacity Utilization 46.4%		ICU Level of Service A	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 19: Cumberland & George



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	32	16	0	0	0	445	259	476	0	137	29
Future Volume (vph)	3	32	16	0	0	0	445	259	476	0	137	29
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.96					0.76	0.89	0.66		0.94	
Frt		0.958						0.950	0.850		0.973	
Flt Protected		0.997					0.950					
Satd. Flow (prot)	0	1336	0	0	0	0	2903	1200	1297	0	2053	0
Flt Permitted		0.997					0.950					
Satd. Flow (perm)	0	1297	0	0	0	0	2219	1200	858	0	2053	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		17									27	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		71.6			97.7			77.0			83.8	
Travel Time (s)		5.2			7.0			5.5			6.0	
Confl. Peds. (#/hr)	152		10				109		266	109		266
Confl. Bikes (#/hr)			7						22			9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	8%	2%	2%	2%	4%	13%	2%	0%	47%	0%
Adj. Flow (vph)	3	35	17	0	0	0	484	282	517	0	149	32
Shared Lane Traffic (%)									27%			
Lane Group Flow (vph)	0	55	0	0	0	0	484	422	377	0	181	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	Right	Right	Left	Left	Right
Median Width(m)		0.0			0.0			8.9			7.4	
Link Offset(m)		0.0			6.0			2.0			1.0	
Crosswalk Width(m)		5.0			4.0			8.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.40	1.40	1.40	1.40	1.40	1.21	1.21	1.21	1.21	1.21	1.21
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA					Prot	NA	Perm		NA	
Protected Phases		4					5	2			6	
Permitted Phases	4								2		6	
Minimum Split (s)	16.7	16.7					21.8	56.0	56.0		24.1	
Total Split (s)	18.0	18.0					43.0	56.0	56.0		39.0	
Total Split (%)	18.0%	18.0%					43.0%	56.0%	56.0%		39.0%	
Maximum Green (s)	11.3	11.3					37.2	49.9	49.9		32.9	
Yellow Time (s)	3.3	3.3					3.3	3.3	3.3		3.3	
All-Red Time (s)	3.4	3.4					2.5	2.8	2.8		2.8	
Lost Time Adjust (s)		0.0					0.0	0.0	0.0		0.0	
Total Lost Time (s)		6.7					5.8	6.1	6.1		6.1	
Lead/Lag							Lead	Lag	Lag		Lag	
Lead-Lag Optimize?							Yes	Yes	Yes		Yes	
Walk Time (s)							5.0	7.0	7.0		7.0	
Flash Dont Walk (s)							11.0	11.0	11.0		11.0	
Pedestrian Calls (#/hr)							50	50	50		50	
Act Effct Green (s)		11.3					37.2	49.9	49.9		32.9	
Actuated g/C Ratio		0.11					0.37	0.50	0.50		0.33	
v/c Ratio		0.34					0.45	0.71	0.88		0.26	
Control Delay		39.7					25.3	27.3	46.7		14.9	
Queue Delay		0.0					0.0	0.0	0.0		0.0	
Total Delay		39.7					25.3	27.3	46.7		14.9	
LOS		D					C	C	D		B	

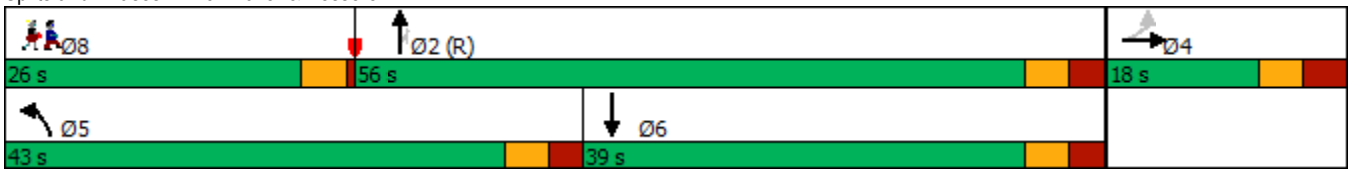
Lane Group	Ø8
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Turn Type	
Protected Phases	8
Permitted Phases	
Minimum Split (s)	20.0
Total Split (s)	26.0
Total Split (%)	26%
Maximum Green (s)	22.0
Yellow Time (s)	3.5
All-Red Time (s)	0.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	50
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		39.7						32.3			14.9	
Approach LOS		D						C			B	
Queue Length 50th (m)		5.6					35.8	63.7	65.8		17.0	
Queue Length 95th (m)		m16.6					49.8	104.0	#127.1		28.0	
Internal Link Dist (m)		47.6			73.7			53.0			59.8	
Turn Bay Length (m)												
Base Capacity (vph)		161					1079	598	428		693	
Starvation Cap Reductn		0					0	0	0		0	
Spillback Cap Reductn		0					0	0	0		0	
Storage Cap Reductn		0					0	0	0		0	
Reduced v/c Ratio		0.34					0.45	0.71	0.88		0.26	

Intersection Summary

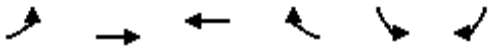
Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 7 (7%), Referenced to phase 2:NBT, Start of Green
Natural Cycle: 95
Control Type: Pretimed
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 30.5 Intersection LOS: C
Intersection Capacity Utilization 53.7% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: Waller & Besserer



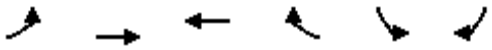
Lane Group	Ø8
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

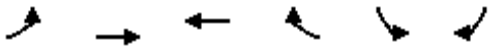


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	29	105	0	0	0
Future Volume (vph)	0	29	105	0	0	0
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1586	1586	0	1586	0
Flt Permitted						
Satd. Flow (perm)	0	1586	1586	0	1586	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		58.1	135.8		47.1	
Travel Time (s)		4.2	9.8		3.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	32	114	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	32	114	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.23	1.23	1.23	1.23
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 9.9%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	39	16	99	264	81	498
Future Volume (vph)	39	16	99	264	81	498
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt			0.891		0.891	0.850
Flt Protected		0.966			0.986	
Satd. Flow (prot)	0	1379	2417	0	1254	1009
Flt Permitted		0.681			0.986	
Satd. Flow (perm)	0	972	2417	0	1254	1009
Right Turn on Red				Yes		No
Satd. Flow (RTOR)			287			
Link Speed (k/h)		50	50		50	
Link Distance (m)		42.9	71.6		86.3	
Travel Time (s)		3.1	5.2		6.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)				1		5
Adj. Flow (vph)	42	17	108	287	88	541
Shared Lane Traffic (%)						43%
Lane Group Flow (vph)	0	59	395	0	321	308
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.40	1.40	1.40	1.40	1.40	1.64
Turning Speed (k/h)	24			14	24	14
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Minimum Split (s)	33.4	33.4	31.4		26.2	26.2
Total Split (s)	55.0	55.0	55.0		45.0	45.0
Total Split (%)	55.0%	55.0%	55.0%		45.0%	45.0%
Maximum Green (s)	49.6	49.6	49.6		39.8	39.8
Yellow Time (s)	3.3	3.3	3.3		3.3	3.3
All-Red Time (s)	2.1	2.1	2.1		1.9	1.9
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.4	5.4		5.2	5.2
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	17.0	17.0	17.0		10.0	10.0
Flash Dont Walk (s)	9.0	9.0	9.0		6.0	6.0
Pedestrian Calls (#/hr)	40	40	40		40	40
Act Effct Green (s)		49.6	49.6		39.8	39.8
Actuated g/C Ratio		0.50	0.50		0.40	0.40
v/c Ratio		0.12	0.29		0.64	0.77
Control Delay		14.5	1.4		22.7	31.7
Queue Delay		0.0	0.1		25.6	27.3
Total Delay		14.5	1.5		48.3	59.0
LOS		B	A		D	E
Approach Delay		14.5	1.5		53.5	
Approach LOS		B	A		D	
Queue Length 50th (m)		5.9	0.1		61.1	67.3

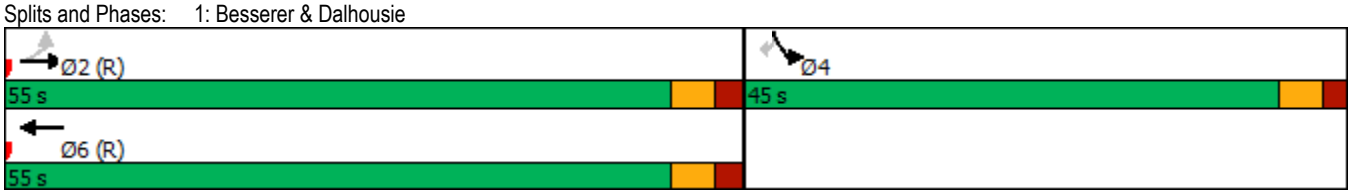


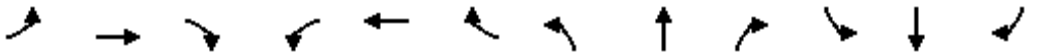
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 95th (m)		13.1	3.8		92.8	#103.2
Internal Link Dist (m)		18.9	47.6		62.3	
Turn Bay Length (m)						
Base Capacity (vph)		482	1343		499	401
Starvation Cap Reductn		0	269		178	97
Spillback Cap Reductn		16	40		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.13	0.37		1.00	1.01

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 14 (14%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 32.4	Intersection LOS: C
Intersection Capacity Utilization 66.1%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 1: Besserer & Dalhousie



