



Transportation Impact Assessment Addendum #2

New Campus Development  
for The Ottawa Hospital  
Hospital and Central Utility Plant



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**Hospital and Central Utility Plant**

**Transportation Impact Assessment Addendum #2**

Prepared for:  
The Ottawa Hospital  
1053 Carling Avenue,  
Ottawa, ON  
K1Y 4E9

Prepared by:  
**Parsons**  
1223 Michael Street North, Suite 100  
Ottawa, ON K1J 7T2

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ORIGINATOR	Juan Lavin, E.I.T.
REVIEWER:	Austin Shih, P.Eng./ Mark Baker, P.Eng.
AUTHORIZATION:	
CIRCULATION LIST:	Mike Giampa, P.Eng.
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The following *TIA Addendum #2* has been prepared in support of the Site Plan Control Application (SPC) for the main Hospital building at the New Campus Development (NCD) of The Ottawa Hospital (TOH). In July 2021, a *TIA and Mobility Study* was prepared in support a Zoning By-law Amendment (ZBLA) for the Master Site Plan of the NCD and to lift the holding provision were approved by City Council in October 2021. Following the Master Site Plan approval, a *TIA Addendum #1* supporting the SPC for *Phase 2: Parking Garage and Green Roof*, was submitted in October 2021 and was approved by City Council in February 2022.

## 1.0 INTRODUCTION

The Ottawa Hospital (TOH) has initiated the development approvals process with the City of Ottawa and the federal government to establish a New Campus Development (NCD) to replace the existing Civic Hospital Campus and become the major referral centre for Eastern Ontario, Western Quebec, and parts of Nunavut. It will be the home of the Eastern Ontario Trauma Centre with a range of specialized services, research, and education facilities, along with related ancillary uses such as resident care stay facilities, and retail service uses. The existing Civic Hospital Campus is located at 1053 Carling Avenue and the NCD will be located approximately 1km to the east on lands leased to The Ottawa Hospital from Public Services and Procurement Canada (PSPC) adjacent to the Dow's Lake Pavilion and Central Experimental Farm (CEF).

The new site will be generally bound by Carling Avenue to the north, Preston Street and Prince of Wales Drive to the east, the Birch Drive to the south, and Maple Drive to the west. The overall development proposal, the existing transportation conditions, and the planned network conditions were described in detail within the *TIA and Mobility Study* (July 2021).

The *TIA Addendum #2* will incorporate the latest information available, including the most recent development statistics for the NCD at Opening Day (2028) and Full Buildout (2048) have been provided in **Section 3.1**. The following list identifies the sections within this Addendum that have been refreshed from the original *TIA and Mobility Study* (July 2021) and the *TIA Addendum #1* (Oct 2021).

- Overall, the NCD site statistics are generally similar to what was assumed in the *TIA and Mobility Study*. The overall footprint of the hospital remains comparable, with some redistribution of gross floor area for hospital uses, while the number of employees has decreased.
- A detailed breakdown of anticipated employee shift schedules and patient registrations at the NCD was provided by TOH. This data was used to update the trip generation forecast for the NCD based on first principles, using anticipated arrival and departure times by staff and different types of visitors. Existing Civic Campus staff and visitor parking activity/patterns were used to calibrate these projections. This methodology replaced the trip generation forecast based on the existing Civic Campus, completed within the original July 30<sup>th</sup>, 2021, submission. The comprehensive breakdown of future employee schedules at the NCD enabled more precise trip generation forecasts for the morning and afternoon “peak hour of the generator” (i.e., hospital, including the parking garage), in addition to the “peak hour of the adjacent street traffic” (i.e. typical commuter peak hours).
- Shift schedules were broken down for different programs at the future campus, which have been incorporated into this analysis. For example, the University of Ottawa Heart Institute will only transfer to the NCD in 2048 and the rehab program is expected to remain at the existing Civic Campus location.
- Adjustments were made to the forecasted peak hour traffic volumes in background conditions from the *TIA and Mobility Study*. Specifically, ‘Streetlight’ was used to provide a better understanding of baseline traffic volumes to/from the existing Civic Campus, which helped inform the process of removing these trips from the background network. Additionally, known development applications have been updated to reflect any recent submissions and included under “other area developments”.

- The proposed parking supply and layouts within the NCD have changed slightly, which triggered a re-distribution of site-generated traffic. Additional parking supply was allocated to the emergency services side of the NCD site, which resulted in an increase in forecasted vehicular traffic to the Prince of Wales/Road E intersection.
- The Active Transportation Plan has been refined based on public and stakeholder feedback. As a result, this triggered refinements to internal roadways (e.g., Road A and Road B) and adjacent intersections that balance mobility, capacity, and active transportation opportunities.

## 2.0 SCREENING FORM

Although the site statistics have changed, the screening form still meets the same criteria as outlined in the original *TIA and Mobility Study (July 2021)*.

## 3.0 SCOPING REPORT

### 3.1 Existing and Planned Conditions

#### 3.1.1 Proposed Development

The TIA Addendum #2 will focus on Phase 3 and 4 of the NCD, which represents the main hospital building as shown in **Figure 1**. This report will also update the long-term analysis at the anticipated full buildout horizon of 2048 using the latest information on ensuing development phases, which have been summarized in **Table 1**.

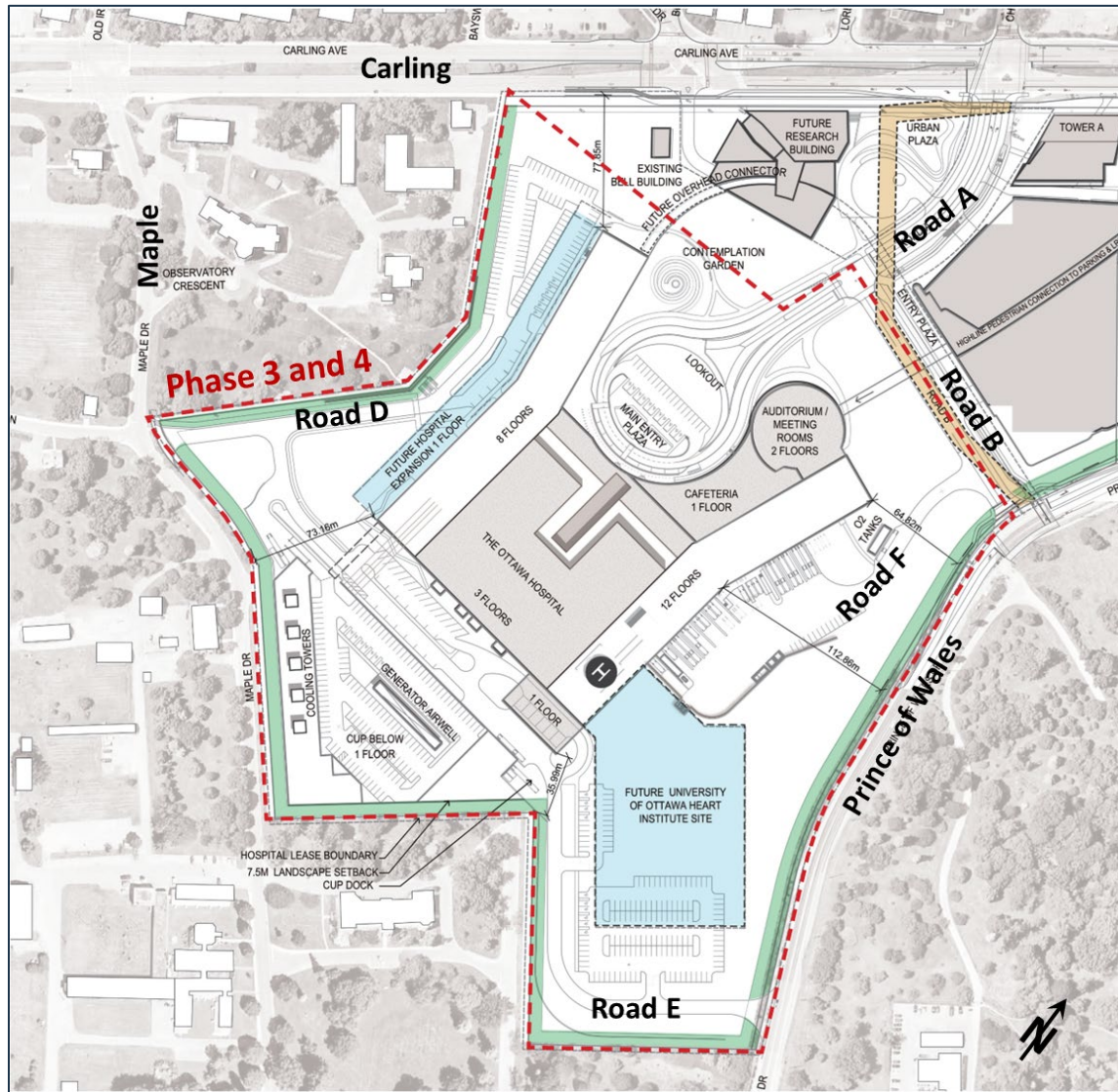
It is important to note that the statistics assumed for future phases may still change and will only be confirmed at the time of their respective Site Plan Control Application.

Table 1: Land Use Statistics for NCD

Independent Variable	Existing Civic Campus	NCD 2028 Opening Day	NCD 2048 Full Buildout
<b>General Statistics</b>			
Total Number of Beds	559	641	1,136
Number of Employees	3,473	5,000	9,956
Number of Parking Spaces	2,500	3,099	3,099
<b>Development Gross Floor Area (GFA) x1,000 ft<sup>2</sup></b>			
Hospital Land Uses	1,815	2,605	3,322
U. Ottawa Heart Institute	305	0	868
Other <sub>1</sub>	0	81	750
1. The 81,000 ft <sup>2</sup> will include ancillary retail services within the NCD main hospital structure. The Life Science Park proposed for 2048 has approximately 100,000 ft <sup>2</sup> Ground Floor Commercial, 162,500 ft <sup>2</sup> Hospital Appointments, 487,500 ft <sup>2</sup> Research and Development land uses.			

Overall, the site statistics have remained similar to the *TIA and Mobility Study (July 2021)*, with the most notable change being an overall reduction in anticipated number of staff for 2028 and 2048.

Figure 1: Proposed Site Plan for the Main Building (Phase 3 and 4) for the NCD



### 3.1.2 Phasing Plan

There are no changes anticipated for the phasing plan, outlined in **Section 3.1.2** of the *TIA and Mobility Study* (July 2021).

### 3.1.3 Existing Conditions

The existing conditions as described in **Section 3.1.3** of the *TIA and Mobility Study* (July 2021) were still valid and used in this report.

#### Existing Transit Network

Minimal changes to existing transit network have occurred since the preparation of the *TIA and Mobility Study* (July 2021). Overall, the same routes within the study area continue to operate, with the following minor changes noted and accounted for within the analyses:

- Frequent Route #53: was moved from former Parkdale Avenue to Holland Avenue (Scott Street to Carling Avenue).



- Local Route #56: was moved from former Holland Avenue to Parkdale Avenue (Scott Street to Carling Avenue).
- Local Route #55: no longer originates at Bayshore Mall, it now originates from Westgate Shopping Center.

#### Existing Peak Hour Volumes

It is noteworthy that the peak hour volumes used in the *TIA and Mobility Study*, *TIA Addendum #1*, and this report reflect pre-COVID-19 pandemic traffic conditions. The pandemic work from home orders have been removed at the time of this writing, however commuting trends for both drivers and transit users have not returned to pre-pandemic levels. While the future of remote work is unclear, there may be a need to revisit baseline traffic assumptions as future phases of the NCD proceed, to determine if City-wide travel behaviour settles into a 'new normal' and the corresponding implications on the future transportation network.

### **3.1.4 Planned Conditions**

#### New Official Plan and Transportation Master Plan

**Section 3.1.4** of the TIA and Mobility Study acknowledged the draft new Official Plan and the 2013 Transportation Master Plan. Since that time, the New Official Plan was approved by City Council (November 24<sup>th</sup>, 2021), but has yet to receive Provincial approval. The City's Transportation Master Plan (TMP) Update is still ongoing, with an anticipated completion date for Part 1 – Policies in Spring 2023 and Part 2 – infrastructure in Fall 2024, meaning the planned conditions still reflect the 2013 TMP.

#### Other Area Developments

New development applications within the study area have been accounted for in this report. **Figure 2** illustrates the previously captured developments in purple, and new developments to be added to background conditions in green. The new developments have also been described below:

##### A – 1081 Carling Avenue

The proposed development has a 22- and 28-storey residential towers. A total of 462 units are proposed. The Transportation Brief (prepared by Parsons) projects an increase in two-way traffic volumes of approximately 95 to 115 veh/h during peak hours. These volumes have been added to the background network.

##### B – 101, 105, 111, 115 Champagne Avenue

The 4 neighbouring high-rise towers, two for Envie and two for Soho will be treated as one lot.

- Envie Towers:
  - Phase 1 (105 Champagne): occupied prior to 2017 – captured in existing traffic counts
  - Phase 2 (101 Champagne): occupied in 2020 – not been captured in existing traffic counts
- Soho Towers:
  - Phase 1 (111 Champagne): occupied prior to 2017 – captured in existing traffic counts
  - Phase 2 (115 Champagne): under construction – not been captured in existing traffic counts

No TIA for the Soho development was found; however, a transportation brief by Parsons for Envie Phase 1 and 2 combined projected two-way traffic volumes of approximately 60 to 65 veh/h during peak hours. Since the Envie and Soho developments share a similar site context and development size, for the purpose of this TIA Addendum #2, the volumes forecasted for Envie Phase 1 and 2 have been layered to the background network to account for volumes not captured in existing counts for Envie Phase 2 and Soho Phase 2.

##### C – 829 Carling Avenue

The proposed development is a 61-storey residential building. A total of 459 units plus some ground floor commercial uses are proposed. The Transportation Brief (prepared by Novatech) projects an increase in two-

way traffic volumes of approximately 150 to 100 veh/h during peak hours. These volumes have been added to the background network.

D – 299 Carling Avenue

The proposed development is envisioned as a mixed-use site which could include approximately 550 residential units and 55,000 ft<sup>2</sup> of commercial uses. This project is still in its infancy and no official Site Plan or Transportation Impact Study have been submitted, thus, no volumes have been added to the background network for this development.

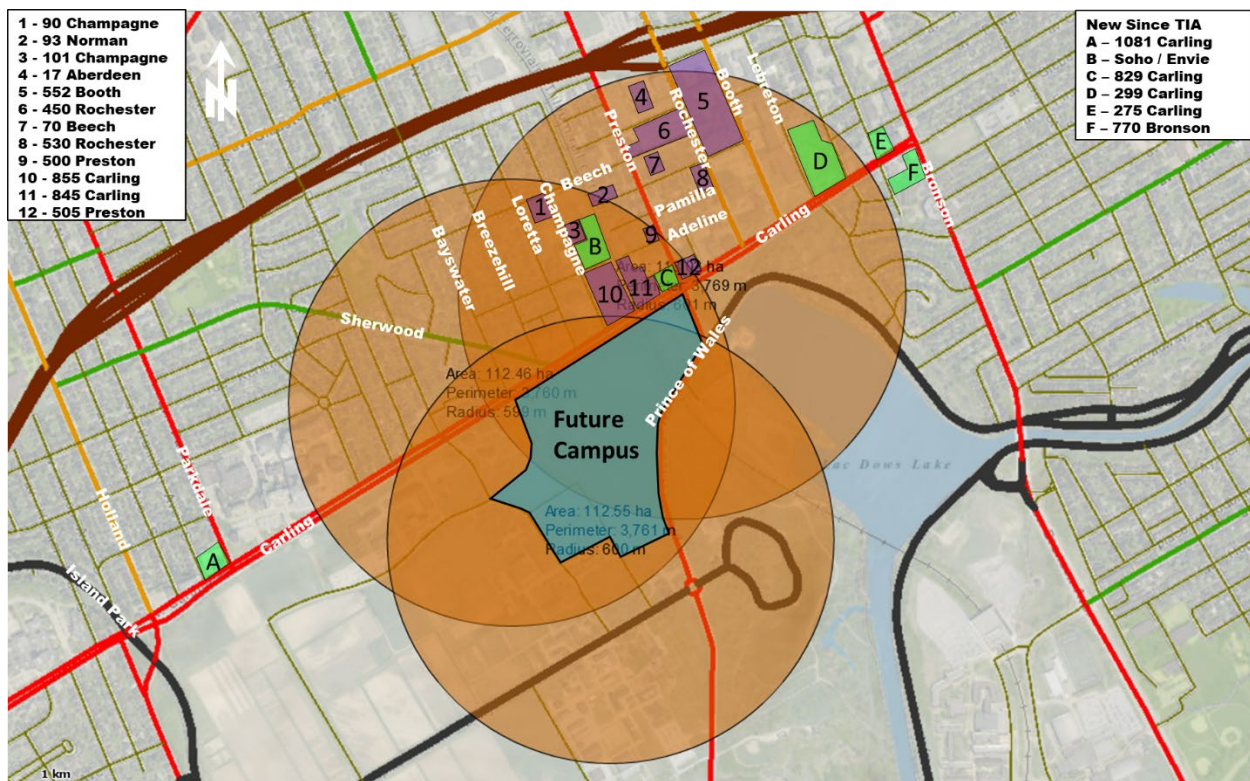
E – 275 Carling Avenue

The proposed development will host 168 senior/retirement units with a ground floor pharmacy. The Transportation Brief (prepared by Parsons) projects an increase in two-way traffic volumes of approximately 40 to 65 veh/h during peak hours. These volumes have been added to the background network.

F – 770 Bronson Avenue

The proposed development is a 26-storey residential building. A total of 153 apartment units and 71 student units are proposed. The Transportation Brief (prepared by CGH) projects an increase in two-way traffic volumes of approximately 70 to 80 veh/h during peak hours. These volumes have been added to the background network.

Figure 2: Updated Other Area Developments



### 3.2 Analysis Parameters

The timing of opening day and full buildout of the NCD, 2028 and 2048 respectively, have not changed for this study. The anticipated peak hour periods have been refined based on new information provided by TOH. The projected employee schedules were provided with corresponding start and end times, which paint a more accurate picture of arrival and departure windows for future employees.

**Table 2** summarizes the different types of employee shifts anticipated at the NCD, including their range of start and end times. TOH provided the proportion of employees that would apply to each shift. It is acknowledged

that some employees may arrive or depart earlier or later than the shown hours, however it was assumed the majority will adhere to the noted schedule.

**Table 2: Types of Shift and Arrival/Departure Times**

Type of Shift	General Arrival Time	General Departure Time	Proportion of Staff 2028 (2048)
Day Shift	06:00 – 08:00	15:00 – 18:00	68% (75%)
Evening Shift	14:00 – 15:00	23:00 – 00:00	11% (9%)
Night Shift	22:00 – 23:00	07:00 – 08:00	3% (3%)
12hr Day Shift	06:00 – 07:00	19:00 – 20:00	11% (8%)
12hr Night Shift	18:00 – 19:00	07:00 – 08:00	7% (5%)
<b>Total</b>			<b>100% (100%)</b>

In general, the peak morning hour of the NCD ('generator') occurs at a similar time to the peak hour of the adjacent street, while in the afternoon, the peak hour of the NCD is expected to occur earlier than the adjacent street peak hour. For this study, three time periods were analyzed, including:

- Morning peak hour for the NCD and adjacent street: 07:00 – 08:00
- Afternoon peak departure hour for the NCD: 15:00 – 16:00
- Afternoon peak hour for the adjacent street: heaviest 60-minute period between 15:30 – 17:30

### 3.3 Exemption Review

Site Plan Control Applications (SPA) and Zoning By-Law Amendments (ZBLA) reports differ in their context according to the City's TIA Guidelines. The *TIA and Mobility Study* (July 2021) supported a ZBLA application. This TIA Addendum is supporting a SPC and as thus, different exemptions are permitted.

Additionally, there are four (4) separate transportation supporting studies that will accompany the SPC covering modules within the TIA in far greater detail. The following modules/elements of the TIA process will be exempted as listed in **Table 3**.

**Table 3: Exemption Review Summary**

Module	Element	Exemption Consideration
5.2 Parking	5.2.2 Spillover Parking	Parking spillover will be captured within a separate "Off-Street Parking Strategy" Report
5.5 Transportation Demand Management (TDM)	All Elements	TDM will be captured within a separate "Transportation Demand Management Strategy" Report
5.6 Neighbourhood Traffic Management (NTM)	All Elements	NTM will be captured within a separate "Neighbourhood Traffic Management Strategy" Report
4.8 Review of Network Concept	All Elements	Zoning has already been approved and NCD does not project any major deviations from original zoning

## 4.0 FORECASTING REPORT

### 4.1 Development-Generated Travel Demand

#### 4.1.1 People Trip Generation

The *TIA and Mobility Study* (July 2021) developed a custom trip generation rate using the existing Civic Campus traffic data and calibrated based on research of similar institutions in North America. The three strongest independent variables; number of beds, number of employees and gross floor area (GFA) were blended together to produce a single local rate to derive person trips to/from the NCD.

At the time of the previous submission, TOH did not have any employee schedules or shifts available. Since that time, they have provided the project team with a comprehensive employee shift breakdown, which replaced the original trip generation approach and methodology. This new approach is expected to provide a more accurate estimate of the number and type of employee arriving and departing the NCD on each day of a week.

Note that approximately 81,000 ft<sup>2</sup> of commercial retail is proposed for Opening Day 2028; however, it is all assumed to be located inside of the main Hospital building and is meant to cater directly to people already within the NCD. All commercial retail trips for Opening Day 2028 are considered internal trips and will not generate any new people trips from the adjacent network.

##### Employee Person Trip Generation

TOH provided the estimated number of full-time equivalent (FTE) employees on a typical weekday based on their schedule and summarizes approximately how many employees work each type of position.

The project team then “adjusted” this number to reflect absenteeism and remote work. A 5% reduction was applied to account for absentees on vacation or sick leave. TOH also confirmed they anticipate approximately 25% of the “day-shift” workers will be administration roles, of which approximately 20% of them on average will be remote-workers and the remainder will travel to the NCD on a typical weekday. The final estimated employee breakdown at 2028 and 2048 is summarized in **Table 4**.

**Table 4: Full Time Employees Anticipated at the NCD in a Typical Weekday – 2028 and 2048**

Type of Shift	Est. Arrival Time	Est. Departure Time	2028 FTE	2028 Adjusted	2048 FTE	2048 Adjusted
<b>The Ottawa Hospital Core Staff (TOH)</b>						
Day Shift	06:00 – 08:00	15:00 – 18:00	3,466	3128	4,488	4,050
Evening Shift	14:00 – 15:00	23:00 – 00:00	524	498	679	645
Night Shift	22:00 – 23:00	07:00 – 08:00	160	152	208	198
12hr Day Shift	06:00 – 07:00	19:00 – 20:00	439	417	568	540
12hr Night Shift	18:00 – 19:00	07:00 – 08:00	310	295	401	381
<b>University of Ottawa Heart Institute (UOHI)</b>						
Day Shift	06:00 – 08:00	15:00 – 18:00	0	0	964	916
Evening Shift	14:00 – 15:00	23:00 – 00:00	0	0	146	139
Night Shift	22:00 – 23:00	07:00 – 08:00	0	0	45	43
12hr Day Shift	06:00 – 07:00	19:00 – 20:00	0	0	122	116
12hr Night Shift	18:00 – 19:00	07:00 – 08:00	0	0	86	82
<b>Residents (Doctors)</b>						
12hr Day Shift	06:00 – 07:00	19:00 – 20:00	75	71	97	92
12hr Night Shift	18:00 – 19:00	07:00 – 08:00	25	24	32	30
<b>Research</b>						
Day Shift	06:00 – 08:00	15:00 – 18:00	0	0	2,120	2,014
<b>TOTAL</b>			<b>5,000</b>	<b>4,585</b>	<b>9,956</b>	<b>9,246</b>

Note: FTE = 'Full Time Equivalent' employees

The anticipated shift schedule provided by TOH was broken down further to understand arrival and departure patterns throughout the day. The employee schedules only provided a range of shift start times and end times, but it was acknowledged there would /be variability in the actual arrival and departure times.

Therefore, the project team requested the existing hourly employee parking entry and exit time stamps from the Civic Campus employee satellite lots. This helped provide a baseline estimate of hourly arrival and departures throughout a typical weekday that was applied to the future adjusted employee shift breakdown in **Table 4**. The parking data has been provided in **Appendix A. Table 5** summarizes the resulting arrival and departure distribution by shift type.

**Table 5: Arrival and Departure Hourly Distribution to/from NCD by Staff – 2028 and 2048**

Type of Shift	23:00 - 24:00	22:00 - 23:00	21:00 - 22:00	20:00 - 21:00	19:00 - 20:00	18:00 - 19:00	17:00 - 18:00	16:00 - 17:00	15:00 - 16:00	14:00 - 15:00	13:00 - 14:00	12:00 - 13:00	11:00 - 12:00	10:00 - 11:00	09:00 - 10:00	08:00 - 09:00	07:00 - 08:00	06:00 - 07:00	05:00 - 06:00	04:00 - 05:00	03:00 - 04:00	02:00 - 03:00	01:00 - 02:00	00:00 - 01:00
Day Shift TOH				4%	13%	8%	14%	22%	25%	10%	4%	2%	2%	3%	5%	14%	37%	32%	5%					
Day Shift Other*							20%	30%	50%							20%	30%	50%						
Evening Shift	60%							20%	20%	60%													20%	20%
Night Shift	25%	75%														25%	75%							
12hr Day Shift				25%	75%												25%	75%						
12hr Night Shift					25%	75%										25%	75%							

Green – Proportion of Arrivals to NCD; Blue – Proportion of Departures from NCD; Grey – Shift Group Working at NCD; \*Day Shift Other refers to UOH and Research

The adjusted full time employee estimates from **Table 4** were then distributed hourly based on the distribution of arrival and departure times for each shift shown in **Table 5**. **Table 6** and **Table 7** show the estimated hourly employee arrival and departure volumes (i.e., employee person trips) at Opening Day 2028 and Full Buildout 2048, respectively. Note that only the heavier forecasted hours between 06:00-09:00 and 15:00-20:00 have been shown in the tables below. For a full 24-hour breakdown, please refer to **Appendix B**.

**Table 6: Estimated Hourly Employee Arrival and Departure Volume at NCD – 2028**

Type of Shift	Day Shift TOH	Day Shift Other*	Evening Shift	Night Shift	12hr Day Shift	12hr Night Shift	TOTAL IN	TOTAL OUT	TOTAL 2-WAY
06:00 - 07:00	1,000	n/a			366		1,366		1,366
07:00 - 08:00	1,152	n/a		114	122	239	1,274	353	1,627
08:00 - 09:00	448	n/a		38		80	448	118	566
15:00 - 16:00	786	n/a	100				100	786	886
16:00 - 17:00	669	n/a	100				100	669	769
17:00 - 18:00	435	n/a						435	435
18:00 - 19:00	251					239	239	251	490
19:00 - 20:00	418				365	80	80	783	863

Green – Proportion of Arrivals to NCD; Blue – Proportion of Departures from NCD; \*Day Shift Other refers to UOH and Research

**Table 7: Estimated Hourly Employee Arrival and Departure Volume at NCD - 2048**

Type of Shift	Day Shift TOH	Day Shift Other*	Evening Shift	Night Shift	12hr Day Shift	12hr Night Shift	TOTAL IN	TOTAL OUT	TOTAL 2-WAY
06:00 - 07:00	1,295	1,465			561		3,321		3,321
07:00 - 08:00	1,492	879		181	187	371	2,558	552	3,110
08:00 - 09:00	580	586		61		124	1,166	185	1,351
15:00 - 16:00	1,018	1,465	236				236	2,483	2,719
16:00 - 17:00	866	879	157				157	1,745	1,902
17:00 - 18:00	563	586						1,149	1,149
18:00 - 19:00	325					371	371	325	696
19:00 - 20:00	541				561	124	124	1,102	1,226

Green – Proportion of Arrivals to NCD; Blue – Proportion of Departures from NCD; \*Day Shift Other refers to UOHI and Research

Visitor Person Trip Generation

The *TIA and Mobility Study* produced a blended trip generation rate that included employees, patients, and non-patient visitors. At the time, it was understood that approximately 1 in 4 person trips to the hospital was a visitor, while the remaining 3 in 4 people was an employee.

TOH has since provided more information regarding visitor trips, with historic numbers and future projections. The type of visit was split into two categories:

- Planned visits - includes patients with appointments and other non-emergency visitors
- Unplanned visits - emergency visits. Note that ambulances have been individually layered on top, which could cause a double counting of trips creating a slightly more conservative value.

TOH historic and forecasted visitation numbers were factored by an additional 20% to account for potential variability and to ensure a conservative approach. The resulting annual and daily visitor trips have been summarized in **Table 8**.

**Table 8: Estimated Annual and Daily Planned and Unplanned Visits (Data Provided by TOH)**

Type of Visitor	2018 Registered Visitor	2028 Estimated Visitor	2048 Estimated Visitor
<b>Annual</b>			
Planned Visitor	263,725	344,293	571,401
Unplanned/Emergency Visitor	86,275	112,632	186,928
<b>TOTAL</b>	<b>350,000</b>	<b>456,925</b>	<b>758,329</b>
<b>Daily (Factored by 1.2)</b>			
Planned Visitor	867	1,132	1,879
Unplanned/Emergency Visitor	284	370	615
<b>TOTAL</b>	<b>1,151</b>	<b>1,502</b>	<b>2,493</b>

Similar to the employee trip generation process, TOH also provided visitor parking activity within public lots at the existing Civic Campus, which provided arrival and departure times. Visitor arrivals and departures were generally consistent between 07:00 and 20:00, which coincided with typical visitor hours. During the time periods outside visitor hours, if the parking data showed no activity, a constant number was assumed to account for possible variability in emergency visits.

The resulting visitor trips at Opening Day 2028 and Full Buildout 2048 are shown in **Table 9** and **Table 10** respectively.

**Table 9: Estimated Hourly Visitor Arrival and Departure Volume – 2028**

Type of Shift	Planned Visit Arrival	Planned Visit Departure	Unplanned Visit Arrival	Unplanned Visit Departure	TOTAL IN	TOTAL OUT	TOTAL 2-WAY
06:00 - 07:00			19	19	19	19	38
07:00 - 08:00	103		19	19	122	19	141
08:00 - 09:00	103	103	19	19	122	122	244
15:00 - 16:00	103	103	19	19	122	122	244
16:00 - 17:00	103	103	19	19	122	122	244
17:00 - 18:00	51	103	19	19	70	122	192
18:00 - 19:00	51	51	19	19	70	70	140
19:00 - 20:00		51	19	19	19	70	89

Green – Proportion of Arrivals to NCD; Blue – Proportion of Departures from NCD

**Table 10: Estimated Hourly Visitor Arrival and Departure Volume - 2048**

Type of Shift	Planned Visit Arrival	Planned Visit Departure	Unplanned Visit Arrival	Unplanned Visit Departure	TOTAL IN	TOTAL OUT	TOTAL 2-WAY
06:00 - 07:00			31	31	31	31	62
07:00 - 08:00	171		31	31	202	31	233
08:00 - 09:00	171	171	31	31	202	202	404
15:00 - 16:00	171	171	31	31	202	202	404
16:00 - 17:00	171	171	31	31	202	202	404
17:00 - 18:00	85	171	31	31	116	202	318
18:00 - 19:00	85	85	31	31	116	116	232
19:00 - 20:00		85	31	31	31	116	147

Green – Proportion of Arrivals to NCD; Blue – Proportion of Departures from NCD

### Life Sciences Park Person Trip Generation

The Life Sciences Park (formerly known as Carling Village) is a reserved parcel of land on the north-eastern quadrant of the site. No formal design has been submitted and only a very basic high-level vision for the site including approximately 750,000 ft<sup>2</sup> of development fronting Carling Avenue has been proposed.

The Life Science Park **will not be built by 2028 and is outside of the current SPC scope of work**. For completeness however, the trip generation analysis was updated to reflect potential land uses and incorporated into the 2048 horizon analysis. The former Carling Village trip generation within the original *TIA and Mobility Study*, now Life Science Park, may still be applicable, however. In order to produce a more conservative analysis, this TIA addendum has assumed 650,000 ft<sup>2</sup> of medical/research office uses and 100,000 ft<sup>2</sup> of commercial uses.

The ITE Trip Generation Manual 11<sup>th</sup> Ed. was used to estimate the person trips generated by the Life Sciences Park. For the purposes of this analysis, it was assumed that 75% of the 650,000 ft<sup>2</sup> of medical/research office use was considered “Research and Development”, while the remaining 25% were “Hospital Uses” under the ITE land use descriptions.

Additionally, the ground floor retail is intended to serve local foot traffic to/from the NCD and the local community already on the adjacent streets (i.e., Carling Avenue and Preston Street). Since these trips are already in the network, they are not creating a new trip and were subsequently treated as “internal” trips. An 80% internal reduction was used for the commercial retail component of the Life Sciences Park. **Table 11** summarizes the resulting person trips generated by the Life Science Park.



**Table 11: Life Science Park Trip Generation Rates**

Land Uses in Life Sciences Park	Size	Reference	Peak Hour	Trip Generation Rate <sub>1</sub>	Person Trips Generated
Ground Floor Commercial (Shopping Center)	100,000 ft <sup>2</sup>	ITE 820	AM	1.20 (x)	24 <sub>2</sub>
			PM	4.88 (x)	98 <sub>2</sub>
Hospital Use	162,500 ft <sup>2</sup>	ITE 610	AM	0.82 (x)	133
			PM	0.86 (x)	139
Research and Development	487,500 ft <sup>2</sup>	ITE 760	AM	1.03 (x)	502
			PM	0.98 (x)	477
1. Trip Generation Rates include a 1.28 factor to account for typical North American auto occupancy, transit and non-motorized mode					
2. Person trips for commercial were internally reduced by 80%.					

### Emergency Transports, Service Vehicles and Transport Trucks

Similar to **Section 4.1.4** in the *TIA and Mobility Study* (July 2021), the NCD estimates approximately 100 emergency transports per day.

Contractor service vehicles and other specialized vehicles such as garbage trucks, small supply deliveries, electronic/ telecommunications technicians, police vehicles, etc. are expected to access the site in addition to employees and visitors. It was assumed 20 of these vehicles (10 vehicles entering and 10 vehicles exiting) would occur during the morning and afternoon peak hour in 2028 and increasing to 40 total vehicles (20 in and 20 out) by 2048. The majority of these vehicles were assumed to use Road E/Prince of Wales Drive or Maple Drive/Road D accesses. Note that Maple Drive/Road D will be strictly reserved for emergency vehicles only (i.e., active ambulances).

Large transport trucks were not assumed to operate frequently during the peak hour periods, due to higher traffic activity. They generally time their arrivals during off-peak periods. To be conservative, it was assumed that 4 transport trucks (2 in and 2 out) would occur during the peak hours in 2028, increasing to 8 transport trucks (4 in and 4 out) by 2048. These trucks will be destined to the loading area off Road F, which will only be accessible via Prince of Wales and Road B.

Conceptual circulation diagrams for the emergency, non-urgent, supplementary vehicles and large transports have been provided in **Appendix C**.

### **4.1.2 Mode Shares and Trips Generated by Mode**

#### Mode Shares

The *TIA and Mobility Study* (July 2021) developed aggregate mode share assumptions for all person-trips to/from the NCD, which had some limitations in not recognizing the discrete mode shares for different users (e.g. employees, planned visitors and emergency visitors), since this information was not available at the time.

Now that projected staff schedules and visitor expectations have been provided, the project team updated the mode share assumptions at the NCD to reflect each user-type noted above. Consideration was given for transit availability during different hours in day, the type of user, the trip context, and other factors which may influence someone from taking one mode of transportation versus another. At the end of this process, it was found that the new aggregate mode share at the NCD for all trips was generally consistent with the original *TIA and Mobility Study*.

The mode share assumptions Opening Day 2028 and Full Buildout 2048 have been summarized in **Table 12** and **Table 13** respectively.

**Table 12: Mode Share Assumptions by User Type at the NCD - 2028**

Type of Shift / Patient	Auto Driver	Passenger	Transit	Walk	Bike	Total
<b>Staff Shift Type</b>						
Day Shift	40%	8%	45%	4%	3%	100%
Evening Shift	75%	19%	4%	1%	1%	100%
Night Shift	75%	19%	4%	1%	1%	100%
12hr Day Shift	50%	15%	30%	3%	2%	100%
12hr Night Shift	50%	15%	30%	3%	2%	100%
<b>Patient Type</b>						
Planned	60%	22%	15%	2%	1%	100%
Unplanned	80%	20%	0%	0%	0%	100%
<b>SUBTOTAL WEIGHTED AVERAGE STAFF + PATIENTS</b>						
<b>Combined</b>	<b>51%</b>	<b>13.4%</b>	<b>30.6%</b>	<b>2.9%</b>	<b>2.1%</b>	<b>100%</b>

**Table 13: Mode Share Assumptions by User Type at the NCD - 2048**

Type of Shift / Patient	Auto Driver	Passenger	Transit	Walk	Bike	Total
<b>Staff Shift Type</b>						
Day Shift	25%	8%	57%	6%	4%	100%
Evening Shift	70%	16%	10%	3%	1%	100%
Night Shift	70%	16%	10%	3%	1%	100%
12hr Day Shift	40%	13%	40%	5%	2%	100%
12hr Night Shift	40%	13%	40%	5%	2%	100%
<b>Patient Type</b>						
Planned	45%	25%	25%	4%	1%	100%
Unplanned	80%	20%	0%	0%	0%	100%
<b>SUBTOTAL WEIGHTED AVERAGE STAFF + PATIENTS</b>						
<b>Combined</b>	<b>36.5%</b>	<b>12.2%</b>	<b>43.4%</b>	<b>5.0%</b>	<b>2.9%</b>	<b>100%</b>
<b>Life Sciences Park</b>						
Commercial	12%	3%	5%	40%	40%	100%
Medical/Research	25%	8%	57%	5%	5%	100%

Trips by Mode

The mode share assumptions were applied to person-trip volumes from each user type: employees and visitors, in 2028 and 2048. The assumptions were also applied to the person-trip results for the Life Sciences Park, and layered onto the peak hour volumes, but only accounted for the 2048 horizon. Additionally, the emergency, supplementary, and large transports were added separately to the peak hour traffic volumes at each horizon. The final trip totals in 2028 and 2048 are shown in **Table 14** and **Table 15** respectively. Note that these tables have been reduced to the peak hours of the adjacent street and the NCD generator as they will be the most critical hours. For a full breakdown of each hour, please refer to **Appendix D**.

Table 14: Trips Generated by NCD by Mode Shares – 2028

Mode Share		Auto Driver	Auto Passenger	Transit	Walk	Bike	TOTAL 2-WAY
AM Peak *	IN	611	138	569	52	38	1,408
	OUT	233	62	76	9	5	385
	TOTAL	844	200	645	61	43	1,793
PM Peak Generator	IN	164	46	19	3	2	234
	OUT	403	90	369	33	25	920
	TOTAL	567	136	388	36	27	1,154
PM Peak Adjacent Street	IN	102	23	4	1	1	131
	OUT	357	81	316	29	21	804
	TOTAL	459	104	320	30	22	935
*AM Peak is both of Adjacent Street and Generator Green – Proportion of Arrivals to NCD; Blue – Proportion of Departures from NCD							

Table 15: Trips Generated by NCD by Mode Shares – 2048

Mode Share		Auto Driver	Auto Passenger	Transit	Walk	Bike	TOTAL 2-WAY
AM Peak *	IN	842	280	1,570	173	115	2,980
	OUT	346	91	216	31	16	700
	TOTAL	1,188	371	1,786	204	131	3,680
PM Peak Generator	IN	291	87	66	14	4	462
	OUT	748	248	1,458	155	101	2,710
	TOTAL	1,039	335	1,524	169	105	3,172
PM Peak Adjacent Street	IN	189	40	74	28	24	355
	OUT	615	206	1,142	141	101	2,205
	TOTAL	804	246	1,216	169	125	2,560
*AM Peak is both of Adjacent Street and Generator Green – Proportion of Arrivals to NCD; Blue – Proportion of Departures from NCD							

### 4.1.3 Trip Distribution

The proposed number and location of site accesses has not changed from the original *TIA and Mobility Study*. Overall, the trip distribution will remain the same, with approximately 35% of trips going to and from the east and west and approximately 15% of trips going to and from the north and south.

### 4.1.4 Trip Assignment

The new site generated trips from **Section 4.1.2** were assigned to the road network based on the updated trip distribution, which have been shown in **Figure 3** and **Figure 4** for Opening Day 2028 and Full Buildout 2048 respectively. Note that the parking supply and layouts within the NCD have changed, which affected assignment. Specifically, a minor increase in vehicular traffic was forecasted via Road E/Prince of Wales and a minor reduction forecasted at all other accesses. Further details about on-site parking can be found in **Section 5.2**.