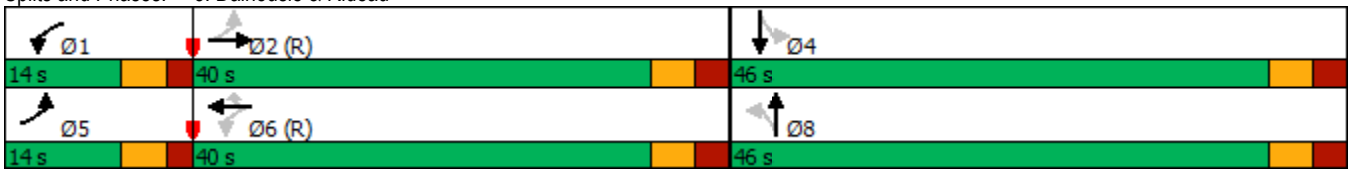


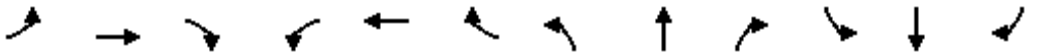
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	240	3	56	162	10	26	265	12	29	520	49
Future Volume (vph)	93	240	3	56	162	10	26	265	12	29	520	49
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	45.0		25.0	35.0		0.0	0.0		0.0	25.0		30.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	20.0			30.0			2.5			14.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.998				0.850		0.994			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1356	1425	0	1356	1427	1213	1356	1419	0	1356	2510	0
Flt Permitted	0.620			0.522			0.342			0.489		
Satd. Flow (perm)	885	1425	0	745	1427	1213	488	1419	0	698	2510	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				91		3			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		120.1			86.0			86.3			100.4	
Travel Time (s)		8.6			6.2			6.2			7.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)											5	5
Adj. Flow (vph)	101	261	3	61	176	11	28	288	13	32	565	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	101	264	0	61	176	11	28	301	0	32	618	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			-1.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.51	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.3	26.2		10.5	26.0	26.0	22.0	22.0		22.0	22.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	14.0	40.0		14.0	40.0	40.0	46.0	46.0		46.0	46.0	
Total Split (%)	14.0%	40.0%		14.0%	40.0%	40.0%	46.0%	46.0%		46.0%	46.0%	
Maximum Green (s)	8.7	34.0		8.7	34.0	34.0	40.0	40.0		40.0	40.0	
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.7		2.0	2.7	2.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	6.0		5.3	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	Max	Max		Max	Max	
Walk Time (s)		7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		10.0			10.0	10.0	9.0	9.0		9.0	9.0	
Pedestrian Calls (#/hr)		40			40	40	40	40		40	40	
Act Effct Green (s)	44.9	37.3		44.0	36.9	36.9	40.0	40.0		40.0	40.0	
Actuated g/C Ratio	0.45	0.37		0.44	0.37	0.37	0.40	0.40		0.40	0.40	
v/c Ratio	0.23	0.50		0.16	0.33	0.02	0.14	0.53		0.11	0.61	
Control Delay	15.9	29.3		7.0	10.4	0.1	7.5	13.6		20.3	22.5	
Queue Delay	0.0	0.0		0.0	0.3	0.0	0.0	9.9		0.0	0.8	
Total Delay	15.9	29.3		7.0	10.7	0.1	7.5	23.4		20.3	23.3	
LOS	B	C		A	B	A	A	C		C	C	
Approach Delay		25.6			9.3			22.1			23.1	
Approach LOS		C			A			C			C	
Queue Length 50th (m)	10.4	40.4		1.2	3.8	0.0	0.9	50.9		3.0	32.1	
Queue Length 95th (m)	19.9	66.0		4.1	13.6	m0.0	2.3	80.9		m6.8	51.9	
Internal Link Dist (m)		96.1			62.0			62.3			76.4	
Turn Bay Length (m)	45.0			35.0						25.0		
Base Capacity (vph)	439	532		385	526	505	195	569		279	1011	
Starvation Cap Reductn	0	0		0	89	0	0	232		0	153	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	132	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.23	0.50		0.16	0.40	0.02	0.14	0.89		0.11	0.72	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 7 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 21.3		Intersection LOS: C	
Intersection Capacity Utilization 69.7%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Dalhousie & Rideau





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	369	0	0	450	67	11	118	78	0	0	68
Future Volume (vph)	170	369	0	0	450	67	11	118	78	0	0	68
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	30.0		0.0	0.0		15.0	0.0		0.0	20.0		0.0
Storage Lanes	1		0	0		1	0		0	0		1
Taper Length (m)	30.0			2.5			2.5			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt						0.850		0.943				0.865
Flt Protected	0.950							0.997				
Satd. Flow (prot)	1356	1427	0	0	1427	1213	0	2550	0	0	0	1235
Flt Permitted	0.337							0.997				
Satd. Flow (perm)	481	1427	0	0	1427	1213	0	2550	0	0	0	1235
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						89						414
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		105.3			159.5			67.1			99.5	
Travel Time (s)		7.6			11.5			4.8			7.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)									5			
Adj. Flow (vph)	185	401	0	0	489	73	12	128	85	0	0	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	185	401	0	0	489	73	0	225	0	0	0	74
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			0.0			0.0	
Link Offset(m)		0.0			0.0			2.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	pm+pt	NA			NA	Perm	Perm	NA				Perm
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8					4
Minimum Split (s)	10.3	31.2			26.2	26.2	25.9	25.9				21.9
Total Split (s)	12.0	70.0			58.0	58.0	30.0	30.0				30.0
Total Split (%)	12.0%	70.0%			58.0%	58.0%	30.0%	30.0%				30.0%
Maximum Green (s)	6.7	64.8			52.8	52.8	24.1	24.1				24.1
Yellow Time (s)	3.3	3.3			3.3	3.3	3.3	3.3				3.3
All-Red Time (s)	2.0	1.9			1.9	1.9	2.6	2.6				2.6
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0				0.0
Total Lost Time (s)	5.3	5.2			5.2	5.2		5.9				5.9
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Walk Time (s)		15.0			15.0	15.0	8.0	8.0				5.0
Flash Dont Walk (s)		6.0			6.0	6.0	12.0	12.0				11.0
Pedestrian Calls (#/hr)		40			40	40	40	40				0
Act Effct Green (s)	64.7	64.8			52.8	52.8		24.1				24.1
Actuated g/C Ratio	0.65	0.65			0.53	0.53		0.24				0.24
v/c Ratio	0.50	0.43			0.65	0.11		0.37				0.12
Control Delay	7.9	5.7			22.0	2.3		33.7				0.4
Queue Delay	0.0	0.3			0.6	0.0		0.1				0.0
Total Delay	7.9	6.0			22.7	2.3		33.7				0.4
LOS	A	A			C	A		C				A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		6.6			20.0			33.7			0.4	
Approach LOS		A			C			C			A	
Queue Length 50th (m)	12.0	28.3			64.8	0.0		19.1				0.0
Queue Length 95th (m)	13.7	40.1			99.8	4.7		30.0				0.0
Internal Link Dist (m)		81.3			135.5			43.1			75.5	
Turn Bay Length (m)	30.0					15.0						
Base Capacity (vph)	369	924			753	682		614				611
Starvation Cap Reductn	0	147			0	0		0				0
Spillback Cap Reductn	0	0			69	0		26				53
Storage Cap Reductn	0	0			0	0		0				0
Reduced v/c Ratio	0.50	0.52			0.71	0.11		0.38				0.13

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Pretimed			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 15.7		Intersection LOS: B	
Intersection Capacity Utilization 65.7%		ICU Level of Service C	
Analysis Period (min) 15			

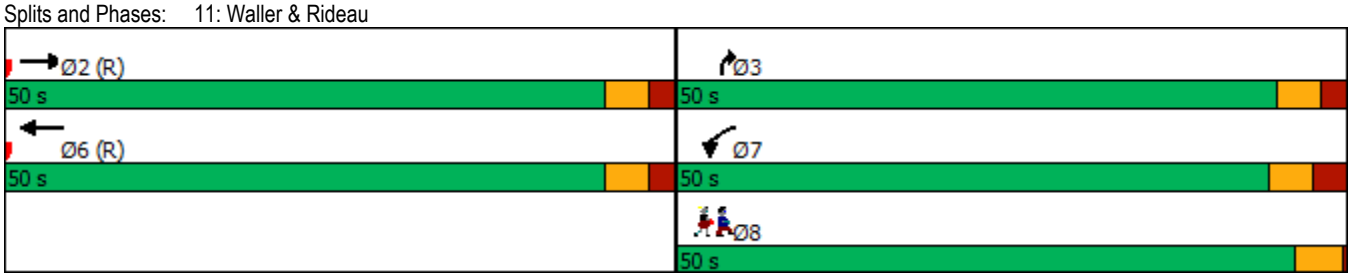
Splits and Phases: 6: Cumberland & Rideau

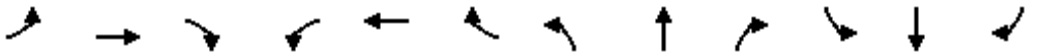
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations							
Traffic Volume (vph)	277	4	301	218	0	262	
Future Volume (vph)	277	4	301	218	0	262	
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	
Storage Length (m)		0.0	30.0		0.0	0.0	
Storage Lanes		0	1		0	1	
Taper Length (m)			30.0		2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	0.998					0.865	
Flt Protected			0.950				
Satd. Flow (prot)	1583	0	1507	1586	0	1372	
Flt Permitted			0.950				
Satd. Flow (perm)	1583	0	1507	1586	0	1372	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	1					457	
Link Speed (k/h)	50			50	50		
Link Distance (m)	86.0			105.3	83.8		
Travel Time (s)	6.2			7.6	6.0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	301	4	327	237	0	285	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	305	0	327	237	0	285	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	0.0		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	1.6			1.6	1.6		
Two way Left Turn Lane							
Headway Factor	1.23	1.23	1.23	1.23	1.23	1.23	
Turning Speed (k/h)		14	24		24	14	
Turn Type	NA		Prot	NA		Prot	
Protected Phases	2		7	6		3	8
Permitted Phases							
Minimum Split (s)	35.4		16.0	25.4		15.4	22.0
Total Split (s)	50.0		50.0	50.0		50.0	50.0
Total Split (%)	50.0%		50.0%	50.0%		50.0%	50%
Maximum Green (s)	44.6		44.0	44.6		44.6	46.0
Yellow Time (s)	3.3		3.3	3.3		3.3	3.5
All-Red Time (s)	2.1		2.7	2.1		2.1	0.5
Lost Time Adjust (s)	0.0		0.0	0.0		0.0	
Total Lost Time (s)	5.4		6.0	5.4		5.4	
Lead/Lag							
Lead-Lag Optimize?							
Walk Time (s)	18.0						7.0
Flash Dont Walk (s)	6.0						10.0
Pedestrian Calls (#/hr)	40						40
Act Effct Green (s)	44.6		44.0	44.6		44.6	
Actuated g/C Ratio	0.45		0.44	0.45		0.45	
v/c Ratio	0.43		0.49	0.34		0.33	
Control Delay	8.8		31.4	12.1		0.9	
Queue Delay	0.1		4.9	0.6		0.3	
Total Delay	8.9		36.3	12.7		1.3	
LOS	A		D	B		A	
Approach Delay	8.9			26.4	1.3		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Approach LOS	A			C	A		
Queue Length 50th (m)	12.1		65.1	12.1		0.0	
Queue Length 95th (m)	16.9		92.7	22.1		0.0	
Internal Link Dist (m)	62.0			81.3	59.8		
Turn Bay Length (m)			30.0				
Base Capacity (vph)	706		663	707		865	
Starvation Cap Reductn	50		263	205		207	
Spillback Cap Reductn	0		0	0		0	
Storage Cap Reductn	0		0	0		0	
Reduced v/c Ratio	0.46		0.82	0.47		0.43	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 98 (98%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 15.6		Intersection LOS: B	
Intersection Capacity Utilization 46.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 11: Waller & Rideau





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	17	24	60	37	8	47	367	22	17	547	64
Future Volume (vph)	10	17	24	60	37	8	47	367	22	17	547	64
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		10.0
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (m)	2.5			2.5			2.5			2.5		
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
Frt		0.936			0.989			0.993				0.850
Flt Protected		0.990			0.972			0.995			0.999	
Satd. Flow (prot)	0	1157	0	0	1201	0	0	1234	0	0	1248	1062
Flt Permitted		0.947			0.812			0.892			0.982	
Satd. Flow (perm)	0	1107	0	0	1003	0	0	1106	0	0	1227	1062
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			4			5				26
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		59.5			47.2			64.3			149.9	
Travel Time (s)		4.3			3.4			4.6			10.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)		5			5			5			5	5
Adj. Flow (vph)	11	18	26	65	40	9	51	399	24	18	595	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	55	0	0	114	0	0	474	0	0	613	70
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.64	1.40	1.40	1.64	1.40	1.40	1.64	1.40	1.40	1.64	1.64
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Minimum Split (s)	26.4	26.4		26.4	26.4		26.7	26.7		26.7	26.7	26.7
Total Split (s)	33.0	33.0		33.0	33.0		67.0	67.0		67.0	67.0	67.0
Total Split (%)	33.0%	33.0%		33.0%	33.0%		67.0%	67.0%		67.0%	67.0%	67.0%
Maximum Green (s)	27.6	27.6		27.6	27.6		61.3	61.3		61.3	61.3	61.3
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.1	2.1		2.1	2.1		2.4	2.4		2.4	2.4	2.4
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	0.0
Total Lost Time (s)		5.4			5.4			5.7			5.7	5.7
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		9.0	9.0		9.0	9.0	9.0
Pedestrian Calls (#/hr)	40	40		40	40		40	40		40	40	40
Act Effct Green (s)		27.6			27.6			61.3			61.3	61.3
Actuated g/C Ratio		0.28			0.28			0.61			0.61	0.61
v/c Ratio		0.17			0.41			0.70			0.82	0.11
Control Delay		18.5			33.8			14.7			26.0	5.9
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		18.5			33.8			14.7			26.0	5.9
LOS		B			C			B			C	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		18.5			33.8			14.7			23.9	
Approach LOS		B			C			B			C	
Queue Length 50th (m)		4.2			17.3			29.6			84.7	3.2
Queue Length 95th (m)		13.6			33.7			42.5			#160.2	8.7
Internal Link Dist (m)		35.5			23.2			40.3			125.9	
Turn Bay Length (m)												10.0
Base Capacity (vph)		324			279			679			752	661
Starvation Cap Reductn		0			0			0			0	0
Spillback Cap Reductn		0			0			0			0	0
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.17			0.41			0.70			0.82	0.11

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 42 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Pretimed			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 21.2		Intersection LOS: C	
Intersection Capacity Utilization 98.2%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

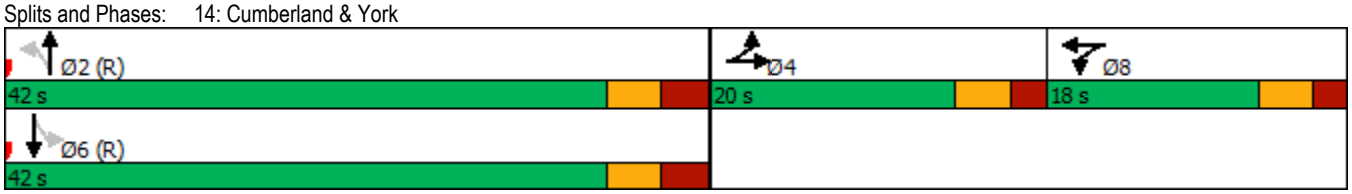
Splits and Phases: 13: Dalhousie & York

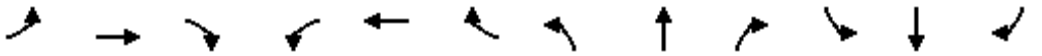
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	18	13	37	75	24	23	320	26	12	94	32
Future Volume (vph)	26	18	13	37	75	24	23	320	26	12	94	32
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.970			0.976			0.991			0.968	
Flt Protected		0.978			0.987			0.997			0.996	
Satd. Flow (prot)	0	1185	0	0	1375	0	0	1410	0	0	1376	0
Flt Permitted		0.978			0.987			0.977			0.957	
Satd. Flow (perm)	0	1185	0	0	1375	0	0	1382	0	0	1322	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			11			6			25	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		150.5			149.4			82.1			78.3	
Travel Time (s)		10.8			10.8			5.9			5.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)		5							5			5
Adj. Flow (vph)	28	20	14	40	82	26	25	348	28	13	102	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	62	0	0	148	0	0	401	0	0	150	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.5			7.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.64	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		8	8			2			6	
Permitted Phases							2			6		
Minimum Split (s)	18.4	18.4		17.4	17.4		37.2	37.2		37.2	37.2	
Total Split (s)	20.0	20.0		18.0	18.0		42.0	42.0		42.0	42.0	
Total Split (%)	25.0%	25.0%		22.5%	22.5%		52.5%	52.5%		52.5%	52.5%	
Maximum Green (s)	14.6	14.6		12.6	12.6		35.8	35.8		35.8	35.8	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.9	2.9		2.9	2.9	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.4			5.4			6.2			6.2	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		20.0	20.0		20.0	20.0	
Flash Dont Walk (s)	6.0	6.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	30	30		30	30		30	30		30	30	
Act Effct Green (s)		14.6			12.6			35.8			35.8	
Actuated g/C Ratio		0.18			0.16			0.45			0.45	
v/c Ratio		0.27			0.66			0.65			0.25	
Control Delay		26.6			45.0			22.8			12.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		26.6			45.0			22.8			12.7	
LOS		C			D			C			B	
Approach Delay		26.6			45.0			22.8			12.7	
Approach LOS		C			D			C			B	
Queue Length 50th (m)		6.3			19.8			44.8			11.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)		16.8			#44.0			75.0			22.9	
Internal Link Dist (m)		126.5			125.4			58.1			54.3	
Turn Bay Length (m)												
Base Capacity (vph)		227			225			621			605	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.27			0.66			0.65			0.25	

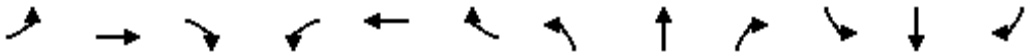
Intersection Summary			
Area Type:	CBD		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 20 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Pretimed			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 25.5		Intersection LOS: C	
Intersection Capacity Utilization 52.2%		ICU Level of Service A	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 14: Cumberland & York





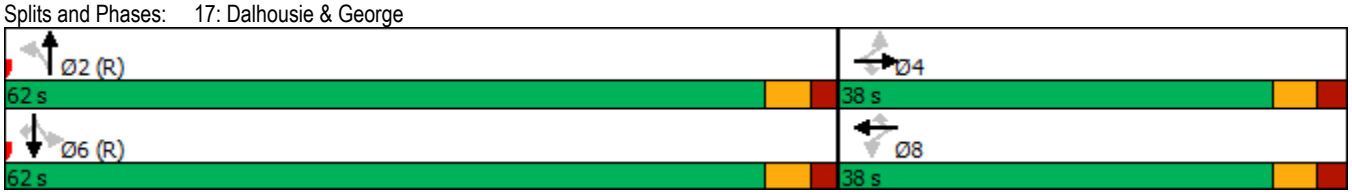
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	22	120	69	38	37	46	273	44	27	389	32
Future Volume (vph)	27	22	120	69	38	37	46	273	44	27	389	32
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	0.0		10.0	0.0		10.0	35.0		0.0	0.0		20.0
Storage Lanes	0		1	0		1	1		0	0		1
Taper Length (m)	2.5			2.5			14.0			2.5		
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
Frt			0.850			0.850		0.979				0.850
Flt Protected		0.973			0.969		0.950				0.997	
Satd. Flow (prot)	0	1215	1062	0	1210	1062	1356	1223	0	0	1245	1019
Flt Permitted		0.836			0.790		0.421				0.964	
Satd. Flow (perm)	0	1044	1062	0	987	1062	601	1223	0	0	1204	1019
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			130			40		13				29
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		58.5			92.6			100.4			58.8	
Travel Time (s)		4.2			6.7			7.2			4.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	10
Parking (#/hr)		5	5		5	5		5			5	5
Adj. Flow (vph)	29	24	130	75	41	40	50	297	48	29	423	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	53	130	0	116	40	50	345	0	0	452	35
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)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.64	1.64	1.40	1.64	1.64	1.40	1.64	1.40	1.40	1.64	1.72
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Minimum Split (s)	24.7	24.7	24.7	24.7	24.7	24.7	31.4	31.4		31.4	31.4	31.4
Total Split (s)	38.0	38.0	38.0	38.0	38.0	38.0	62.0	62.0		62.0	62.0	62.0
Total Split (%)	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	62.0%	62.0%		62.0%	62.0%	62.0%
Maximum Green (s)	32.3	32.3	32.3	32.3	32.3	32.3	56.6	56.6		56.6	56.6	56.6
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.1	2.1		2.1	2.1	2.1
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)		5.7	5.7		5.7	5.7	5.4	5.4			5.4	5.4
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	12.0	7.0	7.0		7.0	7.0	7.0
Pedestrian Calls (#/hr)	40	40	40	40	40	40	40	40		40	40	40
Act Effct Green (s)		32.3	32.3		32.3	32.3	56.6	56.6			56.6	56.6
Actuated g/C Ratio		0.32	0.32		0.32	0.32	0.57	0.57			0.57	0.57
v/c Ratio		0.16	0.30		0.36	0.11	0.15	0.49			0.66	0.06
Control Delay		25.8	6.5		30.1	8.5	4.2	5.5			10.3	1.5
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.7			0.9	0.0
Total Delay		25.8	6.5		30.1	8.5	4.2	6.2			11.3	1.5