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

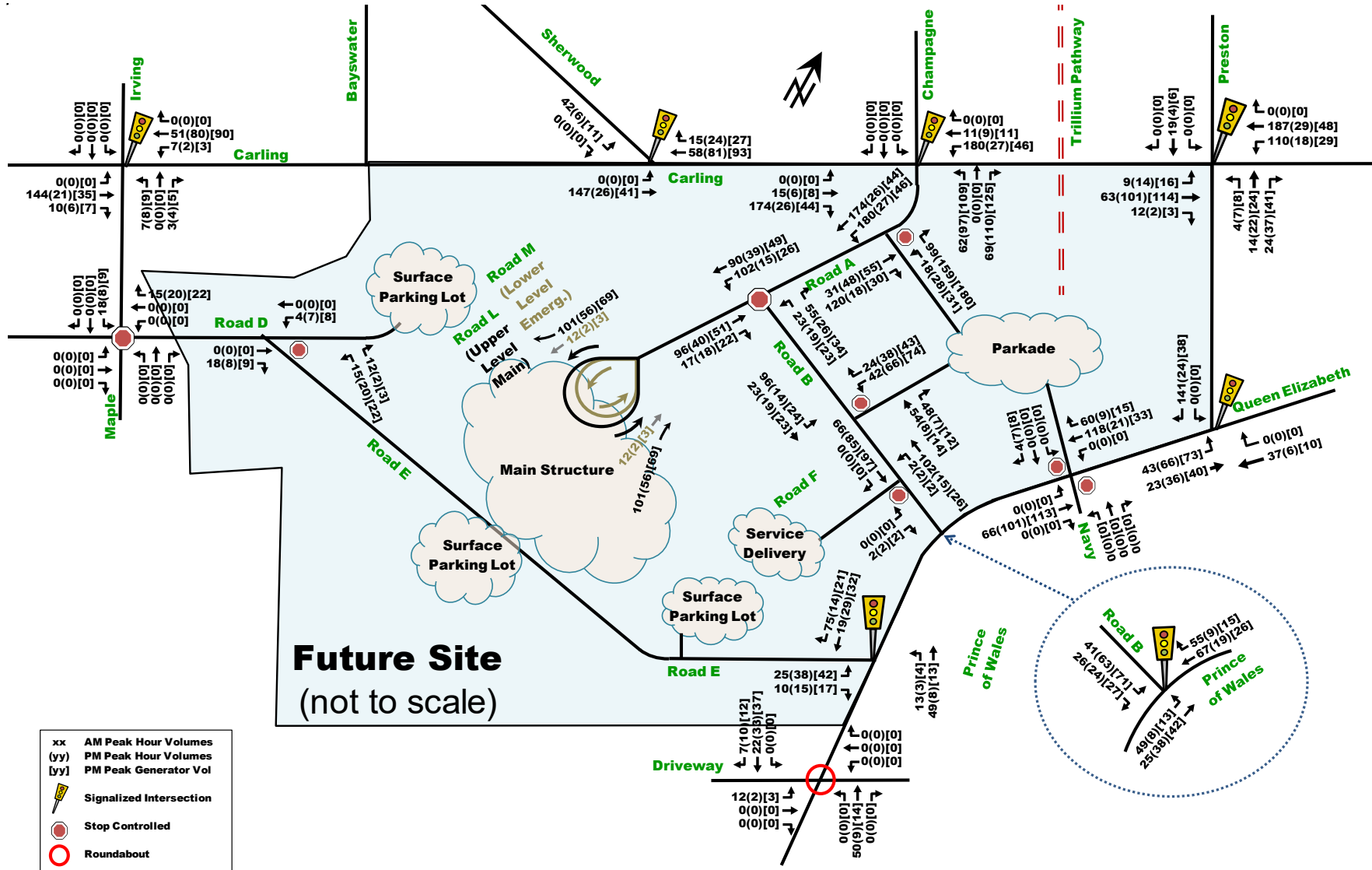
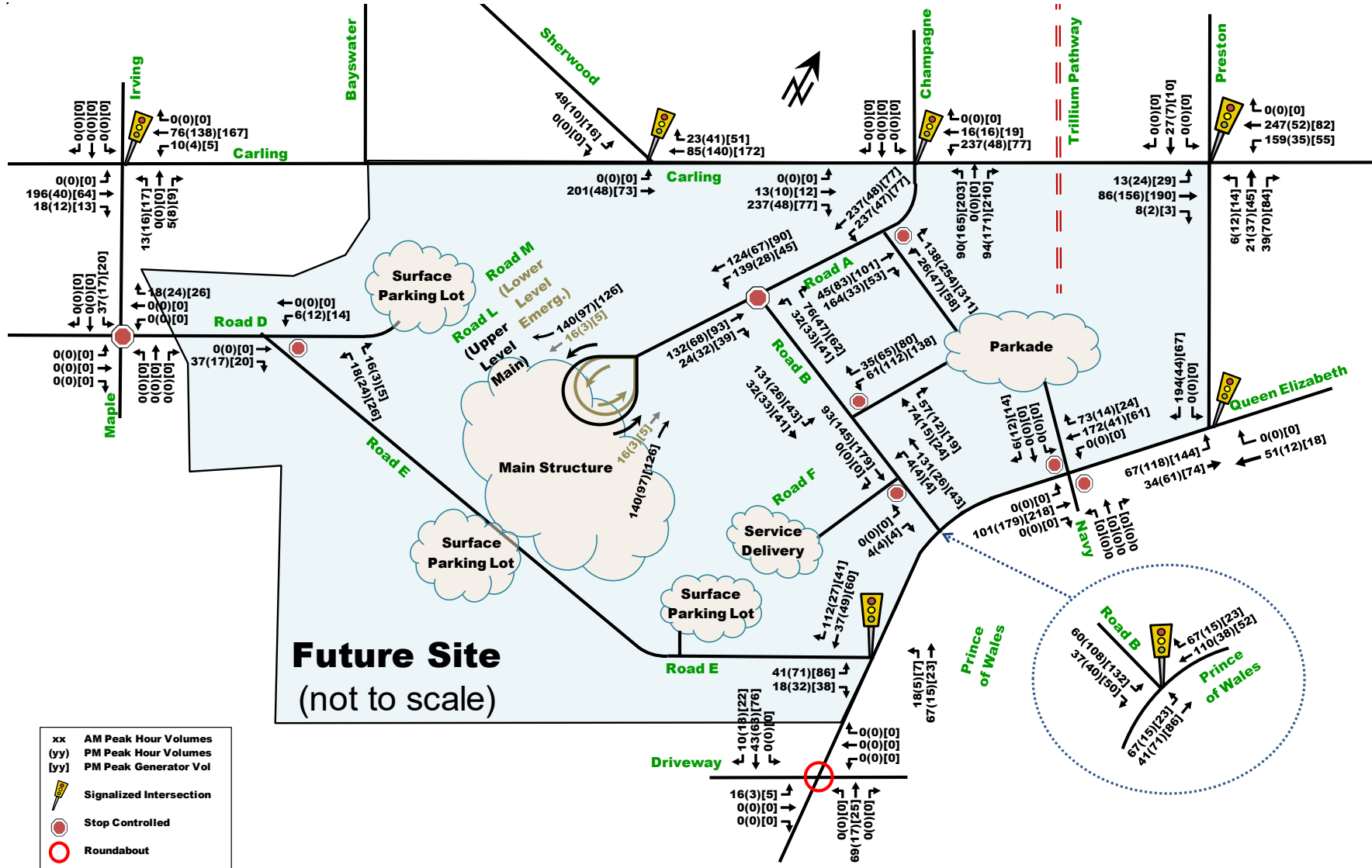


Figure 4: 2048 Full Buildout Site Generated Volumes (Streets Adjacent to NCD)



## 4.2 Background Network Travel Demands

Since the submission of the *TIA and Mobility Study (July 2021)*, TOH retained a ‘Streetlight’ software license which uses historic pings from location-based devices. Using this software tool in combination with existing peak hour traffic counts and TRANS data, Parsons was able to better estimate existing vehicle trips traveling to and from the existing Civic Campus.

For the 2028 background volume horizon, the hospital land use proportion of trips was removed from the network while the trips destined to the UOHI were maintained, estimated based on employee proportions provided by TOH. For the 2048 background volume horizon, the remaining trip generation from the UOHI were removed from the network.

In both horizon years, rehab vehicle trip generation were estimated and added separately following the same process as “Day Shift” staff in **Section 4.1.1**. As previously noted, the rehab program is expected to remain at the existing Civic Campus site.

Finally, some turning movements were balanced to the existing peak hour counts and TRANS data, to ensure the total volumes exiting and entering the greater network aligned better with the total vehicle volumes and directional splits as determined by Streetlight.

Other area development background volumes were updated to reflect the latest development applications within the study area, as discussed in **Section 3.1.4**. The new developments were added to the background volumes for all subsequent analyses. The combined other area development site generated traffic volumes have been provided in **Appendix E**.

**Overall, the background vehicle trips reduction was smaller than originally done by the *TIA and Mobility Study (July 2021)*.**

## 4.3 Demand Rationalization

**Table 16** provides a comparison of the trip generation results for Addendum #2 and the *TIA and Mobility Study (July 2021)*.

**Table 16: TIA and Mobility Study Trip Generation (July 2021) vs Updated Trip Generation**

Mode Share	Original (2021) TIA Peak Street		Updated (2022) Peak Street		% Change		Updated (2022) Peak Gen		Updated (2022) Peak 3h Avg	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
<b>2028</b>										
Vehicle IN	764	456	611	102	-20%	-78%	599	164	1,466	567
Vehicle OUT	359	530	233	357	-35%	-33%	221	403	394	957
TOTAL 2-way	1,123	986	844	459	-25%	-53%	820	567	1,860	1,524
<b>2048</b>										
Vehicle IN	914	557	842	189	-8%	-66%	842	291	2,177	857
Vehicle OUT	434	646	346	615	-20%	-5%	346	748	565	1,563
TOTAL 2-way	1,348	1,203	1,188	804	-12%	-33%	1,188	1,039	2,742	2,420

The updated trip generation process resulted in notably lower peak hour vehicle traffic volume estimates in both 2028 and 2048 compared to the *TIA and Mobility Study (July 2021)*. The key reasons the updated results were considered more reliable and acceptable for this study is as follows:

- The *TIA and Mobility Study* aggregated the trip generation process by developing a local trip generation rate based on the existing Civic Campus, which comprised of a single day traffic count at each access to the existing campus. This approach, while a common practice in the industry, is less

reliable as it represents a single sample and risks not being representative of a typical weekday. The first principles approach based on projected employee shift schedules and historical arrival/departure data for employees and visitors provides a much more comprehensive and accurate forecast of travel activity at the NCD.

- The *TIA and Mobility Study* developed a trip generation rate using existing Civic Campus traffic counts that blended three independent variables: the number of beds, number of employees and the gross floor area. This approach is acceptable if no other information is available about employee travel patterns, but is less reliable based on how different the building design of existing Civic Campus will be compared to the NCD.
- The estimated number of employees at the NCD in 2028 and 2048 has decreased since the original *TIA and Mobility Study*, as more information about future programs has come to light.
- The original *TIA and Mobility Study* did not factor in remote work potential, which has since been confirmed by TOH. The assumed peak hour activity in the *TIA and Mobility Study* was based on the existing Civic Campus traffic counts prior to COVID-19.

There have been no major changes to the planned transportation network surrounding the NCD; the planned Carling Avenue Transit Priority project, the city-wide active transportation and transit initiatives, and active connections to the adjacent pathway networks remain the same. Therefore, the demand rationalizations developed in Section 4.3 in the original *TIA and Mobility Study* were still considered acceptable and were applied to peak hour traffic background volumes for 2028 and 2048 in this study.

The future background volumes were updated based on a new process discussed in **Section 4.2. Overall, the future background volumes were higher (more conservative) compared to the *TIA and Mobility Study* as they include additional other area developments and less conservative reduction factors related to the existing Civic Campus.**

The demand rationalized background volumes and future forecasted volumes with the site generated trips, including updated other area developments have been provided in **Appendix F**.

## 5.0 STRATEGY REPORT

### 5.1 Development Design

The overall NCD site plan has undergone various refinements since the TIA and Mobility Study was submitted, however, many of these changes had little to no effect on the conclusions and recommendations from the previous submission. The more notable changes are discussed below.

With respect to access to and from the proposed parking garage, the original *TIA and Mobility Study* assumed entry to the parking garage via Road A was only open to the public, while the Road B and Navy Private parking garage accesses were open to staff only, for the purpose of balancing traffic distributions onsite and avoid congestion on the internal road network that risks spillback onto the municipal road network. **These assumptions were reassessed in this study with updated development information, and it was determined that these entry restrictions for specific user groups were no longer required.** The proposed parking garage accesses may be accessed by all user groups with low risk of congestion spilling back to the municipal road network.

The Active Transportation Plan for the NCD has been updated to reflect ongoing work and collaborations with City of Ottawa and the NCC, shown in **Figure 5**. The plan also identifies various design refinements made to the NCD site plan since the original *TIA and Mobility Study* submission.

Figure 5: Future Active Transportation Network Map





A list of the key changes is as follows:

- The Prince of Wales intersections at Preston and Road B will now be designed as protected intersections, as per the City's Protected Intersection Design Guidelines (PIDG). The proposed Prince of Wales/Road E intersection design (whether a roundabout or traffic control signal) is still being discussed by the project team, NCC and City of Ottawa. If it is decided to be a signalized intersection, it will also be designed as a protected intersection, ensuring the highest priority is afforded to pedestrians, cyclists and accessibility users at these locations.
- A new multi-use pathway (MUP) has been proposed from the southwest quadrant of Road A/Road B intersection that leads to the main front door entrance of the NCD. The MUP would follow the south side of Road A.
- A new pedestrian path has been proposed that connects the sidewalk along the west building face around to the Road A sidewalk near the front of the main building.
- The sidewalk on Road D has been relocated to the opposing side, providing connectivity to the Maple Drive/Road D intersection, and crossing to the NCD side of the road using a crosswalk. This sidewalk will extend east towards a series of smaller pedestrian desire lines.
- Some of the pedestrian and cycling facility widths have been refined, namely the Preston Street and Prince of Wales Drive segments fronting the site. For more details, refer to **Section 5.3**.

In general, sidewalks are 2m wide or wider, Multi-Use Pathways (MUPs) are 3m wide, and uni-directional cycle tracks are 1.8m wide or wider for each direction, all meeting or exceeding minimum widths required. A detailed breakdown of active transportation facility widths has been provided in **Appendix G**.

It is important to note that discussions are ongoing between TOH, NCC and City of Ottawa on the ultimate design of active transportation facilities on the campus, which may result in further refinements to the Active Transportation Plan over the course of the SPC approvals process.

## 5.2 Parking

### 5.2.1 Parking Supply

Although the number and location of parking spaces are in flux due to minor design refinements, the overall recommendations from the *TIA Addendum #1* in support of Phase 2 Site Plan Application for the Parking Garage and Green Roof from October 2021 are still valid. In addition, the total number of parking spaces proposed outside of the main parking garage structure within the Master Site Plan from the original *TIA and Mobility Study* are also valid, with minor refinements expected.

Parking Zone 4, accessed via Road E, was originally proposed as a staff only parking lot. The latest information received from TOH now envision this lot as a staff and possible overflow parking prior to the relocation of the University of Ottawa Heart Institute (UOHI). Once the UOHI is built, it is understood that the Zone 4 surface parking lot will be converted to underground parking with the potential for some surface parking, with permission for staff and public to use. Details of the future underground and surface lots for Zone 4 along with the detailed design for the UOHI will be completed once a future Site Plan Application is submitted for UOHI.

The parking supply numbers presented herein are not final and are subject to change as the site plan is further refined over the course of the City approvals process. **Table 17** summarizes the minimum required and maximum permitted parking spaces based on the land uses and location of the NCD.

Overall, the parking by-law requirements are still be met, as per the *TIA and Mobility Study*. The site is located in Area X, Schedule 1A for minimum parking rates and Area B, Schedule 1 for maximum parking permitted. The Gross Floor Area (GFA) used reflects some modifications from the GFA's used in the trip generation to account

for wall spaces, elevator shafts, utility rooms and spaces that will not generate vehicle trips and thus do not require parking spaces.

**Table 17: Minimum Required and Maximum Permitted Parking Spaces**

Land Use		GFA x 1,000 m <sup>2</sup>	Min Rate	Min Required	Max Rate	Max Permitted	
Opening Day 2028	Hospital	225	0.7/100 m <sup>2</sup>	1,575	1.6/100 m <sup>2</sup>	3,600	
	Retail	6	1.25/100 m <sup>2</sup>	88	3.6/100 m <sup>2</sup>	252	
Full Buildout 2048	Hospital Expansion	100.5	0.7/100 m <sup>2</sup>	704	1.6/100 m <sup>2</sup>	1,608	
	Office	23.5	1/100 m <sup>2</sup>	235	2.2/100 m <sup>2</sup>	517	
	Research and Dev.	6	0.4/100 m <sup>2</sup>	24	1/100 m <sup>2</sup>	60	
	Medical Facility	22	2/100 m <sup>2</sup>	440	5/100 m <sup>2</sup>	1,100	
				Min Required	3,065	Max Permitted	7,137
				Total Provided	3,099		
				Blended Rate	0.8/100m <sup>2</sup>		

The number and location of bike parking spaces within the parking garage is forecasted to remain the same as discussed in **Section 4.1.2** of the TIA Addendum #1 from October 2021. However, bike parking near the main entrance and north entrance to Tower A have been proposed. Similarly, the total number of new bike parking spaces are still under refinement and will be confirm over the course of the City approvals process.

### 5.2.2 Parking Demand and Spillover

As previously noted, this section of the report has been exempted. TOH is preparing two separate studies that will discuss on-site and off-site parking management.

On-site parking management will be a central focus of the *Transportation Demand Management Strategy*, which aims to define policies, measures, and strategies to aid TOH in reducing single-occupant vehicle demand at the NCD.

The off-site parking implications will be discussed in detail within the *Off-Site Parking Strategy*, including potential mitigation options.

### 5.3 Boundary Street Design

There have been some refinements made to the boundary streets since the original *TIA and Mobility Study* submission, the differences have been discussed below and their respective multi-modal level of service (MMLoS) for interim conditions has been summarized in **Table 18**:

- The full buildout segment of Carling Avenue between the Trillium Pathway and Preston Street is envisioned to have a 3.5m sidewalk with more than 2m boulevard separation and a 3m bi-directional cycle-track. The interim design proposes a 3m bi-directional cycle track and a 2m sidewalk without a boulevard separation.
- The full buildout segment on Preston Street from Carling Avenue to Prince of Wales Drive was originally proposed as a 3m sidewalk with a 3m cycle-track and greater than 2m boulevard separation. The latest RMA proposes a 3m sidewalk with a 3.5m bi-directional cycle-track and greater than 2m boulevard separation to be built prior to 2028 Opening Day. Although an improvement to cycling facilities, the MMLoS analysis will show the same results.
- The full buildout segment on Prince of Wales Drive from Preston Street to Road B was originally proposed as a 2m sidewalk with a 2m unidirectional cycle-track and greater than 2m boulevard separation. The latest RMA proposes a 2m sidewalk with a 1.8m unidirectional cycle-track and greater than 2m boulevard separation to be built prior to 2028 Opening Day. The MMLoS analysis will show the same results.
- No changes anticipated for Maple Drive.

Table 18: Future Interim 2028 Adjacent Road Network MMLoS

Road Segment	Multi-Modal Level of Service (MMLoS)								
	Pedestrian			Bicycle		Transit		Truck	
	Full Buildout PLoS	Interim PLoS	Target	BLoS	Target	TLoS	Target	TkLoS	Target
Carling Ave.	C	E	A						
Preston St.	C	C	A	No change from Table 36 in original TIA and Mobility Study (July 2021)					
Prince of Wales Dr.	C	C	A						

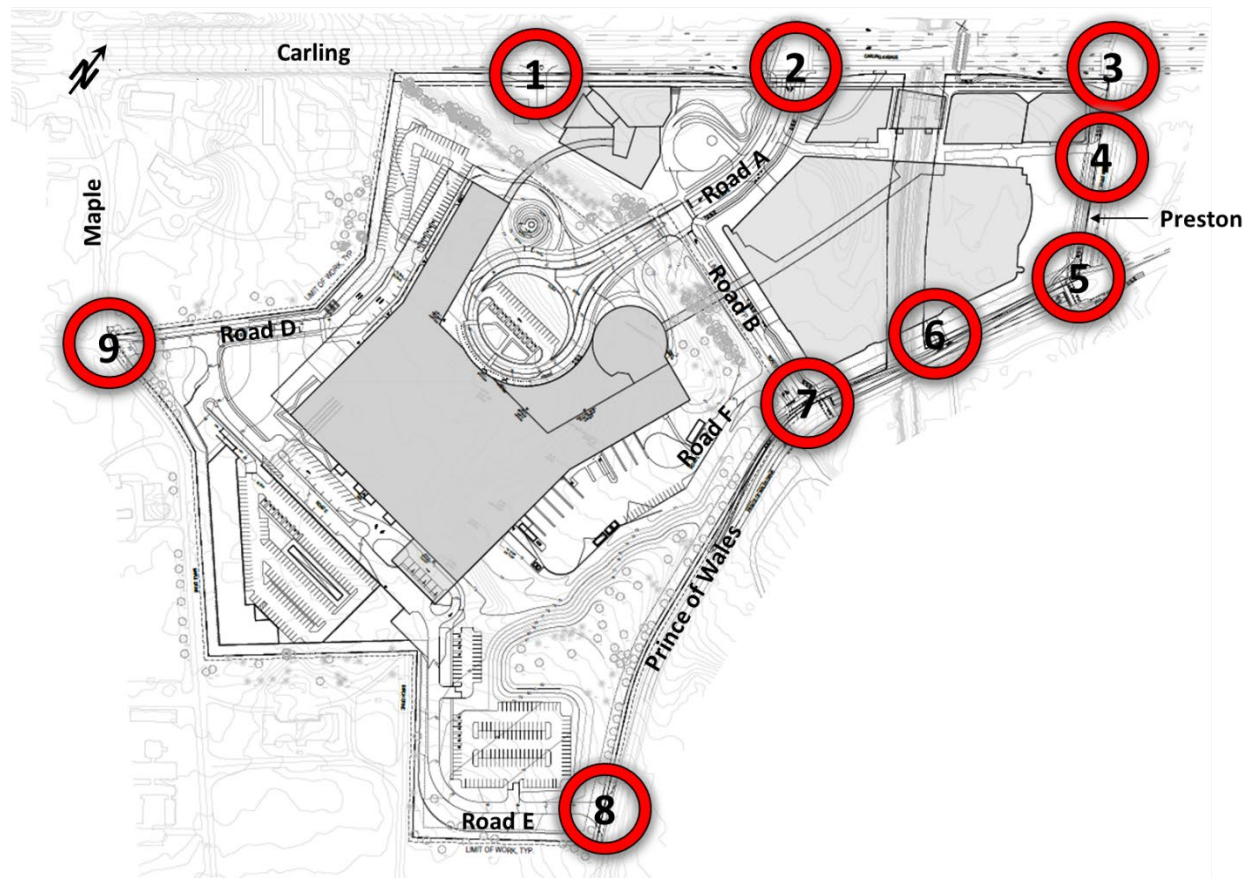
As shown in **Table 18**, Preston Street and Prince of Wales Drive segments are expected to be constructed to its ultimate design by opening day 2028 and show no changes in MMLoS performance. The Carling Avenue frontage will be redeveloped as part of the Carling Avenue Transit Priority Project and is expected to include pedestrian and segregated cycling facilities.

It is important to note that discussions are ongoing between TOH, NCC and City of Ottawa on the ultimate design of the adjacent road network, which may result in further refinements over the course of the SPC approvals process.

### 5.4 Access Intersection Design

**Figure 6** below illustrates the study area intersections along the NCD frontage. Intersections 1, 2 and 3 (on Carling Avenue) will be built to interim conditions until the Carling Avenue Transit Priority project is implemented. The precise timing of Carling Avenue works is currently unknown but anticipated prior to 2029. All other intersections are expected to be constructed to their ultimate design before Opening Day 2028.

Figure 6: Study Area Intersections Fronting the NCD Site



A description of the key changes to the noted intersection is provided below. It is important to note that the intended function and expected users of each intersection has not fundamentally changed since the TIA and Mobility Study submission – only the designs of certain intersections have been refined.

The Road Modification Approvals (RMA) designs have been provided in **Appendix H**. **At this time, three of the four submitted RMAs have been approved, including Prince of Wales Drive/Road B, Carling Avenue/Road A and Prince of Wales Drive/Preston Street. The Prince of Wales Drive/Road E is currently being reviewed and is anticipated to be approved in the coming weeks.**

- 1. Carling Avenue/Sherwood Drive:** No changes are anticipated from the original *TIA and Mobility Study*.
- 2. Carling Avenue/Champagne Avenue/Road A:** An interim new south leg will be built as part of the NCD, with a 75m-long westbound left-turn lane and a 30m-long eastbound right-turn lane are proposed. An extended concrete island on the west approach is proposed to provide a pedestrian shelter when crossing Carling Avenue. Once the Carling Avenue Transit Priority Project is implemented, it is anticipated that all approaches will have unidirectional cross-rides. The ensuing intersection performance analysis reflects a bi-directional cross-ride on the south approach, which represents a worst-case scenario (i.e., would require a time separated phase and an eastbound right-turn lane). The northbound through movement will be prohibited at this intersection to reduce traffic infiltration along Champagne Avenue and Beech Street.
- 3. Carling Avenue/Preston Street:** No changes are anticipated from existing conditions until such time that the Carling Avenue Transit Priority Project is implemented. No changes are anticipated from the original *TIA and Mobility Study* for the full buildout design. Once the Carling Avenue Transit Priority Project is implemented, it is anticipated that all approaches will have uni-directional cross-rides. The ensuing intersection performance analysis reflects a bi-directional cross-ride on the south approach, which represents a worst-case scenario (i.e., would require a time separated phase and an eastbound right-turn lane).
- 4. Life Science Park Laneway/Preston Street:** the original *TIA and Mobility Study* suggested a one-way laneway from Preston Street to Road A. This assumption is still valid for horizon year 2048, once the Life Science Park is built. Prior to construction of the Life Science Park, the laneway will not connect across the Trillium Line and will function as a two-way laneway reserved for service vehicles and snow removal. It is anticipated to have very limited traffic and during off-peak hours only.
- 5. Prince of Wales Drive/Preston Street:** The design of this intersection has evolved considerably since the original *TIA and Mobility Study*. In consultation with City of Ottawa staff and the NCC, the design has been augmented to a fully protected intersection with a bi-directional cross-ride on the west side (to facilitate the realigned Trillium Pathway connection), north side, and south side, with a unidirectional cross-ride on the east side.
- 6. Prince of Wales Drive/Navy Private/Parking Garage Access:** No changes are anticipated from the original *TIA and Mobility Study*.
- 7. Prince of Wales Drive/Road B:** The design of this intersection has also evolved since the previous submission. Uni-directional cycle-cross rides are proposed on the north and west approaches, while a bi-directional cycle track crossing is proposed on the east side of the intersection. The east side of the intersection has also been augmented with a bi-directional bikeway and sidewalk. The Road B/Prince of Wales Drive intersection is currently undergoing refinements with relevant stakeholders such as City of Ottawa and NCC to determine if additional storage capacity extending over to the Trillium Line Bridge is feasible. These refinements will be resolved over the course of the detailed design.
- 8. Prince of Wales Drive/Road E:** This intersection was originally proposed as an unsignalized intersection with free-flow movements on Prince of Wales Drive and a stop-control for the Road E approach. However, the latest Site Plan has allocated more parking to the south side of the main

hospital building, which increases vehicle traffic projections at the Prince of Wales Drive/Road E intersection. As a result, the updated operational analysis supports the need for a traffic control signal or a roundabout to accommodate future traffic volumes. Discussions are ongoing with City and NCC staff on the preferred design option.

**Section 5.9** of this report assessed the implications of both a traffic control signal and a roundabout.

- a. Signalized Option:** The signal design will assume a protection intersection with uni-directional cycle-tracks on all approaches. Auxiliary turn lanes are expected to be required to support this design option.
  - b. Roundabout Option:** A single lane roundabout with the possibility of PXOs on each approach to accommodate pedestrians and cyclists.
- 9. Maple Drive/Winding Way/Road D:** No changes are anticipated from the original *TIA and Mobility Study*. TOH maintains their commitment to restrict access to Road D to emergency vehicles only, reducing traffic implications on Maple Drive.

Similar to the *TIA and Mobility Study* (July 2021), traffic control signal warrants for Road B/Prince of Wales Drive and Road E/Prince of Wales Drive intersections were completed and in both cases, a signalized intersection was not warranted. The requirement for traffic signals was confirmed based on intersection operation and capacity.

## 5.5 Transportation Demand Management

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This section of the report has been exempted. TOH is preparing a comprehensive *Transportation Demand Management (TDM) Strategy* that will identify needs/opportunities, alternative solutions, and prepare a recommended plan that help TOH achieve the necessary mode share targets to limit single-occupant vehicle trips and ensure parking demand does not exceed supply at the NCD. This strategy also includes a long-term vision for TDM, through a framework that can be applied to all TOH hospitals and affiliates in the fullness of time.

## 5.6 Neighbourhood Traffic Management

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This section of the report has been exempted. TOH is preparing a comprehensive *Neighbourhood Traffic Management Strategy (NTMS)* that will identify needs/opportunities, develop a NTMS Toolkit, and prepare a recommended plan for area traffic management measures within the adjacent communities. Representatives from five adjacent community associations, Carlington Community Association, Civic Hospital Neighbourhood Association, Dalhousie Community Association, Dow's Lake Residents Association and Glebe Annex Community Association were engaged directly help identify community values, issues, and opportunities from varying perspectives, specific to each neighbourhood.

Various measures were recommended to help mitigate existing and potential future traffic implications related to the NCD in surrounding community associations, such as turn restrictions, speed humps, flex-posts etc. The strategy also included various community improvement measures for the City and/or NCC to consider that may not be directly related to area traffic management or the NCD, but were acknowledged as possessing intrinsic value and were of great importance to the local community associations.

The strategy also addressed the sensitivities of Maple Drive to the Central Experimental Farm (CEF) and Agriculture and Agri-food Canada (AAFC), and the recommended plan included measures to address potential concerns within the CEF.

## 5.7 Transit

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The following transit discussion expands on the section provided in the *TIA and Mobility Study* now that more transit information has been provided by the City of Ottawa. The NCD will greatly benefit being located in close

proximity to the Dow's Lake LRT Station (Line 2 – Trillium Line) and the future Carling Avenue Transit Priority Corridor – where bus rapid transit is envisioned within the next 10 years. As a result, there was a heavy focus on transit to move people to and from the site.

### Transit Access

Although the site is predominantly within a 600m radius from the Dow's Lake LRT Station to the NCD, it is acknowledged this distance may be a challenge to some, predominantly those with mobility difficulties. The City is currently planning an Environmental Assessment (EA) process that would define possible grade separation solutions for pedestrians crossing Carling Avenue between Dow's Lake Station and the future Life Sciences Park.

Today, there are currently bus stops located on Preston Street between Carling Avenue and Prince of Wales Drive and on Prince of Wales Drive between Preston Street and The NCC Scenic Driveway. It is possible that in the future, OC Transpo may decide to bring these stops back in to regular weekday operation if demand exists. Similarly, buses may be routed via the front door of the hospital if there is such a demand; Roads A and B have been designed to accommodate this possibility as directed by City Council.

### Future Transit Demand

For the purposes of this study, it was estimated that approximately two-thirds of transit trips will arrive or depart using the Trillium Line LRT, while the remaining one-third would use surface bus routes on Carling Avenue, Preston Street or Prince of Wales Drive in the future. This assumption was based on existing Civic Campus visitor origin-destination data and staff postal code information provided by TOH. In addition, factors such as how direct the route options to arrive to the NCD, how many transfers would be required, estimated transit travel time and available hours of service were all considered during this process.

Historic ridership data was requested from OC Transpo and has been provided in **Appendix I**. The data suggests low historic ridership, particularly the average load at departure for Line 2 LRT at Dow's Lake Station, which averages around 35 passengers on the train, on trains with capacity of approximately 500 passengers. It is important to note, however, that these average load departures are taken over a 3-hour period. Further communication with OC Transpo confirmed that the driving force for the Trillium Line ridership is Carleton University, specifically students. It is expected that loads will be much higher in the short periods prior to and after classes.

As previously shown in **Table 14** and **Table 15**, the NCD is forecasted to produce up to 650 new transit trips during the peak hour in 2028 and up to 1,800 new transit trips in 2048. For both 2028 and 2048, the peak transit activity for the NCD is forecasted between 06:00-07:00 based on projected staff schedules. In the PM peak, travel activity was found to be less focused to a single period. Once the Line 2 LRT returns to operation, it is forecasted that the line could provide capacity for approximately 2,500 passengers per direction per hour.

There is a potential risk of a very heavy transit demand hour, exceeding the Line 2 LRT capacity if NCD staff schedules were to coincide with class schedules. That said, current NCD staff daytime shifts (6am-7am) are expected to start earlier than typical University class schedules (8am-9am).

### Transit Capacity

The Trillium Line is currently under construction as part of ongoing Stage 2 LRT expansion works by the City, which will increase the catchment area for the line and attract new users, namely: McDonald Cartier Airport; South Keys; Leitrim Park and Ride; and Riverside South. Line 1 LRT is also undergoing expansions, broadening its catchment area, and making the use of Line 1 to Line 2 connectivity more desirable. Based on the conservative estimate of 1,800 peak hour transit demand for the 2048 horizon year at the NCD, with a two thirds Trillium Line usage (approximately 1,200 LRT trips), combined with increased commuter ridership growth and continued Carleton University classes, it is possible that the Trillium Line may need additional capacity by 2048, which may include a full doubling of the Trillium Line, platform extensions to provide longer trains or increased train frequencies where available.

Recent data from OC Transpo suggests there has been a 50% decrease in transit usage post Covid-19 pandemic; however, these numbers are expected to return to normal in the fullness of time and likely grow as the transit network matures. Once the LRT line expansions are complete, and pending data from OC-Transpo regarding peak existing ridership arrives (Carleton University usage influence), then a more comprehensive understanding of route capacity can be completed.

## 5.8 Review of Network Concept

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As shown in **Table 3**, this section of the report has been exempted as the Zoning By-Law Amendment (ZBLA) was approved in October 2021.

## 5.9 Intersection Design

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As previously discussed, the anticipated peak hour of the NCD generator in the morning was found to coincide with the peak hour of the adjacent street. In the afternoon, the peak hour of the generator and of the adjacent street did not align, and both scenarios were analyzed in 2028 and 2048.

### Intersection Performance

Similar to the *2021 TIA and Mobility Study*, overall intersection performance in 2028 and 2048 did not change significantly, with 2048 normally performing only slightly worse than 2028.

All signalized intersections were shown to operate within acceptable limits (LOS 'E' or better) overall, which was an improvement over the *2021 TIA and Mobility Study*.

As for unsignalized intersections, Rochester Street/Carling Avenue intersection continued to perform at an LoS of 'F' for the critical southbound movement due to the proposed removal of through lanes on Carling Avenue and its heavy westbound through movement. If persistent delays are observed during peak hours at this intersection, drivers have the option of using adjacent signalized intersections instead such as Booth Street or Preston Street with Carling Avenue. The PM peak of the adjacent street almost always performed worse than the PM peak of the NCD.

A summary table of intersection performance for 2028 and 2048 has been provided in **Appendix J** and detailed Synchro outputs in **Appendix K**. All results in this study do not vary significantly from the *2021 TIA and Mobility Study*.

### Queuing Analysis

Another important measure of the health of an intersection is determining if there will be queueing implications and if vehicles are likely to spillback to adjacent intersections with consistency. A detailed summary of all queueing analysis using SimTraffic software along with intersections deemed sensitive or at risk of queueing implications have been summarized within the table in **Appendix L**.

**Overall, most intersections have experienced a reduction in queue lengths compared to the *2021 TIA and Mobility Study* with the exception of Preston Street/Prince of Wales Drive intersection.**

The Preston Street/Prince of Wales Drive intersection has a few movements which at times, predominantly the peak hours only, exceed the storage capacity. These movements include the eastbound left-turn, the southbound right-turn, and the southbound through-left-movement. The queues could be mitigated at the expense of active transportation priority. Through public and City review staff consultation, it was recommended that this intersection provide cyclist and pedestrian priority due to the major pathway connectivity on three of the four quadrants, at the expense of vehicular performance and queueing implications. Given that the queues will only occur during peak hours, predominantly the hours of 15:00-16:30,

and the intersection would then provide better safety for active transportation modes, then the forecasted queues can be accepted.

The Preston Street/Carling Avenue intersection shows possible queuing constraints, but was considered reasonable considering it was modelled with a time separated bi-directional crossing of the south leg, which is the most conservative scenario. The City is expected to redesign this intersection as part of the Carling Avenue Transit Priority project, and the intersection will be reassessed at that time.

The Road B/Prince of Wales Drive intersection did not show significant queuing constraints, but it is currently undergoing refinements with relevant stakeholders such as City of Ottawa and NCC to determine if additional storage capacity extending over to the Trillium Line Bridge is feasible. These refinements will be resolved over the course of the detailed design.

### 5.10 Monitoring

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This section of the report has been exempted. TOH is preparing a comprehensive *Transportation Monitoring Strategy* that will outline how TOH will monitor, process, and report future traffic conditions to enable them to make informed decision related to the long-term implementation plan for each transportation strategy. The Monitoring Strategy will take shape after the recommendations within the four other transportation studies have been vetted by City of Ottawa staff.

## 6.0 CONCLUSIONS

As previously noted in the introduction of this report, there have been a number of refinements made to the NCD site plan since the submission of the TIA and Mobility Study (July 2021). A summary of the key conclusions to the TIA Addendum #2 is as follows:

- The changes in the site plan and programming projections since the *TIA and Mobility Study* (July 2021) submission did not alter the overall conclusions and recommendations in that document.
- The main Hospital building can be accommodated by the adjacent road network with recommended modifications to the adjacent road network as included in the Road Modification Drawings attached as Appendix H.
- Discussions are ongoing between TOH, the City of Ottawa, NCC and federal departments on the design and implementation of adjacent road network modifications to support the main Hospital building and may be further refined prior to detailed design.

For reference, the conclusions and recommendations from *TIA and Mobility Study* (July 2021) have been provided with corresponding commentary on any changes or implications stemming from the preceding analysis, please refer to **Appendix M**.



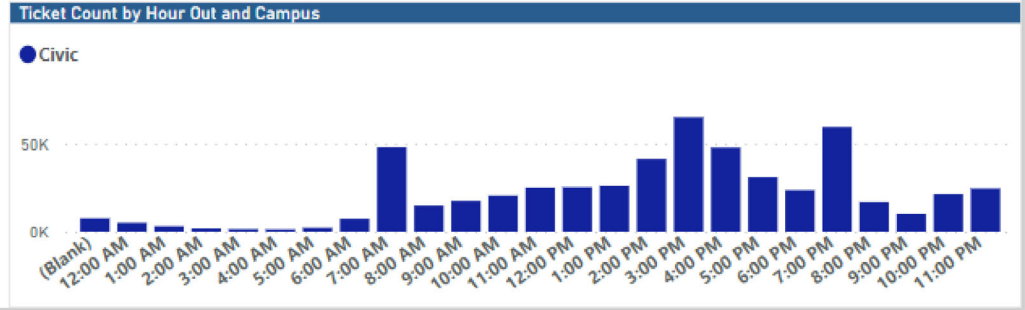
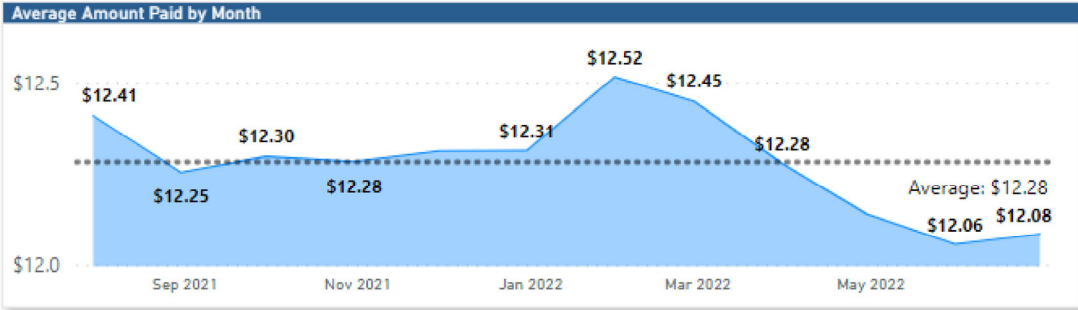
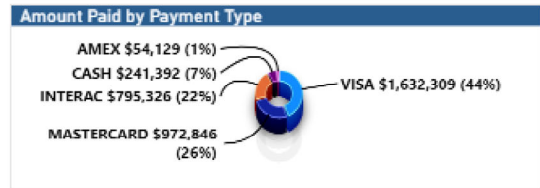
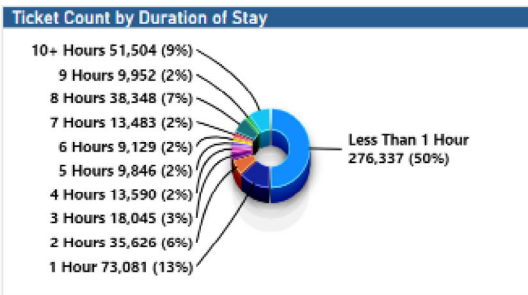
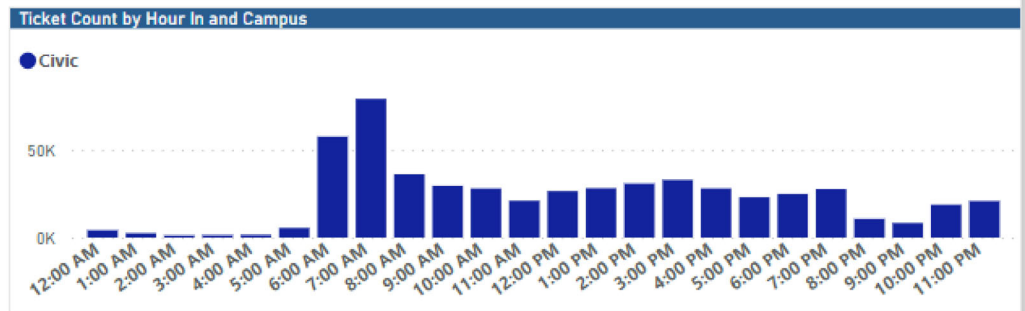
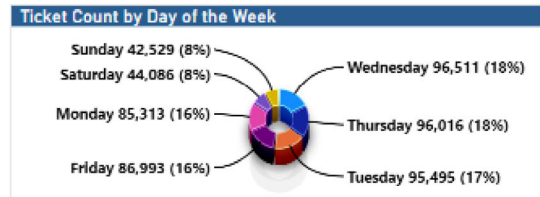
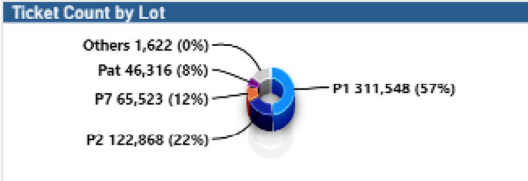
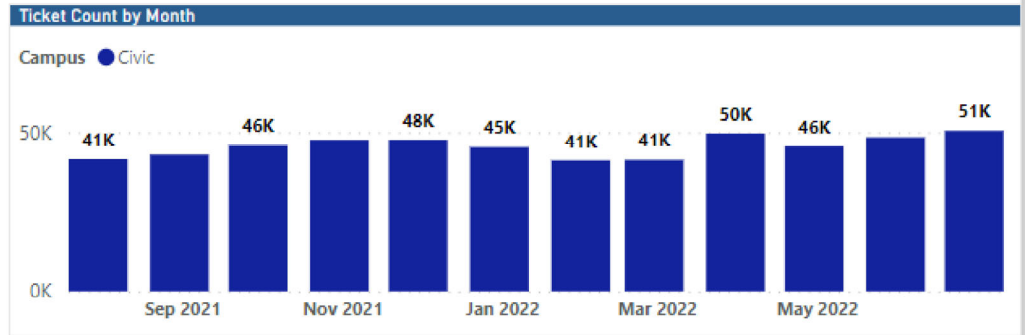
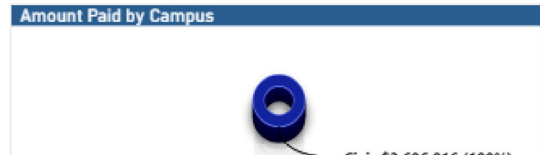
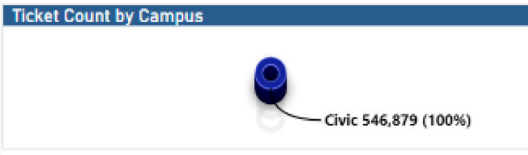
**Appendix A:  
Existing Civic Campus Parking Data**

# TOH Parking Patient Summary

01/07/2021 30/06/2022

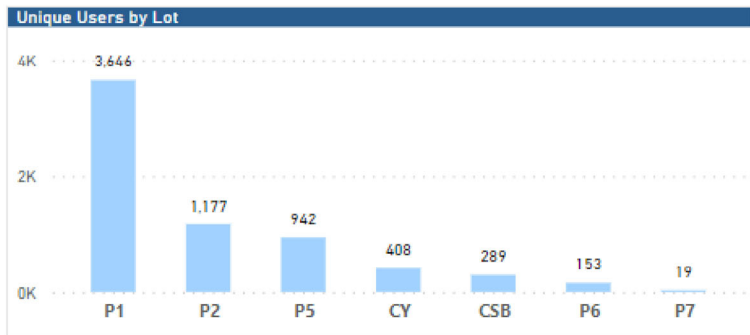
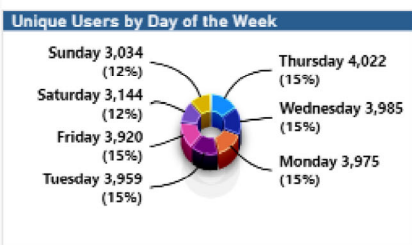
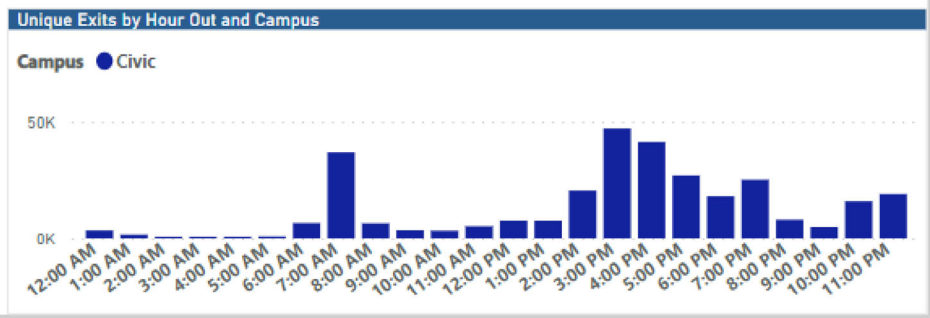
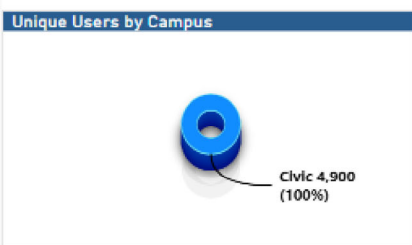
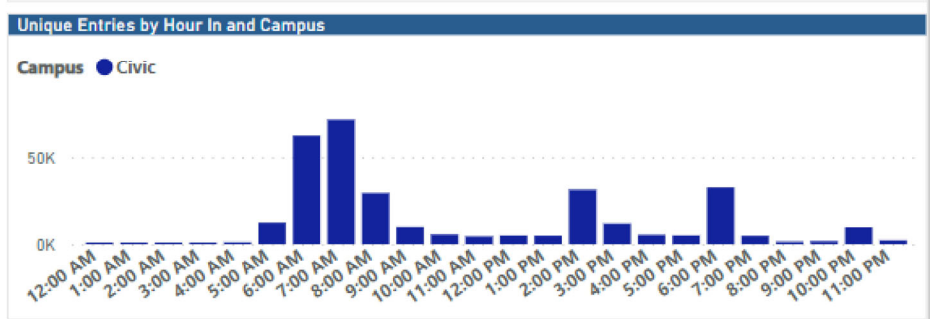
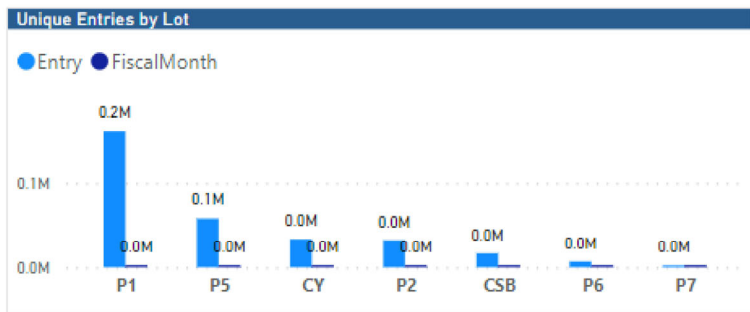
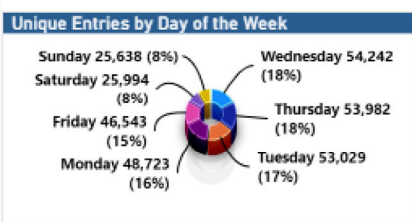
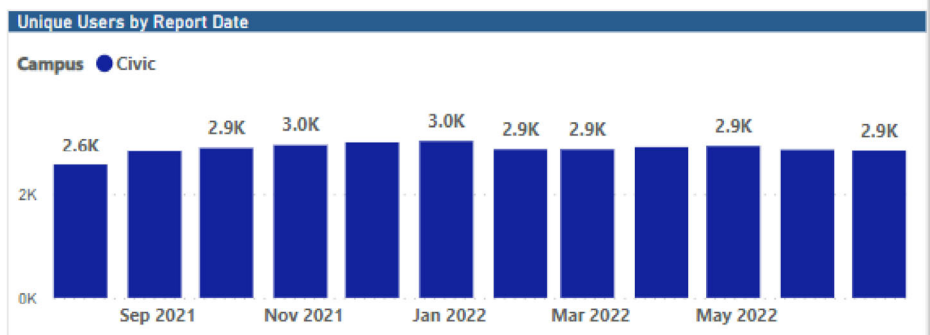
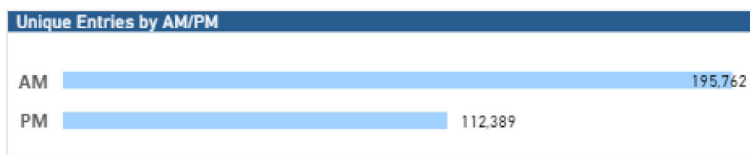
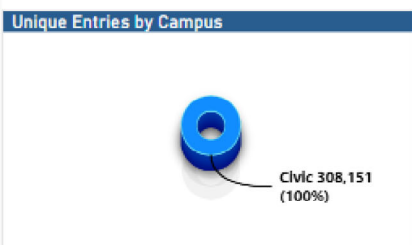


Amount Paid	Ticket Count	Lot Name	Lot Type	Campus	Duration of Stay	Weekday	Month
\$3,696,016	546,879	All	All	All	All	All	All



# TOH Parking Staff Summary

<b>Unique Users</b> 4,900	<b>Unique Entries</b> 308,151	<b>Lot Name</b> All	<b>Lot Type</b> All	<b>Campus</b> All	<b>AM/PM</b> All	<b>Weekday</b> All	<b>Month</b> All
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**Appendix B:  
24-Hour Estimated Hourly Trip Generation – People Trips**

Table 6: Number of Hourly Staff People Trips Generated To and From NCD - 2028

Time Interval	23:00 - 24:00	22:00 - 23:00	21:00 - 22:00	20:00 - 21:00	19:00 - 20:00	18:00 - 19:00	17:00 - 18:00	16:00 - 17:00	15:00 - 16:00	14:00 - 15:00	13:00 - 14:00	12:00 - 13:00	11:00 - 12:00	10:00 - 11:00	09:00 - 10:00	08:00 - 09:00	07:00 - 08:00	06:00 - 07:00	05:00 - 06:00	04:00 - 05:00	03:00 - 04:00	02:00 - 03:00	01:00 - 02:00	00:00 - 01:00
<b>Type of Shift</b>																								
Day Shift TOH				134	418	251	435	669	786	301	134	64	64	80	160	448	1,152	1,000	160					
Day Shift Other*							n/a	n/a	n/a							n/a	n/a	n/a						
Evening Shift	299							100	100	299													100	100
Night Shift	38	114														38	114							
12hr Day Shift				122	365												122	366						
12hr Night Shift					80	239										80	239							
<b>TOTAL IN</b>	38	114			80	239		100	100	299		64	64	80	160	448	1,274	1,366	160					
<b>TOTAL OUT</b>	299			256	783	251	435	669	786	301	134					118	353						100	100
<b>TOTAL 2-WAY</b>	337	114	0	256	863	490	435	769	886	600	134	64	64	80	160	566	1,627	1,366	160	0	0	0	100	100

Green - Proportion of Arrivals to NCD, Blue - Proportion of Departures from NCD, Grey - Shift Group Working at NCD, \*Day Shift Other refers to UOH and Research

Table 7: Number of Hourly Staff People Trips To and From NCD - 2048

Time Interval	Day Shift TOH	Day Shift Other*	Evening Shift	Night Shift	12hr Day Shift	12hr Night Shift	TOTAL IN	TOTAL OUT	TOTAL 2-WAY
23:00 - 24:00			393	61			61	393	454
22:00 - 23:00				181			181		181
21:00 - 22:00									0
20:00 - 21:00	173				187			360	360
19:00 - 20:00	541				561	124	124	1,102	1,226
18:00 - 19:00	325					371	371	325	696
17:00 - 18:00	563	586						1,149	1,149
16:00 - 17:00	866	879	157				157	1,745	1,902
15:00 - 16:00	1,018	1,465	236				236	2,483	2,719
14:00 - 15:00	390		393				393	390	783
13:00 - 14:00	173							173	173
12:00 - 13:00	83						83		83
11:00 - 12:00	83						83		83
10:00 - 11:00	104						104		104
09:00 - 10:00	207						207		207
08:00 - 09:00	580	586		61		124	1,166	185	1,351
07:00 - 08:00	1,492	879		181	187	371	2,558	552	3,110
06:00 - 07:00	1,295	1,465			561		3,321		3,321
05:00 - 06:00	207						207		207
04:00 - 05:00									0
03:00 - 04:00									0
02:00 - 03:00									0
01:00 - 02:00			157					157	157
00:00 - 01:00			236					236	236

Green - Proportion of Arrivals to NCD, Blue - Proportion of Departures from NCD, Grey - Shift Group Working at NCD, \*Day Shift Other refers to UOH and Research

**Table 9: Hourly Breakdown Estimate of Planned and Unplanned Patient/Visitor Person Trips - 2028**

Type of Shift	23:00 - 24:00	22:00 - 23:00	21:00 - 22:00	20:00 - 21:00	19:00 - 20:00	18:00 - 19:00	17:00 - 18:00	16:00 - 17:00	15:00 - 16:00	14:00 - 15:00	13:00 - 14:00	12:00 - 13:00	11:00 - 12:00	10:00 - 11:00	09:00 - 10:00	08:00 - 09:00	07:00 - 08:00	06:00 - 07:00	05:00 - 06:00	04:00 - 05:00	03:00 - 04:00	02:00 - 03:00	01:00 - 02:00	00:00 - 01:00	
Planned Visit Arrival						51	51	103	103	103	103	103	103	103	103	103	103								
Planned Visit Departure					51	51	103	103	103	103	103	103	103	103	103	103									
Unplanned Visit Arrival	9	9	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	9	9	9	9	9	9	9
Unplanned Visit Departure	9	9	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	9	9	9	9	9	9	9
TOTAL IN	9	9	19	19	19	70	70	122	122	122	122	122	122	122	122	122	122	19	9	9	9	9	9	9	9
TOTAL OUT	9	9	19	19	70	70	122	122	122	122	122	122	122	122	122	122	19	9	9	9	9	9	9	9	9
TOTAL 2-WAY	18	18	38	38	89	140	192	244	244	244	244	244	244	244	244	244	141	38	18	18	18	18	18	18	18

Green – Proportion of Arrivals to NCD, Blue – Proportion of Departures from NCD

**Table 10: Hourly Breakdown Estimate of Planned and Unplanned Patient/Visitor Person Trips - 2048**

Type of Shift	23:00 - 24:00	22:00 - 23:00	21:00 - 22:00	20:00 - 21:00	19:00 - 20:00	18:00 - 19:00	17:00 - 18:00	16:00 - 17:00	15:00 - 16:00	14:00 - 15:00	13:00 - 14:00	12:00 - 13:00	11:00 - 12:00	10:00 - 11:00	09:00 - 10:00	08:00 - 09:00	07:00 - 08:00	06:00 - 07:00	05:00 - 06:00	04:00 - 05:00	03:00 - 04:00	02:00 - 03:00	01:00 - 02:00	00:00 - 01:00
Planned Visit Arrival						85	85	171	171	171	171	171	171	171	171	171	171							
Planned Visit Departure					85	85	171	171	171	171	171	171	171	171	171	171								
Unplanned Visit Arrival	15	15	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	15	15	15	15	15
Unplanned Visit Departure	15	15	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	15	15	15	15	15
TOTAL IN	15	15	31	31	31	116	116	202	202	202	202	202	202	202	202	202	202	31	15	15	15	15	15	15
TOTAL OUT	15	15	31	31	116	116	202	202	202	202	202	202	202	202	202	202	31	15	15	15	15	15	15	15
TOTAL 2-WAY	30	30	62	62	147	232	318	404	404	404	404	404	404	404	404	404	233	62	30	30	30	30	30	30

Green – Proportion of Arrivals to NCD, Blue – Proportion of Departures from NCD



**Appendix C:  
Conceptual Vehicle Circulation Diagrams for NCD**

### 1.3.6.2 Staff Circulation

Figure 60 illustrates that vehicular staff access and circulation is planned from Prince of Wales Drive to Level P1, or from Road B to Level P2, including the opportunity for staff to enter and exit the garage at Road B via Carling Avenue. Garage access from Road A is reserved for public, patients and visitors as a way to give precedent and to manage congestion into and out of the Parking Garage on Road A.

Likewise, staff will utilize Road E from Prince of Wales Drive to access parking lots south and east of the Hospital.

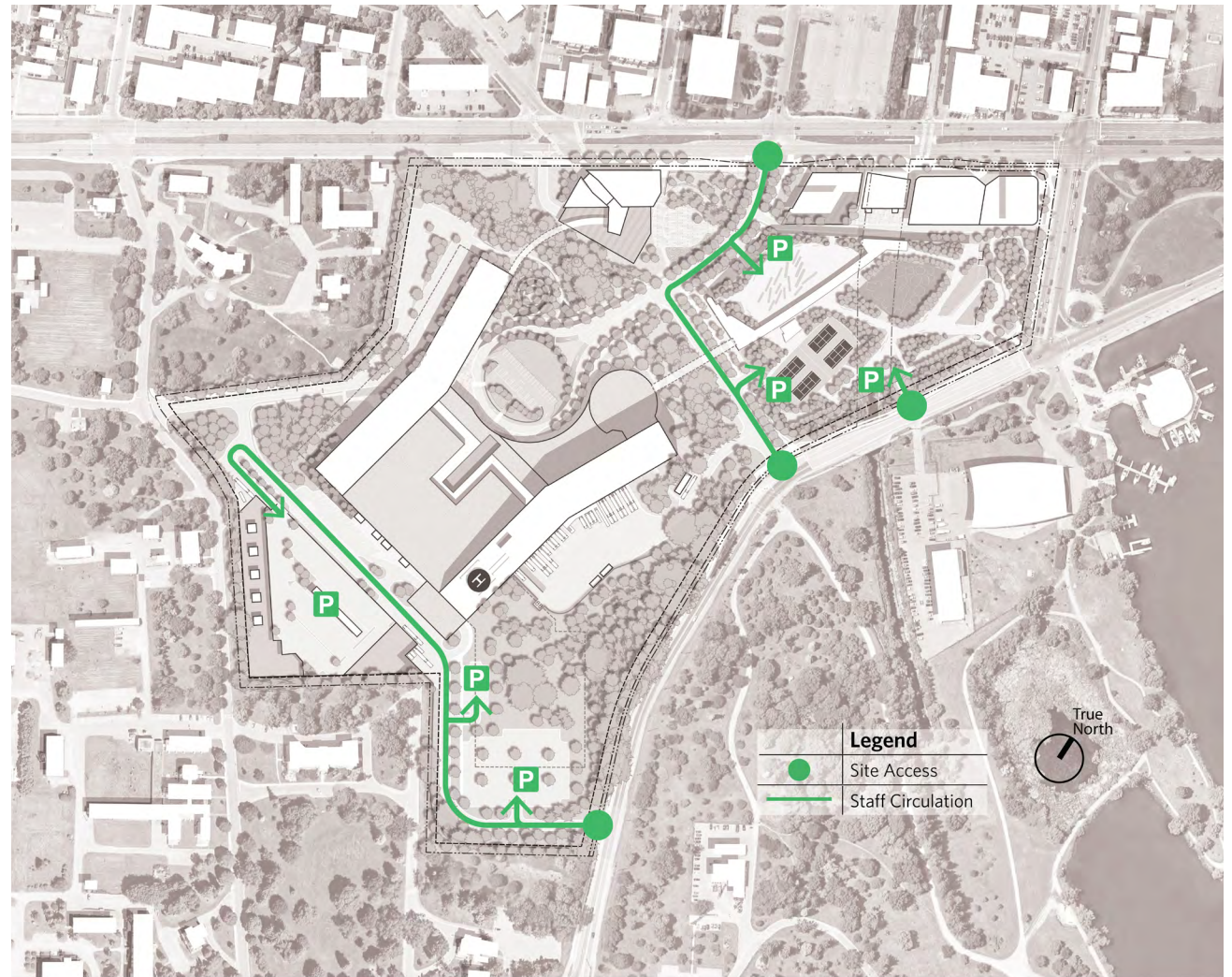


Figure 60: Hospital - Staff Vehicular Garage Access Circulation

### 1.3.6.3 Public Vehicular Access

Figure 61 illustrates public, front of house, vehicular access to the hospital from the north and east; from Carling Avenue and Prince of Wales Drive respectively. Public parking is provided at the main entrance to the Hospital on level 1 and on the lower level E for the emergency walk-in entrance. Primary public parking however will be provided for at the parking garage, accessible from Roads A and B and Prince of Wales Drive.

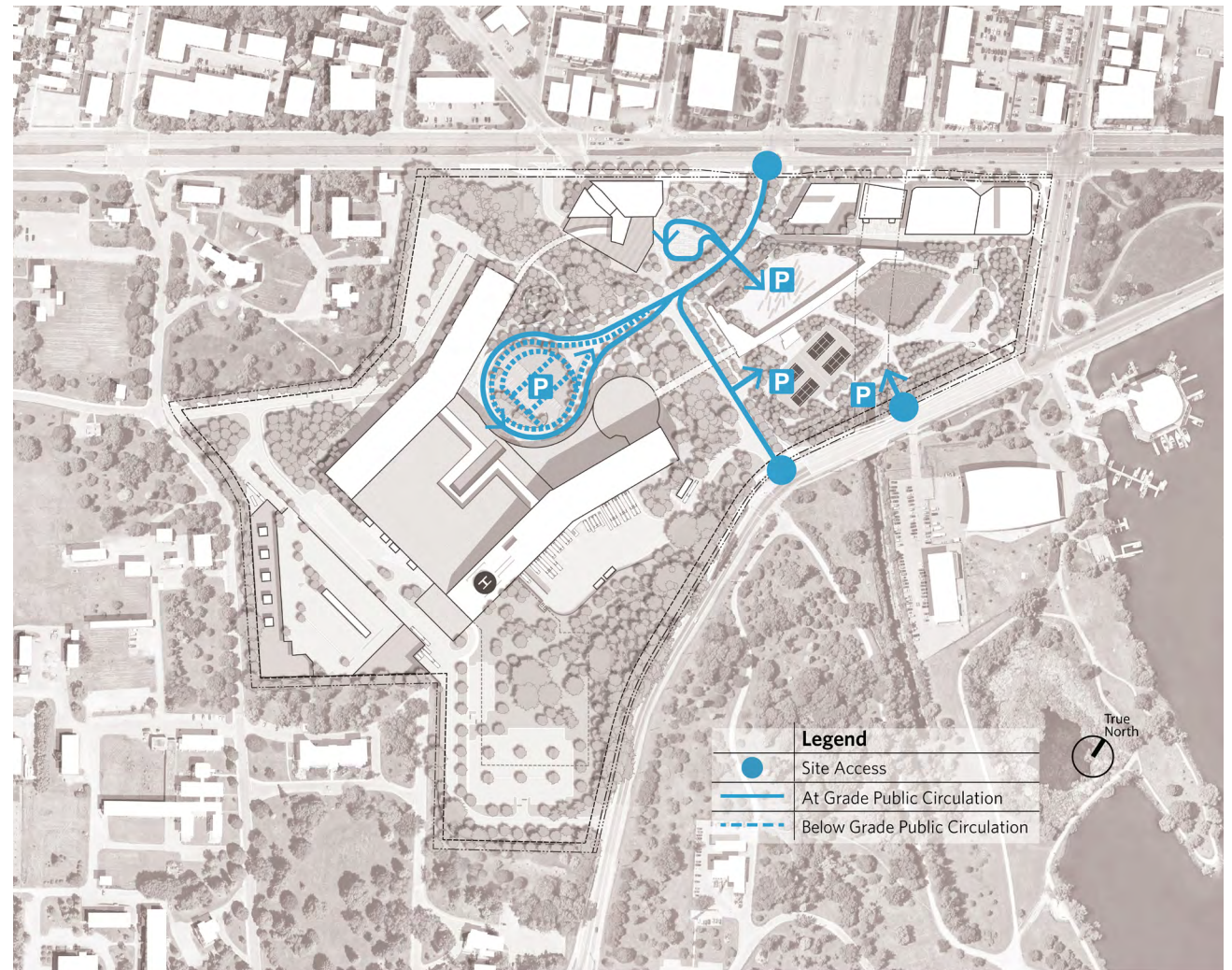


Figure 61: Hospital - Public Vehicular Circulation

### 1.3.6.4 Bicycle Circulation

Figure 62 illustrates bicycle circulation to and through the NCD, which plans for localized bike traffic from the Intersection of Roads A and B, with either a multi-use path or bi-directional cycle track along the south side of Road A to the main entrance of the Hospital on level 1.

Consistent with the Master Site Plan, a multi-use path is being provided along the north side of Road D, connecting Maple Drive to the west hospital entrance.

Bicycle parking is planned at each of the public entrances to the Hospital at level 1 main entry plaza and at the west entry on level E.

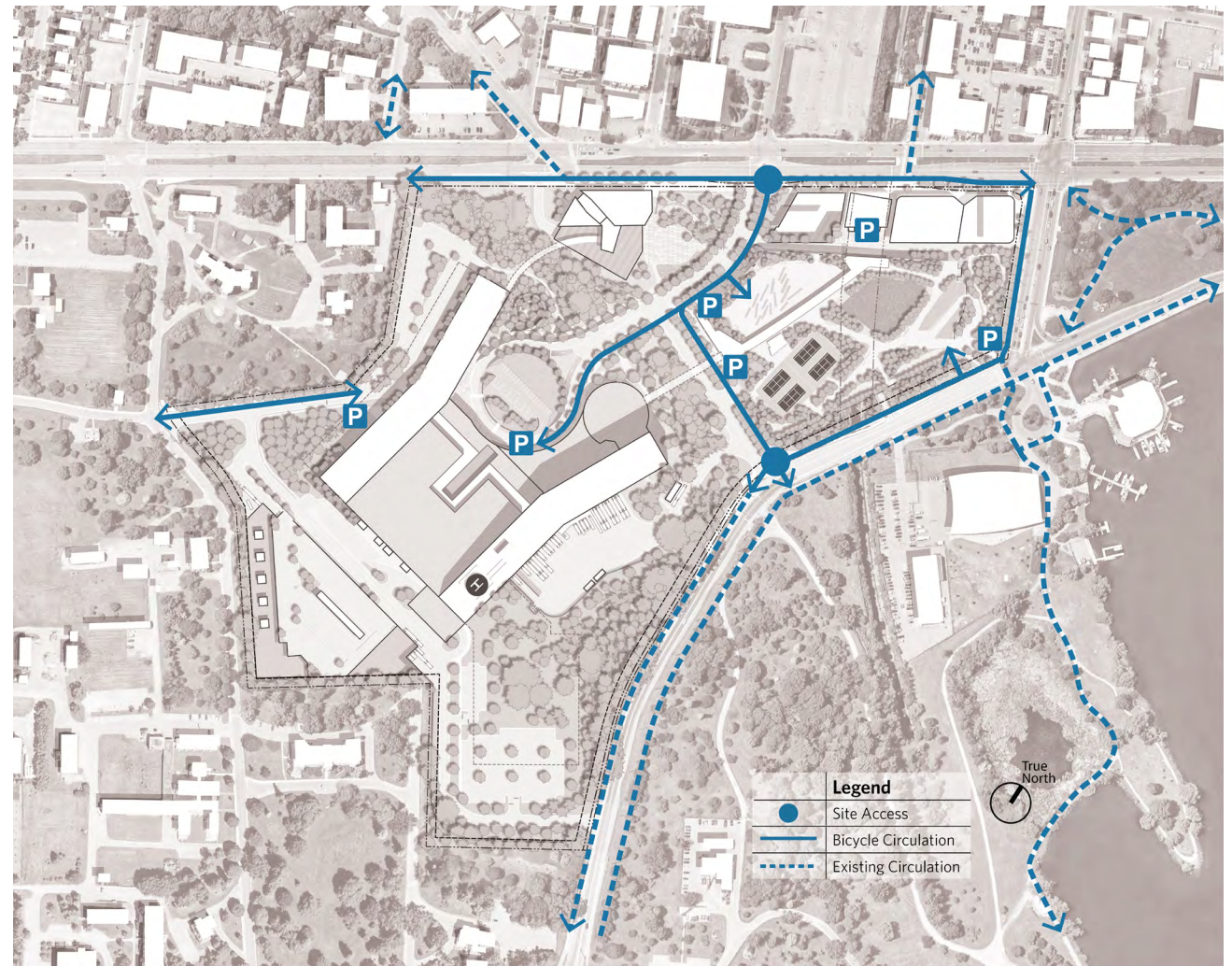


Figure 62: Hospital - Bicycle Circulation

### 1.3.6.5 Emergency Services Circulation

Figure 63 illustrates ambulance access routes, for which the destination is emergency services on the south side of the Hospital. Primary access for ambulances is shown from Carling Avenue and Maple Drive with secondary, access from Prince of Wales Drive.

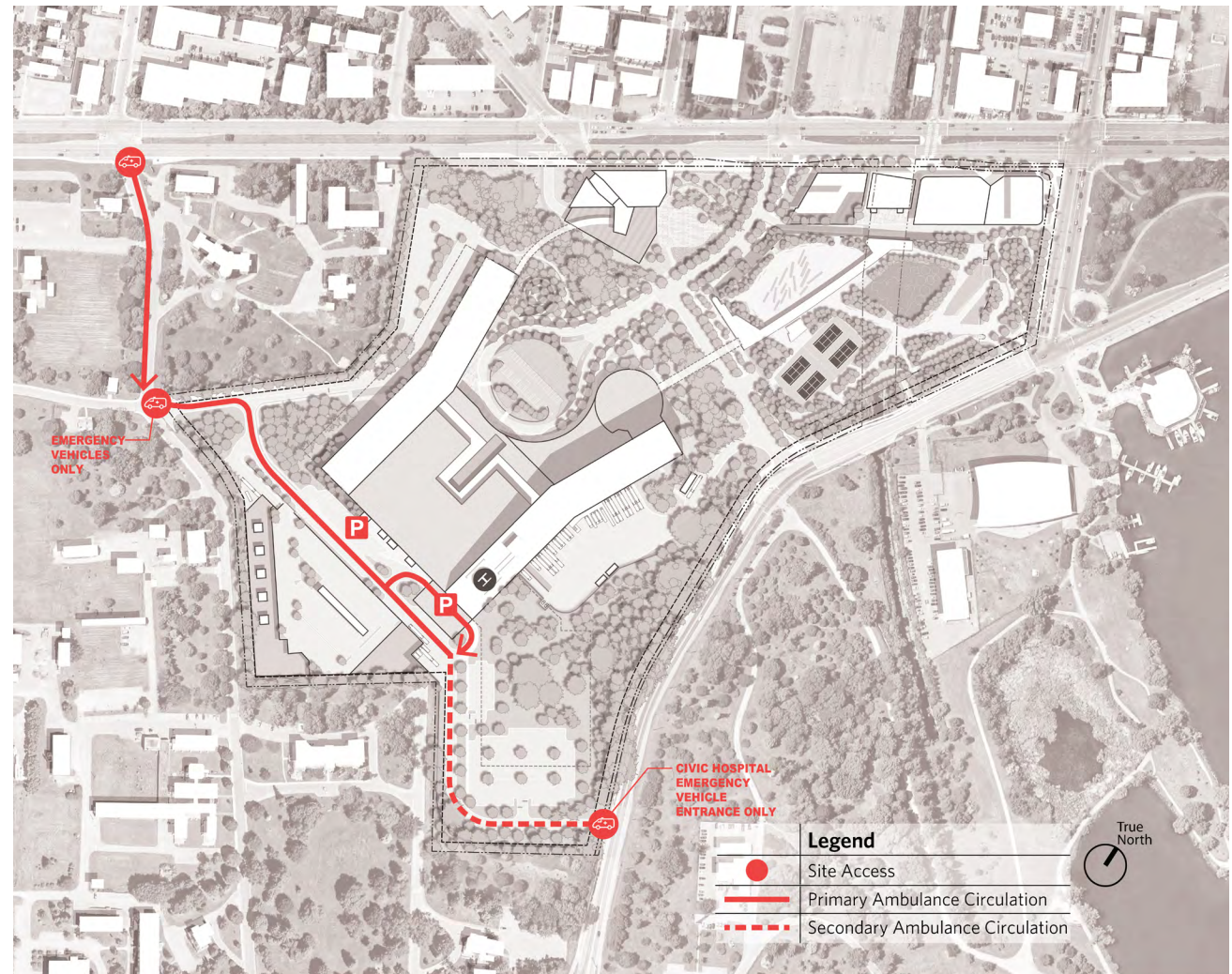


Figure 63: Hospital - Emergency Services Circulation

### 1.3.6.6 Service Access

Loading docks are the lifeline of the Hospital and service and delivery trucks need to access the lowest level of the hospital to move materials efficiently to and through the Hospital. For this reason, the docks are on Level B, with access to the formal City trucking route: Prince of Wales Drive.

The CUP will receive FedEx truck-style delivery and garbage pick-up vehicles, daily and weekly. It will also receive diesel fuel trucks approximately once per month to replace fuel used for emergency generator tests. These vehicled trips are intended to come from Prince of Wales Drive.

Once every five years large, semi-trucks are expected to need access to the CUP to replace equipment. Refer to Figure 64.

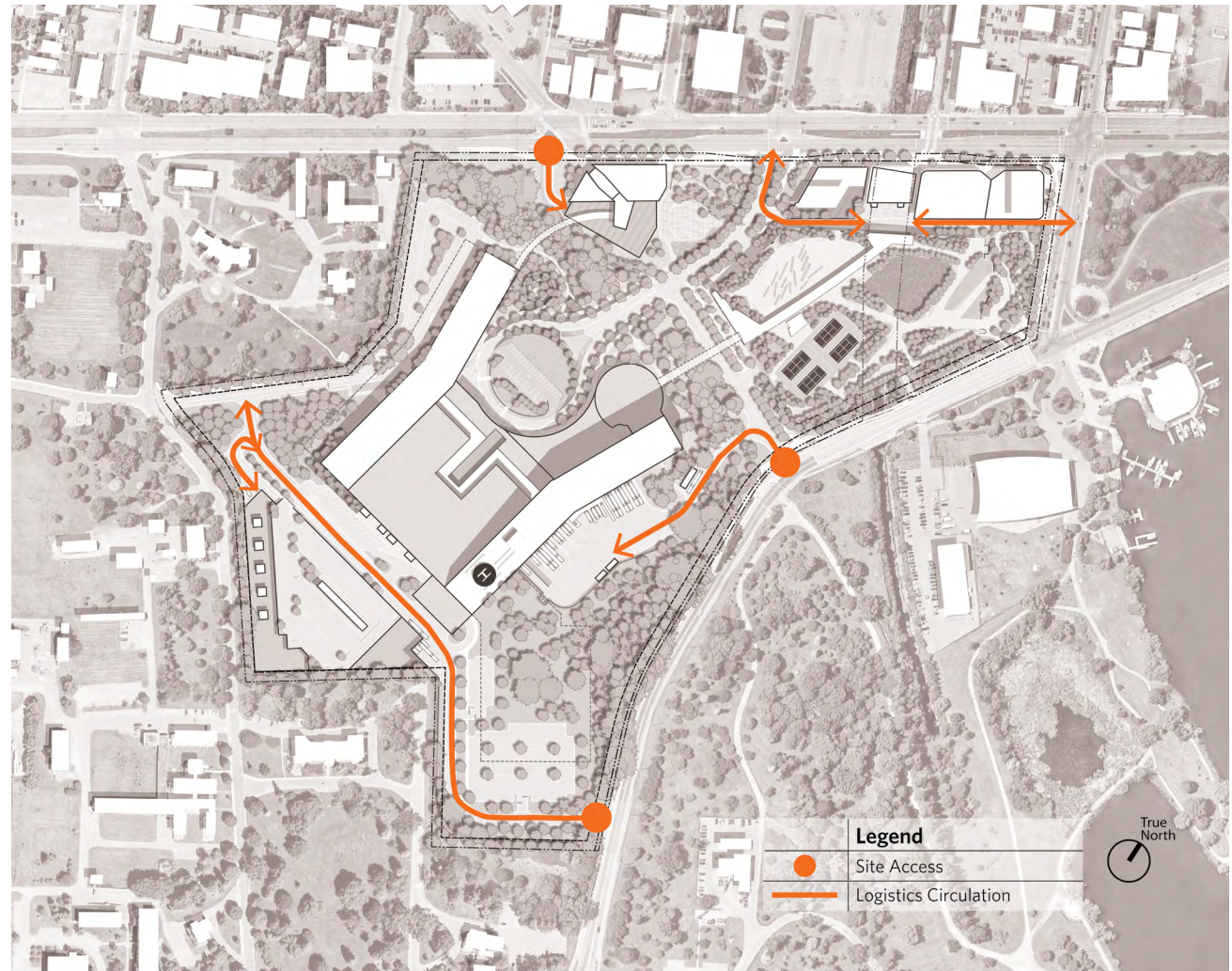


Figure 64: Hospital - Emergency Services Circulation

**Appendix D:  
24-Hour Estimated Hourly Trip Generation – Trips by Mode Share**

Table 14: Trips Generated by NCD by Mode Shares - 2028

Mode Share	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	06:00 - 07:00	07:00 - 08:00	08:00 - 09:00	09:00 - 10:00	10:00 - 11:00	11:00 - 12:00	12:00 - 13:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 24:00
Auto Driver IN Staff	0	0	0	0	0	64	584	522	179	64	32	26	0	0	224	75	75	0	120	40	0	0	86	29
Auto Driver OUT Staff	75	75	0	0	0	0	0	206	69	0	0	0	26	54	120	314	268	174	100	350	115	0	0	224
Passenger Staff	19	19	0	0	0	13	135	169	55	13	6	5	5	11	81	82	73	35	56	100	30	0	22	64
Transit Staff	4	4	0	0	0	72	560	630	228	72	36	29	29	60	147	358	305	196	184	322	96	0	5	14
Walk Staff	1	1	0	0	0	6	51	59	20	6	3	3	3	5	15	32	28	17	18	30	9	0	1	3
Bike Staff	1	1	0	0	0	5	37	42	14	5	2	2	2	4	12	25	21	13	12	21	6	0	1	3
Two-Way Total Staff	100	100	0	0	0	160	1367	1628	565	160	79	65	65	134	599	886	770	435	490	863	256	0	115	337
Auto Driver IN Patient	7	7	7	7	7	7	15	77	77	77	77	77	77	77	77	77	15	15	15	15	15	15	7	7
Auto Driver OUT Pat.	7	7	7	7	7	7	15	15	77	77	77	77	77	77	77	77	77	15	15	15	15	15	7	7
Passenger Patient	4	4	4	4	4	4	8	31	54	54	54	54	54	54	54	54	31	8	8	8	8	8	4	4
Transit Patient	0	0	0	0	0	0	0	15	30	30	30	30	30	30	30	30	15	0	0	0	0	0	0	0
Walk Patient	0	0	0	0	0	0	0	2	4	4	4	4	4	4	4	4	2	0	0	0	0	0	0	0
Bike Patient	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	0	0	0	0	0	0	0
Two-Way Total Pat.	18	18	18	18	18	18	38	141	244	244	244	244	244	244	244	244	141	38	38	38	38	38	18	18
Auto Driver IN TOTAL	7	7	7	7	7	71	599	599	256	141	109	103	77	77	301	152	90	15	135	55	15	15	93	36
Auto Driver OUT TOTAL	82	82	7	7	7	7	15	221	146	77	77	77	103	131	197	391	345	189	115	365	130	15	7	231
Passenger TOTAL	23	23	4	4	4	17	143	200	109	67	60	59	59	65	135	136	104	43	64	108	38	8	26	68
Transit TOTAL	4	4	0	0	0	72	560	645	258	102	66	59	59	90	177	388	320	196	184	322	96	0	5	14
Walk TOTAL	1	1	0	0	0	6	51	61	24	10	7	7	7	9	19	36	30	17	18	30	9	0	1	3
Bike TOTAL	1	1	0	0	0	5	37	43	16	7	4	4	4	6	14	27	22	13	12	21	6	0	1	3
Transport <sub>1</sub>								24								24	24							
TOTAL IN	9	9	9	9	9	169	1,386	1,408	570	282	201	187	122	122	421	234	131	19	258	98	19	19	124	47



TOTAL OUT	109	109	9	9	9	9	19	385	239	122	122	122	187	256	422	920	804	454	270	803	275	19	9	308
TOTAL 2-WAY	118	118	18	18	18	178	1,405	1,793	809	404	323	309	309	378	843	1,154	935	473	528	901	294	38	133	355
1. Transports will occur at all hours in the day, but this table only shows transports for the hours that will be analyzed.																								