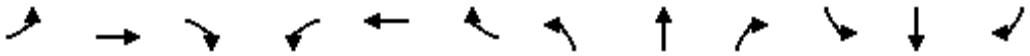


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		C	A		C	A	A	A			B	A
Approach Delay		12.1			24.6			5.9			10.6	
Approach LOS		B			C			A			B	
Queue Length 50th (m)		7.3	0.0		17.1	0.0	1.3	8.2			16.2	0.1
Queue Length 95th (m)		16.5	12.7		32.7	7.1	m3.0	14.3			m38.2	m0.0
Internal Link Dist (m)		34.5			68.6			76.4			34.8	
Turn Bay Length (m)			10.0			10.0	35.0					20.0
Base Capacity (vph)		337	431		318	370	340	697			681	589
Starvation Cap Reductn		0	0		0	0	0	127			72	0
Spillback Cap Reductn		0	0		0	0	0	17			0	0
Storage Cap Reductn		0	0		0	0	0	0			0	0
Reduced v/c Ratio		0.16	0.30		0.36	0.11	0.15	0.61			0.74	0.06

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 50 (50%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 11.1		Intersection LOS: B	
Intersection Capacity Utilization 79.6%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 17: Dalhousie & George



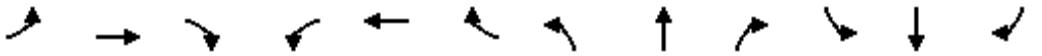


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	69	30	18	43	37	85	220	50	0	20	99
Future Volume (vph)	55	69	30	18	43	37	85	220	50	0	20	99
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.973			0.950			0.979			0.888	
Flt Protected		0.982			0.991			0.988				
Satd. Flow (prot)	0	1193	0	0	1344	0	0	2623	0	0	1268	0
Flt Permitted		0.861			0.921			0.845				
Satd. Flow (perm)	0	1046	0	0	1249	0	0	2244	0	0	1268	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			33			42			108	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		101.3			100.5			99.5			49.6	
Travel Time (s)		7.3			7.2			7.2			3.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)		5							5			
Adj. Flow (vph)	60	75	33	20	47	40	92	239	54	0	22	108
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	168	0	0	107	0	0	385	0	0	130	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)		1.5			1.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			-2.0	
Crosswalk Width(m)		5.0			3.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.64	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2					
Minimum Split (s)	21.0	21.0		21.0	21.0		29.0	29.0			29.0	
Total Split (s)	25.0	25.0		25.0	25.0		60.0	60.0			60.0	
Total Split (%)	29.4%	29.4%		29.4%	29.4%		70.6%	70.6%			70.6%	
Maximum Green (s)	18.9	18.9		18.9	18.9		53.9	53.9			53.9	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)	2.8	2.8		2.8	2.8		2.8	2.8			2.8	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.1			6.1			6.1			6.1	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		17.0	17.0			12.0	
Pedestrian Calls (#/hr)	30	30		30	30		30	30			30	
Act Effct Green (s)		18.9			18.9			53.9			53.9	
Actuated g/C Ratio		0.22			0.22			0.63			0.63	
v/c Ratio		0.69			0.35			0.27			0.15	
Control Delay		45.1			23.5			6.6			2.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		45.1			23.5			6.6			2.3	
LOS		D			C			A			A	
Approach Delay		45.1			23.5			6.6			2.3	
Approach LOS		D			C			A			A	
Queue Length 50th (m)		23.2			10.0			11.3			1.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)		#51.4			24.1			17.6			7.0	
Internal Link Dist (m)		77.3			76.5			75.5			25.6	
Turn Bay Length (m)												
Base Capacity (vph)		242			303			1438			843	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.69			0.35			0.27			0.15	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 16.4		Intersection LOS: B	
Intersection Capacity Utilization 44.8%		ICU Level of Service A	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 19: Cumberland & George



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	28	12	0	0	0	340	262	287	0	272	33
Future Volume (vph)	3	28	12	0	0	0	340	262	287	0	272	33
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1800	1800	1800	1600	1600	1600
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	0.95	1.00	0.95	0.95
Frt		0.962						0.984	0.850		0.984	
Flt Protected		0.997					0.950					
Satd. Flow (prot)	0	1369	0	0	0	0	2960	1501	1297	0	2669	0
Flt Permitted		0.997					0.950					
Satd. Flow (perm)	0	1369	0	0	0	0	2960	1501	1297	0	2669	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		13									15	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		71.6			53.3			73.1			83.8	
Travel Time (s)		5.2			3.8			5.3			6.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	30	13	0	0	0	370	285	312	0	296	36
Shared Lane Traffic (%)									11%			
Lane Group Flow (vph)	0	46	0	0	0	0	370	319	278	0	332	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			8.9			7.4	
Link Offset(m)		0.0			6.0			2.0			1.0	
Crosswalk Width(m)		5.0			4.0			8.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.40	1.40	1.40	1.40	1.40	1.21	1.21	1.21	1.40	1.40	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA					Prot	NA	Perm		NA	
Protected Phases		4					5	2			6	
Permitted Phases	4								2		6	
Minimum Split (s)	16.7	16.7					21.8	56.0	56.0		43.0	
Total Split (s)	18.0	18.0					39.0	56.0	56.0		43.0	
Total Split (%)	18.0%	18.0%					39.0%	56.0%	56.0%		43.0%	
Maximum Green (s)	11.3	11.3					33.2	49.9	49.9		36.9	
Yellow Time (s)	3.3	3.3					3.3	3.3	3.3		3.3	
All-Red Time (s)	3.4	3.4					2.5	2.8	2.8		2.8	
Lost Time Adjust (s)		0.0					0.0	0.0	0.0		0.0	
Total Lost Time (s)		6.7					5.8	6.1	6.1		6.1	
Lead/Lag							Lead	Lag	Lag		Lag	
Lead-Lag Optimize?							Yes	Yes	Yes		Yes	
Walk Time (s)							5.0	7.0	7.0		7.0	
Flash Dont Walk (s)							11.0	11.0	11.0		11.0	
Pedestrian Calls (#/hr)							50	50	50		50	
Act Effct Green (s)		11.3					33.2	49.9	49.9		36.9	
Actuated g/C Ratio		0.11					0.33	0.50	0.50		0.37	
v/c Ratio		0.28					0.38	0.43	0.43		0.33	
Control Delay		24.7					26.9	18.2	18.6		13.2	
Queue Delay		0.0					0.0	0.0	0.0		0.7	
Total Delay		24.7					26.9	18.2	18.6		13.9	
LOS		C					C	B	B		B	
Approach Delay		24.7						21.6			13.9	
Approach LOS		C						C			B	
Queue Length 50th (m)		6.3					27.9	39.7	34.7		34.9	
Queue Length 95th (m)		m12.0					40.2	62.2	56.4		43.1	

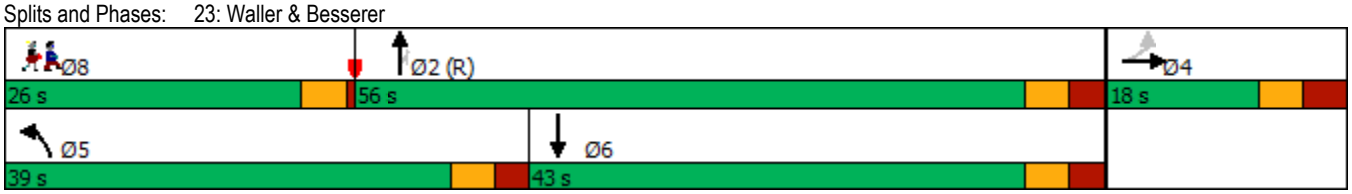
Lane Group	Ø8
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Peak Hour Factor	
Adj. 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)	
Turn Type	
Protected Phases	8
Permitted Phases	
Minimum Split (s)	20.0
Total Split (s)	26.0
Total Split (%)	26%
Maximum Green (s)	22.0
Yellow Time (s)	3.5
All-Red Time (s)	0.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	50
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (m)		47.6			29.3			49.1			59.8	
Turn Bay Length (m)												
Base Capacity (vph)		166					982	748	647		994	
Starvation Cap Reductn		0					0	0	0		374	
Spillback Cap Reductn		0					0	0	0		0	
Storage Cap Reductn		0					0	0	0		0	
Reduced v/c Ratio		0.28					0.38	0.43	0.43		0.54	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 59 (59%), Referenced to phase 2:NBT, Start of Green			
Natural Cycle: 95			
Control Type: Pretimed			
Maximum v/c Ratio: 0.43			
Intersection Signal Delay: 19.8		Intersection LOS: B	
Intersection Capacity Utilization 46.5%		ICU Level of Service A	
Analysis Period (min) 15			

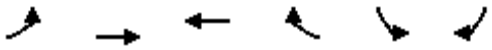
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: Waller & Besserer



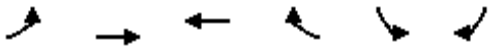
Lane Group	Ø8
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

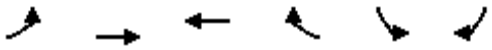


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	56	37	53	62	53	91
Future Volume (vph)	56	37	53	62	53	91
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.928		0.915	
Flt Protected		0.971			0.982	
Satd. Flow (prot)	0	1540	1472	0	1425	0
Flt Permitted		0.971			0.982	
Satd. Flow (perm)	0	1540	1472	0	1425	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		92.6	101.3		32.5	
Travel Time (s)		6.7	7.3		2.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	61	40	58	67	58	99
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	101	125	0	157	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.23	1.23	1.23	1.23
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 29.5%		ICU Level of Service A	
Analysis Period (min) 15			



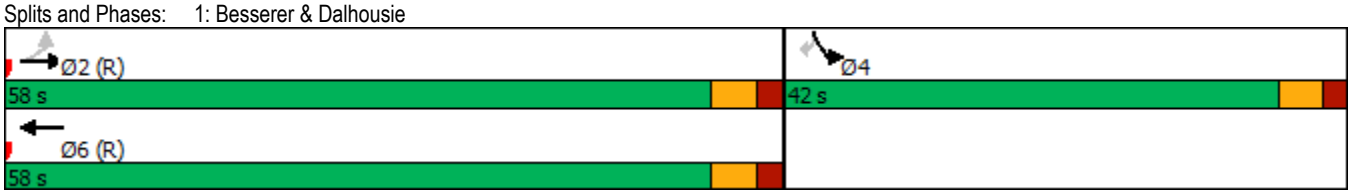
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	111	63	172	376	50	418
Future Volume (vph)	111	63	172	376	50	418
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.93	0.81		0.90	0.97
Frt			0.897		0.881	0.850
Flt Protected		0.969			0.990	
Satd. Flow (prot)	0	1295	1944	0	1222	1009
Flt Permitted		0.505			0.990	
Satd. Flow (perm)	0	630	1944	0	1123	980
Right Turn on Red				Yes		No
Satd. Flow (RTOR)			409			
Link Speed (k/h)		50	50		50	
Link Distance (m)		301.3	71.6		86.3	
Travel Time (s)		21.7	5.2		6.2	
Confl. Peds. (#/hr)	228			228	124	8
Confl. Bikes (#/hr)						3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	0%	4%	4%	0%	2%
Parking (#/hr)				1		5
Adj. Flow (vph)	121	68	187	409	54	454
Shared Lane Traffic (%)						45%
Lane Group Flow (vph)	0	189	596	0	258	250
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.40	1.40	1.40	1.40	1.40	1.64
Turning Speed (k/h)	24			14	24	14
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Minimum Split (s)	33.4	33.4	31.4		26.2	26.2
Total Split (s)	58.0	58.0	58.0		42.0	42.0
Total Split (%)	58.0%	58.0%	58.0%		42.0%	42.0%
Maximum Green (s)	52.6	52.6	52.6		36.8	36.8
Yellow Time (s)	3.3	3.3	3.3		3.3	3.3
All-Red Time (s)	2.1	2.1	2.1		1.9	1.9
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.4	5.4		5.2	5.2
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	17.0	17.0	17.0		10.0	10.0
Flash Dont Walk (s)	9.0	9.0	9.0		6.0	6.0
Pedestrian Calls (#/hr)	40	40	40		40	40
Act Effct Green (s)		52.6	52.6		36.8	36.8
Actuated g/C Ratio		0.53	0.53		0.37	0.37
v/c Ratio		0.57	0.49		0.57	0.69
Control Delay		24.5	5.3		21.2	28.6
Queue Delay		1.6	0.2		1.6	2.9
Total Delay		26.2	5.5		22.8	31.4

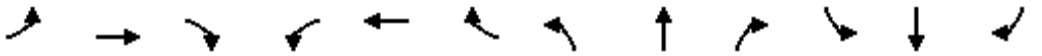


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
LOS		C	A		C	C
Approach Delay		26.2	5.5		27.0	
Approach LOS		C	A		C	
Queue Length 50th (m)		23.7	15.7		44.8	49.7
Queue Length 95th (m)		47.9	21.1		m68.6	m#81.0
Internal Link Dist (m)		277.3	47.6		62.3	
Turn Bay Length (m)						
Base Capacity (vph)		331	1216		449	360
Starvation Cap Reductn		0	107		76	45
Spillback Cap Reductn		49	153		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.67	0.56		0.69	0.79

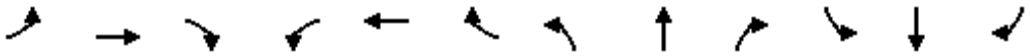
Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 62 (62%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 17.0		Intersection LOS: B	
Intersection Capacity Utilization 74.5%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Besserer & Dalhousie





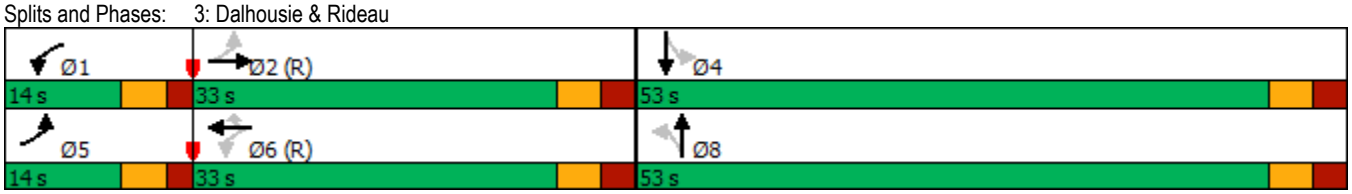
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	365	7	48	276	9	49	400	38	38	413	55
Future Volume (vph)	91	365	7	48	276	9	49	400	38	38	413	55
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	45.0		25.0	35.0		0.0	0.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	20.0			30.0			2.5			14.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor	0.68	0.99		0.89		0.33	0.72	0.94		0.80	0.92	
Frt		0.997				0.850		0.987			0.982	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1182	1414	0	1383	1427	1115	954	1297	0	1343	2269	0
Flt Permitted	0.403			0.270			0.432			0.355		
Satd. Flow (perm)	340	1414	0	351	1427	373	311	1297	0	403	2269	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				91		6			20	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		309.9			86.0			86.3			100.4	
Travel Time (s)		22.3			6.2			6.2			7.2	
Confl. Peds. (#/hr)	431		289	289		431	382		389	389		382
Confl. Bikes (#/hr)			18			11			22			13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	17%	2%	0%	0%	2%	11%	45%	5%	0%	3%	2%	16%
Parking (#/hr)											5	5
Adj. Flow (vph)	99	397	8	52	300	10	53	435	41	41	449	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	99	405	0	52	300	10	53	476	0	41	509	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			-1.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.51	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8			4		

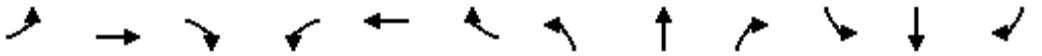


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	20.0		5.0	20.0	20.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.3	26.2		10.5	26.0	26.0	22.0	22.0		22.0	22.0	
Total Split (s)	14.0	33.0		14.0	33.0	33.0	53.0	53.0		53.0	53.0	
Total Split (%)	14.0%	33.0%		14.0%	33.0%	33.0%	53.0%	53.0%		53.0%	53.0%	
Maximum Green (s)	8.7	27.0		8.7	27.0	27.0	47.0	47.0		47.0	47.0	
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.7		2.0	2.7	2.7	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	6.0		5.3	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	Max	Max		Max	Max	
Walk Time (s)		7.0			7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		10.0			10.0	10.0	9.0	9.0		9.0	9.0	
Pedestrian Calls (#/hr)		40			40	40	40	40		40	40	
Act Effct Green (s)	38.1	30.4		36.9	29.8	29.8	47.0	47.0		47.0	47.0	
Actuated g/C Ratio	0.38	0.30		0.37	0.30	0.30	0.47	0.47		0.47	0.47	
v/c Ratio	0.50	0.94		0.25	0.71	0.06	0.36	0.78		0.22	0.47	
Control Delay	28.4	68.0		9.1	22.0	0.4	17.6	25.2		14.2	13.3	
Queue Delay	0.0	0.0		0.0	1.1	0.0	0.0	55.0		0.0	0.4	
Total Delay	28.4	68.0		9.1	23.1	0.4	17.6	80.3		14.2	13.7	
LOS	C	E		A	C	A	B	F		B	B	
Approach Delay		60.2			20.5			74.0			13.7	
Approach LOS		E			C			E			B	
Queue Length 50th (m)	12.0	~83.8		0.9	25.2	0.0	4.8	91.3		2.8	18.3	
Queue Length 95th (m)	23.0	#144.3		m2.7	#90.3	m0.0	m20.0	#130.5		m5.8	32.8	
Internal Link Dist (m)		285.9			62.0			62.3			76.4	
Turn Bay Length (m)	45.0			35.0						25.0		
Base Capacity (vph)	202	430		221	425	175	146	612		189	1077	
Starvation Cap Reductn	0	0		0	28	0	0	259		0	204	
Spillback Cap Reductn	0	0		0	0	4	0	68		4	63	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.49	0.94		0.24	0.76	0.06	0.36	1.35		0.22	0.58	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 66 (66%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 43.4		Intersection LOS: D	
Intersection Capacity Utilization 89.6%		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.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Dalhousie & Rideau