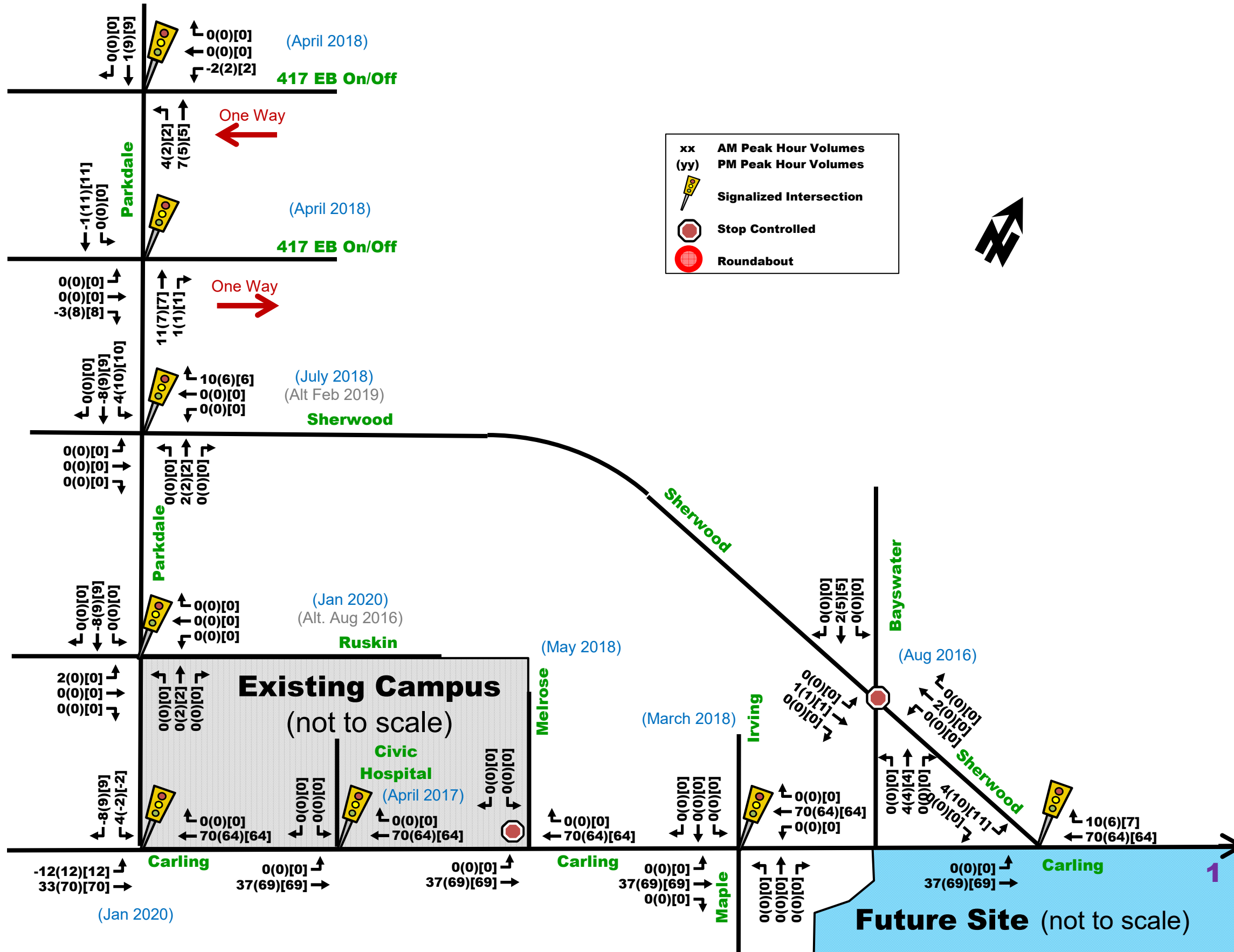
Table 15: Trips Generated by NCD by Mode Shares - 2048

Mode Share	23:00 - 24:00	22:00 - 23:00	21:00 - 22:00	20:00 - 21:00	19:00 - 20:00	18:00 - 19:00	17:00 - 18:00	16:00 - 17:00	15:00 - 16:00	14:00 - 15:00	13:00 - 14:00	12:00 - 13:00	11:00 - 12:00	10:00 - 11:00	09:00 - 10:00	08:00 - 09:00	07:00 - 08:00	06:00 - 07:00	05:00 - 06:00	04:00 - 05:00	03:00 - 04:00	02:00 - 03:00	01:00 - 02:00	00:00 - 01:00
Auto Driver IN Staff	43	126	0	0	49	148	0	110	165	275	0	0	21	26	52	292	668	916	52	0	0	0	0	0
Auto Driver OUT Staff	275	0	0	118	360	81	288	437	622	98	43	21	0	0	0	92	274	0	0	0	0	0	110	165
Passenger Staff	73	29	0	39	132	74	92	164	237	94	14	7	7	8	17	119	291	295	17	0	0	0	25	38
Transit Staff	45	18	0	174	582	333	655	1,011	1,438	261	99	47	47	59	118	720	1,592	1,798	118	0	0	0	16	23
Walk Staff	14	5	0	19	65	38	69	110	155	35	10	5	5	6	12	78	175	192	12	0	0	0	5	7
Bike Staff	5	1	0	11	35	20	46	71	101	20	7	3	3	4	8	49	107	121	8	0	0	0	1	2
Two-Way Total Staff	455	179	0	361	1,223	694	1,150	1,903	2,718	783	173	83	83	103	207	1,350	3,107	3,322	207	0	0	0	157	235
Auto Driver IN Patient	12	12	25	25	25	25	25	25	102	102	102	102	102	102	102	102	102	25	12	6	6	6	12	12
Auto Driver OUT Pat.	12	12	25	25	25	25	25	102	102	102	102	102	102	102	102	102	25	25	12	6	6	6	12	12
Passenger Patient	6	6	12	12	12	12	12	55	98	98	98	98	98	98	98	98	55	43	0	0	0	6	6	6
Transit Patient	0	0	0	0	0	0	0	43	86	86	86	86	86	86	86	86	43	0	0	0	0	0	0	0
Walk Patient	0	0	0	0	0	0	0	7	14	14	14	14	14	14	14	14	7	0	0	0	0	0	0	0
Bike Patient	0	0	0	0	0	0	0	2	4	4	4	4	4	4	4	4	2	0	0	0	0	0	0	0
Two-Way Total Pat.	30	30	62	62	62	62	62	234	406	406	406	406	406	406	406	406	234	62	30	30	30	30	30	30
Auto Driver IN LSP <sub>1</sub>								30									48							
Auto Driver OUT LSP <sub>1</sub>								52									23							
Passenger LSP <sub>1</sub>								27									25							
Transit LSP <sub>1</sub>								163									151							
Walk LSP <sub>1</sub>								52									22							
Bike LSP <sub>1</sub>								52									22							
Two-Way Total LSP <sub>1</sub>								376									290							
Auto Driver IN TOTAL	55	138	25	25	74	173	25	165	267	377	102	102	123	128	154	394	818	941	64	12	12	12	12	12
Auto Driver OUT TOTAL	287	12	25	143	385	106	313	591	724	200	145	123	102	102	102	194	322	25	12	12	12	12	122	177

79	45	14	5		77	408	485
35	18	5	1		194	15	209
12	0	0	0		31	31	62
51	174	19	11		31	392	423
144	582	65	35		153	1,132	1,285
86	333	38	20		400	356	756
104	655	69	46		31	1,181	1,212
246	1,217	169	125	48	355	2,205	2,560
335	1,524	169	105	48	462	2,710	3,172
192	347	49	24		596	593	1,189
112	185	24	11		203	376	579
105	133	19	7		203	286	489
105	133	19	7		286	203	489
106	145	20	8		306	203	509
115	204	26	12		410	203	613
217	806	92	53		1,369	387	1,756
371	1,786	204	131	48	2,980	700	3,680
307	1,798	192	121		3,353	31	3,384
23	118	12	8		222	15	237
6	0	0	0		15	15	30
6	0	0	0		15	15	30
6	0	0	0		15	15	30
31	16	5	1		15	172	187
44	23	7	2		15	250	265
Passenger TOTAL	Transit TOTAL	Walk TOTAL	Bike TOTAL	Transport <sub>1</sub>	TOTAL IN	TOTAL OUT	TOTAL 2-WAY

1. Transports will occur at all hours in the day, but this table only shows transports for the hours that will be analyzed. The Life Science Park trips may occur within other regular work hours, but the majority will be concentrated within the 3 horizon hours being analyzed.

**Appendix E:  
Combined Other Area Development Background Volumes**

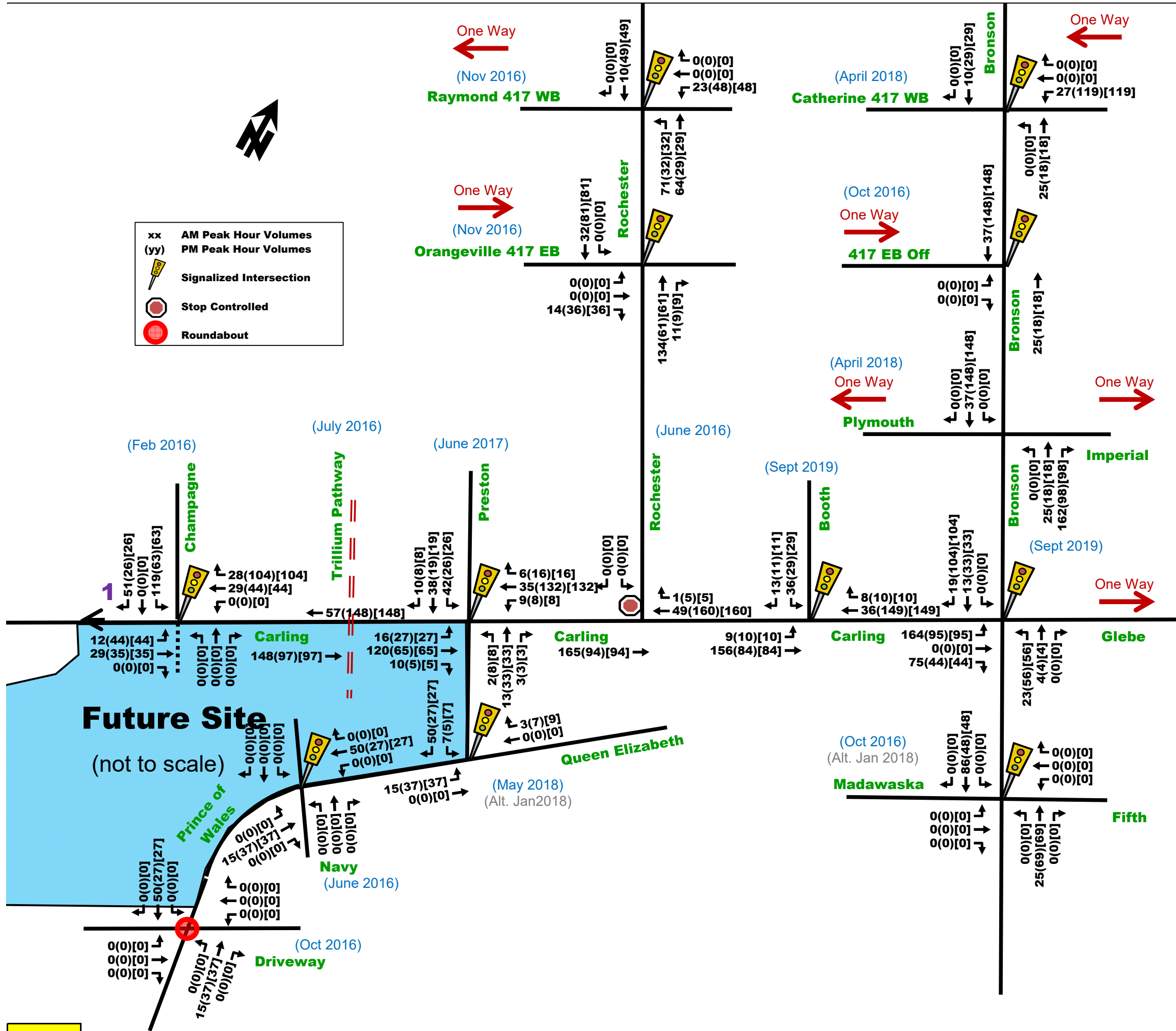


xx AM Peak Hour Volumes  
 (yy) PM Peak Hour Volumes

Signalized Intersection

Stop Controlled

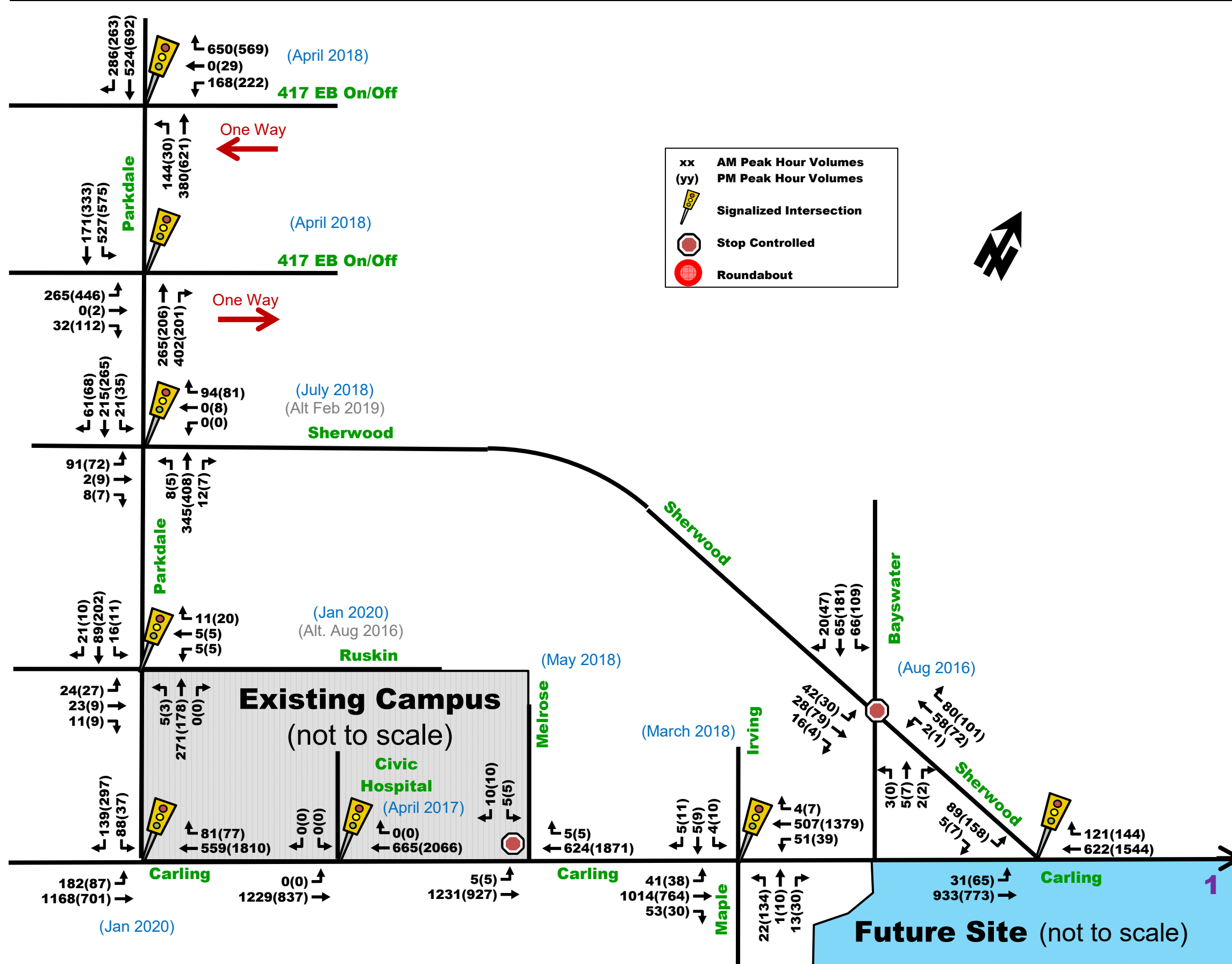
Roundabout

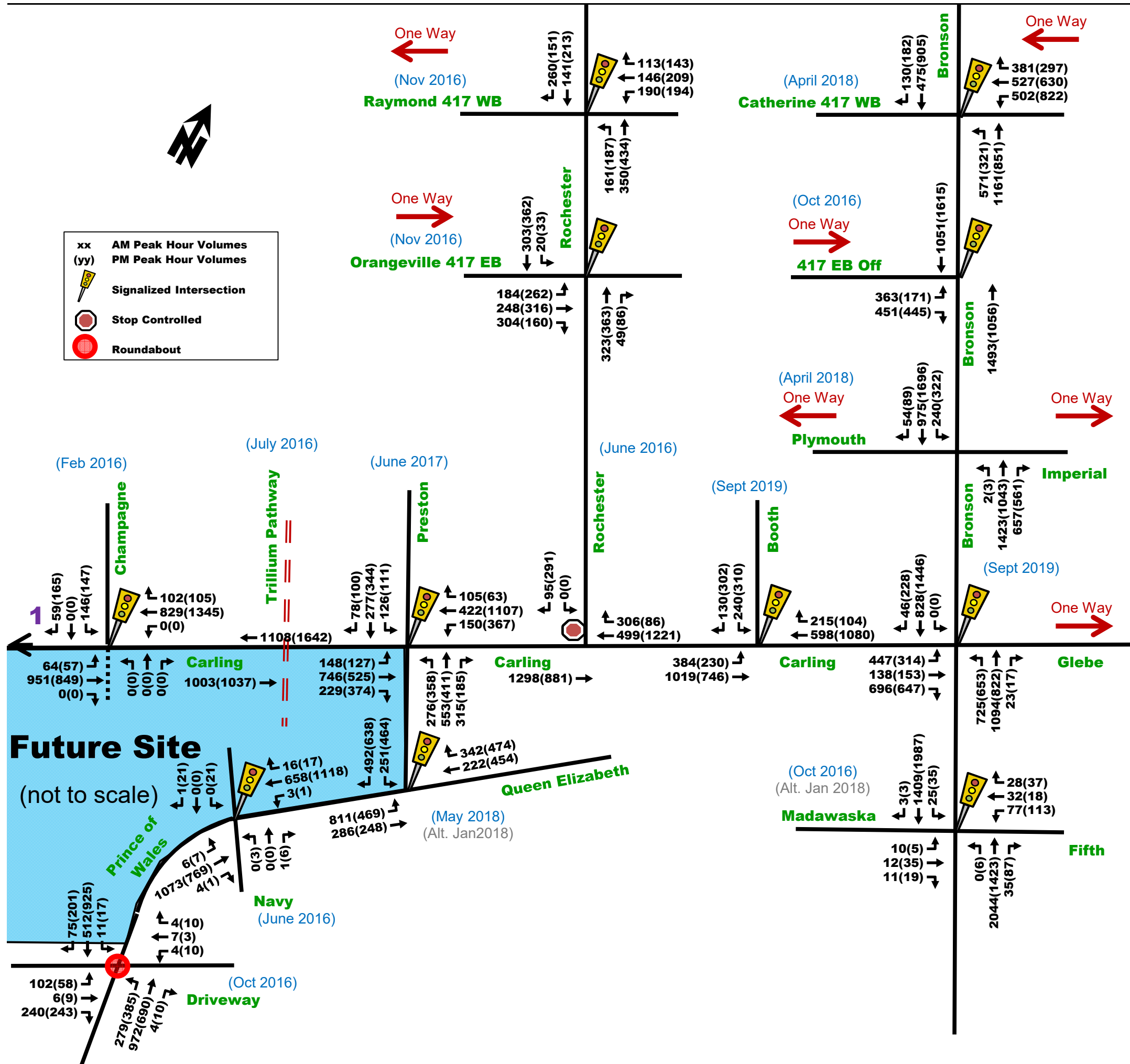


**Appendix F:  
Future Projected Background Volumes**

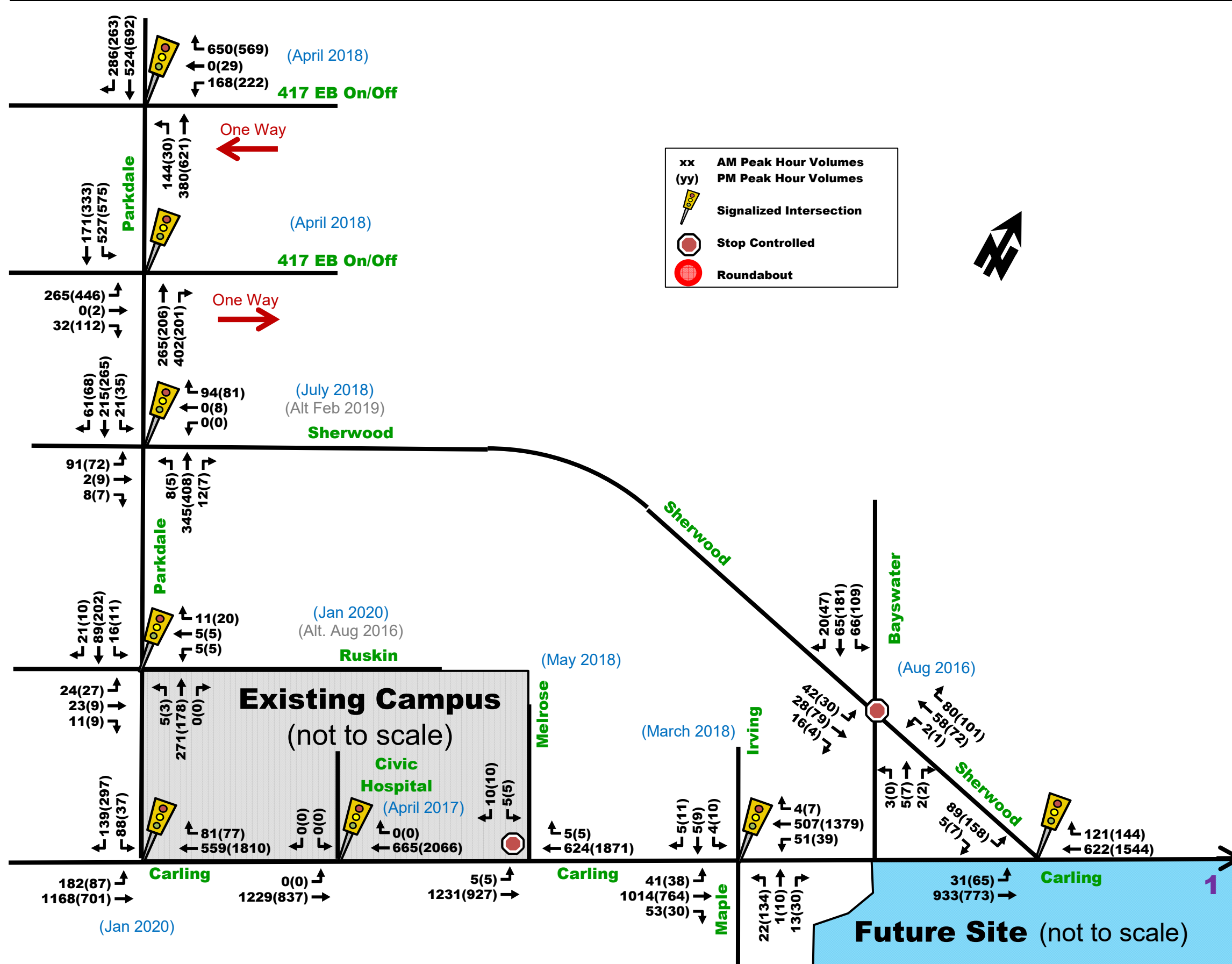
## 2028 Background Volumes

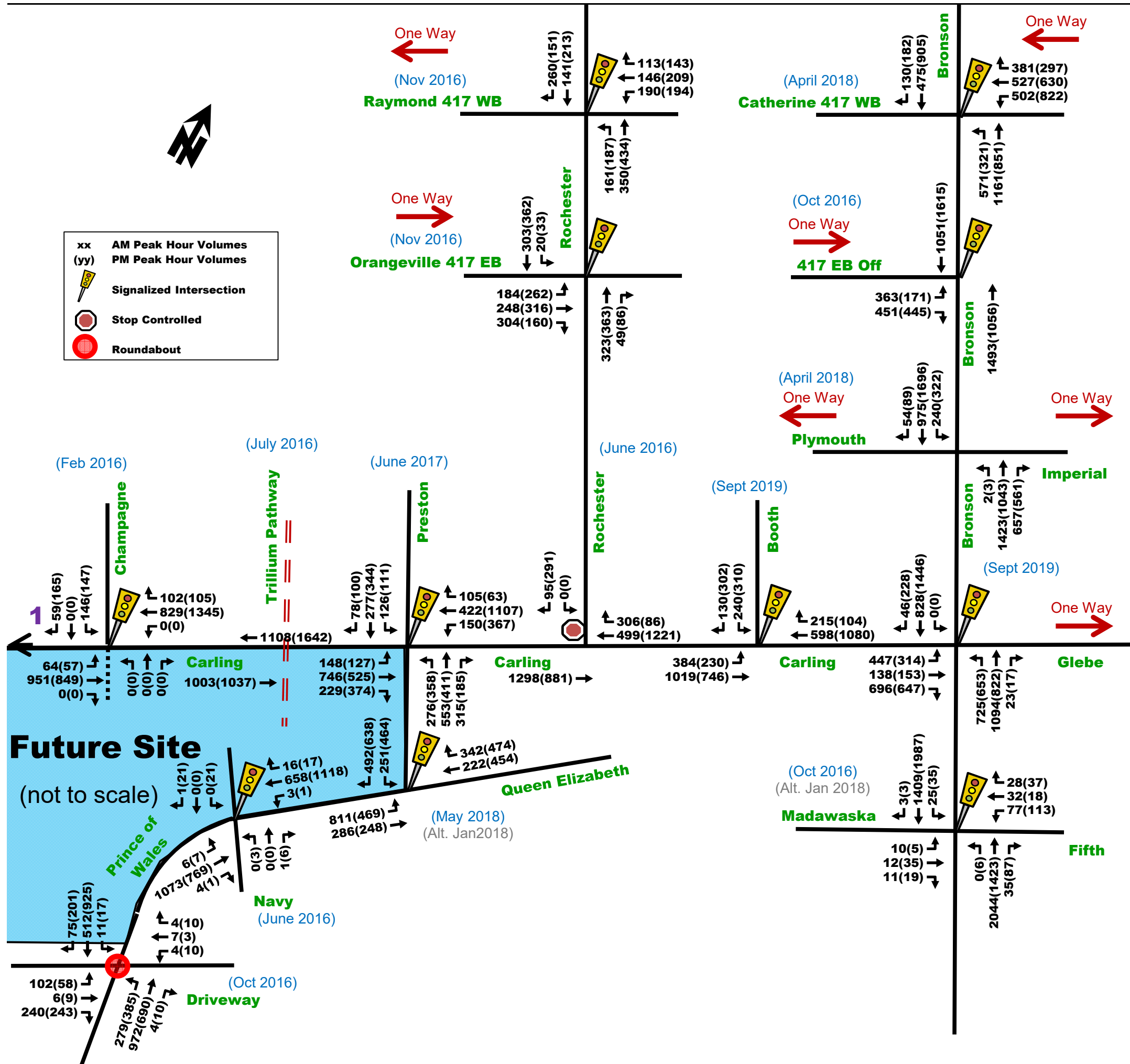




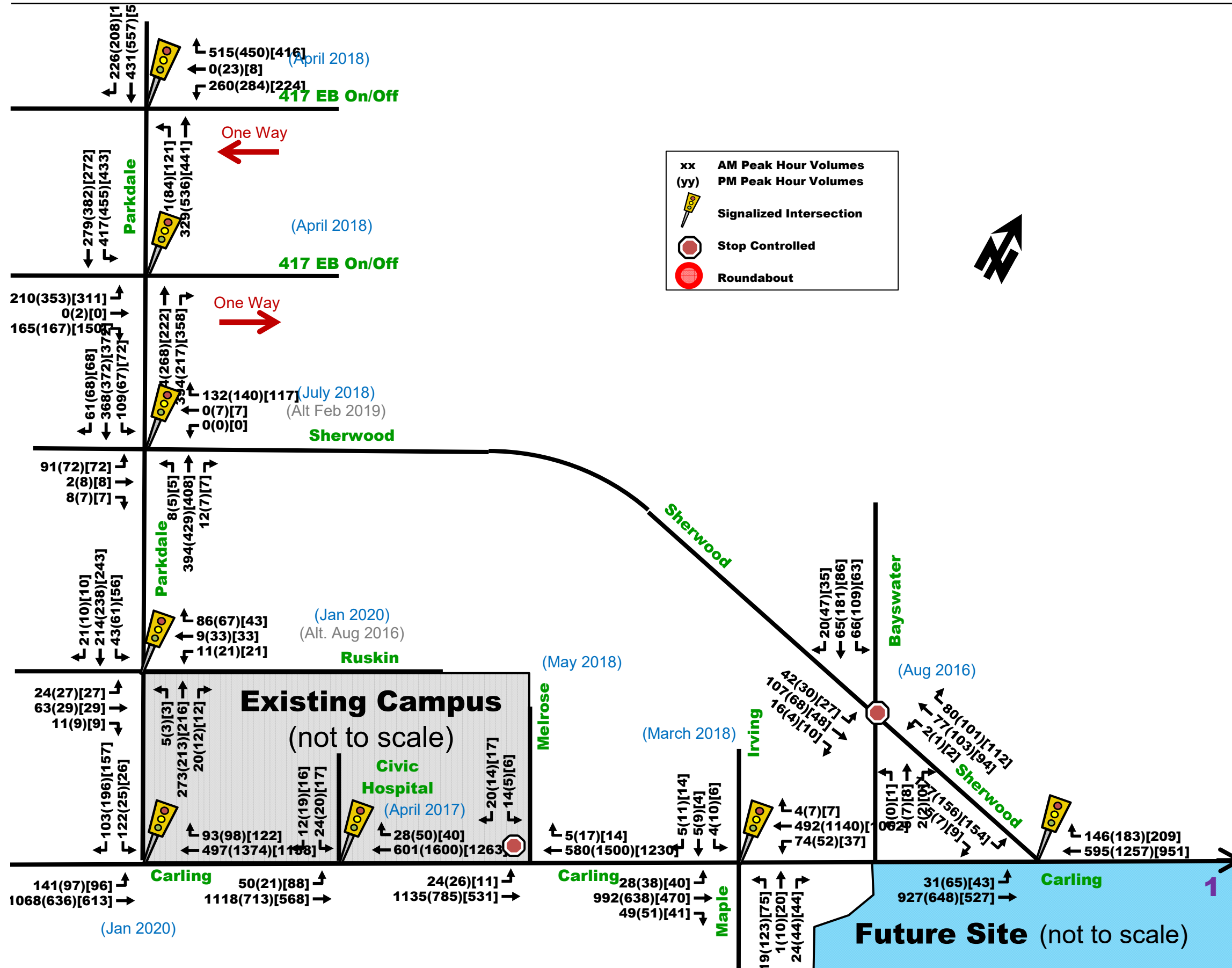


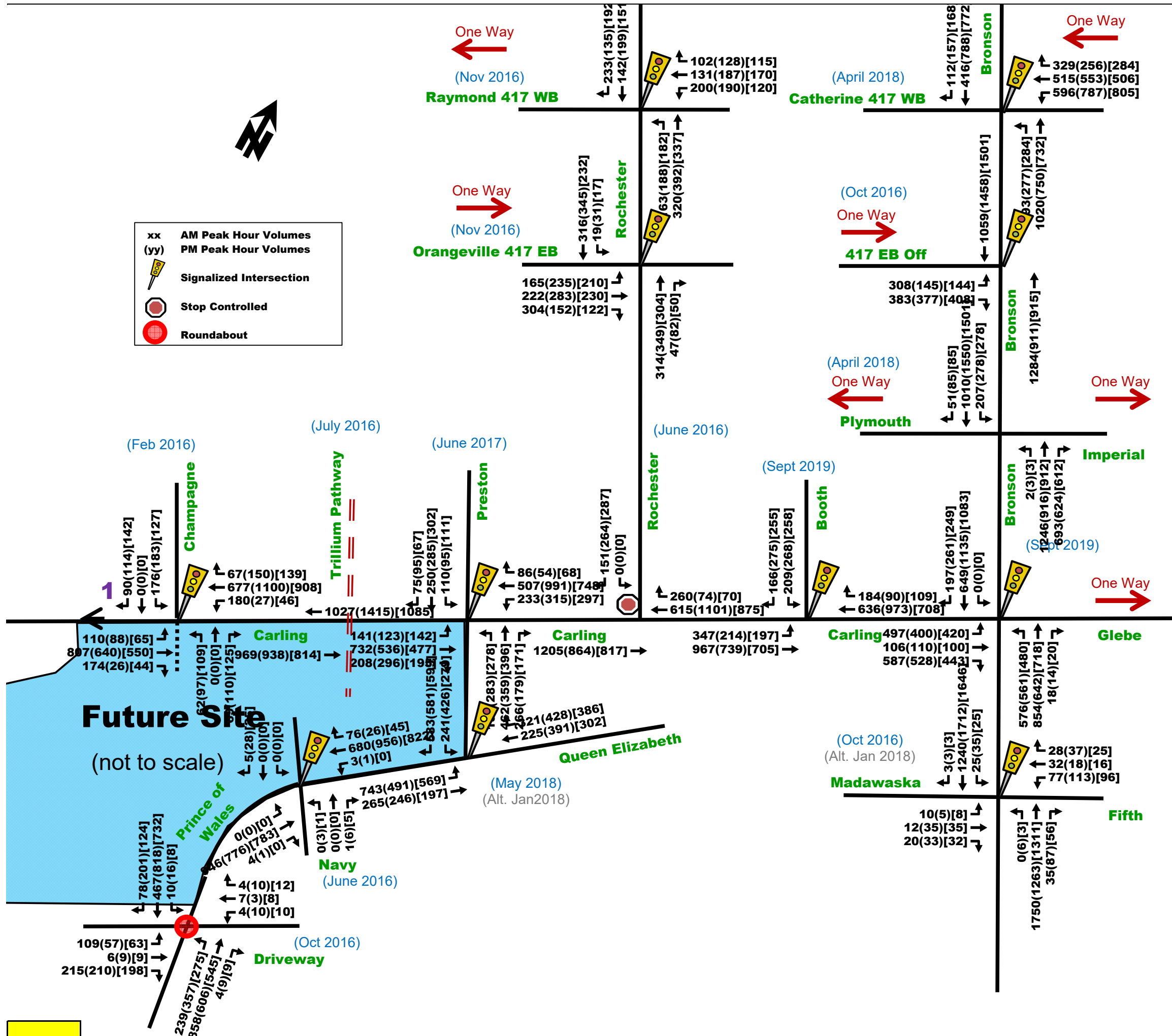
2048 Background Volumes



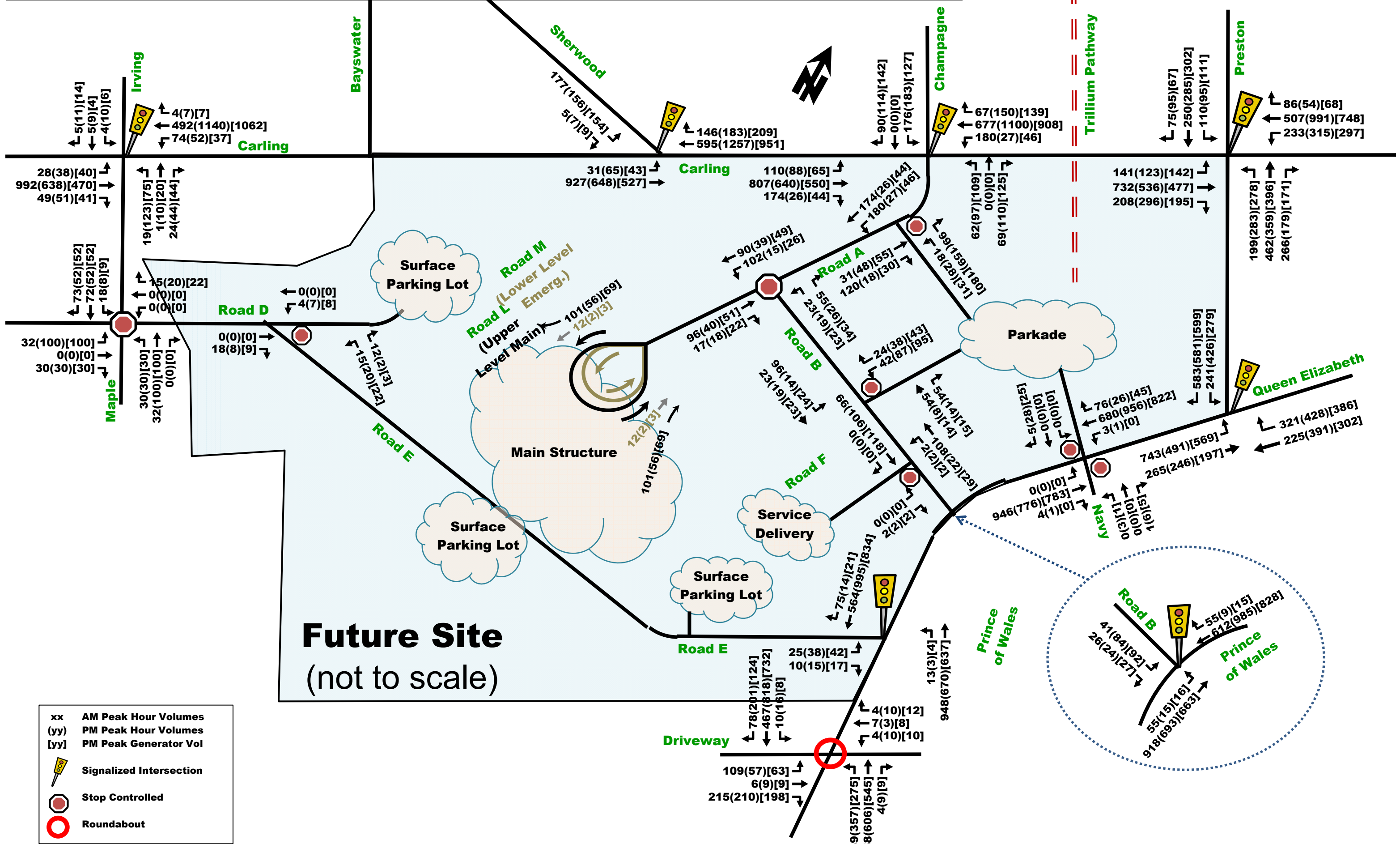


## 2028 Forecasted Volumes with NCD



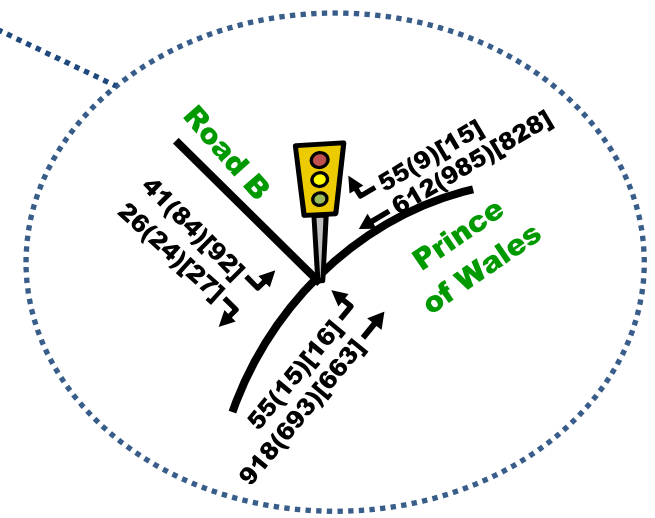




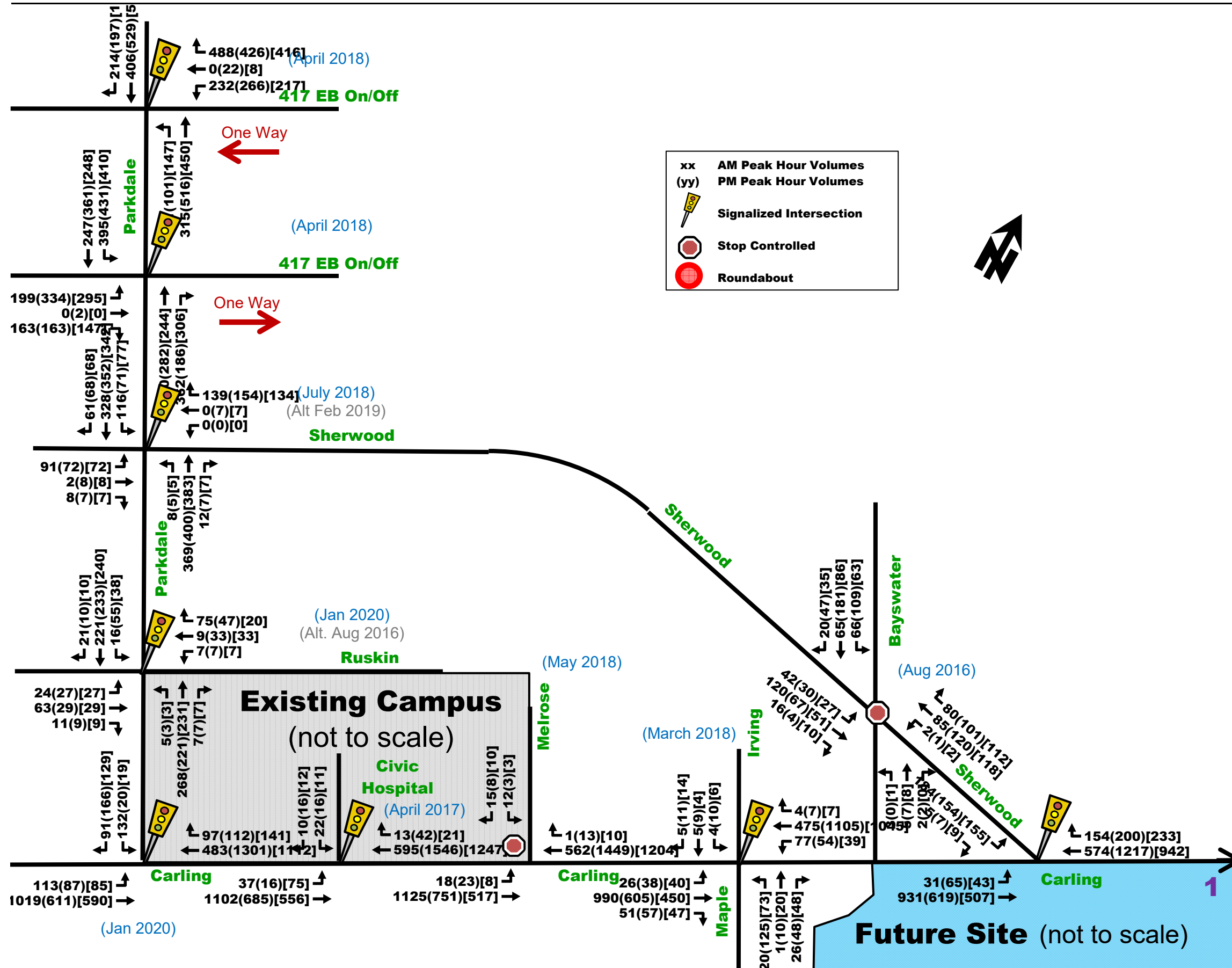


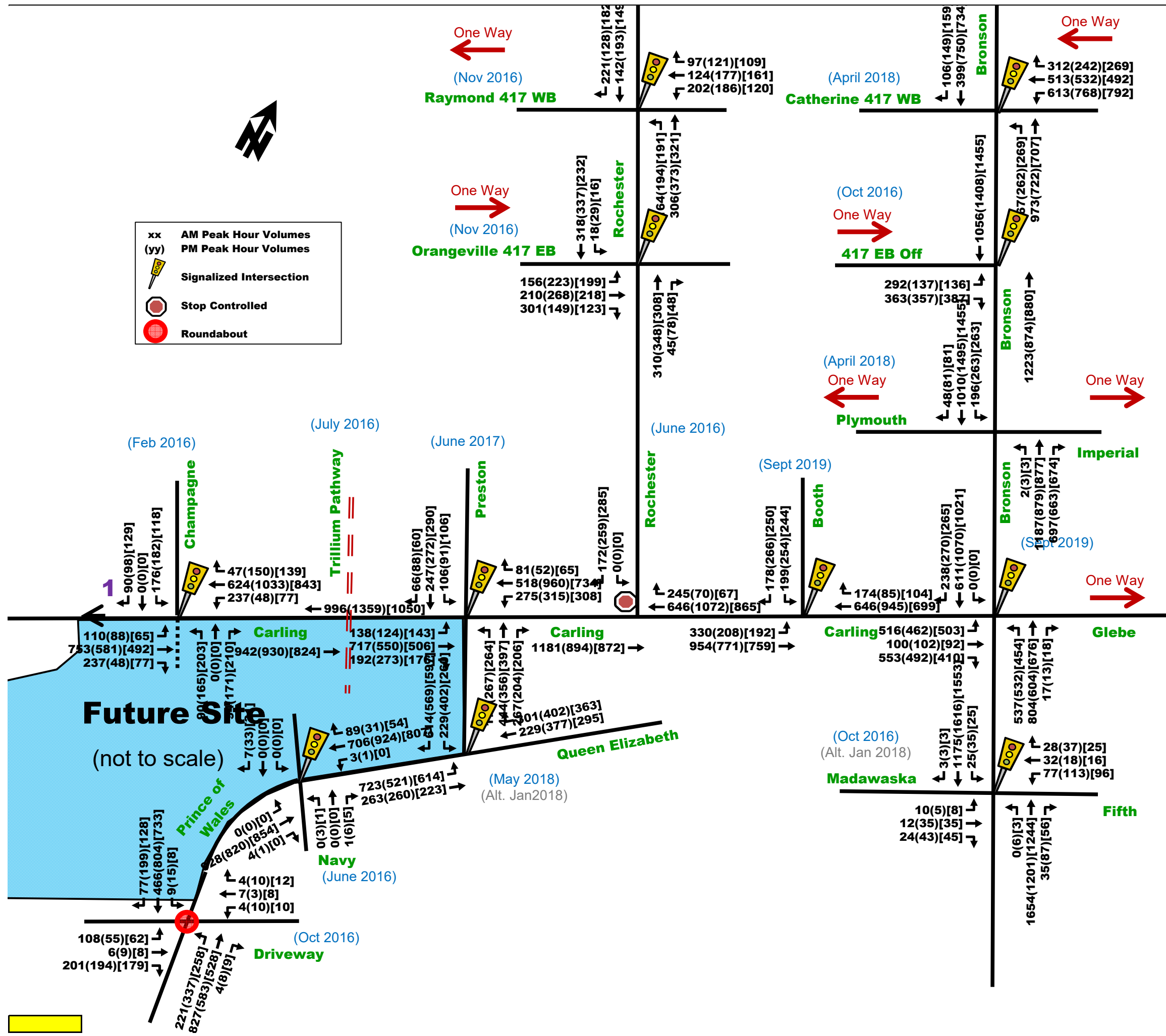
xx AM Peak Hour Volumes  
 yy PM Peak Hour Volumes  
 [yy] PM Peak Generator Vol  
 Signalized Intersection  
 Stop Controlled  
 Roundabout