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	582	0	0	381	97	24	321	83	0	0	91
Future Volume (vph)	124	582	0	0	381	97	24	321	83	0	0	91
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	30.0		0.0	0.0		15.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		1	0		0	0		1
Taper Length (m)	32.0			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.88					0.67		0.87				0.97
Frt						0.850		0.971				0.865
Flt Protected	0.950							0.997				
Satd. Flow (prot)	1281	1427	0	0	1427	1058	0	2330	0	0	0	1259
Flt Permitted	0.383							0.997				
Satd. Flow (perm)	456	1427	0	0	1427	706	0	2264	0	0	0	1225
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						89						199
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		105.3			142.8			104.9			99.5	
Travel Time (s)		7.6			10.3			7.6			7.2	
Confl. Peds. (#/hr)	288			166		288	215		258			
Confl. Bikes (#/hr)			3			24			19			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	2%	0%	0%	2%	17%	4%	2%	5%	0%	0%	0%
Parking (#/hr)									5			
Adj. Flow (vph)	135	633	0	0	414	105	26	349	90	0	0	99
Shared Lane Traffic (%)												
Lane Group Flow (vph)	135	633	0	0	414	105	0	465	0	0	0	99
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			0.0			0.0	
Link Offset(m)		0.0			0.0			2.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	pm+pt	NA			NA	Perm	Perm	NA				Perm
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8					4
Minimum Split (s)	10.3	31.2			26.2	26.2	25.9	25.9				21.9
Total Split (s)	12.0	68.0			56.0	56.0	32.0	32.0				32.0
Total Split (%)	12.0%	68.0%			56.0%	56.0%	32.0%	32.0%				32.0%
Maximum Green (s)	6.7	62.8			50.8	50.8	26.1	26.1				26.1
Yellow Time (s)	3.3	3.3			3.3	3.3	3.3	3.3				3.3
All-Red Time (s)	2.0	1.9			1.9	1.9	2.6	2.6				2.6
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0				0.0
Total Lost Time (s)	5.3	5.2			5.2	5.2		5.9				5.9
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Walk Time (s)		15.0			15.0	15.0	8.0	8.0				5.0
Flash Dont Walk (s)		6.0			6.0	6.0	12.0	12.0				11.0
Pedestrian Calls (#/hr)		40			40	40	40	40				0
Act Effct Green (s)	62.7	62.8			50.8	50.8		26.1				26.1
Actuated g/C Ratio	0.63	0.63			0.51	0.51		0.26				0.26
v/c Ratio	0.40	0.71			0.57	0.26		0.79				0.21

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	9.4	14.0			21.0	5.7		45.4				8.1
Queue Delay	0.0	1.2			0.0	0.0		0.0				0.0
Total Delay	9.4	15.2			21.0	5.7		45.4				8.1
LOS	A	B			C	A		D				A
Approach Delay		14.2			17.9			45.4			8.1	
Approach LOS		B			B			D			A	
Queue Length 50th (m)	7.9	48.7			53.3	1.5		44.2				4.3
Queue Length 95th (m)	m14.9	109.6			82.6	10.4		#67.1				12.9
Internal Link Dist (m)		81.3			118.8			80.9			75.5	
Turn Bay Length (m)	30.0					15.0						
Base Capacity (vph)	341	896			724	402		590				466
Starvation Cap Reductn	0	106			0	0		0				0
Spillback Cap Reductn	0	0			0	0		0				0
Storage Cap Reductn	0	0			0	0		0				0
Reduced v/c Ratio	0.40	0.80			0.57	0.26		0.79				0.21

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 56 (56%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 65
Control Type: Pretimed
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 22.8 Intersection LOS: C
Intersection Capacity Utilization 67.4% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

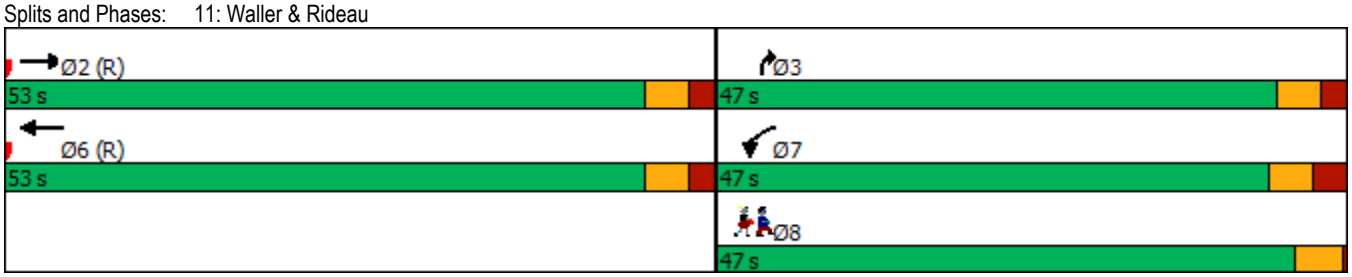
Splits and Phases: 6: Cumberland & Rideau

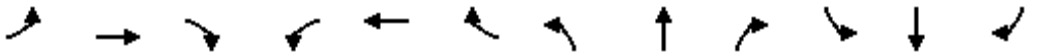
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations							
Traffic Volume (vph)	438	3	163	333	0	268	
Future Volume (vph)	438	3	163	333	0	268	
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	
Storage Length (m)		0.0	32.0		0.0	0.0	
Storage Lanes		0	1		0	1	
Taper Length (m)			30.0		2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	1.00		0.82				
Frt	0.999					0.865	
Flt Protected			0.950				
Satd. Flow (prot)	1581	0	1507	1207	0	1249	
Flt Permitted			0.950				
Satd. Flow (perm)	1581	0	1238	1207	0	1249	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)						24	
Link Speed (k/h)	50			50	50		
Link Distance (m)	86.0			105.3	83.8		
Travel Time (s)	6.2			7.6	6.0		
Confl. Peds. (#/hr)		429	429			3	
Confl. Bikes (#/hr)						23	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Heavy Vehicles (%)	2%	0%	2%	34%	0%	12%	
Adj. Flow (vph)	476	3	177	362	0	291	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	479	0	177	362	0	291	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	0.0		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	1.6			1.6	1.6		
Two way Left Turn Lane							
Headway Factor	1.23	1.23	1.23	1.23	1.23	1.23	
Turning Speed (k/h)		14	24		24	14	
Turn Type	NA		Prot	NA		Prot	
Protected Phases	2		7	6		3	8
Permitted Phases							
Minimum Split (s)	35.4		16.0	25.4		15.4	22.0
Total Split (s)	53.0		47.0	53.0		47.0	47.0
Total Split (%)	53.0%		47.0%	53.0%		47.0%	47%
Maximum Green (s)	47.6		41.0	47.6		41.6	43.0
Yellow Time (s)	3.3		3.3	3.3		3.3	3.5
All-Red Time (s)	2.1		2.7	2.1		2.1	0.5
Lost Time Adjust (s)	0.0		0.0	0.0		0.0	
Total Lost Time (s)	5.4		6.0	5.4		5.4	
Lead/Lag							
Lead-Lag Optimize?							
Walk Time (s)	18.0						7.0
Flash Dont Walk (s)	6.0						10.0
Pedestrian Calls (#/hr)	40						40
Act Effct Green (s)	47.6		41.0	47.6		41.6	
Actuated g/C Ratio	0.48		0.41	0.48		0.42	
v/c Ratio	0.64		0.29	0.63		0.55	
Control Delay	16.7		22.3	16.9		17.0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Queue Delay	2.0		0.0	0.4		1.3	
Total Delay	18.7		22.3	17.3		18.3	
LOS	B		C	B		B	
Approach Delay	18.7			18.9	18.3		
Approach LOS	B			B	B		
Queue Length 50th (m)	31.1		30.5	22.9		10.9	
Queue Length 95th (m)	m37.2		m48.1	m36.9		m34.6	
Internal Link Dist (m)	62.0			81.3	59.8		
Turn Bay Length (m)			32.0				
Base Capacity (vph)	752		617	574		533	
Starvation Cap Reductn	147		0	33		99	
Spillback Cap Reductn	54		0	19		0	
Storage Cap Reductn	0		0	0		0	
Reduced v/c Ratio	0.79		0.29	0.67		0.67	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 47 (47%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 18.7		Intersection LOS: B	
Intersection Capacity Utilization 64.5%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 11: Waller & Rideau





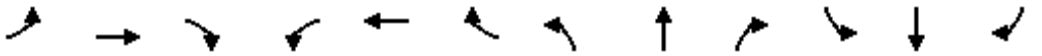
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	36	86	64	43	24	19	396	24	7	359	89
Future Volume (vph)	38	36	86	64	43	24	19	396	24	7	359	89
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		10.0
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (m)	2.5			2.5			2.5			2.5		
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		0.86			0.90			0.97			1.00	0.45
Frt		0.927			0.975			0.993				0.850
Flt Protected		0.988			0.976			0.998			0.999	
Satd. Flow (prot)	0	1033	0	0	1129	0	0	1201	0	0	1163	1062
Flt Permitted		0.902			0.784			0.975			0.991	
Satd. Flow (perm)	0	906	0	0	861	0	0	1160	0	0	1151	482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		59			11			5				50
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		306.1			47.2			64.3			276.6	
Travel Time (s)		22.0			3.4			4.6			19.9	
Confl. Peds. (#/hr)	84		57	57		84	259		133	133		259
Confl. Bikes (#/hr)			14			12			9			1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	0%	0%	7%	0%	7%	3%	0%	29%	9%	2%
Parking (#/hr)		5			5			5			5	5
Adj. Flow (vph)	41	39	93	70	47	26	21	430	26	8	390	97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	173	0	0	143	0	0	477	0	0	398	97
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.64	1.40	1.40	1.64	1.40	1.40	1.64	1.40	1.40	1.64	1.64
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Minimum Split (s)	26.4	26.4		26.4	26.4		26.7	26.7		26.7	26.7	26.7
Total Split (s)	35.0	35.0		35.0	35.0		65.0	65.0		65.0	65.0	65.0
Total Split (%)	35.0%	35.0%		35.0%	35.0%		65.0%	65.0%		65.0%	65.0%	65.0%
Maximum Green (s)	29.6	29.6		29.6	29.6		59.3	59.3		59.3	59.3	59.3
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.1	2.1		2.1	2.1		2.4	2.4		2.4	2.4	2.4
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	0.0
Total Lost Time (s)		5.4			5.4			5.7			5.7	5.7
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		9.0	9.0		9.0	9.0	9.0
Pedestrian Calls (#/hr)	40	40		40	40		40	40		40	40	40
Act Effct Green (s)		29.6			29.6			59.3			59.3	59.3
Actuated g/C Ratio		0.30			0.30			0.59			0.59	0.59
v/c Ratio		0.56			0.55			0.69			0.58	0.32