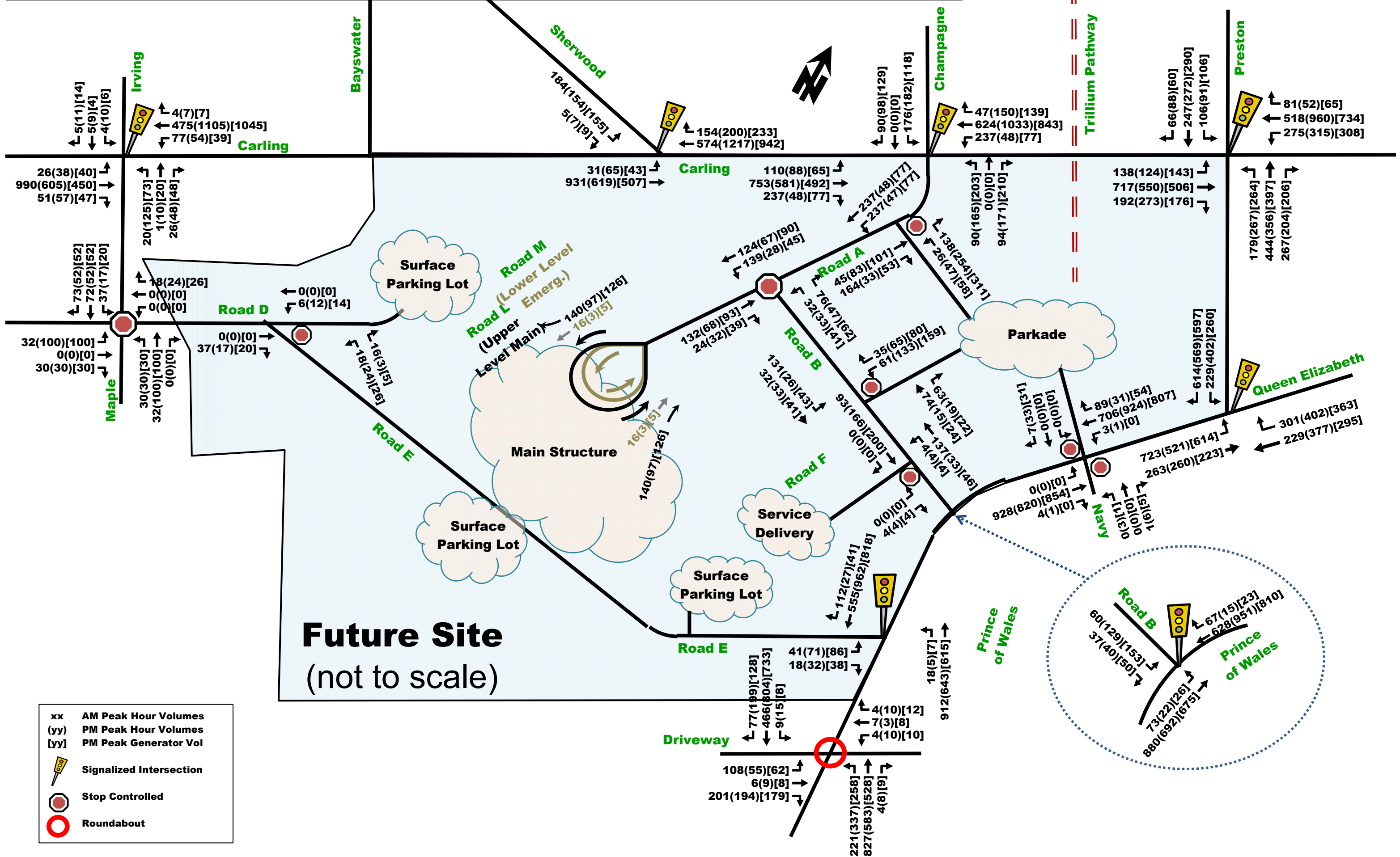
**Future Site**  
(not to scale)



## 2048 Forecasted Volumes with NCD

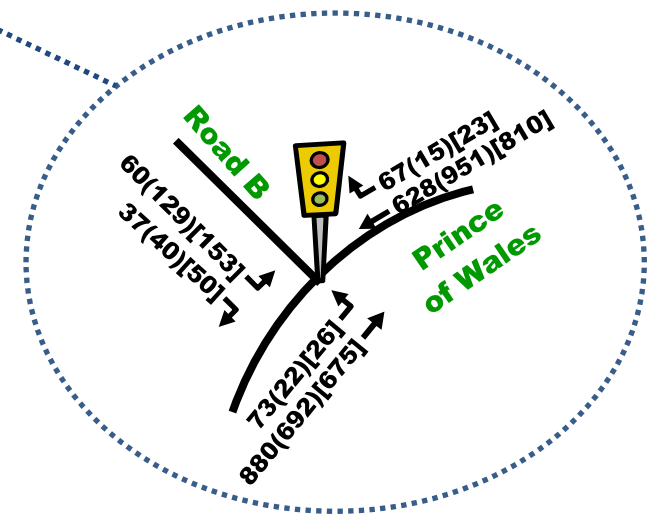






**xx** AM Peak Hour Volumes  
**(yy)** PM Peak Hour Volumes  
**[yy]** PM Peak Generator Vol  
 Signalized Intersection  
 Stop Controlled  
 Roundabout

**Future Site**  
(not to scale)



**Appendix G:  
Active Transportation Facility Proposed Widths**

Active Transportation Facilities Proposed Adjacent and Internal to the NCD Site

Roadway	Side	Sidewalk Facility	Cycling Facility	Multi-Use Pathway (MUP)
Road A	North	2 m	-	-
Road A	South	2 m	3 m	-
Carling to Road A	South	-	-	3 m
Road B	East	2 m	3 m	-
Carling near Preston	South	2 m	3 m	-
Preston	West	3 m	3.5 m	-
Prince of Wales	North	2 m	1.8 m (unidirectional)	-
Prince of Wales	South	2 m	1.8 m (unidirectional)	-
Road D	North	-	-	3 m
Road D	South	2 m	-	-
Road E	North	-	-	3 m
Other Internals	-	3 m north and south sides of Road A from Road A/B to main entrance	3.5 m on south side of Road A from Road A/B to main entrance	-

**Appendix H:  
Road Modification Application (RMA) Designs**



**CITY OF OTTAWA**  
**ROAD MODIFICATION**  
**APPROVAL UNDER DELEGATED AUTHORITY**

**DATE: July 12, 2022**

**RMA-2022-TPC-030**

**RECOMMENDATIONS**

- Staff recommend road works at the intersection of Carling Avenue, Champagne Ave South, and the new Road A to install an upgraded 3.0m asphalt pathway, a 75m southbound dedicated left-turn lane along Carling Avenue for southbound traffic onto the future Road A, a right-turn lane on the south side of Carling Ave for southbound traffic onto Road A, re-organization of the geometry of the concrete median on Carling Avenue; as well as new concrete sidewalks and TWSIs at the entrance to Road A, as described in this report.

**LOCATION**

- Intersection of Carling Avenue, Champagne Ave South, and the new Road A.
- Ward 15 – Jeff Leiper and Ward 16 – Riley Brockington

**BACKGROUND**

- The proposed site is located at the intersection of Prince of Wales Drive (POW) and Preston Street. These roadway modifications are being recommended to support access to the new Ottawa Hospital – Civic Campus.
- The new Civic Campus is to be constructed by horizon year 2028. Construction will start in 2024.
- Expected opening day capacity is approximately 6,600 (full-time equivalent) staff and approximately 770 patient beds.  
Gross floor area of the new Ottawa Hospital by opening day is projected to be approximately 2.4M ft<sup>2</sup>.

**COMPLIANCE WITH THE STRATEGIC ROAD SAFETY ACTION PLAN**

The recommendations summarized in this report will help achieve the following objectives from the City's 2020 Strategic Road Safety Action Plan.

Reduce collisions involving a pedestrian, cyclist, or a motorcyclist by:

- Improving safety at intersections with high volume of traffic and pedestrian or cyclists.

**MODIFICATION OUTCOMES - BENEFITS AND IMPACTS**

The recommendations summarized in this report will help achieve the following objectives from the City's current Transportation Master Plan:

- Section 4.1 – Build a Continuous, Well Connected Pedestrian Network
- Section 4.2 – Create a Walkable Environment
- Section 4.3 – Improve Pedestrian Safety and Promotion

- Section 5.1 – Build and Maintain a Network of Quality Cycling Facilities
- Section 5.3 – Improve Cycling Safety and Promotion
- Section 7.1 – Design and Build Complete Streets
- Section 7.2 – Strategically Modify Road Network
- Section 7.3 – Maximize Road Network Efficiency
- Section 7.4 – Maximize Road Safety for All Users
- Section 7.7 – Minimize Environmental Effects

### **Potential Benefits**

- Cycle track and sidewalks provide active transportation alternatives for access to the future Ottawa Hospital.
- Improved crosswalks and TWSIs will help accommodate already high pedestrian and cyclist demand at this intersection.
- The proposed dedicated southbound turn lanes will help accommodate demand for vehicles turning into the Hospital Campus.
- Modifications will provide improved hospital access for pedestrians and cyclists approaching the hospital campus from the north.
- Reduces congestion at the campus entrances off Prince of Wales Drive.

### **EXISTING ROAD CONDITIONS**

- Carling Avenue is a major east-west arterial with a 6-lane urban cross section within the study area. Carling fronts the existing and proposed site and extends from Bronson Avenue to March Road in Kanata. Provides connection to Highway 417 with full movement ramps. The posted speed limit is 60km/h.
- Champagne Avenue is a north-south local road which extends from Young Street in the north to Carling Avenue in the south. The posted speed limit is 40km/h.
- The future Carling/Road A/Champagne intersection is a 3-legged, arterial-to-local signalized intersection.
- O-Train Line 2 (Trillium Line) LRT: Carling Station is located on the northeast corner of the future proposed campus. Provides connection to the O-Train Line 1 (Confederation Line) in the north (east-west LRT) and to the south BRT Transitway which connects Hurdman Station to southern neighborhoods, with future expansion of the Trillium Line currently under construction, extending to the Airport and Barrhaven.
- Between 2014 and 2018, City records show 7 collisions at the intersection of Carling Ave and Champagne Ave; with 6 of those involving only property damage, and one involving a non-fatal injury. No fatal injuries were recorded during this period. Collisions are summarized as follows:
  - 2 Rear-End Collisions
  - 3 Sideswipe Collisions
  - 1 Angle Collision
  - 1 Turning Movement (Non-Fatal Injury)

## PROPOSED ROAD MODIFICATIONS

- It must be emphasized that the following road modifications (see Attachment 2) are conceptual and intended only to illustrate the proposed function. The approval of any detailed design of the road modifications stemming from this report will be subject to the City's detailed design review process.
- The detailed design review process will include requirements for roadside safety provisions, center medians, utility relocations, street lighting, drainage and other needs as deemed appropriate by the City.
- Any required easements or property requirements identified to implement the project as a result of the approved design review process will be the responsibility of the applicant to secure at their cost, to the satisfaction of the City of Ottawa.

### Proposed road modifications:

- Installation of an upgraded 3.0m asphalt multi-use pathway
- A 75m southbound dedicated left-turn lane along Carling Avenue for southbound traffic onto the future Road A
- A 30 m right-turn lane on the south side of Carling Ave for southbound traffic onto Road A
- Revised geometry to the existing concrete median on Carling Avenue
- New concrete sidewalks and TWSIs at the entrance to Road A

## FINANCIAL COMMENTS

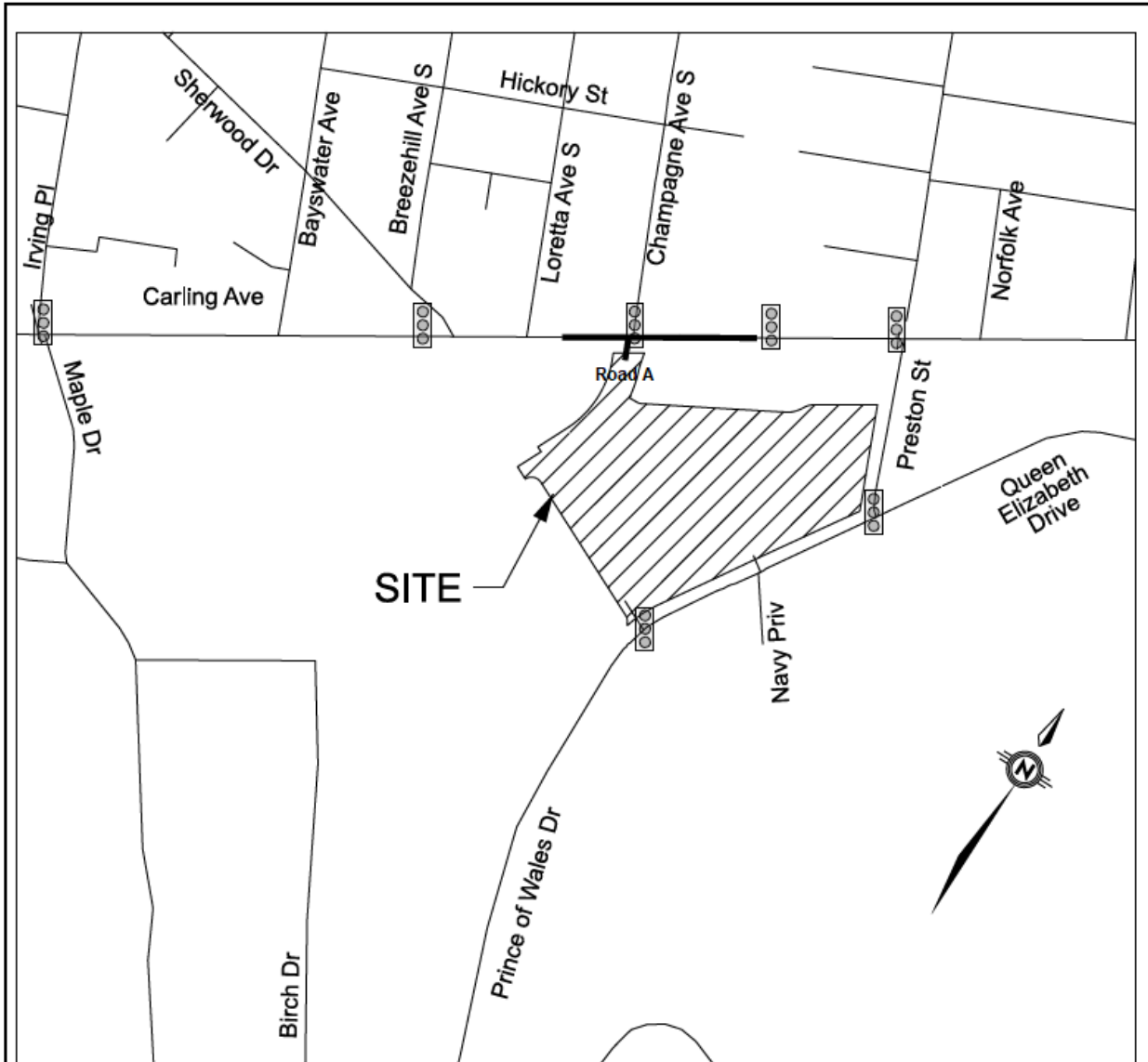
- The implementation of these intersection improvements at Carling and future Road A and the 3.0 m MUP are **growth related** and is in the total estimated cost in the amount of \$1,065,750.00 (including engineering, construction, utilities, miscellaneous and contingency) and a portion of its funding is subject to the approval of the 2023 Capital Budget.

## CONSULTATIONS

- City Council approved a master site plan for the new Ottawa Hospital's campus near Dow's Lake on October 13, 2021.
- RMA was posted publicly on City of Ottawa website for 10 days, ending November 2, 2022; no comments received.
- Consultation with Councilor Brockington on November 3, 2022 to discuss functional design and concept plan for Carling and Site Road A.
- Preliminary approval was received from the Manager of Transportation Engineering Services on October 13, 2022.
- Concurrence from Ward 15 Councilor received on October 31, 2022.
- Concurrence from Ward 16 Councilor received on November 4, 2022.
- Approval from Director of Transportation Planning received November 4, 2022.

## ATTACHMENTS

- Attachment 1 – Key Plan
- Attachment 2 – Proposed Road Modifications



LEGEND:	
	EXISTING TRAFFIC SIGNALS
	AREA OF PROPOSED ROADWAY MODIFICATION
	PROPOSED DEVELOPMENT

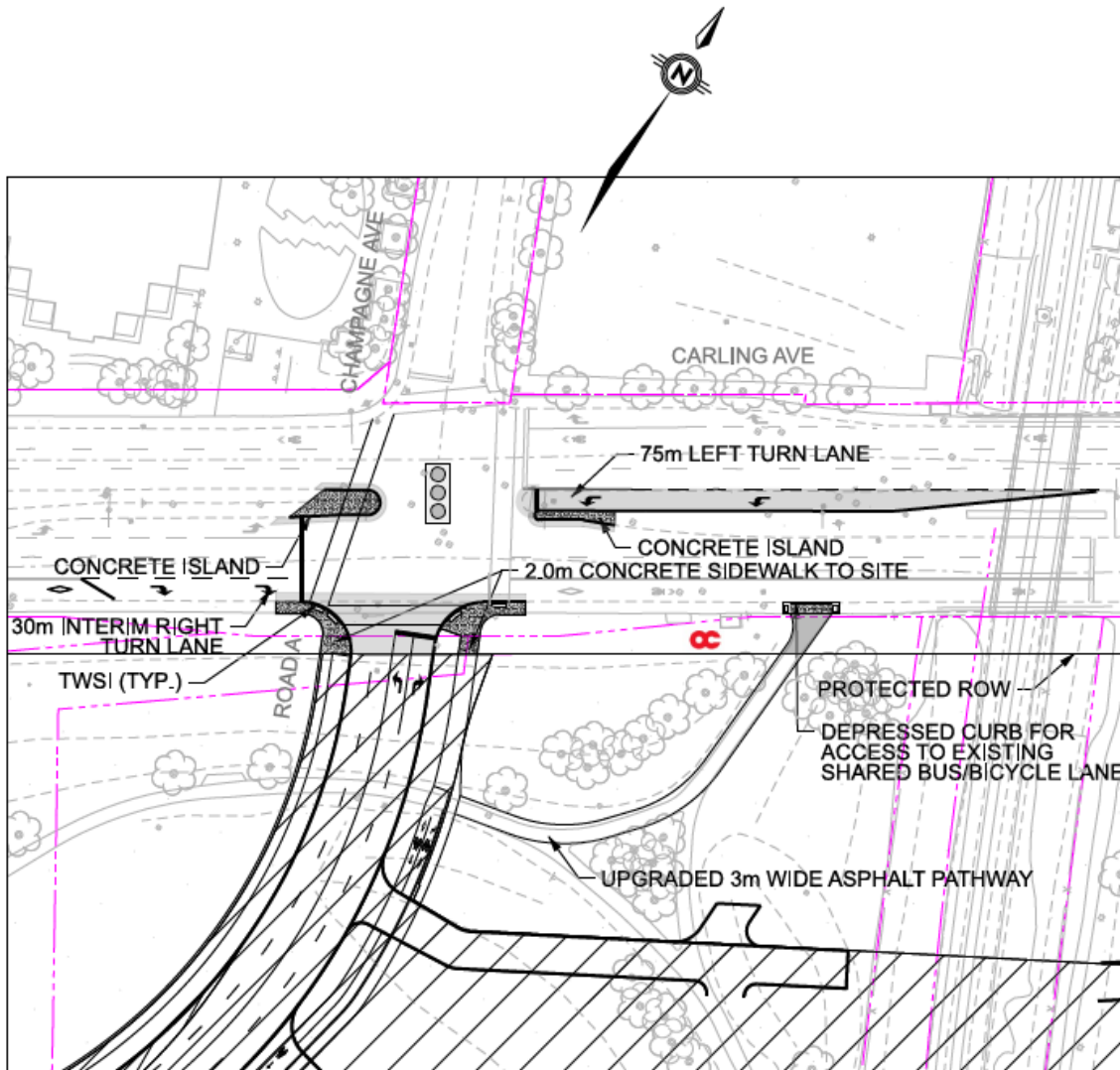
**Ottawa**  
TRANSPORTATION SERVICES  
DEPARTMENT





KEY PLAN

**THE OTTAWA HOSPITAL  
NEW CIVIC DEVELOPMENT  
PARKING GARAGE**

1053 CARLING AVE  
OTTAWA, ON, K1Y 4E9

Transportation Engineering Services Branch		
Approved By:	E. M.	Drawing No.:  RMA-2022-TPD-031A
Completed By:	PARSONS	
Scale:	Date:	
N.T.S.	JULY 2022	



LEGEND:			
	PROPOSED ASPHALT		PROPOSED DEVELOPMENT
	PROPOSED CONCRETE SIDEWALK/MEDIAN		EXISTING TRAFFIC SIGNALS

	<p><u>PROPOSED ROADWAY MODIFICATIONS</u></p> <p><b>THE OTTAWA HOSPITAL NEW CIVIC DEVELOPMENT PARKING GARAGE</b></p> <p>1053 CARLING AVE OTTAWA, ON, K1Y 4E9</p>	<p>Transportation Engineering Services Branch</p>	
		<p>Approved By: E. M.</p>	<p>Drawing No.:</p>
		<p>Completed By: PARSONS</p>	<p><b>RMA-2022-TPD-031B</b></p>
		<p>Scale: N.T.S.</p>	<p>Date: JULY 2022</p>

**CITY OF OTTAWA**  
**ROAD MODIFICATION**  
**APPROVAL UNDER DELEGATED AUTHORITY**

**DATE: July 05, 2022**

**RMA-2022-TPC-029**

**RECOMMENDATIONS**

- Staff recommend road works at intersection of Prince of Wales Drive and Road B to install a traffic control signal, add a bidirectional cycle track to the southeast side of the intersection, and a concrete sidewalk and westbound cycle track on the northwest side of the intersection, as described in this report.

**LOCATION**

- Intersection of Prince of Wales Drive and Road B
- Ward 16, see Attachment 1.

**BACKGROUND**

- The proposed site is located at the intersection of Prince of Wales (POW) Drive and Road B. Road B is planned as one of the primary access points for emergency vehicles to access the new Ottawa Hospital – Civic Campus.
- Development is to be constructed by horizon year 2028.
- Expected opening day capacity is approximately 6,600 (full-time equivalent) staff and approximately 770 patient beds.
- Gross floor area of the New Ottawa Hospital by opening day is projected to be approximately 2.4M ft<sup>2</sup>.

**COMPLIANCE WITH THE STRATEGIC ROAD SAFETY ACTION PLAN**

The recommendations summarized in this report will help achieve the following objectives from the City's 2020 Strategic Road Safety Action Plan.

Reduce collisions involving a pedestrian, cyclist, or a motorcyclist by:

- Implementing a warranted pedestrian signal,
- Improving safety at intersections with high volume of traffic and pedestrian or cyclists.

**MODIFICATION OUTCOMES - BENEFITS AND IMPACTS**

The recommendations summarized in this report will help achieve the following objectives from the City's current Transportation Master Plan:

- Section 4.2 – Create a Walkable Environment
- Section 4.3 – Improve Pedestrian Safety and Promotion

- Section 5.1 – Build and Maintain a Network of Quality Cycling Facilities
- Section 5.3 – Improve Cycling Safety and Promotion
- Section 7.1 – Design and Build Complete Streets
- Section 7.2 – Strategically Modify Road Network
- Section 7.3 – Maximize Road Network Efficiency
- Section 7.4 – Maximize Road Safety for All Users

### **Potential Benefits**

- The proposed signalization will accommodate the anticipated increased demand at this intersection for emergency vehicle access.
- Access for civilian vehicles needing emergency services, pedestrians, and cyclists approaching the hospital campus from the south and east.
- Reduces congestion at the campus entrances off Carling Ave.

### **EXISTING ROAD CONDITIONS**

- Prince of Wales Drive is a north-south arterial road with a 2-lane urban/rural cross section within the study area. Prince of Wales fronts the proposed site and extends from Preston Road in the north to Fourth Line Road in the south. Prince of Wales is a major connector to southern neighborhoods. The posted speed limit is 60km/h.
- Road B will be constructed as part of the future Ottawa Hospital – Civic Campus and is anticipated to be a major access point for the campus for vehicles approaching from the south.
- The future Prince of Wales and Road B intersection currently hosts a traffic signal and pedestrian crossover to allow pedestrians and cyclists to cross over from Dow's Lake Pavilion and the Arboretum to proceed towards the Experimental Farm, and vice versa.
- Along Prince of Wales, to the south is a roundabout at the intersection with the NCC Driveway, and to the northeast there is an arterial-to-arterial signalized intersection with Preston Street.
- Currently the Trillium Pathway extends from the Trans Canada Trail from the north which borders the Ottawa River to Prince of Wales/Queen Elizabeth Driveway where it connects to the Rideau Canal Western Pathway. As part of the New Ottawa Hospital construction the Trillium pathway will be realigned to provide a continuous path for active transportation.
- O-Train Line 2 (Trillium Line) LRT: Carling Station is located on the northeast corner of the future proposed campus. Provides connection to the O-Train Line 1 (Confederation Line) in the north (east-west LRT) and to the south BRT Transitway which connects Hurdman Station to southern neighborhoods, with future expansion of the Trillium Line currently under construction, extending to the Airport and Barrhaven.
- Between 2014 and 2018, City records show 28 collisions at the intersection of Prince of Wales and the NCC Driveway; and 23 collisions at the intersection of Preston Street and Prince of Wales, with the vast majority (92%) involving only property damage. No fatal injuries were recorded during this time period.

## PROPOSED ROAD MODIFICATIONS

- It must be emphasized that the following road modifications (see Attachment 2) are conceptual and intended only to illustrate the proposed function. The approval of any detailed design of the road modifications stemming from this report will be subject to the City's detailed design review process.
- The detailed design review process will include requirements for roadside safety provisions, center medians, utility relocations, street lighting, drainage and other needs as deemed appropriate by the City.
- Any required easements or property requirements identified to implement the project as a result of the approved design review process will be the responsibility of the applicant to secure at their cost, to the satisfaction of the City of Ottawa.

### Proposed road modifications:

- Installation of a full traffic signal,
- Addition of a bidirectional cycle track to the southeast side of the intersection,
- Addition of a concrete sidewalk and westbound cycle track on the northwest side of the intersection.

## FINANCIAL COMMENTS

- The implementation of the Preston and Road B intersection improvements is **growth related** and is in the total estimated cost in the amount of \$1,850,330.00 (including engineering, construction, utilities, miscellaneous and contingency) and a portion of its funding is subject to the approval of the 2023 Capital Budget.

## CONSULTATIONS

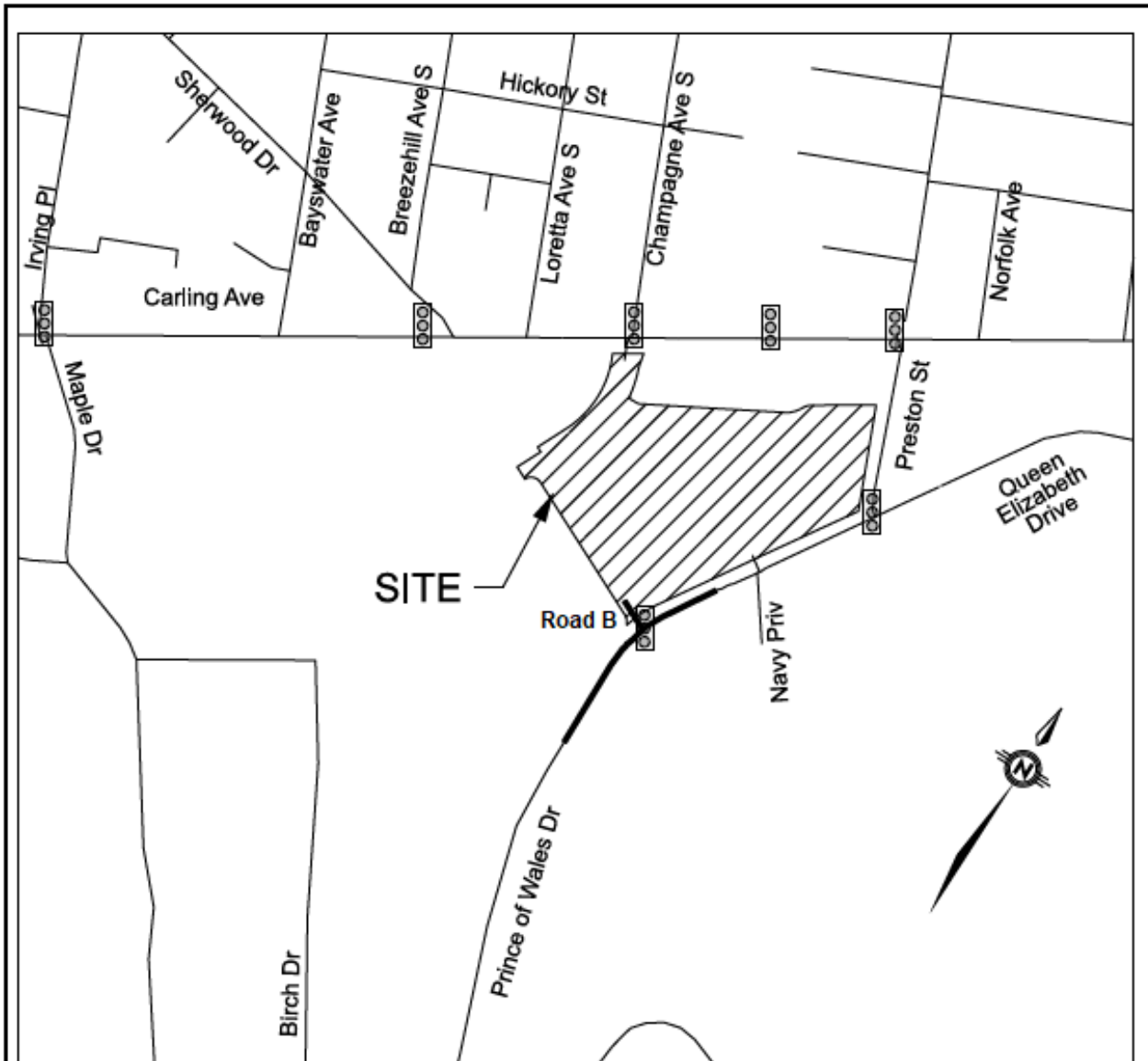
- Two meetings on June 16<sup>th</sup>, 2022 and July 13<sup>th</sup>, 2022 were held between the New Ottawa Hospital Design Consultant and City staff to discuss design options for this intersection.
- On July 6, 2022, City staff and the new Ottawa Hospital design consultants met with the National Capital Commission staff to review the improvements to the intersection design at Prince of Wales/Preston Street and Queen Elizabeth Driveway. NCC staff were appreciative of the active transportation improvements to the intersection and the connections to the NCC pathways. Preliminary Federal Land Use and Design approval procedures were discussed.
- RMA was posted publicly on City of Ottawa website for 10 days, ending November 2, 2022; no comments received.
- Consultation with Councilor Brockington on November 3, 2022 to discuss functional design and concept plan for Prince of Wales and Site Road B.
- Councilor Brockington expressed the desire to maintain the transit stop on the east side of Prince of Wales immediately south of the intersection. Further discussion with OC Transpo and lead consultant to progress during detailed design phase to maintain transit stop at this location.



- Preliminary approval was received from the Manager of Transportation Engineering Services on 14 October 2022.
- Concurrence for Ward Councilor received on 4 November 2022.
- Approval from Program Manager of Transportation Engineering Services received on 4 November 2022.

## **ATTACHMENTS**

- Attachment 1 – Key Plan
- Attachment 2 – Proposed Road Modifications



LEGEND:	
	EXISTING TRAFFIC SIGNALS
	AREA OF PROPOSED ROADWAY MODIFICATION
	PROPOSED DEVELOPMENT

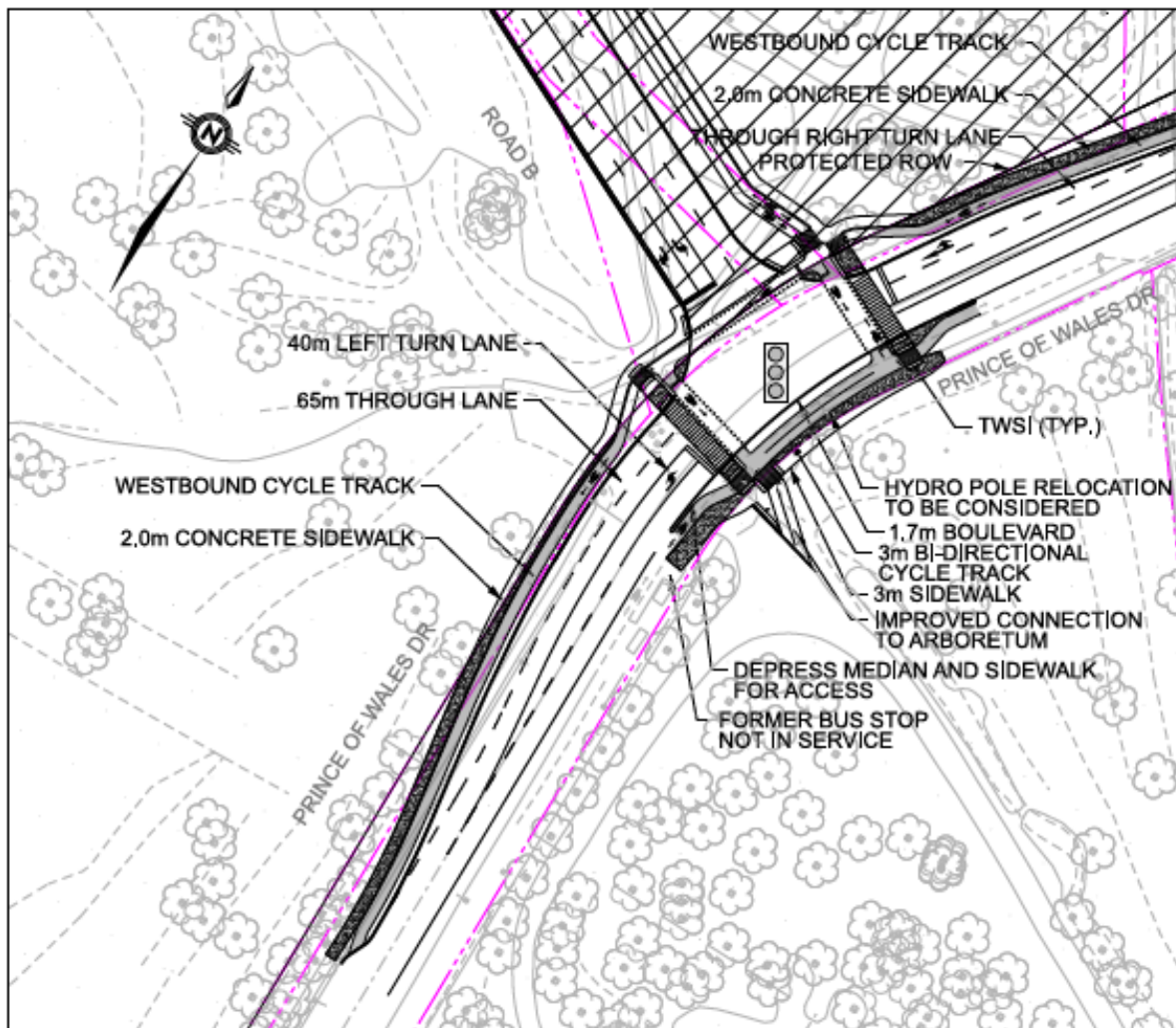
**Ottawa**  
TRANSPORTATION SERVICES  
DEPARTMENT

KEY PLAN





**THE OTTAWA HOSPITAL  
NEW CIVIC DEVELOPMENT  
PARKING GARAGE**

1053 CARLING AVE  
OTTAWA, ON, K1Y 4E9

Transportation Engineering Services Branch			
Approved By:		E. M.	
Completed By:		PARSONS	
Scale:	Date:	RMA-2022-TPC-029A	
N.T.S.	JUNE 2022		



MATCH LINE - FIGURE D

LEGEND:	
	PROPOSED ASPHALT
	PROPOSED DEVELOPMENT
	PROPOSED SIDEWALK/MEDIAN
	EXISTING TRAFFIC SIGNALS

 TRANSPORTATION SERVICES DEPARTMENT	<b>PROPOSED ROADWAY                  MODIFICATIONS</b>	Transportation Engineering Services Branch	
	<b>THE OTTAWA HOSPITAL                  NEW CIVIC DEVELOPMENT                  PARKING GARAGE</b>	Approved By: <b>E. M.</b>	Drawing No.:
	1053 CARLING AVE OTTAWA, ON, K1Y 4E9	Completed By: PARSONS	<b>RMA-2022-                  TPC-029B</b>
		Scale: N.T.S.	Date: JUNE 2022

**CITY OF OTTAWA**  
**ROAD MODIFICATION**  
**APPROVAL UNDER DELEGATED AUTHORITY**

**DATE: November 21, 2022**

**RMA-2022-TPC-030**

**RECOMMENDATIONS**

- Staff recommend road works at the intersection of Prince of Wales Drive (POW) and Preston Street to install sidewalks and a bidirectional cycle track along the west side of Preston St, south side of Carling Ave, and north side of POW; a second northbound turn lane from POW onto Preston; as well as TWSIs, pedestrian crosswalks and cycle crossings at the intersection of POW and Preston.

**LOCATION**

- Intersection of Prince of Wales Drive and Preston Street.
- Ward 17 and Ward 14, see Attachment 1.

**BACKGROUND**

- The proposed site is located at the intersection of Prince of Wales Drive and Preston Street. These roadway modifications are being recommended to support access to the new Ottawa Hospital – Civic Campus.
- The new Civic Campus is to be constructed by horizon year 2028 with construction activities commencing in 2024.
- The expected opening day capacity is approximately 6,600 (full-time equivalent) staff and approximately 770 patient beds.
- The gross floor area of the new Ottawa Hospital by opening day is projected to be approximately 2.4M ft<sup>2</sup>. The Trillium pathway will be realigned to the east on Carling Avenue, south on Preston Street to Prince of Wales/Queen Elizabeth Driveway, connecting to the Rideau Canal Western Pathway.

**COMPLIANCE WITH THE STRATEGIC ROAD SAFETY ACTION PLAN**

The recommendations summarized in this report will help achieve the following objectives from the City's 2020 Strategic Road Safety Action Plan.

Reduce collisions involving a pedestrian, cyclist, or a motorcyclist by:

- Improving safety at intersections with high volume of traffic and pedestrian or cyclists.

Reducing collisions occurring at, or related to, an intersection by:

- implementing fully protected left turns to mitigate left-turn collisions.

## **MODIFICATION OUTCOMES - BENEFITS AND IMPACTS**

The recommendations summarized in this report will help achieve the following objectives from the City's current Transportation Master Plan:

- Section 4.2 – Create a Walkable Environment
- Section 4.3 – Improve Pedestrian Safety and Promotion
- Section 5.1 – Build and Maintain a Network of Quality Cycling Facilities
- Section 5.3 – Improve Cycling Safety and Promotion
- Section 7.1 – Design and Build Complete Streets
- Section 7.2 – Strategically Modify Road Network
- Section 7.3 – Maximize Road Network Efficiency
- Section 7.4 – Maximize Road Safety for All Users

### **Potential Benefits**

- The realignment of the Trillium pathway will consist of the installation of sidewalks and bi-directional cycle tracks and maintain active transportation corridors to the surrounding community and new Ottawa Hospital.
- Improved crosswalks, dedicated cycle crossings, and TWSIs will help accommodate already high pedestrian and cyclist demand at this intersection of POW/Preston.
- The proposed second northbound left turn lane will accommodate the anticipated increased demand at this intersection for resident access to the parking garage.
- Modifications will provide improved hospital access for pedestrians and cyclists approaching the hospital campus from the north and east.
- Reduces congestion at the campus entrances off Carling Ave.

### **EXISTING ROAD CONDITIONS**

- Prince of Wales Drive is a north-south arterial road with a 2-lane urban/rural cross section within the study area. Prince of Wales fronts the proposed site and extends from Preston Road in the north to Fourth Line in the south. Prince of Wales is a major connector to southern neighborhoods. The posted speed limit is 60km/h.
- Preston Street is a north-south arterial with a 2-lane urban cross section and on-street parking. Preston Road fronts the proposed site and extends from Prince of Wales in the south to Albert Street in the north. The unposted speed limit is assumed 50km/h.
- The future Prince of Wales and Road B Preston Street and Queen Elizabeth Driveway intersection is a 3-legged, arterial-to-arterial, signalized intersection.
- Currently the Trillium Pathway extends from the Trans Canada Trail from the north which borders the Ottawa River to Prince of Wales/Queen Elizabeth Driveway where it connects to the Rideau Canal Western Pathway.
- O-Train Line 2 (Trillium Line) LRT: Carling Station is located on the northeast corner of the future proposed campus. Provides connection to the O-Train Line 1 (Confederation Line) in the north (east-west LRT) and to the south BRT Transitway which connects Hurdman Station to southern neighborhoods, with

future expansion of the Trillium Line currently under construction, extending to the Airport and Barrhaven.

- Between 2014 and 2018, City records show 23 collisions at the intersection of Prince of Wales and Preston Street; with 16 of those involving only property damage. No fatal injuries were recorded during this time period.

## PROPOSED ROAD MODIFICATIONS

- It must be emphasized that the following road modifications (see Attachment 2) are conceptual and intended only to illustrate the proposed function. The approval of any detailed design of the road modifications stemming from this report will be subject to the City's detailed design review process.
- The detailed design review process will include requirements for roadside safety provisions, center medians, utility relocations, street lighting, drainage and other needs as deemed appropriate by the City.
- Any required easements or property requirements identified to implement the project as a result of the approved design review process will be the responsibility of the applicant to secure at their cost, to the satisfaction of the City of Ottawa.

### Proposed road modifications:

- The realignment of the Trillium pathway will consist of the installation of a 3.0 m sidewalk and a 3.5 m wide bidirectional cycle track along the west side of Preston St, south side of Carling Ave, and north side of POW.
- Install a second northbound turn lane from POW onto Preston.
- Installation of new TWSIs, pedestrian crosswalks and cycle crossings at the intersection of POW and Preston.

## FINANCIAL COMMENTS

- The implementation of the realignment of the Trillium pathway and the intersection of Prince of Wales Drive and Preston Street is **growth related** and the total estimated cost is in the amount of \$2,215,010.00 (including engineering, construction, utilities, miscellaneous and contingency) and a portion of its funding is subject to the approval of the 2023 Capital Budget.

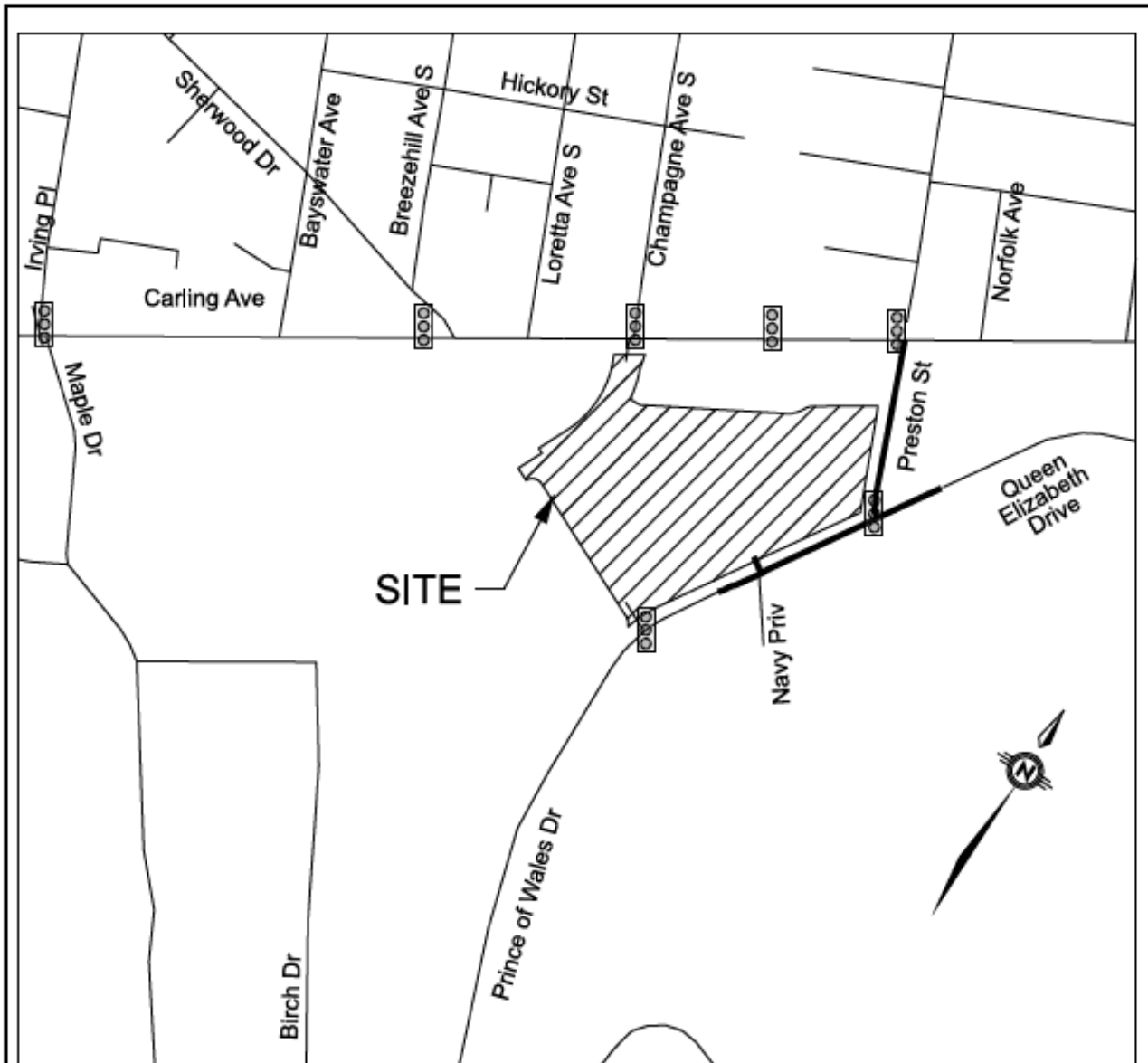
## CONSULTATIONS

- City Council approved a master site plan for the new Ottawa Hospital's campus near Dow's Lake on October 13, 2021.
- On July 6, 2022, City staff and the new Ottawa Hospital design consultants met with the National Capital Commission staff to review the improvements to the intersection design at Prince of Wales/Preston Street and Queen Elizabeth Driveway. NCC staff were appreciative of the active transportation improvements to the intersection and the connections to the NCC pathways. Preliminary Federal Land Use and Design approval procedures were discussed.
- Preliminary approval was received from the Manager of Transportation Engineering Services on 11 October 2022.

- Concurrence from Ward 17 Councilor received on 31 October 2022.
- Approval from Program Manager of Transportation Engineering Services received on 21 November 2022.

## **ATTACHMENTS**

- Attachment 1 – Key Plan
- Attachment 2 – Proposed Road Modifications
- Attachment 3 – Proposed Road Modifications



LEGEND:	
	EXISTING TRAFFIC SIGNALS
	AREA OF PROPOSED ROADWAY MODIFICATION
	PROPOSED DEVELOPMENT

**Ottawa**  
TRANSPORTATION SERVICES  
DEPARTMENT

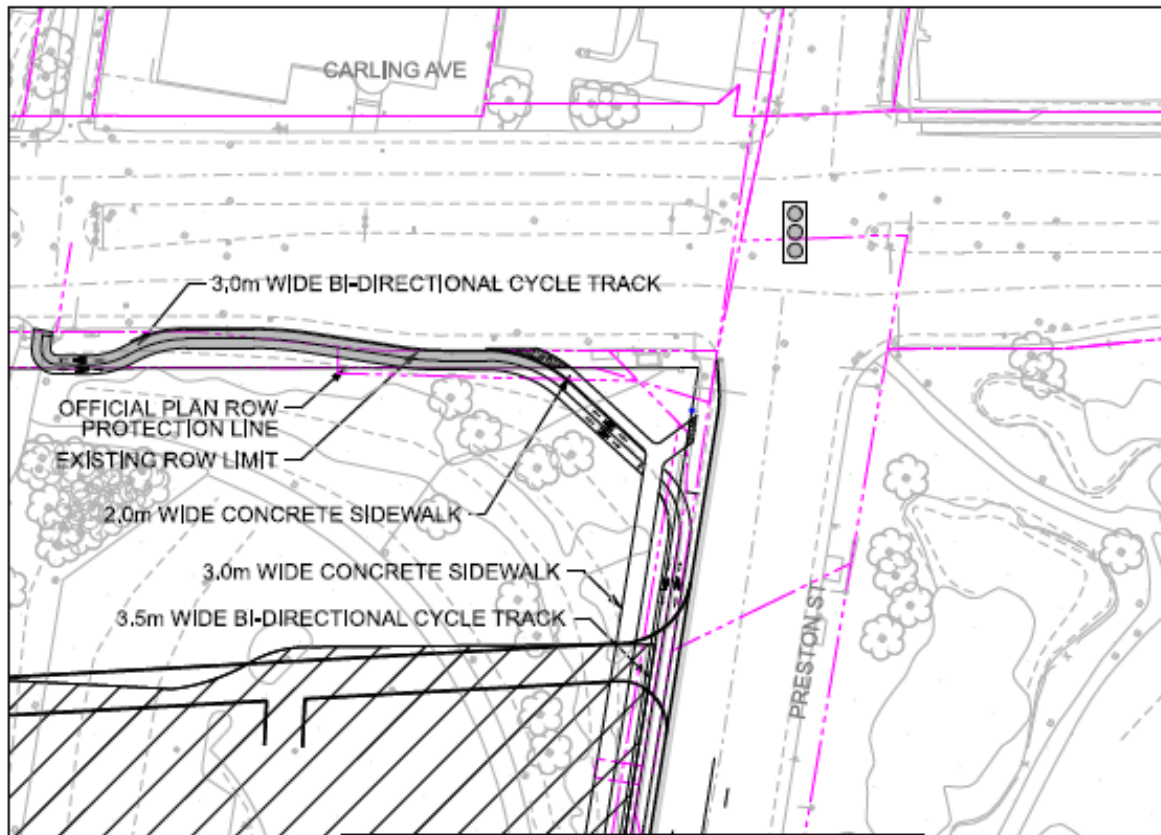
KEY PLAN

**THE OTTAWA HOSPITAL  
NEW CIVIC DEVELOPMENT  
PARKING GARAGE**





1053 CARLING AVE  
OTTAWA, ON, K1Y 4E9

Transportation Engineering Services Branch		
Approved By:	E. M.	Drawing No.:  <b>RMA-2022-TPD-030A</b>
Completed By:	PARSONS	
Scale:	Date:	
N.T.S.	JULY 2022	

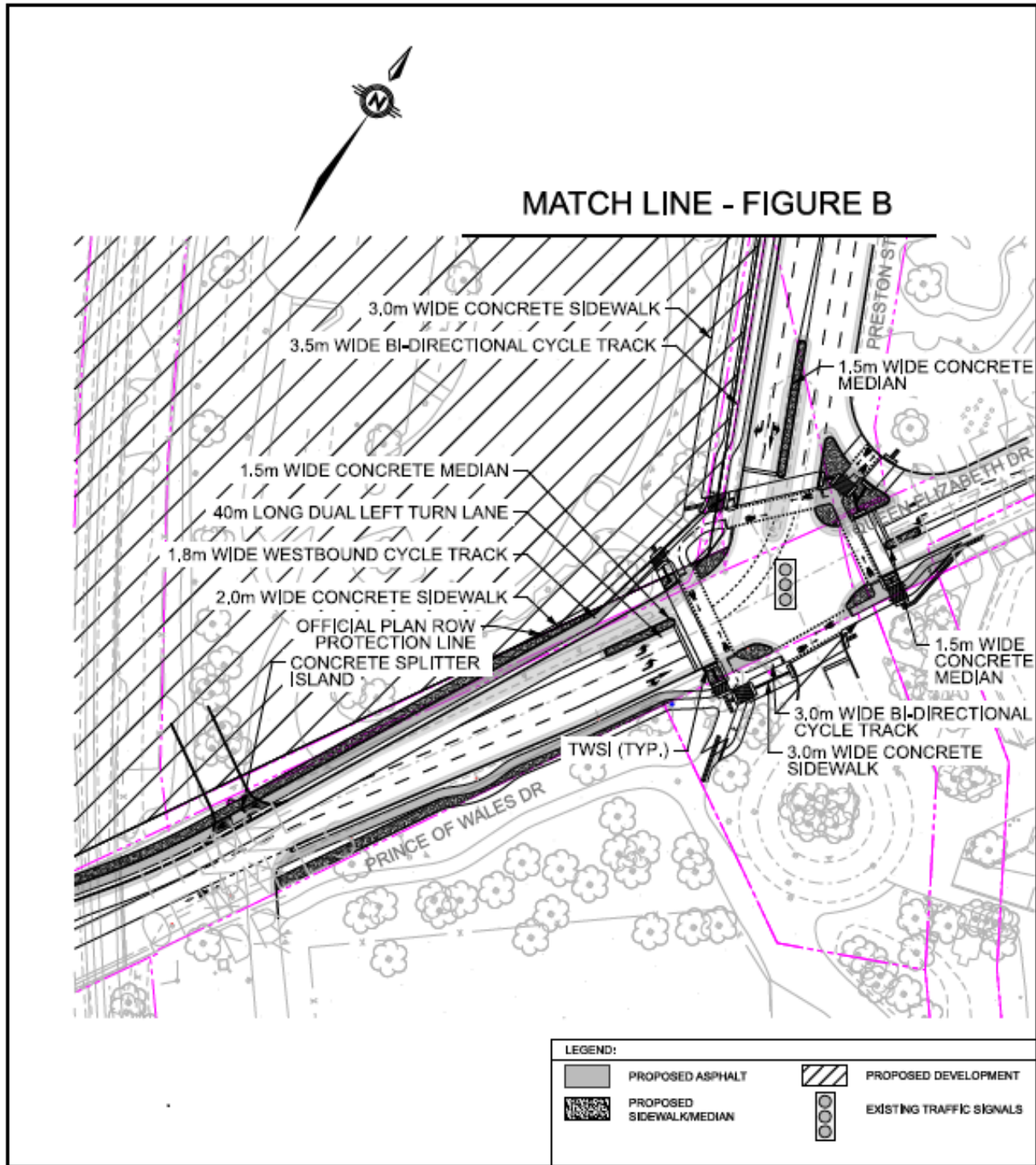




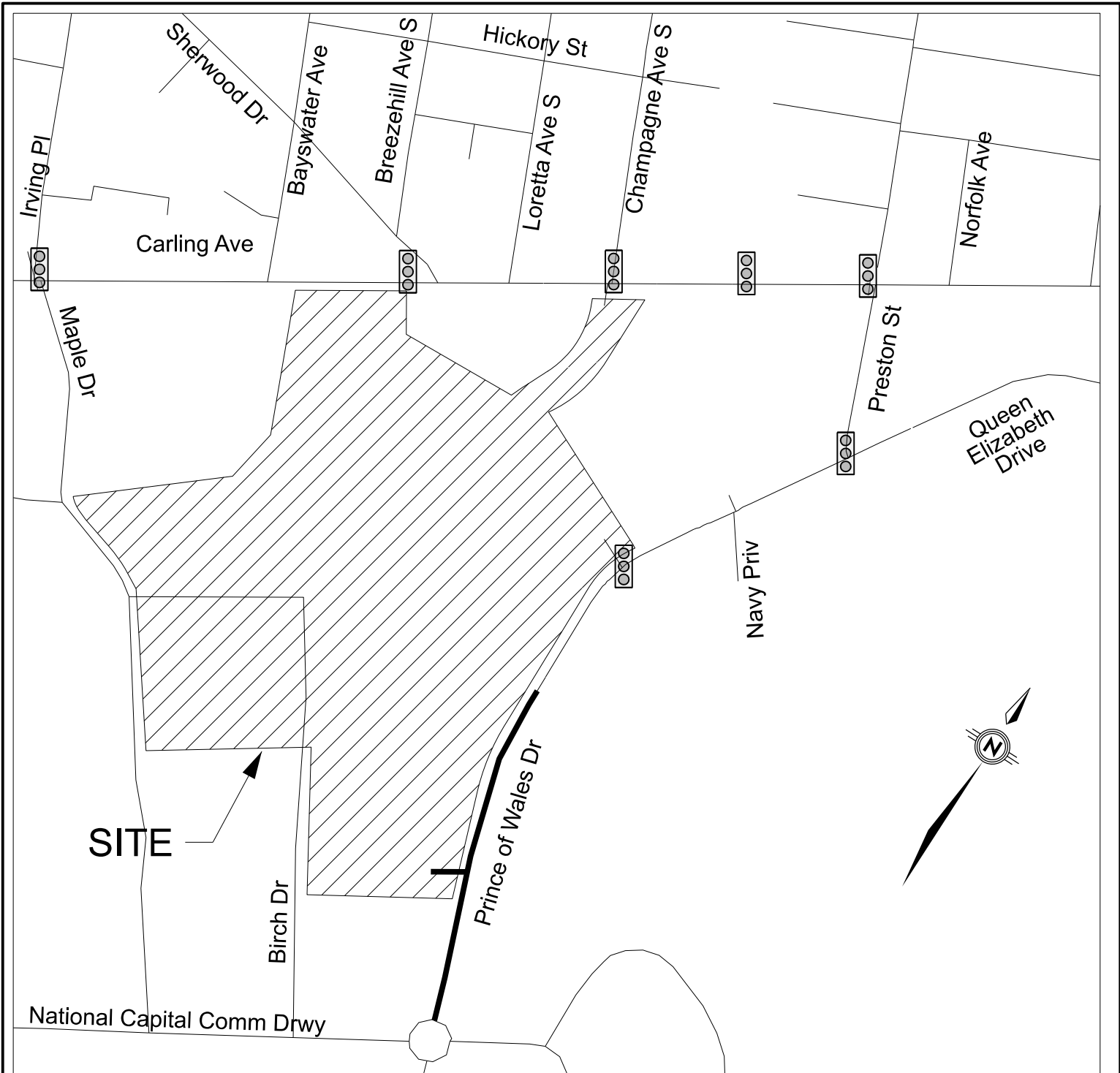
MATCH LINE - FIGURE C

LEGEND:	
	PROPOSED ASPHALT
	PROPOSED DEVELOPMENT
	PROPOSED SIDEWALK/MEDIAN
	EXISTING TRAFFIC SIGNALS




 <p>TRANSPORTATION SERVICES DEPARTMENT</p>	<p><u>PROPOSED ROADWAY MODIFICATIONS</u></p> <p><b>THE OTTAWA HOSPITAL NEW CIVIC DEVELOPMENT PARKING GARAGE</b></p> <p>1053 CARLING AVE OTTAWA, ON, K1Y 4E9</p>	<p>Transportation Engineering Services Branch</p>	
		<p>Approved By: <b>E. M.</b></p>	<p>Drawing No.:</p>
		<p>Completed By: <b>PARSONS</b></p>	<p><b>RMA-2022-TPD-030B</b></p>
		<p>Scale: <b>N.T.S.</b></p>	



 TRANSPORTATION SERVICES DEPARTMENT	<b>PROPOSED ROADWAY MODIFICATIONS</b> <b>THE OTTAWA HOSPITAL                  NEW CIVIC DEVELOPMENT                  PARKING GARAGE</b> 1053 CARLING AVE OTTAWA, ON, K1Y 4E9	Transportation Engineering Services Branch	
	Approved By: <b>E. M.</b>		Drawing No.:
	Completed By: <b>PARSONS</b>		<b>RMA-2022-TPD-030C</b>
	Scale: <b>N.T.S.</b>	Date: <b>JULY 2022</b>	



**LEGEND:**

-  EXISTING TRAFFIC SIGNALS
-  AREA OF PROPOSED ROADWAY MODIFICATION
-  PROPOSED DEVELOPMENT



**TRANSPORTATION SERVICES DEPARTMENT**

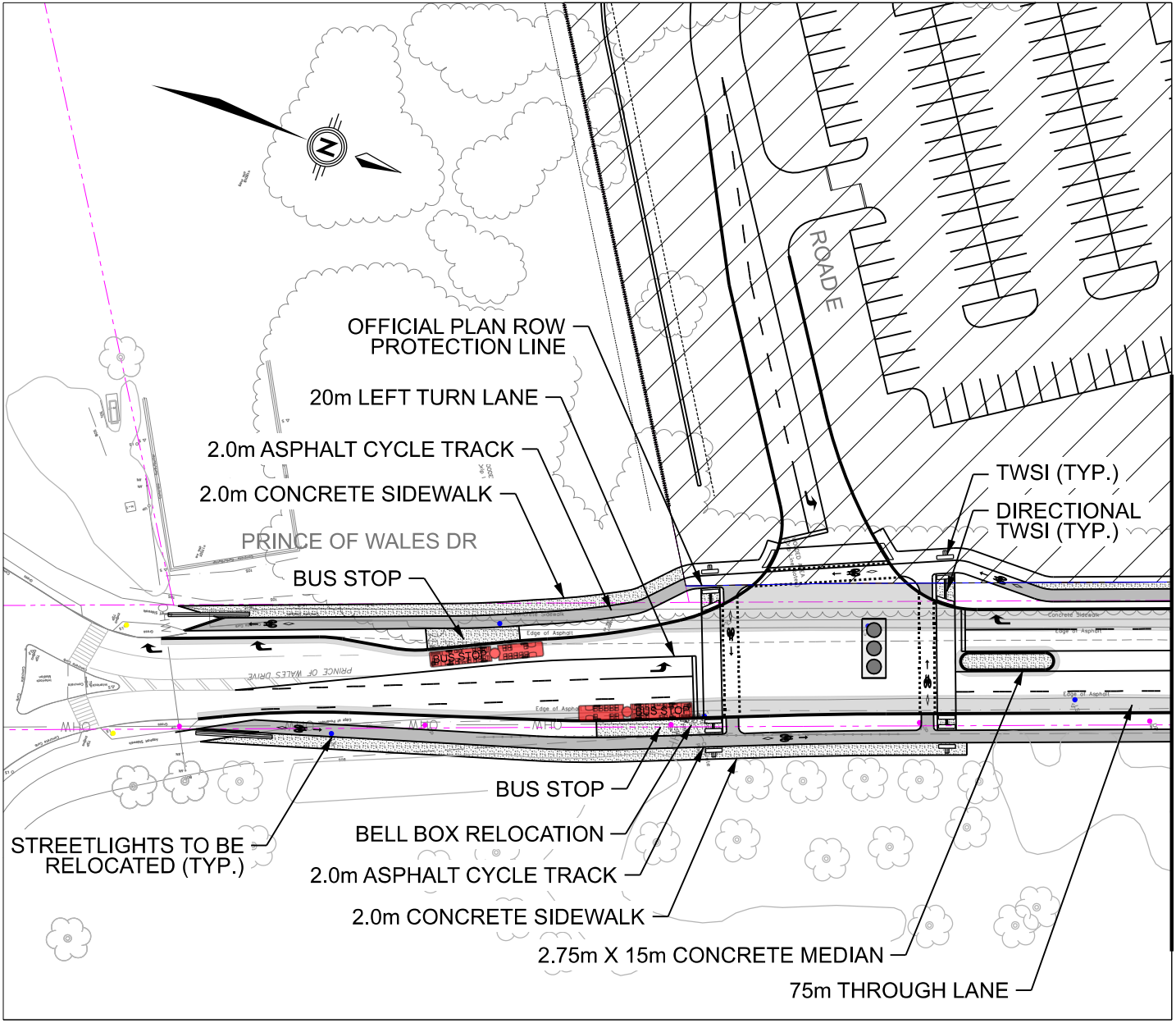
KEY PLAN

**THE OTTAWA HOSPITAL  
NEW CIVIC DEVELOPMENT  
PARKING GARAGE**

1053 CARLING AVE  
OTTAWA, ON, K1Y 4E9

Transportation Engineering Services Branch

Approved By: ...	Drawing No.:
Completed By: PARSONS	<b>RMA-2021- TPD-XXX-A</b>
Scale: N.T.S.	



LEGEND:	
	PROPOSED ASPHALT
	PROPOSED DEVELOPMENT
	PROPOSED SIDEWALK/MEDIAN
	PROPOSED TRAFFIC SIGNALS

**Ottawa**  
TRANSPORTATION SERVICES  
DEPARTMENT

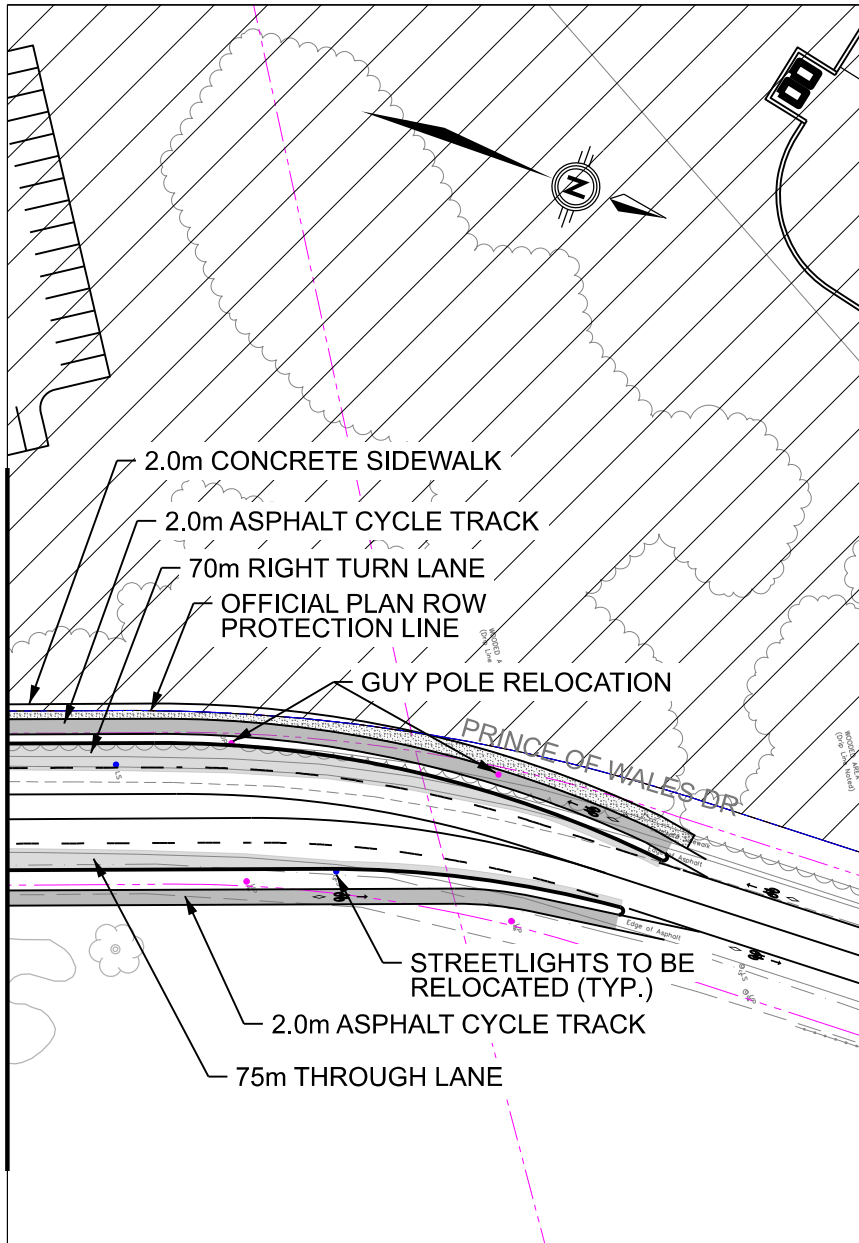
PROPOSED ROADWAY  
MODIFICATIONS




**THE OTTAWA HOSPITAL  
NEW CIVIC DEVELOPMENT  
PARKING GARAGE**

1053 CARLING AVE  
OTTAWA, ON, K1Y 4E9

Transportation Engineering Services Branch	
Approved By:	..
Completed By:	PARSONS
Scale:	Date:
N.T.S.	OCT 2022
Drawing No.:	
<b>RMA-2021- TPD-XXX-B</b>	

MATCH LINE - FIGURE B



LEGEND:	
	PROPOSED ASPHALT
	PROPOSED DEVELOPMENT
	PROPOSED SIDEWALK/MEDIAN



TRANSPORTATION SERVICES  
DEPARTMENT

PROPOSED ROADWAY  
MODIFICATIONS

**THE OTTAWA HOSPITAL  
NEW CIVIC DEVELOPMENT  
PARKING GARAGE**

1053 CARLING AVE  
OTTAWA, ON, K1Y 4E9

Transportation Engineering Services Branch	
Approved By: ..	Drawing No.:
Completed By: PARSONS	RMA-2021- TPD-XXX-C
Scale: N.T.S.	

**Appendix I:  
Historic OC-Transpo Ridership Data**

## Bus stops near current hospital site

Data previously provided for Fall 2019 (October 6 - December 21) and Winter 2020 pre-pandemic (January 5 - March 11) periods

Spring 2022 (April 24 - June 25)												
Stop	Location	Route	Dir.	AM (06:00-09:00)			PM (15:00-18:00)			24-hr		
				Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure
1324	Carling / Parkdale	55	WB	0	0	4	0	0	7	0	0	4
		85	WB	9	2	17	7	0	17	27	8	13
2390	Carling / Parkdale	55	EB	3	0	8	4	0	6	7	0	5
		85	EB	1	1	13	5	9	15	14	23	11
3644	Carling / Melrose South	55	EB	2	0	9	10	0	9	16	0	7
		56	EB	0	1	6	9	3	6	10	5	5
		85	EB	4	7	11	7	0	17	14	11	11
7359	Parkdale / Ruskin	56	EB	0	0	7	1	0	4	1	1	3
		114	WB	-	-	-	-	-	-	0	0	3
7360	Parkdale / Inglewood	56	WB	1	1	4	6	10	8	14	12	3
		114	EB	-	-	-	-	-	-	0	0	4
7361	Parkdale / Carling	56	EB	2	1	6	1	0	5	3	2	2
		114	WB	-	-	-	-	-	-	0	0	3
7365	Carling / Melrose South	55	WB	0	16	6	1	2	7	1	33	5
		56	WB	2	17	5	1	0	8	3	21	5
		85	WB	1	7	17	4	0	16	20	15	12
8016	Carling / TOH Civic Campus	55	WB	0	16	4	2	8	7	5	58	4
		85	WB	8	20	16	17	3	16	79	59	13
8020	Carling / TOH Civic Campus	55	EB	14	0	9	19	0	8	68	0	6
		56	EB	3	5	6	16	1	6	23	8	5
		85	EB	2	11	12	21	6	16	56	55	11
8070	Parkdale / Ruskin	56	WB	0	2	4	5	0	9	8	2	3
		114	EB	-	-	-	-	-	-	0	0	4
8075	Parkdale / Inglewood	56	EB	0	4	6	0	0	4	1	5	3
		114	WB	-	-	-	-	-	-	0	0	3

## Bus stops near future hospital site

### Fall 2019 (October 6 - December 21)

Stop	Location	Route	Dir.	AM (06:00-09:00)			PM (15:00-18:00)			24-hr		
				Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure
2397	Preston / Carling	85	WB	4	11	18	15	8	21	37	23	14
6657	Preston / Carling	85	EB	12	11	22	21	5	23	54	40	16
7367	Carling / Sherwood	55	WB	5	2	23	4	3	33	9	7	19
		56	WB	1	0	12	6	0	18	7	1	11
		85	WB	4	1	21	16	13	26	36	20	18
7368	Carling / Sherwood	55	EB	1	4	36	2	6	23	7	15	20
		56	EB	1	0	14	0	0	10	1	1	10
		85	EB	4	5	27	4	8	26	23	33	19
7369	Carling / O-Train Station	55	EB	9	16	34	8	32	20	28	89	18
		56	EB	4	6	14	2	5	9	7	11	10
		85	EB	7	46	23	4	51	22	31	214	16
8014	Carling / O-Train Station	55	WB	29	8	23	26	6	31	104	33	19
		56	WB	15	15	12	6	11	17	26	27	11
		85	WB	33	5	20	88	13	26	273	54	17
8015	Maple Drive / Central Experimental Farm	55	WB	0	9	22	5	3	33	7	15	19
		56	WB	1	8	11	2	3	17	2	11	11
		85	WB	11	9	19	23	21	26	82	54	18
8021	Maple Drive / Central Experimental Farm	55	EB	3	4	36	10	0	23	15	5	20
		56	EB	0	0	14	5	0	10	4	0	10
		85	EB	2	1	26	12	2	26	22	14	19
8023	Carling / Preston	55	EB	2	16	31	7	8	18	12	29	17
		56	EB	4	5	13	2	2	9	5	9	9

### Winter 2020 pre-pandemic (January 5 - March 16)

Stop	Location	Route	Dir.	AM (06:00-09:00)			PM (15:00-18:00)			24-hr		
				Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure
2397	Preston / Carling	85	WB	5	24	22	21	6	20	43	42	15
6657	Preston / Carling	85	EB	27	32	22	20	7	19	68	64	15
7367	Carling / Sherwood	55	WB	5	2	23	1	9	27	9	16	18
		56	WB	4	20	9	0	2	15	4	25	10
		85	WB	1	2	24	11	8	27	41	28	18
7368	Carling / Sherwood	55	EB	2	2	31	3	2	17	9	13	18
		56	EB	2	0	7	0	0	12	2	0	9
		85	EB	17	10	28	9	13	22	30	34	17
7369	Carling / O-Train Station	55	EB	9	22	29	4	32	15	19	106	16
		56	EB	4	4	6	2	11	11	9	19	8
		85	EB	8	70	22	9	51	18	35	235	15
8014	Carling / O-Train Station	55	WB	35	6	23	30	5	28	103	17	18
		56	WB	8	5	11	12	5	16	24	12	11



		85	WB	29	10	23	86	24	27	257	69	18
8015	Maple Drive / Central Experimental Farm	55	WB	0	10	22	9	3	28	10	19	17
		56	WB	0	8	9	0	2	15	0	13	10
		85	WB	2	14	22	25	14	29	66	57	19
8021	Maple Drive / Central Experimental Farm	55	EB	2	3	30	6	0	17	14	3	18
		56	EB	2	2	7	7	0	12	9	3	9
		85	EB	3	10	27	11	1	23	21	20	17
8023	Carling / Preston	55	EB	2	21	27	6	9	14	18	39	16
		56	EB	1	1	7	5	2	12	6	6	9

**Spring 2022 (April 24 - June 25)**

Stop	Location	Route	Dir.	AM (06:00-09:00)			PM (15:00-18:00)			24-hr		
				Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure
2397	Preston / Carling	85	WB	18	10	16	39	12	15	137	44	12
6657	Preston / Carling	2	NB	7	48	4	17	79	6	53	317	4
		85	EB	10	21	9	19	35	14	62	107	9
7367	Carling / Sherwood	55	WB	0	2	7	0	4	7	0	6	6
		56	WB	0	0	7	0	0	8	0	1	6
		85	WB	8	0	17	7	3	16	27	10	12
7368	Carling / Sherwood	55	EB	2	0	9	2	1	9	4	1	7
		56	EB	0	0	6	1	0	7	1	0	6
		85	EB	9	4	12	0	5	18	13	16	11
7369	Carling / O-Train Station	55	EB	6	0	9	10	0	10	38	0	7
		56	EB	2	0	6	6	1	8	10	1	6
		85	EB	1	17	10	2	21	15	8	73	10
8014	Carling / O-Train Station	55	WB	5	4	8	6	11	7	16	33	6
		56	WB	2	2	7	0	6	8	2	10	6
		85	WB	12	1	17	14	0	15	56	9	12
8015	Maple Drive / Central Experimental Farm	55	WB	0	5	7	2	2	7	2	11	6
		56	WB	0	4	7	0	0	8	0	4	6
		85	WB	0	1	17	3	3	15	10	7	12
8021	Maple Drive / Central Experimental Farm	55	EB	0	0	9	5	0	9	5	0	7
		56	EB	0	0	6	5	0	7	6	0	6
		85	EB	2	6	11	4	2	18	10	18	11
8023	Carling / Preston	55	EB	3	4	9	7	1	10	23	9	8
		56	EB	0	0	6	4	3	7	4	3	6

## O-Train Line 2, before closure for Stage 2 expansion

Winter 2020 pre-pandemic (January 5 - March 16)												
Stop	Location	Route	Direction	AM (06:00-09:00)			PM (15:00-18:00)			24-hr		
				Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure
3061	Carling Station	Line 2	NB	124	165	40	207	308	65	589	1108	33
		Line 2	SB	197	143	15	285	208	18	1134	694	13

**Appendix J:**  
**Summary 2028 and 2048 Intersection Performance**

Table 19: 2028 Intersection Performance

Intersection	Weekday AM Peak (PM Peak of Street) [PM Peak of Generator]					
	Critical Movement			Intersection 'As a Whole'		
	LoS	Max Delay (s) or v/c	Movement	Delay (s)	LoS	Max v/c
<b>Signalized Intersections</b>						
Parkdale/Carling	C	0.77	SBL	22.1	A	0.48
	(C)	(0.72)	(SBL)	(18.5)	(B)	(0.65)
	[B]	[0.67]	[SBL]	[15.9]	[A]	[0.57]
Civic/Carling	A	0.38	EBT	3.0	A	0.38
	(A)	(0.60)	(WBT)	(6.8)	(A)	(0.59)
	[A]	[0.53]	[WBT]	[10.1]	[A]	[0.52]
Maple/Old Irving/Carling	A	0.41	EBT	10.2	A	0.38
	(B)	(0.69)	(NBT)	(13.0)	(A)	(0.48)
	[A]	[0.56]	[NBT]	[11.0]	[A]	[0.43]
Sherwood/Carling	C	0.71	SBL	11.6	A	0.42
	(B)	(0.69)	(SBL)	(9.7)	(A)	(0.55)
	[B]	[0.69]	[SBL]	[10.0]	[A]	[0.44]
Road A/Champagne/Carling	C	0.79	SBL	29.0	A	0.54
	(D)	(0.82)	(SBL)	(38.8)	(B)	(0.66)
	[C]	[0.71]	[SBL]	[27.6]	[A]	[0.51]
Trillium MUP/Carling	A	0.42	WBT	8.3	A	0.42
	(A)	(0.47)	(WBT)	(5.8)	(A)	(0.47)
	[A]	[0.36]	[WBT]	[4.7]	[A]	[0.36]
Preston/Carling	E	0.92	EBR	60.4	D	0.87
	(E)	(0.99)	(NBL)	(76.4)	(E)	(0.95)
	[E]	[0.96]	[WBL]	[61.1]	[D]	[0.82]
Booth/Carling	D	0.85	WBT	26.7	C	0.77
	(E)	(0.98)	(WBT)	(41.8)	(E)	(0.93)
	[C]	[0.73]	[WBT]	[22.9]	[B]	[0.69]
Bronson/Carling	D	0.89	EBL	41.2	D	0.86
	(E)	(0.94)	(NBL)	(53.5)	(E)	(0.94)
	[E]	[0.94]	[SBL]	[48.4]	[D]	[0.90]
Hwy 417 WB on-off/Parkdale	C	0.75	WBT	24.0	B	0.70
	(D)	(0.83)	(WBT)	(26.0)	(C)	(0.76)
	[C]	[0.74]	[SBL]	[18.9]	[B]	[0.68]
Hwy 417 EB on-off/Parkdale	B	0.70	EBT	32.9	A	0.57
	(C)	(0.78)	(EBT)	(32.4)	(B)	(0.63)
	[C]	[0.78]	[EBT]	[26.1]	[B]	[0.61]
Sherwood/Parkdale	B	0.63	EBT	10.5	A	0.44
	(A)	(0.56)	(SBL)	(9.8)	(A)	(0.46)
	[A]	[0.57]	[SBL]	[9.9]	[A]	[0.48]
Ruskin/Parkdale	A	0.40	EBT	9.6	A	0.25
	(A)	(0.39)	(WBT)	(10.2)	(A)	(0.25)
	[A]	[0.35]	[EBT]	[10.1]	[A]	[0.22]
Preston/Prince of Wales	D	0.90	SBR	34.0	C	0.73
	(E)	(0.97)	(SBL)	(47.2)	(C)	(0.80)
	[E]	[0.92]	[SBR]	[41.7]	[C]	[0.71]
Hwy 417 on Raymond/Rochester	A	0.58	WBT	12.3	A	0.45
	(C)	(0.72)	(WBT)	(18.7)	(A)	(0.53)
	[B]	[0.70]	[WBT]	[17.1]	[A]	[0.49]
Hwy 417 off Orangeville/Rochester	B	0.70	EBT	11.2	A	0.44
	(C)	(0.75)	(EBT)	(17.0)	(A)	(0.46)
	[C]	[0.71]	[EBT]	[16.8]	[A]	[0.42]
Hwy 417 on-off Catherine/Bronson	D	0.89	NBL	35.4	D	0.81
	(E)	(0.96)	(WBL)	(55.8)	(E)	(0.95)
	[E]	[0.98]	[WBL]	[59.8]	[E]	[0.96]
Hwy 417 EB off/Bronson	D	0.85	EBR	17.7	B	0.66
	(D)	(0.86)	(EBR)	(18.4)	(C)	(0.73)
	[D]	[0.87]	[EBR]	[21.1]	[C]	[0.78]