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		27.3			50.3			6.6			17.0	8.4
Queue Delay		0.0			0.0			1.2			0.0	0.0
Total Delay		27.3			50.3			7.8			17.0	8.4
LOS		C			D			A			B	A
Approach Delay		27.3			50.3			7.8			15.3	
Approach LOS		C			D			A			B	
Queue Length 50th (m)		18.2			27.8			10.9			44.7	3.8
Queue Length 95th (m)		40.6			m47.1			m15.5			73.5	13.4
Internal Link Dist (m)		282.1			23.2			40.3			252.6	
Turn Bay Length (m)												10.0
Base Capacity (vph)		309			262			689			682	306
Starvation Cap Reductn		0			0			73			0	0
Spillback Cap Reductn		0			0			0			0	0
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.56			0.55			0.77			0.58	0.32

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 95 (95%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 18.0		Intersection LOS: B	
Intersection Capacity Utilization 78.8%		ICU Level of Service D	
Analysis Period (min) 15			

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

Splits and Phases: 13: Dalhousie & York



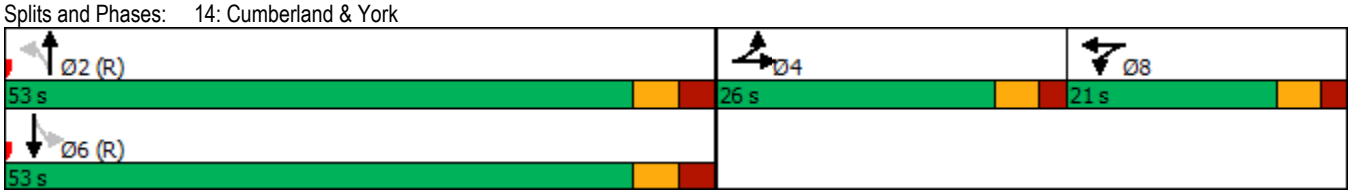
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	24	18	33	62	27	40	573	26	15	100	23
Future Volume (vph)	34	24	18	33	62	27	40	573	26	15	100	23
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		30.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		0.89			0.91			0.98			0.95	
Frt		0.967			0.970			0.994			0.977	
Flt Protected		0.978			0.987			0.997			0.995	
Satd. Flow (prot)	0	1094	0	0	1316	0	0	2620	0	0	1230	0
Flt Permitted		0.978			0.987			0.925			0.910	
Satd. Flow (perm)	0	1034	0	0	1253	0	0	2402	0	0	1116	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			12			6			14	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		150.5			165.1			42.0			166.8	
Travel Time (s)		10.8			11.9			3.0			12.0	
Confl. Peds. (#/hr)	59		51	51		59	121		113	113		121
Confl. Bikes (#/hr)			18			30			9			6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	8%	0%	0%	3%	0%	0%	3%	22%	20%	8%	13%
Parking (#/hr)		5							5			5
Adj. Flow (vph)	37	26	20	36	67	29	43	623	28	16	109	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	83	0	0	132	0	0	694	0	0	150	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.5			7.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.64	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		8	8			2			6	
Permitted Phases							2			6		
Minimum Split (s)	18.4	18.4		17.4	17.4		37.2	37.2		37.2	37.2	
Total Split (s)	26.0	26.0		21.0	21.0		53.0	53.0		53.0	53.0	
Total Split (%)	26.0%	26.0%		21.0%	21.0%		53.0%	53.0%		53.0%	53.0%	
Maximum Green (s)	20.6	20.6		15.6	15.6		46.8	46.8		46.8	46.8	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.9	2.9		2.9	2.9	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.4			5.4			6.2			6.2	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		20.0	20.0		20.0	20.0	
Flash Dont Walk (s)	6.0	6.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	30	30		30	30		30	30		30	30	
Act Effct Green (s)		20.6			15.6			46.8			46.8	
Actuated g/C Ratio		0.21			0.16			0.47			0.47	
v/c Ratio		0.35			0.61			0.62			0.28	

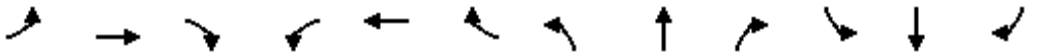
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		34.9			49.1			14.8			16.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		34.9			49.1			14.8			16.5	
LOS		C			D			B			B	
Approach Delay		34.9			49.1			14.8			16.5	
Approach LOS		C			D			B			B	
Queue Length 50th (m)		10.7			21.9			29.2			15.5	
Queue Length 95th (m)		m22.9			#43.9			38.7			29.1	
Internal Link Dist (m)		126.5			141.1			18.0			142.8	
Turn Bay Length (m)												
Base Capacity (vph)		236			215			1127			529	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.35			0.61			0.62			0.28	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 6 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Pretimed
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 20.9 Intersection LOS: C
Intersection Capacity Utilization 48.0% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Cumberland & York





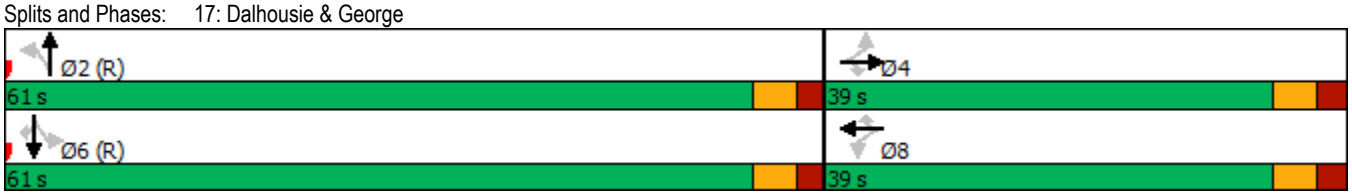
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	26	102	99	48	48	46	538	52	26	345	10
Future Volume (vph)	33	26	102	99	48	48	46	538	52	26	345	10
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Storage Length (m)	0.0		10.0	0.0		10.0	35.0		0.0	0.0		20.0
Storage Lanes	0		1	0		1	1		0	0		1
Taper Length (m)	2.5			2.5			14.0			2.5		
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	0.85		0.92	0.95	0.83	0.97			0.99	0.62
Frt			0.850			0.850		0.987				0.850
Flt Protected		0.973			0.967		0.950				0.997	
Satd. Flow (prot)	0	1240	1083	0	1232	1083	1383	1175	0	0	1195	1040
Flt Permitted		0.804			0.760		0.455				0.937	
Satd. Flow (perm)	0	1011	924	0	887	1029	550	1175	0	0	1117	648
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			111			41		8				29
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		304.0			58.1			100.4			58.8	
Travel Time (s)		21.9			4.2			7.2			4.2	
Confl. Peds. (#/hr)	11		86	86		11	157		150	150		157
Confl. Bikes (#/hr)			3			1			6			16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	50%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	10
Parking (#/hr)		5	5		5	5		5			5	5
Adj. Flow (vph)	36	28	111	108	52	52	50	585	57	28	375	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	64	111	0	160	52	50	642	0	0	403	11
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)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.64	1.64	1.40	1.64	1.64	1.40	1.64	1.40	1.40	1.64	1.72
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Minimum Split (s)	24.7	24.7	24.7	24.7	24.7	24.7	31.4	31.4		31.4	31.4	31.4
Total Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	61.0	61.0		61.0	61.0	61.0
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	61.0%	61.0%		61.0%	61.0%	61.0%
Maximum Green (s)	33.3	33.3	33.3	33.3	33.3	33.3	55.6	55.6		55.6	55.6	55.6
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	2.1	2.1		2.1	2.1	2.1
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)		5.7	5.7		5.7	5.7	5.4	5.4			5.4	5.4
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	12.0	7.0	7.0		7.0	7.0	7.0
Pedestrian Calls (#/hr)	40	40	40	40	40	40	40	40		40	40	40
Act Effct Green (s)		33.3	33.3		33.3	33.3	55.6	55.6			55.6	55.6
Actuated g/C Ratio		0.33	0.33		0.33	0.33	0.56	0.56			0.56	0.56

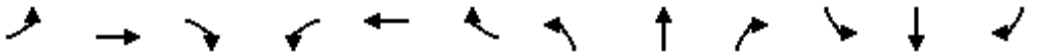
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.19	0.29		0.54	0.14	0.16	0.98			0.65	0.03
Control Delay		25.7	6.9		33.7	9.6	8.5	41.0			15.4	0.5
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0			0.4	0.0
Total Delay		25.7	6.9		33.7	9.6	8.5	41.0			15.9	0.5
LOS		C	A		C	A	A	D			B	A
Approach Delay		13.8			27.8			38.7			15.5	
Approach LOS		B			C			D			B	
Queue Length 50th (m)		8.8	0.0		25.6	2.0	2.5	38.3			31.7	0.0
Queue Length 95th (m)		18.9	11.7		47.7	m10.1	m5.1	#190.3			50.3	m0.0
Internal Link Dist (m)		280.0			34.1			76.4			34.8	
Turn Bay Length (m)			10.0			10.0	35.0					20.0
Base Capacity (vph)		336	381		295	370	305	656			621	373
Starvation Cap Reductn		0	0		0	0	0	0			37	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	0.29		0.54	0.14	0.16	0.98			0.69	0.03