Road B/Prince of Wales	B (A) [A]	0.61 (0.55) [0.58]	EBT (SBL) [SBL]	8.0 (9.8) [10.5]	A (A) [A]	0.60 (0.49) [0.47]
Road E/Prince of Wales <sub>1</sub>	A (B) [A]	0.38 (0.66) [0.56]	SBT (SBT) [SBT]	5.0 (11.0) [9.1]	A (B) [A]	0.37 (0.64) [0.55]
<b>Unsignalized Intersections</b>						
Melrose/Carling	C (E) [C]	20 (39) [24]	SB (SB) [SB]	1 (1) [0]	A (A) [A]	-
Rochester/Carling	C (F) [F]	17 (177) [84]	SB (SB) [SB]	1 (20) [12]	A (C) [B]	-
Navy/Prince of Wales	C (D) [C]	17 (33) [21]	NB (NB) [NB]	0 (0) [0]	A (A) [A]	-
Road A/Parking garage	B (B) [B]	11 (10) [10]	NB (NB) [NB]	4 (7) [6]	A (A) [A]	-
Road B/Parking garage	B (A) [B]	10 (9) [10]	WB (WB) [WB]	5 (7) [7]	A (A) [A]	-
Road B/Road F	B (B) [B]	10 (10) [10]	EB (EB) [EB]	0 (0) [0]	A (A) [A]	-
Road E/Road D	A (A) [A]	9 (9) [9]	NB (NB) [NB]	5 (7) [7]	A (A) [A]	-
Bayswater/Sherwood	A (B) [A]	9 (11) [9]	SB (SB) [SB]	9 (10) [9]	A (B) [A]	-
Maple/Road D	A (A) [A]	8 (8) [8]	SB (EB) [EB]	8 (8) [8]	A (A) [A]	-
Road A/Road B	A (A) [A]	9 (8) [8]	WB (WB) [WB]	8 (7) [8]	A (A) [A]	-
<b>Roundabout Intersections</b>						
NCC Scenic Driveway/Prince of Wales	B (C) [B]	14 (22) [16]	WB (EB) [EB]	6 (9) [7]	A (A) [A]	-
Road E/Prince of Wales <sub>1</sub>	B (B) [B]	11 (16) [13]	EB (EB) [EB]	4 (4) [4]	A (A) [A]	-

Note: Analysis of intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane; 1. Option as signals or roundabout

Lanes, Volumes, Timings  
10: Carling & Parkdale

2028 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø10
Lane Configurations							
Traffic Volume (vph)	141	1068	497	93	122	103	
Future Volume (vph)	141	1068	497	93	122	103	
Satd. Flow (prot)	1695	3390	3390	1517	1610	0	
Flt Permitted	0.950				0.974		
Satd. Flow (perm)	1597	3390	3390	1273	1592	0	
Satd. Flow (RTOR)				93	36		
Lane Group Flow (vph)	141	1068	497	93	225	0	
Turn Type	Prot	NA	NA	Perm	Perm		
Protected Phases	5	2	6				10
Permitted Phases				6	4		
Detector Phase	5	2	6	6	4		
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		1.0
Minimum Split (s)	11.1	26.7	26.7	26.7	37.2		5.0
Total Split (s)	40.0	73.0	33.0	33.0	47.0		5.0
Total Split (%)	32.0%	58.4%	26.4%	26.4%	37.6%		4%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.0		2.0
All-Red Time (s)	2.4	1.9	1.9	1.9	3.2		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.1	5.6	5.6	5.6	6.2		
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Min	C-Min	C-Min	None		Min
Act Effct Green (s)	15.8	85.0	63.2	63.2	20.7		
Actuated g/C Ratio	0.13	0.68	0.51	0.51	0.17		
v/c Ratio	0.66	0.46	0.29	0.13	0.77		
Control Delay	66.2	10.9	20.4	5.0	58.2		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	66.2	10.9	20.4	5.0	58.2		
LOS	E	B	C	A	E		
Approach Delay		17.3	17.9		58.2		
Approach LOS		B	B		E		
Queue Length 50th (m)	33.5	58.9	36.2	0.0	45.2		
Queue Length 95th (m)	52.1	89.6	59.8	10.5	67.3		
Internal Link Dist (m)		207.1	170.5		278.4		
Turn Bay Length (m)	155.0			80.0			
Base Capacity (vph)	459	2306	1713	689	543		
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	0.31	0.46	0.29	0.13	0.41		

Intersection Summary

Cycle Length: 125  
 Actuated Cycle Length: 125  
 Offset: 106 (85%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 22.1

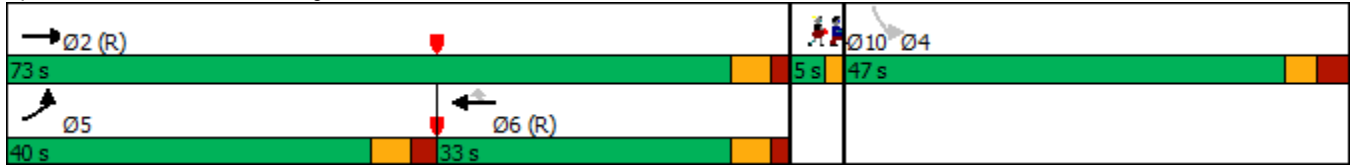
Intersection LOS: C

Intersection Capacity Utilization 59.1%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 10: Carling & Parkdale



Lanes, Volumes, Timings  
11: Carling & Civic

2028 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	50	1118	601	28	24	12
Future Volume (vph)	50	1118	601	28	24	12
Satd. Flow (prot)	1695	3390	3390	1517	1620	0
Flt Permitted	0.425				0.968	
Satd. Flow (perm)	745	3390	3390	1411	1575	0
Satd. Flow (RTOR)				28	12	
Lane Group Flow (vph)	50	1118	601	28	36	0
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		2	6			
Permitted Phases	2			6	4	
Detector Phase	2	2	6	6	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	31.3	31.3	31.3	31.3	23.3	
Total Split (s)	90.0	90.0	51.0	51.0	30.0	
Total Split (%)	75.0%	75.0%	42.5%	42.5%	25.0%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	
All-Red Time (s)	2.7	2.7	2.7	2.7	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.4	6.4	6.4	6.4	5.3	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	
Act Effct Green (s)	105.4	105.4	105.4	105.4	11.6	
Actuated g/C Ratio	0.88	0.88	0.88	0.88	0.10	
v/c Ratio	0.08	0.38	0.20	0.02	0.22	
Control Delay	2.9	3.1	0.6	0.0	39.1	
Queue Delay	0.0	0.2	0.0	0.0	0.0	
Total Delay	2.9	3.3	0.6	0.0	39.1	
LOS	A	A	A	A	D	
Approach Delay		3.3	0.6		39.1	
Approach LOS		A	A		D	
Queue Length 50th (m)	1.8	29.1	2.4	0.0	5.4	
Queue Length 95th (m)	6.0	54.0	4.6	0.0	14.6	
Internal Link Dist (m)		170.5	180.8		39.9	
Turn Bay Length (m)	90.0			140.0		
Base Capacity (vph)	654	2976	2976	1242	333	
Starvation Cap Reductn	0	898	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.08	0.54	0.20	0.02	0.11	

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated



Maximum v/c Ratio: 0.38

Intersection Signal Delay: 3.0

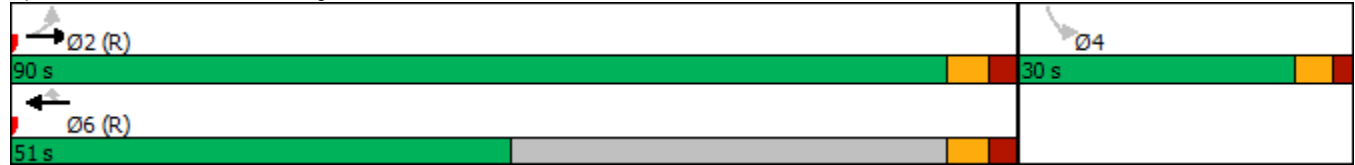
Intersection LOS: A

Intersection Capacity Utilization 55.1%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 11: Carling & Civic



Lanes, Volumes, Timings  
13: Maple/Old Irvine & Carling

2028 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	992	49	74	492	4	19	1	24	4	5	5
Future Volume (vph)	28	992	49	74	492	4	19	1	24	4	5	5
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	0	1589	0	0	1646	0
Flt Permitted	0.470			0.258				0.884			0.940	
Satd. Flow (perm)	807	3390	1323	453	3390	1361	0	1413	0	0	1561	0
Satd. Flow (RTOR)			40			40		24			5	
Lane Group Flow (vph)	28	992	49	74	492	4	0	44	0	0	14	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	35.0	35.0	35.0	34.3	34.3	34.3	42.4	42.4		42.4	42.4	
Total Split (s)	77.0	77.0	77.0	77.0	77.0	77.0	43.0	43.0		43.0	43.0	
Total Split (%)	64.2%	64.2%	64.2%	64.2%	64.2%	64.2%	35.8%	35.8%		35.8%	35.8%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	4.4	4.4		4.4	4.4	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.7		7.4			7.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	86.5	86.5	86.5	86.5	86.5	86.5		25.0			25.0	
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.72	0.72		0.21			0.21	
v/c Ratio	0.05	0.41	0.05	0.23	0.20	0.00		0.14			0.04	
Control Delay	9.7	10.2	3.9	13.3	9.1	0.0		18.8			24.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	9.7	10.2	3.9	13.3	9.1	0.0		18.8			24.1	
LOS	A	B	A	B	A	A		B			C	
Approach Delay		9.9			9.6			18.8			24.1	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	2.6	64.4	0.7	8.3	28.3	0.0		3.4			1.5	
Queue Length 95th (m)	6.5	79.3	5.5	18.1	37.7	m0.0		12.3			6.5	
Internal Link Dist (m)		236.1			191.5			174.3			220.8	
Turn Bay Length (m)	20.0		15.0	45.0		25.0						
Base Capacity (vph)	581	2444	965	326	2444	992		436			466	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.05	0.41	0.05	0.23	0.20	0.00		0.10			0.03	

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 75 (63%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.41

Intersection Signal Delay: 10.2

Intersection LOS: B

Intersection Capacity Utilization 75.6%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 13: Maple/Old Irvine & Carling



Lanes, Volumes, Timings  
15: Carling & Sherwood

2028 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↗	↗↗	↗↗	↗	↘	↘
Traffic Volume (vph)	31	927	595	146	177	5
Future Volume (vph)	31	927	595	146	177	5
Satd. Flow (prot)	1695	3390	3390	1517	1695	1517
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1488	3390	3390	1094	1668	1472
Satd. Flow (RTOR)				146		4
Lane Group Flow (vph)	31	927	595	146	177	5
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.3	25.1	25.1	25.1	25.1	25.1
Total Split (s)	13.0	79.0	66.0	66.0	41.0	41.0
Total Split (%)	10.8%	65.8%	55.0%	55.0%	34.2%	34.2%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	7.7	91.3	82.8	82.8	18.1	18.1
Actuated g/C Ratio	0.06	0.76	0.69	0.69	0.15	0.15
v/c Ratio	0.29	0.36	0.25	0.18	0.71	0.02
Control Delay	63.5	4.8	6.8	1.0	62.8	26.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.5	4.8	6.8	1.0	62.8	26.6
LOS	E	A	A	A	E	C
Approach Delay		6.7	5.7		61.8	
Approach LOS		A	A		E	
Queue Length 50th (m)	7.2	25.7	24.0	0.0	40.1	0.2
Queue Length 95th (m)	17.0	40.8	26.2	2.5	59.9	3.6
Internal Link Dist (m)		118.3	141.7		152.1	
Turn Bay Length (m)	30.0			90.0		15.0
Base Capacity (vph)	118	2578	2338	800	496	440
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.36	0.25	0.18	0.36	0.01

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 112 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings  
 15: Carling & Sherwood

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 11.6

Intersection LOS: B

Intersection Capacity Utilization 47.4%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 15: Carling & Sherwood



Lanes, Volumes, Timings  
16: Road A/Champagne & Carling

2028 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	110	807	174	180	677	67	62	0	69	176	0	90
Future Volume (vph)	110	807	174	180	677	67	62	0	69	176	0	90
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1695	1414	0	1695	1456	0
Flt Permitted	0.950			0.950			0.699			0.712		
Satd. Flow (perm)	1504	3390	1370	1665	3390	1058	1216	1414	0	1206	1456	0
Satd. Flow (RTOR)						111					352	
Lane Group Flow (vph)	110	807	174	180	677	67	62	69	0	176	90	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases			2			6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.3	26.3	26.3	10.3	26.3	26.3	18.3	18.3		32.9	32.9	
Total Split (s)	16.0	32.0	32.0	38.0	59.0	59.0	35.0	35.0		35.0	35.0	
Total Split (%)	13.3%	26.7%	26.7%	31.7%	49.2%	49.2%	29.2%	29.2%		29.2%	29.2%	
Yellow Time (s)	3.3	3.7	3.7	3.3	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	1.6	1.6	2.0	1.6	1.6	2.0	2.0		2.6	2.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3		5.9	5.9	
Lead/Lag	Lead			Lead								
Lead-Lag Optimize?	Yes			Yes								
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	12.0	60.8	60.8	18.1	67.3	67.3	22.8	22.8		22.2	22.2	
Actuated g/C Ratio	0.10	0.51	0.51	0.15	0.56	0.56	0.19	0.19		0.18	0.18	
v/c Ratio	0.65	0.47	0.25	0.71	0.36	0.10	0.27	0.26		0.79	0.16	
Control Delay	63.7	26.7	25.1	75.4	8.1	1.0	42.4	41.8		70.3	0.6	
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0		0.0	0.0	
Total Delay	63.7	26.7	25.1	75.4	8.2	1.0	42.4	41.8		70.3	0.6	
LOS	E	C	C	E	A	A	D	D		E	A	
Approach Delay		30.2			20.8			42.1			46.7	
Approach LOS		C			C			D			D	
Queue Length 50th (m)	24.6	69.6	26.0	40.0	9.7	0.0	12.5	13.9		39.7	0.0	
Queue Length 95th (m)	#53.4	118.7	55.1	45.5	72.4	3.3	23.7	25.5		61.2	0.0	
Internal Link Dist (m)		141.7			98.6			63.9			477.2	
Turn Bay Length (m)	55.0		75.0	61.0		35.0				30.0		
Base Capacity (vph)	176	1716	693	461	1901	642	300	349		292	619	
Starvation Cap Reductn	0	0	0	0	409	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.63	0.47	0.25	0.39	0.45	0.10	0.21	0.20		0.60	0.15	

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

Lane Group	Ø9	Ø10	Ø11
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	9	10	11
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0
Total Split (s)	10.0	5.0	5.0
Total Split (%)	8%	4%	4%
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	
Recall Mode	None	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Lanes, Volumes, Timings  
 16: Road A/Champagne & Carling

2028 AM Demand Rationalized Main Hospital SPA

10/18/2022

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 29.0

Intersection LOS: C

Intersection Capacity Utilization 67.5%

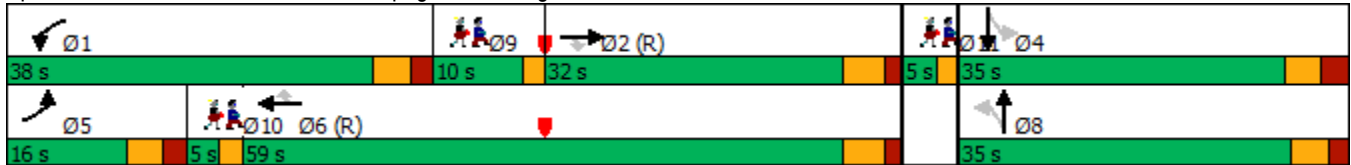
ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 16: Road A/Champagne & Carling

















Lanes, Volumes, Timings  
17: Carling & Trillium MUP

2028 AM Demand Rationalized Main Hospital SPA

10/18/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑							
Traffic Volume (vph)	0	969	0	0	1027	0	0	0	0	0	0	0
Future Volume (vph)	0	969	0	0	1027	0	0	0	0	0	0	0
Satd. Flow (prot)	0	3390	0	0	3390	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3390	0	0	3390	0	0	0	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	969	0	0	1027	0	0	0	0	0	0	0
Turn Type		NA			NA							
Protected Phases		2			6							
Permitted Phases												
Detector Phase		2			6							
Switch Phase												
Minimum Initial (s)		10.0			10.0							
Minimum Split (s)		31.3			31.3							
Total Split (s)		84.0			84.0							
Total Split (%)		70.0%			70.0%							
Yellow Time (s)		3.7			3.7							
All-Red Time (s)		1.4			1.4							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		5.1			5.1							
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Min			C-Min							
Act Effct Green (s)		87.4			87.4							
Actuated g/C Ratio		0.73			0.73							
v/c Ratio		0.39			0.42							
Control Delay		6.5			9.1							
Queue Delay		0.1			0.8							
Total Delay		6.6			9.9							
LOS		A			A							
Approach Delay		6.6			9.9							
Approach LOS		A			A							
Queue Length 50th (m)		35.5			56.7							
Queue Length 95th (m)		35.0			70.2							
Internal Link Dist (m)		98.6			92.8			53.0			60.9	
Turn Bay Length (m)												
Base Capacity (vph)		2470			2470							
Starvation Cap Reductn		355			1025							
Spillback Cap Reductn		0			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.46			0.71							
<b>Intersection Summary</b>												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 70												
Control Type: Actuated-Coordinated												

Lane Group	Ø4	Ø8
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	4	8
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	35.6	35.6
Total Split (s)	36.0	36.0
Total Split (%)	30%	30%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	3.6	3.6
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

Lanes, Volumes, Timings  
 17: Carling & Trillium MUP

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 8.3

Intersection LOS: A

Intersection Capacity Utilization 34.2%

ICU Level of Service A

Analysis Period (min) 15

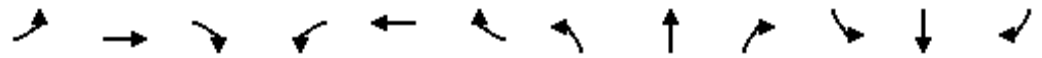
Splits and Phases: 17: Carling & Trillium MUP

 Ø2 (R) 84 s	 Ø4 36 s
 Ø6 (R) 84 s	 Ø8 36 s

Lanes, Volumes, Timings  
18: Preston & Carling

2028 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	141	732	208	233	507	86	199	462	266	110	250	75
Future Volume (vph)	141	732	208	233	507	86	199	462	266	110	250	75
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1695	3168	0	1695	1679	0
Flt Permitted	0.950			0.950			0.201			0.375		
Satd. Flow (perm)	1584	3390	1517	1647	3390	1272	350	3168	0	665	1679	0
Satd. Flow (RTOR)						193					11	
Lane Group Flow (vph)	141	732	208	233	507	86	199	728	0	110	325	0
Turn Type	Prot	NA	custom	Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	9 2	9 3	1	6		3	8				4
Permitted Phases						6	8			4		
Detector Phase	5	9 2	9 3	1	6	6	3	8		4		4
Switch Phase												
Minimum Initial (s)	5.0			5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2			11.2	30.0	30.0	11.9	43.9		38.9	38.9	
Total Split (s)	23.5			31.0	41.6	41.6	16.0	54.9		38.9	38.9	
Total Split (%)	18.1%			23.8%	32.0%	32.0%	12.3%	42.2%		29.9%	29.9%	
Yellow Time (s)	3.7			3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5			2.5	2.3	2.3	3.6	3.6		3.6	3.6	
Lost Time Adjust (s)	0.0			0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2			6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead			Lead			Lead					
Lead-Lag Optimize?	Yes			Yes			Yes					
Recall Mode	None			None	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	14.8	39.5	19.5	21.7	41.5	41.5	49.8	45.8		29.8	29.8	
Actuated g/C Ratio	0.11	0.30	0.15	0.17	0.32	0.32	0.38	0.35		0.23	0.23	
v/c Ratio	0.73	0.71	0.92	0.83	0.47	0.16	0.88	0.65		0.72	0.83	
Control Delay	76.9	46.6	96.3	75.3	39.2	0.6	88.6	64.3		72.7	63.9	
Queue Delay	0.0	2.3	0.0	0.5	0.0	0.0	0.0	0.0		0.0	0.1	
Total Delay	76.9	48.8	96.3	75.8	39.2	0.6	88.6	64.3		72.7	64.0	
LOS	E	D	F	E	D	A	F	E		E	E	
Approach Delay		61.6			45.5			69.5			66.2	
Approach LOS		E			D			E			E	
Queue Length 50th (m)	35.1	92.6	53.5	57.5	58.6	0.0	47.4	92.8		25.6	75.5	
Queue Length 95th (m)	57.0	#119.1	#100.7	#89.1	76.3	0.0	#87.5	119.4		#52.8	#116.1	
Internal Link Dist (m)		92.8			165.9			145.6			55.2	
Turn Bay Length (m)	70.0		90.0	120.0		95.0				35.0		
Base Capacity (vph)	225	1029	227	323	1083	537	227	1169		163	421	
Starvation Cap Reductn	0	173	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	8	0	0	0	0		0	2	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.63	0.86	0.92	0.74	0.47	0.16	0.88	0.62		0.67	0.78	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 116 (89%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 115  
 Control Type: Actuated-Coordinated

Lane Group	Ø2	Ø9	Ø10	Ø11	Ø12
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Satd. Flow (RTOR)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	2	9	10	11	12
Permitted Phases					
Detector Phase					
Switch Phase					
Minimum Initial (s)	10.0	1.0	1.0	1.0	1.0
Minimum Split (s)	30.0	7.0	5.0	5.0	5.0
Total Split (s)	30.1	9.0	5.0	5.0	5.0
Total Split (%)	23%	7%	4%	4%	4%
Yellow Time (s)	3.7	3.7	2.0	2.0	2.0
All-Red Time (s)	2.3	2.3	0.0	0.0	0.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes		Yes	Yes	
Recall Mode	C-Min	Min	None	None	None
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (m)					
Queue Length 95th (m)					
Internal Link Dist (m)					
Turn Bay Length (m)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					
Intersection Summary					

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 60.4

Intersection LOS: E

Intersection Capacity Utilization 93.6%

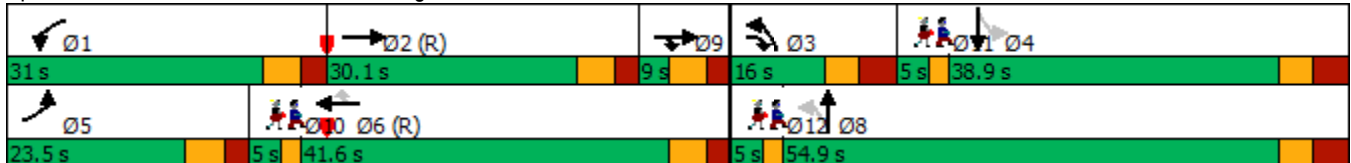
ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

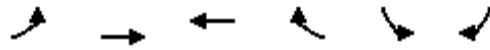
Splits and Phases: 18: Preston & Carling



Lanes, Volumes, Timings  
20: Carling & Booth

2028 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗↗	↖	↗	↘	↙
Traffic Volume (vph)	347	967	636	184	209	166
Future Volume (vph)	347	967	636	184	209	166
Satd. Flow (prot)	1695	3390	1784	1517	1695	1517
Flt Permitted	0.135				0.950	
Satd. Flow (perm)	241	3390	1784	1197	1658	1187
Satd. Flow (RTOR)				65		163
Lane Group Flow (vph)	347	967	636	184	209	166
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	29.7	29.7	29.7	39.0	39.0
Total Split (s)	34.0	81.0	47.0	47.0	39.0	39.0
Total Split (%)	28.3%	67.5%	39.2%	39.2%	32.5%	32.5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	79.1	79.3	50.2	50.2	29.0	29.0
Actuated g/C Ratio	0.66	0.66	0.42	0.42	0.24	0.24
v/c Ratio	0.79	0.43	0.85	0.34	0.52	0.40
Control Delay	34.7	11.3	47.1	20.0	43.3	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	11.3	47.1	20.0	43.3	8.5
LOS	C	B	D	B	D	A
Approach Delay		17.4	41.0		27.9	
Approach LOS		B	D		C	
Queue Length 50th (m)	49.9	58.2	145.6	19.8	40.9	0.5
Queue Length 95th (m)	83.0	72.2	#230.3	40.8	64.0	17.2
Internal Link Dist (m)		100.4	299.3		220.7	
Turn Bay Length (m)	50.0			30.0		30.0
Base Capacity (vph)	499	2239	746	538	455	444
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.43	0.85	0.34	0.46	0.37

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 116 (97%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 26.7

Intersection LOS: C

Intersection Capacity Utilization 97.0%

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: 20: Carling & Booth





Lanes, Volumes, Timings  
21: Bronson & Carling/Glebe

2028 AM Demand Rationalized Main Hospital SPA

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	497	106	587	0	0	0	576	854	18	0	649	197
Future Volume (vph)	497	106	587	0	0	0	576	854	18	0	649	197
Satd. Flow (prot)	1610	1646	1517	0	0	0	3288	1773	0	0	3223	0
Flt Permitted	0.950	0.971					0.950					
Satd. Flow (perm)	1520	1591	1274	0	0	0	3197	1773	0	0	3223	0
Satd. Flow (RTOR)			177					2			37	
Lane Group Flow (vph)	343	260	587	0	0	0	576	872	0	0	846	0
Turn Type	Perm	NA	pm+ov				Prot	NA			NA	
Protected Phases		4	5				5	2			6	
Permitted Phases	4		4									
Detector Phase	4	4	5				5	2			6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0				10.0	10.0			10.0	
Minimum Split (s)	31.0	31.0	16.0				16.0	25.1			33.0	
Total Split (s)	31.0	31.0	33.0				33.0	79.0			46.0	
Total Split (%)	26.5%	26.5%	28.2%				28.2%	67.5%			39.3%	
Yellow Time (s)	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	
Lost Time Adjust (s)	0.0	0.0	0.0				0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0	6.0				6.0	6.0			6.0	
Lead/Lag			Lead				Lead				Lag	
Lead-Lag Optimize?			Yes				Yes				Yes	
Recall Mode	None	None	None				None	C-Min			C-Min	
Act Effct Green (s)	29.8	29.8	54.9				25.1	67.8			36.7	
Actuated g/C Ratio	0.25	0.25	0.47				0.21	0.58			0.31	
v/c Ratio	0.89	0.64	0.79				0.82	0.85			0.82	
Control Delay	68.4	48.8	25.9				53.9	29.1			42.5	
Queue Delay	0.0	0.0	0.0				0.0	0.0			0.0	
Total Delay	68.4	48.8	25.9				53.9	29.1			42.5	
LOS	E	D	C				D	C			D	
Approach Delay		43.1						39.0			42.5	
Approach LOS		D						D			D	
Queue Length 50th (m)	80.9	56.7	65.8				63.8	152.9			91.4	
Queue Length 95th (m)	#150.1	#98.5	#117.0				83.6	195.7			109.7	
Internal Link Dist (m)		74.7			115.0			394.4			328.4	
Turn Bay Length (m)	40.0						50.0					
Base Capacity (vph)	387	405	765				758	1106			1126	
Starvation Cap Reductn	0	0	0				0	0			0	
Spillback Cap Reductn	0	0	0				0	0			0	
Storage Cap Reductn	0	0	0				0	0			0	
Reduced v/c Ratio	0.89	0.64	0.77				0.76	0.79			0.75	

Intersection Summary

Cycle Length: 117  
 Actuated Cycle Length: 117  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

Lane Group	Ø10
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	7.0
Total Split (s)	7.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings  
 21: Bronson & Carling/Glebe

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 41.2

Intersection LOS: D

Intersection Capacity Utilization 82.8%

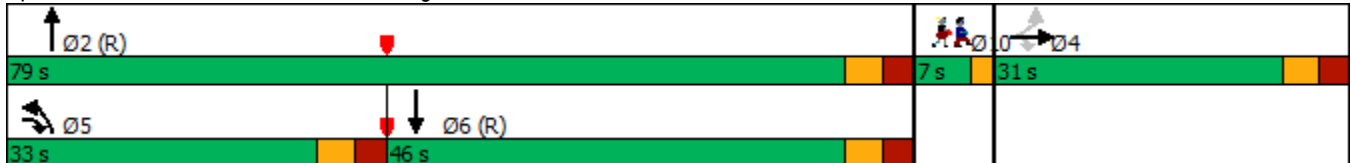
ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 21: Bronson & Carling/Glebe



Lanes, Volumes, Timings  
22: Parkdale & 417 WB on/off

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	260	0	515	171	329	0	0	431	226
Future Volume (vph)	0	0	0	260	0	515	171	329	0	0	431	226
Satd. Flow (prot)	0	0	0	1695	1481	0	1695	1784	0	0	1662	0
Flt Permitted				0.950			0.265					
Satd. Flow (perm)	0	0	0	1695	1481	0	473	1784	0	0	1662	0
Satd. Flow (RTOR)					482						35	
Lane Group Flow (vph)	0	0	0	260	515	0	171	329	0	0	657	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				29.0	29.0		10.3	27.3			25.1	
Total Split (s)				34.0	34.0		14.0	66.0			52.0	
Total Split (%)				34.0%	34.0%		14.0%	66.0%			52.0%	
Yellow Time (s)				3.3	3.3		3.0	3.0			3.0	
All-Red Time (s)				2.2	2.2		2.2	3.3			3.3	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				5.5	5.5		5.2	6.3			6.3	
Lead/Lag							Lag				Lead	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				None	None		None	C-Min			C-Min	
Act Effct Green (s)				21.0	21.0		68.3	67.2			52.2	
Actuated g/C Ratio				0.21	0.21		0.68	0.67			0.52	
v/c Ratio				0.73	0.75		0.39	0.27			0.74	
Control Delay				48.3	11.5		14.1	7.3			25.7	
Queue Delay				0.0	0.0		11.4	1.4			5.7	
Total Delay				48.3	11.5		25.5	8.7			31.5	
LOS				D	B		C	A			C	
Approach Delay					23.8			14.4			31.5	
Approach LOS					C			B			C	
Queue Length 50th (m)				47.1	5.2		11.4	23.2			97.4	
Queue Length 95th (m)				67.1	34.9		21.2	42.9			#170.6	
Internal Link Dist (m)		157.5			140.3			45.3			171.5	
Turn Bay Length (m)												
Base Capacity (vph)				483	766		447	1198			884	
Starvation Cap Reductn				0	0		244	665			0	
Spillback Cap Reductn				0	0		0	0			172	
Storage Cap Reductn				0	0		0	0			0	
Reduced v/c Ratio				0.54	0.67		0.84	0.62			0.92	

Intersection Summary

Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 69 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 24.0

Intersection LOS: C

Intersection Capacity Utilization 120.1%

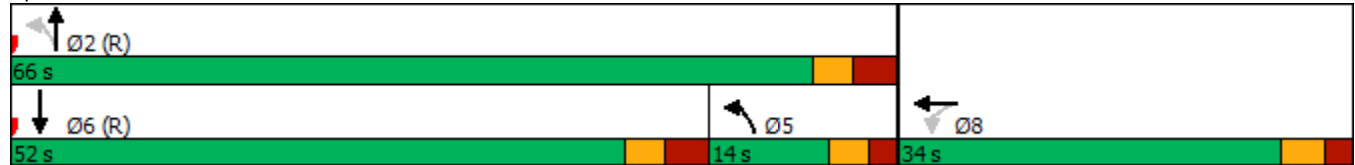
ICU Level of Service H

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 22: Parkdale & 417 WB on/off



Lanes, Volumes, Timings  
23: Parkdale & 417 EB on/off

2028 AM Demand Rationalized Main Hospital SPA

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗					↕↗		↖	↖	
Traffic Volume (vph)	210	0	165	0	0	0	0	294	394	417	279	0
Future Volume (vph)	210	0	165	0	0	0	0	294	394	417	279	0
Satd. Flow (prot)	0	1695	1517	0	0	0	0	2918	0	1695	1784	0
Flt Permitted		0.950								0.278		
Satd. Flow (perm)	0	1692	1474	0	0	0	0	2918	0	487	1784	0
Satd. Flow (RTOR)			165					372				
Lane Group Flow (vph)	0	210	165	0	0	0	0	688	0	417	279	0
Turn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0					10.0		5.0	10.0	
Minimum Split (s)	25.1	25.1	25.1					25.1		10.3	25.1	
Total Split (s)	34.0	34.0	34.0					40.0		26.0	66.0	
Total Split (%)	34.0%	34.0%	34.0%					40.0%		26.0%	66.0%	
Yellow Time (s)	3.3	3.3	3.3					3.0		3.0	3.0	
All-Red Time (s)	2.6	2.6	2.6					2.8		2.3	2.8	
Lost Time Adjust (s)		0.0	0.0					0.0		0.0	0.0	
Total Lost Time (s)		5.9	5.9					5.8		5.3	5.8	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None	None					C-Min		None	C-Min	
Act Effct Green (s)		17.7	17.7					43.0		71.1	70.6	
Actuated g/C Ratio		0.18	0.18					0.43		0.71	0.71	
v/c Ratio		0.70	0.42					0.47		0.68	0.22	
Control Delay		50.9	8.5					14.7		21.0	8.6	
Queue Delay		0.0	0.0					0.2		56.9	2.5	
Total Delay		50.9	8.5					14.8		77.9	11.1	
LOS		D	A					B		E	B	
Approach Delay		32.3						14.8			51.1	
Approach LOS		C						B			D	
Queue Length 50th (m)		38.7	0.0					24.3		49.8	25.4	
Queue Length 95th (m)		57.8	15.5					51.9		76.3	m45.1	
Internal Link Dist (m)		109.8			145.0			90.1			45.3	
Turn Bay Length (m)			75.0									
Base Capacity (vph)		475	532					1493		634	1259	
Starvation Cap Reductn		0	0					217		296	843	
Spillback Cap Reductn		0	0					44		0	0	
Storage Cap Reductn		0	0					0		0	0	
Reduced v/c Ratio		0.44	0.31					0.54		1.23	0.67	

**Intersection Summary**  
 Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 53 (53%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 32.9

Intersection LOS: C

Intersection Capacity Utilization 120.1%

ICU Level of Service H

Analysis Period (min) 15

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

Splits and Phases: 23: Parkdale & 417 EB on/off



Lanes, Volumes, Timings  
24: Parkdale & Sherwood

2028 AM Demand Rationalized Main Hospital SPA

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	91	2	8	0	0	132	8	394	12	109	368	61
Future Volume (vph)	91	2	8	0	0	132	8	394	12	109	368	61
Satd. Flow (prot)	0	1665	0	0	1441	0	0	1769	0	0	1726	0
Flt Permitted		0.551						0.991			0.835	
Satd. Flow (perm)	0	954	0	0	1441	0	0	1754	0	0	1441	0
Satd. Flow (RTOR)		4			537			5			20	
Lane Group Flow (vph)	0	101	0	0	132	0	0	414	0	0	538	0
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	18.0	18.0		18.0	18.0		25.1	25.1		25.1	25.1	
Total Split (s)	18.0	18.0		18.0	18.0		82.0	82.0		82.0	82.0	
Total Split (%)	18.0%	18.0%		18.0%	18.0%		82.0%	82.0%		82.0%	82.0%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.0			4.0			5.6			5.6	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Ped	Ped		Ped	Ped		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		16.4			16.4			74.0			74.0	
Actuated g/C Ratio		0.16			0.16			0.74			0.74	
v/c Ratio		0.63			0.19			0.32			0.50	
Control Delay		54.9			0.6			5.5			7.8	
Queue Delay		0.0			0.0			0.0			0.5	
Total Delay		54.9			0.6			5.5			8.3	
LOS		D			A			A			A	
Approach Delay		54.9			0.6			5.5			8.3	
Approach LOS		D			A			A			A	
Queue Length 50th (m)		18.0			0.0			21.0			38.2	
Queue Length 95th (m)		33.3			0.0			42.0			45.9	
Internal Link Dist (m)		221.3			335.0			289.1			90.1	
Turn Bay Length (m)												
Base Capacity (vph)		160			685			1341			1105	
Starvation Cap Reductn		0			0			0			224	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.63			0.19			0.31			0.61	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 25 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated



Maximum v/c Ratio: 0.63

Intersection Signal Delay: 10.5

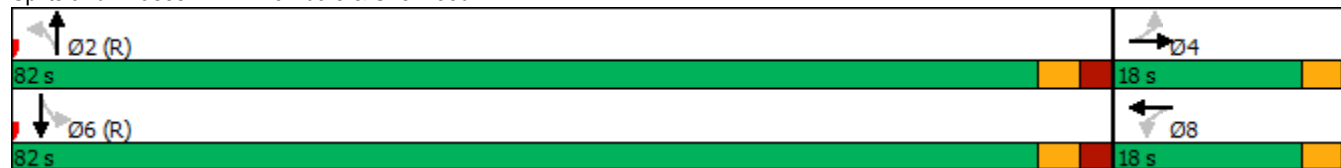
Intersection LOS: B

Intersection Capacity Utilization 93.3%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 24: Parkdale & Sherwood



Lanes, Volumes, Timings  
25: Parkdale & Ruskin

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗			↕			↕	
Traffic Volume (vph)	24	63	11	11	9	86	5	273	20	43	214	21
Future Volume (vph)	24	63	11	11	9	86	5	273	20	43	214	21
Satd. Flow (prot)	0	1714	0	1695	1468	0	0	1761	0	0	1747	0
Flt Permitted		0.895		0.716				0.996			0.920	
Satd. Flow (perm)	0	1541	0	1184	1468	0	0	1755	0	0	1616	0
Satd. Flow (RTOR)		6			86			10			11	
Lane Group Flow (vph)	0	98	0	11	95	0	0	298	0	0	278	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	19.4	19.4		19.4	19.4		31.8	31.8		31.8	31.8	
Total Split (s)	20.0	20.0		20.0	20.0		65.0	65.0		65.0	65.0	
Total Split (%)	23.5%	23.5%		23.5%	23.5%		76.5%	76.5%		76.5%	76.5%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.4	2.4		2.4	2.4		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.4		5.4	5.4			5.8			5.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		13.3		13.3	13.3			64.7			64.7	
Actuated g/C Ratio		0.16		0.16	0.16			0.76			0.76	
v/c Ratio		0.40		0.06	0.31			0.22			0.23	
Control Delay		35.0		30.8	11.9			4.5			4.5	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		35.0		30.8	11.9			4.5			4.5	
LOS		D		C	B			A			A	
Approach Delay		35.0			13.9			4.5			4.5	
Approach LOS		D			B			A			A	
Queue Length 50th (m)		13.4		1.5	1.3			14.0			13.0	
Queue Length 95th (m)		27.4		5.9	13.5			23.3			22.1	
Internal Link Dist (m)		220.6			228.6			278.4			289.1	
Turn Bay Length (m)				40.0								
Base Capacity (vph)		269		203	323			1339			1233	
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		0.36		0.05	0.29			0.22			0.23	