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 92 (92%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 27.8 Intersection LOS: C
Intersection Capacity Utilization 90.1% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 17: Dalhousie & George



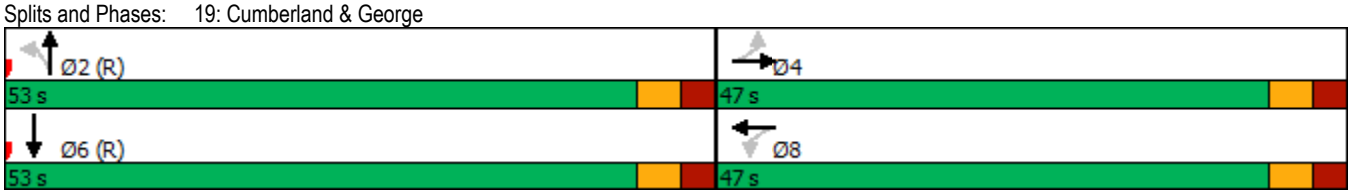


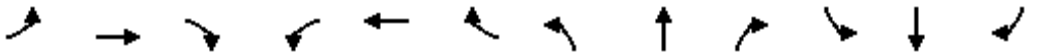
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	106	40	31	64	85	95	378	69	0	20	95
Future Volume (vph)	54	106	40	31	64	85	95	378	69	0	20	95
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		0.98			0.95			0.95			0.98	
Frt		0.973			0.937			0.981			0.889	
Flt Protected		0.987			0.991			0.991				
Satd. Flow (prot)	0	1194	0	0	1225	0	0	2531	0	0	1236	0
Flt Permitted		0.868			0.920			0.862				
Satd. Flow (perm)	0	1031	0	0	1137	0	0	2135	0	0	1236	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			54			22			103	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		135.8			100.5			99.5			46.0	
Travel Time (s)		9.8			7.2			7.2			3.3	
Confl. Peds. (#/hr)	50					50	95		74	95		
Confl. Bikes (#/hr)			10			13			15			8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	0%	3%	7%	3%	2%	14%	0%	0%	3%
Parking (#/hr)		5							5			
Adj. Flow (vph)	59	115	43	34	70	92	103	411	75	0	22	103
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	217	0	0	196	0	0	589	0	0	125	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)		1.5			1.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			-2.0	
Crosswalk Width(m)		5.0			3.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.64	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2					
Minimum Split (s)	21.0	21.0		21.0	21.0		32.0	32.0			32.0	
Total Split (s)	47.0	47.0		47.0	47.0		53.0	53.0			53.0	
Total Split (%)	47.0%	47.0%		47.0%	47.0%		53.0%	53.0%			53.0%	
Maximum Green (s)	41.0	41.0		41.0	41.0		47.0	47.0			47.0	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)	2.7	2.7		2.7	2.7		2.7	2.7			2.7	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		15.0	15.0			15.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	30	30		30	30		30	30			30	
Act Effct Green (s)		41.0			41.0			47.0			47.0	
Actuated g/C Ratio		0.41			0.41			0.47			0.47	
v/c Ratio		0.50			0.39			0.58			0.20	
Control Delay		27.0			17.5			9.3			2.3	
Queue Delay		0.0			0.0			1.1			0.0	
Total Delay		27.0			17.5			10.3			2.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		C			B			B			A	
Approach Delay		27.0			17.5			10.3			2.3	
Approach LOS		C			B			B			A	
Queue Length 50th (m)		30.9			18.4			15.3			1.1	
Queue Length 95th (m)		m51.6			36.6			23.2			m4.5	
Internal Link Dist (m)		111.8			76.5			75.5			22.0	
Turn Bay Length (m)												
Base Capacity (vph)		431			498			1015			635	
Starvation Cap Reductn		0			0			210			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.50			0.39			0.73			0.20	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 10 (10%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 55			
Control Type: Pretimed			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 13.9		Intersection LOS: B	
Intersection Capacity Utilization 57.6%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 19: Cumberland & George





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	32	16	0	0	0	458	268	489	0	137	29
Future Volume (vph)	3	32	16	0	0	0	458	268	489	0	137	29
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.96					0.76	0.89	0.66		0.94	
Frt		0.958						0.950	0.850		0.973	
Flt Protected		0.997					0.950					
Satd. Flow (prot)	0	1336	0	0	0	0	2903	1200	1297	0	2053	0
Flt Permitted		0.997					0.950					
Satd. Flow (perm)	0	1297	0	0	0	0	2219	1200	858	0	2053	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		17									27	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		71.6			97.7			77.0			83.8	
Travel Time (s)		5.2			7.0			5.5			6.0	
Confl. Peds. (#/hr)	152		10				109		266	109		266
Confl. Bikes (#/hr)			7						22			9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	8%	2%	2%	2%	4%	13%	2%	0%	47%	0%
Adj. Flow (vph)	3	35	17	0	0	0	498	291	532	0	149	32
Shared Lane Traffic (%)									27%			
Lane Group Flow (vph)	0	55	0	0	0	0	498	435	388	0	181	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	Right	Right	Left	Left	Right
Median Width(m)		0.0			0.0			8.9			7.4	
Link Offset(m)		0.0			6.0			2.0			1.0	
Crosswalk Width(m)		5.0			4.0			8.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.40	1.40	1.40	1.40	1.40	1.40	1.21	1.21	1.21	1.21	1.21	1.21
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA					Prot	NA	Perm		NA	
Protected Phases		4					5	2			6	
Permitted Phases	4								2		6	
Minimum Split (s)	16.7	16.7					21.8	56.0	56.0		24.1	
Total Split (s)	18.0	18.0					43.0	56.0	56.0		39.0	
Total Split (%)	18.0%	18.0%					43.0%	56.0%	56.0%		39.0%	
Maximum Green (s)	11.3	11.3					37.2	49.9	49.9		32.9	
Yellow Time (s)	3.3	3.3					3.3	3.3	3.3		3.3	
All-Red Time (s)	3.4	3.4					2.5	2.8	2.8		2.8	
Lost Time Adjust (s)		0.0					0.0	0.0	0.0		0.0	
Total Lost Time (s)		6.7					5.8	6.1	6.1		6.1	
Lead/Lag							Lead	Lag	Lag		Lag	
Lead-Lag Optimize?							Yes	Yes	Yes		Yes	
Walk Time (s)							5.0	7.0	7.0		7.0	
Flash Dont Walk (s)							11.0	11.0	11.0		11.0	
Pedestrian Calls (#/hr)							50	50	50		50	
Act Effct Green (s)		11.3					37.2	49.9	49.9		32.9	
Actuated g/C Ratio		0.11					0.37	0.50	0.50		0.33	
v/c Ratio		0.34					0.46	0.73	0.91		0.26	
Control Delay		39.3					25.5	28.4	50.7		15.2	
Queue Delay		0.0					0.0	0.0	0.0		0.0	
Total Delay		39.3					25.5	28.4	50.7		15.2	
LOS		D					C	C	D		B	

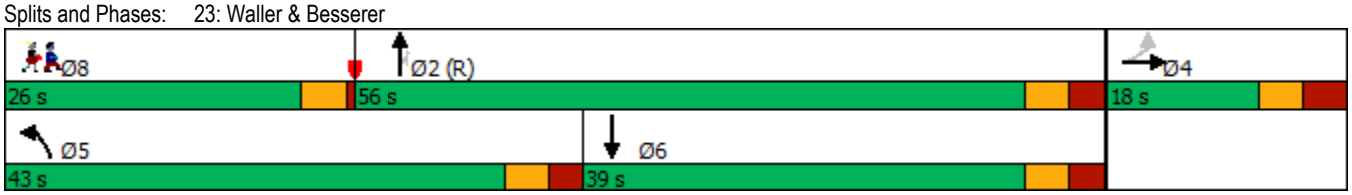
Lane Group	Ø8
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Turn Type	
Protected Phases	8
Permitted Phases	
Minimum Split (s)	20.0
Total Split (s)	26.0
Total Split (%)	26%
Maximum Green (s)	22.0
Yellow Time (s)	3.5
All-Red Time (s)	0.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	50
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		39.3						33.9			15.2	
Approach LOS		D						C			B	
Queue Length 50th (m)		5.8					37.2	66.8	69.4		17.8	
Queue Length 95th (m)		m15.6					51.3	108.9	#132.3		28.7	
Internal Link Dist (m)		47.6			73.7			53.0			59.8	
Turn Bay Length (m)												
Base Capacity (vph)		161					1079	598	428		693	
Starvation Cap Reductn		0					0	0	0		0	
Spillback Cap Reductn		0					0	0	0		0	
Storage Cap Reductn		0					0	0	0		0	
Reduced v/c Ratio		0.34					0.46	0.73	0.91		0.26	

Intersection Summary

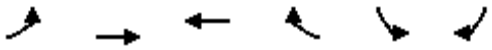
Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 7 (7%), Referenced to phase 2:NBT, Start of Green
Natural Cycle: 95
Control Type: Pretimed
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 31.9 Intersection LOS: C
Intersection Capacity Utilization 54.2% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: Waller & Besserer



Lane Group	Ø8
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	68	36	115	74	48	80
Future Volume (vph)	68	36	115	74	48	80
Ideal Flow (vphpl)	1600	1600	1600	1600	1600	1600
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.947		0.916	
Flt Protected		0.968			0.982	
Satd. Flow (prot)	0	1535	1502	0	1427	0
Flt Permitted		0.968			0.982	
Satd. Flow (perm)	0	1535	1502	0	1427	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		58.1	135.8		47.1	
Travel Time (s)		4.2	9.8		3.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	39	125	80	52	87
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	113	205	0	139	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.23	1.23	1.23	1.23
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.3%		ICU Level of Service A	
Analysis Period (min) 15			