Intersection Summary

Cycle Length: 85

Actuated Cycle Length: 85

Offset: 45 (53%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 9.6

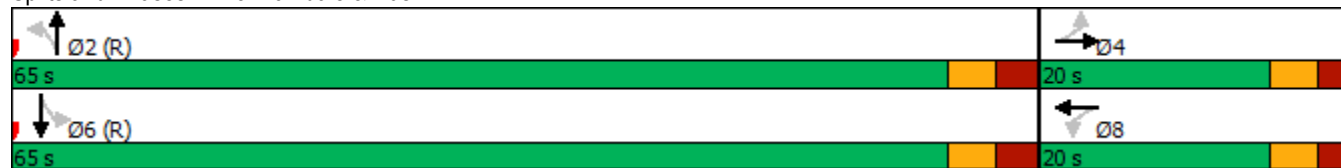
Intersection LOS: A

Intersection Capacity Utilization 62.5%

ICU Level of Service B

Analysis Period (min) 15

























Splits and Phases: 25: Parkdale & Ruskin



Lanes, Volumes, Timings  
30: Prince of Wales & Preston

2028 AM Demand Rationalized Main Hospital SPA

10/18/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 			 				 			 	
Traffic Volume (vph)	743	265	1	0	225	321	0	2	1	241	1	583
Future Volume (vph)	743	265	1	0	225	321	0	2	1	241	1	583
Satd. Flow (prot)	3288	1782	0	1784	1784	1517	0	1633	0	0	1700	1517
Flt Permitted	0.950		0.726									
Satd. Flow (perm)	3221	1782	0	1784	1784	1483	0	1633	0	0	1203	1417
Satd. Flow (RTOR)							273					
Lane Group Flow (vph)	743	266	0	0	225	321	0	3	0	0	242	583
Turn Type	Prot	NA		Prot	NA	Free		NA		custom	NA	custom
Protected Phases	5	2		1	6			8		11	4 11	5
Permitted Phases							Free	8		4		
Detector Phase	5	2		1	6		8	8		11	4 11	5
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0		10.0		5.0
Minimum Split (s)	11.1	27.1		10.3	27.1		23.5	23.5		20.0		11.1
Total Split (s)	50.9	69.9		10.3	29.3		24.8	24.8		20.0		50.9
Total Split (%)	39.2%	53.8%		7.9%	22.5%		19.1%	19.1%		15.4%		39.2%
Yellow Time (s)	3.7	3.7		3.3	3.7		3.3	3.3		2.0		3.7
All-Red Time (s)	2.4	2.4		2.0	2.4		2.2	2.2		0.0		2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0				0.0
Total Lost Time (s)	6.1	6.1		5.3	6.1			5.5				6.1
Lead/Lag	Lead			Lead				Lead				
Lead-Lag Optimize?	Yes			Yes				Yes				
Recall Mode	None	C-Min		None	C-Min		None	None		None		None
Act Effct Green (s)	43.3	83.4			34.5	130.0		13.5			28.0	56.2
Actuated g/C Ratio	0.33	0.64			0.27	1.00		0.10			0.22	0.43
v/c Ratio	0.68	0.23			0.48	0.22		0.02			0.77	0.90
Control Delay	40.4	12.9			47.7	0.3		49.0			60.4	37.5
Queue Delay	0.0	0.0			0.0	0.0		0.0			0.0	0.4
Total Delay	40.4	12.9			47.7	0.3		49.0			60.4	37.9
LOS	D	B			D	A		D			E	D
Approach Delay	33.1		19.8				49.0					
Approach LOS	C		B				D					
Queue Length 50th (m)	70.9	20.6			52.8	0.0		0.7			52.3	78.6
Queue Length 95th (m)	118.9	69.4			#83.6	0.0		3.6			m69.4	m112.9
Internal Link Dist (m)	79.9		173.8				12.4					
Turn Bay Length (m)	45.0					45.0						
Base Capacity (vph)	1176	1143			472	1483		242			378	682
Starvation Cap Reductn	0	0			0	0		0			0	8
Spillback Cap Reductn	0	0			0	0		0			0	0
Storage Cap Reductn	0	0			0	0		0			0	0
Reduced v/c Ratio	0.63	0.23			0.48	0.22		0.01			0.64	0.86
<b>Intersection Summary</b>												
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 100												
Control Type: Actuated-Coordinated												

Lane Group	Ø4	Ø9	Ø10	Ø12
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	4	9	10	12
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	10.0	1.0	1.0	1.0
Minimum Split (s)	15.5	5.0	5.0	20.0
Total Split (s)	24.8	5.0	5.0	20.0
Total Split (%)	19%	4%	4%	15%
Yellow Time (s)	3.3	2.0	2.0	2.0
All-Red Time (s)	2.2	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				
Intersection Summary				

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 34.0

Intersection LOS: C

Intersection Capacity Utilization 83.9%

ICU Level of Service E

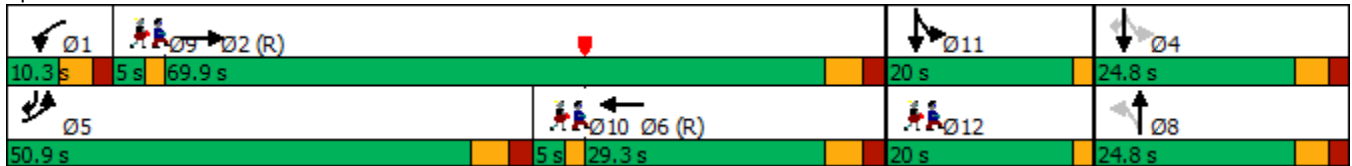
Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 30: Prince of Wales & Preston



Lanes, Volumes, Timings  
31: Rochester & 417 WB on/Raymond

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	200	131	102	163	320	0	0	142	233
Future Volume (vph)	0	0	0	200	131	102	163	320	0	0	142	233
Satd. Flow (prot)	0	0	0	1695	1621	0	1695	1784	0	0	1784	1517
Flt Permitted				0.950			0.533					
Satd. Flow (perm)	0	0	0	1678	1621	0	930	1784	0	0	1784	1436
Satd. Flow (RTOR)					67							233
Lane Group Flow (vph)	0	0	0	200	233	0	163	320	0	0	142	233
Turn Type				Perm	NA		pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8			2					6
Detector Phase				8	8		5	2			6	6
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	10.0
Minimum Split (s)				23.7	23.7		10.9	27.3			24.9	24.9
Total Split (s)				24.0	24.0		11.0	36.0			25.0	25.0
Total Split (%)				40.0%	40.0%		18.3%	60.0%			41.7%	41.7%
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	3.3
All-Red Time (s)				2.4	2.4		2.6	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)				5.7	5.7		5.9	5.9			5.9	5.9
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode				None	None		None	C-Min			C-Min	C-Min
Act Effct Green (s)				13.0	13.0		35.4	35.4			24.7	24.7
Actuated g/C Ratio				0.22	0.22		0.59	0.59			0.41	0.41
v/c Ratio				0.55	0.58		0.26	0.30			0.19	0.32
Control Delay				26.2	20.1		5.9	5.9			14.9	4.0
Queue Delay				0.0	0.0		0.0	0.2			0.0	0.0
Total Delay				26.2	20.1		5.9	6.2			14.9	4.0
LOS				C	C		A	A			B	A
Approach Delay					22.9			6.1			8.2	
Approach LOS					C			A			A	
Queue Length 50th (m)				20.0	16.2		7.6	15.3			10.4	0.0
Queue Length 95th (m)				32.7	30.5		11.8	21.2			23.0	12.5
Internal Link Dist (m)		122.0			89.8			72.3			151.7	
Turn Bay Length (m)												35.0
Base Capacity (vph)				511	540		639	1051			736	729
Starvation Cap Reductn				0	0		0	257			0	0
Spillback Cap Reductn				0	0		0	0			0	0
Storage Cap Reductn				0	0		0	0			0	0
Reduced v/c Ratio				0.39	0.43		0.26	0.40			0.19	0.32

**Intersection Summary**

Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 53 (88%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 12.3

Intersection LOS: B

Intersection Capacity Utilization 56.2%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 31: Rochester & 417 WB on/Raymond





Lanes, Volumes, Timings  
32: Rochester & 417 EB off/Orangeville

2028 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕						↕↕			↕↕	
Traffic Volume (vph)	165	222	304	0	0	0	0	314	47	19	316	0
Future Volume (vph)	165	222	304	0	0	0	0	314	47	19	316	0
Satd. Flow (prot)	0	3078	0	0	0	0	0	3307	0	0	3380	0
Flt Permitted		0.988									0.928	
Satd. Flow (perm)	0	3075	0	0	0	0	0	3307	0	0	3144	0
Satd. Flow (RTOR)		304						33				
Lane Group Flow (vph)	0	691	0	0	0	0	0	361	0	0	335	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Detector Phase	4	4						2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0						25.1		25.1	25.1	
Total Split (s)	30.0	30.0						30.0		30.0	30.0	
Total Split (%)	50.0%	50.0%						50.0%		50.0%	50.0%	
Yellow Time (s)	3.3	3.3						3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3						2.1		2.1	2.1	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.6						5.4			5.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None						C-Min		C-Min	C-Min	
Act Effct Green (s)		14.7						34.3			34.3	
Actuated g/C Ratio		0.24						0.57			0.57	
v/c Ratio		0.70						0.19			0.19	
Control Delay		14.9						7.2			7.9	
Queue Delay		0.0						0.0			0.0	
Total Delay		14.9						7.2			7.9	
LOS		B						A			A	
Approach Delay		14.9						7.2			7.9	
Approach LOS		B						A			A	
Queue Length 50th (m)		19.3						15.7			13.7	
Queue Length 95th (m)		29.9						m19.2			21.6	
Internal Link Dist (m)		104.8			107.2			99.1			72.3	
Turn Bay Length (m)												
Base Capacity (vph)		1430						1904			1797	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.48						0.19			0.19	
<b>Intersection Summary</b>												
Cycle Length: 60												
Actuated Cycle Length: 60												
Offset: 52 (87%), Referenced to phase 2:NBT and 6:SBTL, Start of Green												
Natural Cycle: 55												
Control Type: Actuated-Coordinated												

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 11.2

Intersection LOS: B

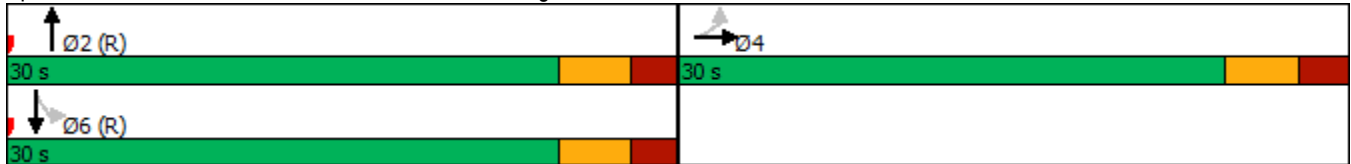
Intersection Capacity Utilization 59.6%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 32: Rochester & 417 EB off/Orangeville



Lanes, Volumes, Timings  
33: Bronson & Catherine 417 WB on

2028 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↔		↗	↕			↘	↗
Traffic Volume (vph)	0	0	0	596	515	329	493	1020	0	0	416	112
Future Volume (vph)	0	0	0	596	515	329	493	1020	0	0	416	112
Satd. Flow (prot)	0	0	0	1458	4239	0	1695	3390	0	0	3239	0
Flt Permitted				0.950	0.991		0.225					
Satd. Flow (perm)	0	0	0	1458	4239	0	396	3390	0	0	3239	0
Satd. Flow (RTOR)					56						33	
Lane Group Flow (vph)	0	0	0	405	1035	0	493	1020	0	0	528	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				25.9	25.9		11.0	25.1			25.1	
Total Split (s)				41.0	41.0		26.0	54.0			28.0	
Total Split (%)				43.2%	43.2%		27.4%	56.8%			29.5%	
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)				2.6	2.6		2.7	2.8			2.8	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				5.9	5.9		6.0	6.1			6.1	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				None	None		None	C-Min			C-Min	
Act Effct Green (s)				31.7	31.7		51.4	51.3			20.6	
Actuated g/C Ratio				0.33	0.33		0.54	0.54			0.22	
v/c Ratio				0.83	0.71		0.89	0.56			0.72	
Control Delay				44.6	28.7		43.4	20.5			38.8	
Queue Delay				4.2	0.1		13.5	4.0			0.0	
Total Delay				48.9	28.9		57.0	24.5			38.8	
LOS				D	C		E	C			D	
Approach Delay					34.5			35.1			38.8	
Approach LOS					C			D			D	
Queue Length 50th (m)				75.0	57.4		77.6	80.1			45.2	
Queue Length 95th (m)				#119.5	72.1		#136.5	107.5			61.3	
Internal Link Dist (m)		151.3			165.9			71.3			230.9	
Turn Bay Length (m)												
Base Capacity (vph)				538	1602		551	1831			777	
Starvation Cap Reductn				0	0		55	709			0	
Spillback Cap Reductn				75	72		0	0			1	
Storage Cap Reductn				0	0		0	0			0	
Reduced v/c Ratio				0.87	0.68		0.99	0.91			0.68	

Intersection Summary

Cycle Length: 95  
 Actuated Cycle Length: 95  
 Offset: 35 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 35.4

Intersection LOS: D

Intersection Capacity Utilization 112.0%

ICU Level of Service H

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 33: Bronson & Catherine 417 WB on





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	308	383	0	1284	1059	0
Future Volume (vph)	308	383	0	1284	1059	0
Satd. Flow (prot)	1695	1517	0	3390	3390	0
Flt Permitted	0.950					
Satd. Flow (perm)	1695	1474	0	3390	3390	0
Satd. Flow (RTOR)		115				
Lane Group Flow (vph)	308	383	0	1284	1059	0
Turn Type	Perm	Perm		NA	NA	
Protected Phases				2	6	
Permitted Phases	4	4				
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		10.0	10.0	
Minimum Split (s)	25.1	25.1		34.3	34.3	
Total Split (s)	30.0	30.0		65.0	65.0	
Total Split (%)	31.6%	31.6%		68.4%	68.4%	
Yellow Time (s)	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.1	2.1		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.4	5.4		5.8	5.8	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None		C-Min	C-Min	
Act Effct Green (s)	23.5	23.5		60.3	60.3	
Actuated g/C Ratio	0.25	0.25		0.63	0.63	
v/c Ratio	0.74	0.85		0.60	0.49	
Control Delay	43.2	41.1		12.5	6.8	
Queue Delay	0.6	0.0		0.2	0.6	
Total Delay	43.8	41.1		12.8	7.4	
LOS	D	D		B	A	
Approach Delay	42.3			12.8	7.4	
Approach LOS	D			B	A	
Queue Length 50th (m)	51.0	47.1		69.0	2.8	
Queue Length 95th (m)	76.1	#82.8		96.5	114.6	
Internal Link Dist (m)	81.4			50.7	71.3	
Turn Bay Length (m)		60.0				
Base Capacity (vph)	467	489		2209	2209	
Starvation Cap Reductn	0	0		0	712	
Spillback Cap Reductn	28	0		308	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.70	0.78		0.68	0.71	

**Intersection Summary**

Cycle Length: 95  
 Actuated Cycle Length: 95  
 Offset: 72 (76%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 17.7

Intersection LOS: B

Intersection Capacity Utilization 112.0%

ICU Level of Service H

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 34: Bronson & 417 EB off



Lanes, Volumes, Timings  
39: Prince of Wales & Road B

2028 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	55	918	612	55	41	26	
Future Volume (vph)	55	918	612	55	41	26	
Satd. Flow (prot)	1695	1784	3338	0	1695	1517	
Flt Permitted	0.364				0.950		
Satd. Flow (perm)	646	1784	3338	0	1634	1419	
Satd. Flow (RTOR)						26	
Lane Group Flow (vph)	55	918	667	0	41	26	
Turn Type	pm+pt	NA	NA		Perm	Perm	
Protected Phases	5	2	6				9
Permitted Phases	2				4	4	
Detector Phase	5	2	6		4	4	
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0		10.0	10.0	1.0
Minimum Split (s)	10.3	23.3	23.3		23.3	23.3	15.0
Total Split (s)	10.4	91.7	81.3		23.3	23.3	15.0
Total Split (%)	8.0%	70.5%	62.5%		17.9%	17.9%	12%
Yellow Time (s)	3.3	3.3	3.3		3.3	3.3	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3		5.3	5.3	
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	None	C-Min	C-Min		None	None	None
Act Effct Green (s)	107.9	108.9	99.6		11.6	11.6	
Actuated g/C Ratio	0.83	0.84	0.77		0.09	0.09	
v/c Ratio	0.09	0.61	0.26		0.28	0.17	
Control Delay	2.7	7.3	5.9		59.3	20.3	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	2.7	7.3	5.9		59.3	20.3	
LOS	A	A	A		E	C	
Approach Delay		7.0	5.9		44.2		
Approach LOS		A	A		D		
Queue Length 50th (m)	1.7	55.3	2.5		10.1	0.0	
Queue Length 95th (m)	3.0	213.9	m67.9		20.3	8.5	
Internal Link Dist (m)		198.2	95.9		17.7		
Turn Bay Length (m)	45.0						
Base Capacity (vph)	585	1494	2567		226	218	
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	0.09	0.61	0.26		0.18	0.12	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 8.0

Intersection LOS: A

Intersection Capacity Utilization 70.1%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 39: Prince of Wales & Road B

 Ø2 (R)	 Ø9	 Ø4
91.7 s	15 s	23.3 s
 Ø5	 Ø6 (R)	
10.4 s	81.3 s	



Lanes, Volumes, Timings  
40: Prince of Wales & Road E

2028 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	25	10	13	948	564	75	
Future Volume (vph)	25	10	13	948	564	75	
Satd. Flow (prot)	1544	1406	1601	3390	1784	1488	
Flt Permitted	0.950		0.950				
Satd. Flow (perm)	1544	1406	1574	3390	1784	1387	
Satd. Flow (RTOR)							
Lane Group Flow (vph)	25	10	13	948	564	75	
Turn Type	Perm	Perm	Prot	NA	NA	Perm	
Protected Phases			5	2	6		9
Permitted Phases	4	4				6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	1.0
Minimum Split (s)	23.3	23.3	10.3	23.3	23.3	23.3	10.0
Total Split (s)	25.0	25.0	12.0	95.0	83.0	83.0	10.0
Total Split (%)	19.2%	19.2%	9.2%	73.1%	63.8%	63.8%	8%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	11.6	11.6	6.7	114.0	108.8	108.8	
Actuated g/C Ratio	0.09	0.09	0.05	0.88	0.84	0.84	
v/c Ratio	0.18	0.08	0.16	0.32	0.38	0.06	
Control Delay	56.6	53.8	62.7	3.4	3.7	1.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	56.6	53.8	62.7	3.4	3.7	1.8	
LOS	E	D	E	A	A	A	
Approach Delay	55.8			4.2	3.5		
Approach LOS	E			A	A		
Queue Length 50th (m)	6.1	2.4	3.3	21.3	9.1	1.2	
Queue Length 95th (m)	14.2	7.6	10.0	58.5	71.8	4.6	
Internal Link Dist (m)	165.3			279.2	63.5		
Turn Bay Length (m)	45.0		50.0			50.0	
Base Capacity (vph)	233	213	88	2973	1493	1160	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.11	0.05	0.15	0.32	0.38	0.06	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 22 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 5.0

Intersection LOS: A

Intersection Capacity Utilization 48.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 40: Prince of Wales & Road E



Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗↗	↗↗	↘	↘↘	
Traffic Vol, veh/h	24	1135	580	5	14	20
Future Vol, veh/h	24	1135	580	5	14	20
Conflicting Peds, #/hr	40	0	0	40	3	9
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	25	-	-	20	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	1135	580	5	14	20

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	625	0	-	0	1239 339
Stage 1	-	-	-	-	620 -
Stage 2	-	-	-	-	619 -
Critical Hdwy	4.14	-	-	-	6.84 6.94
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.22	-	-	-	3.52 3.32
Pot Cap-1 Maneuver	952	-	-	-	168 657
Stage 1	-	-	-	-	499 -
Stage 2	-	-	-	-	499 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	920	-	-	-	153 630
Mov Cap-2 Maneuver	-	-	-	-	153 -
Stage 1	-	-	-	-	470 -
Stage 2	-	-	-	-	482 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	19.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	920	-	-	-	276
HCM Lane V/C Ratio	0.026	-	-	-	0.123
HCM Control Delay (s)	9	-	-	-	19.9
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑	↑		↑
Traffic Vol, veh/h	0	1205	615	260	0	151
Future Vol, veh/h	0	1205	615	260	0	151
Conflicting Peds, #/hr	36	0	0	36	1	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	30	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1205	615	260	0	151

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	-	0	-	0	653
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	3.319
Pot Cap-1 Maneuver	0	-	-	-	466
Stage 1	0	-	-	-	-
Stage 2	0	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	451
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.9
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	451
HCM Lane V/C Ratio	-	-	-	0.335
HCM Control Delay (s)	-	-	-	16.9
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	1.5

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻			↻			↻				↻
Traffic Vol, veh/h	0	946	4	3	680	76	0	0	1	0	0	5
Future Vol, veh/h	0	946	4	3	680	76	0	0	1	0	0	5
Conflicting Peds, #/hr	2	0	7	7	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	946	4	3	680	76	0	0	1	0	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	957	0	0	1682	1719	955	-	-	720
Stage 1	-	-	-	-	-	-	955	955	-	-	-	-
Stage 2	-	-	-	-	-	-	727	764	-	-	-	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	-	-	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	719	-	-	75	90	313	0	0	428
Stage 1	0	-	-	-	-	-	310	337	-	0	0	-
Stage 2	0	-	-	-	-	-	415	413	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	715	-	-	73	89	311	-	-	427
Mov Cap-2 Maneuver	-	-	-	-	-	-	73	89	-	-	-	-
Stage 1	-	-	-	-	-	-	310	335	-	-	-	-
Stage 2	-	-	-	-	-	-	407	409	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			16.6			13.5		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	311	-	-	715	-	-	427
HCM Lane V/C Ratio	0.003	-	-	0.004	-	-	0.012
HCM Control Delay (s)	16.6	-	-	10.1	0	-	13.5
HCM Lane LOS	C	-	-	B	A	-	B
HCM 95th %tile Q(veh)	0	-	-	0	-	-	0

Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	31	120	180	174	5	18	0	99	0	0	5
Future Vol, veh/h	0	31	120	180	174	5	18	0	99	0	0	5
Conflicting Peds, #/hr	10	0	10	10	0	10	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	31	120	180	174	5	18	0	99	0	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	189	0	0	161	0	0	548	650	86	563	708	100
Stage 1	-	-	-	-	-	-	101	101	-	547	547	-
Stage 2	-	-	-	-	-	-	447	549	-	16	161	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1382	-	-	1416	-	-	419	387	956	409	358	936
Stage 1	-	-	-	-	-	-	894	811	-	489	516	-
Stage 2	-	-	-	-	-	-	560	515	-	1001	764	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1370	-	-	1404	-	-	368	327	948	324	302	928
Mov Cap-2 Maneuver	-	-	-	-	-	-	368	327	-	324	302	-
Stage 1	-	-	-	-	-	-	887	805	-	485	439	-
Stage 2	-	-	-	-	-	-	478	438	-	896	758	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	4.1	10.6	8.9
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	763	1370	-	-	1404	-	-	928
HCM Lane V/C Ratio	0.153	-	-	-	0.128	-	-	0.005
HCM Control Delay (s)	10.6	0	-	-	7.9	0.2	-	8.9
HCM Lane LOS	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.5	0	-	-	0.4	-	-	0

Intersection						
Int Delay, s/veh	4.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑	↑		↑↑
Traffic Vol, veh/h	42	24	54	54	96	23
Future Vol, veh/h	42	24	54	54	96	23
Conflicting Peds, #/hr	0	0	0	15	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	0	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	24	54	54	96	23

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	273	69	0	0	123
Stage 1	69	-	-	-	-
Stage 2	204	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	705	994	-	-	1463
Stage 1	953	-	-	-	-
Stage 2	811	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	649	981	-	-	1444
Mov Cap-2 Maneuver	649	-	-	-	-
Stage 1	941	-	-	-	-
Stage 2	757	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	6.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	740	1444
HCM Lane V/C Ratio	-	-	0.089	0.066
HCM Control Delay (s)	-	-	10.3	7.7
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0.2

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	2	2	108	66	0
Future Vol, veh/h	0	2	2	108	66	0
Conflicting Peds, #/hr	0	0	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	100	100	100	2	2	100
Mvmt Flow	0	2	2	108	66	0

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	129	38	71	0	0
Stage 1	71	-	-	-	-
Stage 2	58	-	-	-	-
Critical Hdwy	8.8	8.9	6.1	-	-
Critical Hdwy Stg 1	7.8	-	-	-	-
Critical Hdwy Stg 2	7.8	-	-	-	-
Follow-up Hdwy	4.5	4.3	3.2	-	-
Pot Cap-1 Maneuver	632	780	1029	-	-
Stage 1	717	-	-	-	-
Stage 2	731	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	626	777	1025	-	-
Mov Cap-2 Maneuver	626	-	-	-	-
Stage 1	713	-	-	-	-
Stage 2	728	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1025	-	777	-	-
HCM Lane V/C Ratio	0.002	-	0.003	-	-
HCM Control Delay (s)	8.5	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-



Intersection						
Int Delay, s/veh	5.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	18	4	0	15	12
Future Vol, veh/h	0	18	4	0	15	12
Conflicting Peds, #/hr	0	10	10	0	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	18	4	0	15	12

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	28	0	37 29
Stage 1	-	-	-	-	19 -
Stage 2	-	-	-	-	18 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1585	-	975 1046
Stage 1	-	-	-	-	1004 -
Stage 2	-	-	-	-	1005 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1572	-	956 1028
Mov Cap-2 Maneuver	-	-	-	-	956 -
Stage 1	-	-	-	-	996 -
Stage 2	-	-	-	-	994 -

Approach	EB	WB	NB
HCM Control Delay, s	0	7.3	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	987	-	-	1572	-
HCM Lane V/C Ratio	0.027	-	-	0.003	-
HCM Control Delay (s)	8.8	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	42	107	16	2	77	80	3	5	2	66	65	20
Future Vol, veh/h	42	107	16	2	77	80	3	5	2	66	65	20
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	42	107	16	2	77	80	3	5	2	66	65	20
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.7	8.2	7.9	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	30%	25%	1%	44%
Vol Thru, %	50%	65%	48%	43%
Vol Right, %	20%	10%	50%	13%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	165	159	151
LT Vol	3	42	2	66
Through Vol	5	107	77	65
RT Vol	2	16	80	20
Lane Flow Rate	10	165	159	151
Geometry Grp	1	1	1	1
Degree of Util (X)	0.013	0.206	0.186	0.196
Departure Headway (Hd)	4.785	4.486	4.211	4.672
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	747	802	854	769
Service Time	2.82	2.507	2.232	2.698
HCM Lane V/C Ratio	0.013	0.206	0.186	0.196
HCM Control Delay	7.9	8.7	8.2	8.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.8	0.7	0.7

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	32	0	30	0	0	15	30	32	0	18	72	73
Future Vol, veh/h	32	0	30	0	0	15	30	32	0	18	72	73
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	32	0	30	0	0	15	30	32	0	18	72	73
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.6	6.9	7.7	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	48%	52%	0%	11%
Vol Thru, %	52%	0%	0%	44%
Vol Right, %	0%	48%	100%	45%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	62	62	15	163
LT Vol	30	32	0	18
Through Vol	32	0	0	72
RT Vol	0	30	15	73
Lane Flow Rate	62	62	15	163
Geometry Grp	1	1	1	1
Degree of Util (X)	0.074	0.071	0.016	0.175
Departure Headway (Hd)	4.289	4.145	3.878	3.867
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	828	850	928	921
Service Time	2.353	2.241	1.878	1.921
HCM Lane V/C Ratio	0.075	0.073	0.016	0.177
HCM Control Delay	7.7	7.6	6.9	7.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.2	0	0.6

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑	↘	
Traffic Vol, veh/h	96	17	102	90	23	55
Future Vol, veh/h	96	17	102	90	23	55
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	96	17	102	90	23	55
Number of Lanes	2	0	1	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	2
HCM Control Delay	7.9	8.6	7.7
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	29%	0%	0%	100%	0%
Vol Thru, %	0%	100%	65%	0%	100%
Vol Right, %	71%	0%	35%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	78	64	49	102	90
LT Vol	23	0	0	102	0
Through Vol	0	64	32	0	90
RT Vol	55	0	17	0	0
Lane Flow Rate	78	64	49	102	90
Geometry Grp	2	7	7	7	7
Degree of Util (X)	0.093	0.087	0.063	0.148	0.118
Departure Headway (Hd)	4.291	4.876	4.632	5.232	4.731
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	839	738	776	679	750
Service Time	2.296	2.587	2.343	3.013	2.512
HCM Lane V/C Ratio	0.093	0.087	0.063	0.15	0.12
HCM Control Delay	7.7	8.1	7.7	8.9	8.2
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.3	0.3	0.2	0.5	0.4

Lanes, Volumes, Timings  
10: Carling & Parkdale

2028 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø10
Lane Configurations							
Traffic Volume (vph)	97	636	1374	98	25	196	
Future Volume (vph)	97	636	1374	98	25	196	
Satd. Flow (prot)	1695	3390	3390	1517	1519	0	
Flt Permitted	0.950				0.994		
Satd. Flow (perm)	1656	3390	3390	1239	1518	0	
Satd. Flow (RTOR)				88	188		
Lane Group Flow (vph)	97	636	1374	98	221	0	
Turn Type	Prot	NA	NA	Perm	Perm		
Protected Phases	5	2	6				10
Permitted Phases				6	4		
Detector Phase	5	2	6	6	4		
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		1.0
Minimum Split (s)	11.1	26.7	26.7	26.7	37.2		5.0
Total Split (s)	16.0	92.8	76.8	76.8	37.2		5.0
Total Split (%)	11.9%	68.7%	56.9%	56.9%	27.6%		4%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.0		2.0
All-Red Time (s)	2.4	1.9	1.9	1.9	3.2		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.1	5.6	5.6	5.6	6.2		
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Min	C-Min	C-Min	None		Min
Act Effct Green (s)	13.7	103.4	83.6	83.6	12.3		
Actuated g/C Ratio	0.10	0.77	0.62	0.62	0.09		
v/c Ratio	0.56	0.24	0.65	0.12	0.72		
Control Delay	69.8	5.1	19.4	3.7	25.6		
Queue Delay	0.0	0.0	1.5	0.0	0.0		
Total Delay	69.8	5.1	21.0	3.7	25.6		
LOS	E	A	C	A	C		
Approach Delay		13.6	19.8		25.6		
Approach LOS		B	B		C		
Queue Length 50th (m)	25.0	20.2	111.3	0.9	8.5		
Queue Length 95th (m)	42.3	35.0	171.5	9.6	33.4		
Internal Link Dist (m)		297.5	170.5		278.4		
Turn Bay Length (m)	155.0			80.0			
Base Capacity (vph)	174	2597	2099	800	493		
Starvation Cap Reductn	0	0	502	0	0		
Spillback Cap Reductn	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0		
Reduced v/c Ratio	0.56	0.24	0.86	0.12	0.45		

Intersection Summary

Cycle Length: 135  
 Actuated Cycle Length: 135  
 Offset: 66 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 18.5

Intersection LOS: B

Intersection Capacity Utilization 80.0%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 10: Carling & Parkdale



Lanes, Volumes, Timings  
11: Carling & Civic

2028 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗↗	↖↖	↖	↘↘	
Traffic Volume (vph)	21	713	1600	50	20	19
Future Volume (vph)	21	713	1600	50	20	19
Satd. Flow (prot)	1695	3390	3390	1517	1590	0
Flt Permitted	0.950				0.975	
Satd. Flow (perm)	1686	3390	3390	1394	1578	0
Satd. Flow (RTOR)				50	19	
Lane Group Flow (vph)	21	713	1600	50	39	0
Turn Type	Prot	NA	NA	Perm	Perm	
Protected Phases	5	2	6			
Permitted Phases				6	4	
Detector Phase	5	2	6	6	4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.4	31.3	31.3	31.3	23.3	
Total Split (s)	12.5	106.7	94.2	94.2	23.3	
Total Split (%)	9.6%	82.1%	72.5%	72.5%	17.9%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	
All-Red Time (s)	2.7	2.7	2.7	2.7	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.4	6.4	6.4	6.4	5.3	
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	
Act Effct Green (s)	7.2	111.0	102.3	102.3	11.6	
Actuated g/C Ratio	0.06	0.85	0.79	0.79	0.09	
v/c Ratio	0.23	0.25	0.60	0.05	0.25	
Control Delay	63.9	2.7	7.3	1.5	36.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	63.9	2.7	7.3	1.5	36.6	
LOS	E	A	A	A	D	
Approach Delay		4.5	7.2		36.6	
Approach LOS		A	A		D	
Queue Length 50th (m)	5.3	15.7	71.9	0.0	4.9	
Queue Length 95th (m)	13.8	29.8	82.2	1.9	15.2	
Internal Link Dist (m)		170.5	180.8		39.9	
Turn Bay Length (m)	90.0			140.0		
Base Capacity (vph)	95	2895	2685	1114	234	
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	0.22	0.25	0.60	0.04	0.17	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 6.8

Intersection LOS: A

Intersection Capacity Utilization 67.4%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 11: Carling & Civic





Lanes, Volumes, Timings  
13: Maple/Old Irvine & Carling

2028 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗		↕			↕	
Traffic Volume (vph)	38	638	51	52	1140	7	123	10	44	10	9	11
Future Volume (vph)	38	638	51	52	1140	7	123	10	44	10	9	11
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	0	1649	0	0	1652	0
Flt Permitted	0.214			0.397				0.774			0.891	
Satd. Flow (perm)	372	3390	1293	676	3390	1178	0	1309	0	0	1486	0
Satd. Flow (RTOR)			37			37		13			11	
Lane Group Flow (vph)	38	638	51	52	1140	7	0	177	0	0	30	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	35.0	35.0	35.0	34.3	34.3	34.3	42.4	42.4		42.4	42.4	
Total Split (s)	87.0	87.0	87.0	87.0	87.0	87.0	43.0	43.0		43.0	43.0	
Total Split (%)	66.9%	66.9%	66.9%	66.9%	66.9%	66.9%	33.1%	33.1%		33.1%	33.1%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	4.4	4.4		4.4	4.4	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.7		7.4			7.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	92.4	92.4	92.4	92.4	92.4	92.4		24.5			24.5	
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.71	0.71		0.19			0.19	
v/c Ratio	0.14	0.26	0.05	0.11	0.47	0.01		0.69			0.10	
Control Delay	8.3	6.5	2.9	8.8	10.2	0.0		57.7			28.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	8.3	6.5	2.9	8.8	10.2	0.0		57.7			28.0	
LOS	A	A	A	A	B	A		E			C	
Approach Delay		6.4			10.1			57.7			28.0	
Approach LOS		A			B			E			C	
Queue Length 50th (m)	1.6	14.8	0.4	3.4	55.1	0.0		40.7			4.2	
Queue Length 95th (m)	5.6	28.2	3.1	10.8	97.3	0.0		58.6			11.3	
Internal Link Dist (m)		236.1			191.5			174.3			220.8	
Turn Bay Length (m)	20.0		15.0	45.0		25.0						
Base Capacity (vph)	264	2408	929	480	2408	847		367			414	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.14	0.26	0.05	0.11	0.47	0.01		0.48			0.07	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 28 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 13.0

Intersection LOS: B

Intersection Capacity Utilization 80.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 13: Maple/Old Irvine & Carling



Lanes, Volumes, Timings  
15: Carling & Sherwood

2028 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗↗	↖↖	↗	↖	↗
Traffic Volume (vph)	65	648	1257	183	156	7
Future Volume (vph)	65	648	1257	183	156	7
Satd. Flow (prot)	1695	3390	3390	1517	1695	1517
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1615	3390	3390	1072	1669	1473
Satd. Flow (RTOR)				183		5
Lane Group Flow (vph)	65	648	1257	183	156	7
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.3	25.1	25.1	25.1	25.1	25.1
Total Split (s)	15.0	89.0	74.0	74.0	41.0	41.0
Total Split (%)	11.5%	68.5%	56.9%	56.9%	31.5%	31.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	10.3	101.9	88.6	88.6	17.5	17.5
Actuated g/C Ratio	0.08	0.78	0.68	0.68	0.13	0.13
v/c Ratio	0.49	0.24	0.54	0.23	0.69	0.03
Control Delay	68.5	4.4	3.0	0.6	69.1	30.6
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0
Total Delay	68.5	4.4	3.2	0.6	69.1	30.6
LOS	E	A	A	A	E	C
Approach Delay		10.2	2.9		67.5	
Approach LOS		B	A		E	
Queue Length 50th (m)	16.2	19.6	13.1	0.0	38.7	0.5
Queue Length 95th (m)	30.4	32.3	17.2	m0.0	58.6	4.7
Internal Link Dist (m)		118.3	141.7		152.1	
Turn Bay Length (m)	30.0			90.0		15.0
Base Capacity (vph)	146	2656	2309	788	458	408
Starvation Cap Reductn	0	0	391	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	0.45	0.24	0.66	0.23	0.34	0.02

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 24 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings  
 15: Carling & Sherwood

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 9.7

Intersection LOS: A

Intersection Capacity Utilization 64.6%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 15: Carling & Sherwood



Lanes, Volumes, Timings  
16: Road A/Champagne & Carling

2028 PM Demand Rationalized Main Hospital SPA

10/18/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	640	26	27	1100	150	97	0	110	183	0	114
Future Volume (vph)	88	640	26	27	1100	150	97	0	110	183	0	114
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1695	1402	0	1695	1417	0
Flt Permitted	0.950			0.950			0.498			0.686		
Satd. Flow (perm)	1587	3390	1357	1641	3390	1021	854	1402	0	1156	1417	0
Satd. Flow (RTOR)						147					294	
Lane Group Flow (vph)	88	640	26	27	1100	150	97	110	0	183	114	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8				4
Permitted Phases			2			6	8			4		
Detector Phase	5	2	2	1	6	6	3	8		4		4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	15.3	26.3	26.3	15.3	26.3	26.3	10.3	23.3		37.9	37.9	
Total Split (s)	15.3	50.8	50.8	15.3	55.8	55.8	11.0	53.9		37.9	37.9	
Total Split (%)	11.8%	39.1%	39.1%	11.8%	42.9%	42.9%	8.5%	41.5%		29.2%	29.2%	
Yellow Time (s)	3.3	3.7	3.7	3.3	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	1.6	1.6	2.0	1.6	1.6	2.0	2.0		2.6	2.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3		5.9	5.9	
Lead/Lag	Lead			Lead			Lead					
Lead-Lag Optimize?	Yes			Yes			Yes					
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	11.5	68.5	68.5	10.0	61.9	61.9	39.8	39.8		25.0	25.0	
Actuated g/C Ratio	0.09	0.53	0.53	0.08	0.48	0.48	0.31	0.31		0.19	0.19	
v/c Ratio	0.59	0.36	0.04	0.21	0.68	0.27	0.31	0.26		0.82	0.22	
Control Delay	75.2	20.3	19.1	60.5	30.9	5.4	34.2	33.9		77.9	1.0	
Queue Delay	0.0	0.0	0.0	0.0	18.6	0.0	0.0	0.0		0.0	0.0	
Total Delay	75.2	20.3	19.1	60.5	49.5	5.4	34.2	33.9		77.9	1.0	
LOS	E	C	B	E	D	A	C	C		E	A	
Approach Delay		26.7			44.5			34.0			48.4	
Approach LOS		C			D			C			D	
Queue Length 50th (m)	20.3	63.2	3.5	6.6	117.0	0.4	17.8	20.6		45.1	0.0	
Queue Length 95th (m)	#47.2	93.2	9.8	16.3	161.3	14.3	28.9	33.1		68.4	0.0	
Internal Link Dist (m)		141.7			98.6			63.9			477.2	
Turn Bay Length (m)	55.0		75.0	61.0		35.0				30.0		
Base Capacity (vph)	149	1785	714	130	1613	563	312	524		284	570	
Starvation Cap Reductn	0	0	0	0	531	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	9	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.59	0.36	0.04	0.21	1.02	0.27	0.31	0.21		0.64	0.20	
<b>Intersection Summary</b>												
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 115												
Control Type: Actuated-Coordinated												

Lane Group	Ø9	Ø10	Ø11
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	9	10	11
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	1.0	1.0	1.0
Minimum Split (s)	10.0	5.0	5.0
Total Split (s)	10.0	5.0	5.0
Total Split (%)	8%	4%	4%
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes
Recall Mode	None	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Lanes, Volumes, Timings  
 16: Road A/Champagne & Carling

2028 PM Demand Rationalized Main Hospital SPA

10/18/2022

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 38.8

Intersection LOS: D

Intersection Capacity Utilization 78.8%

ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 16: Road A/Champagne & Carling

Ø1	Ø9	Ø2 (R)	Ø3	Ø10	Ø4
15.3 s	10 s	50.8 s	11 s	5 s	37.9 s
Ø5	Ø10	Ø6 (R)	Ø8		
15.3 s	5 s	55.8 s	53.9 s		

Lanes, Volumes, Timings  
17: Carling & Trillium MUP



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑							
Traffic Volume (vph)	0	938	0	0	1415	0	0	0	0	0	0	0
Future Volume (vph)	0	938	0	0	1415	0	0	0	0	0	0	0
Satd. Flow (prot)	0	3390	0	0	3390	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3390	0	0	3390	0	0	0	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	938	0	0	1415	0	0	0	0	0	0	0
Turn Type		NA			NA							
Protected Phases		2			6							
Permitted Phases												
Detector Phase		2			6							
Switch Phase												
Minimum Initial (s)		10.0			10.0							
Minimum Split (s)		31.1			31.1							
Total Split (s)		35.0			35.0							
Total Split (%)		50.0%			50.0%							
Yellow Time (s)		3.7			3.7							
All-Red Time (s)		1.4			1.4							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		5.1			5.1							
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Min			C-Min							
Act Effct Green (s)		62.0			62.0							
Actuated g/C Ratio		0.89			0.89							
v/c Ratio		0.31			0.47							
Control Delay		4.9			6.4							
Queue Delay		0.0			0.0							
Total Delay		4.9			6.4							
LOS		A			A							
Approach Delay		4.9			6.4							
Approach LOS		A			A							
Queue Length 50th (m)		0.0			4.8							
Queue Length 95th (m)		67.7			m#115.7							
Internal Link Dist (m)		98.6			92.8			53.0			60.9	
Turn Bay Length (m)												
Base Capacity (vph)		3002			3002							
Starvation Cap Reductn		45			29							
Spillback Cap Reductn		68			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.32			0.48							
<b>Intersection Summary</b>												
Cycle Length: 70												
Actuated Cycle Length: 70												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 75												
Control Type: Actuated-Coordinated												



Lane Group	Ø4	Ø8
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	4	8
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	35.6	35.6
Total Split (s)	35.0	35.0
Total Split (%)	50%	50%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	3.6	3.6
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 5.8

Intersection LOS: A

Intersection Capacity Utilization 45.5%

ICU Level of Service A

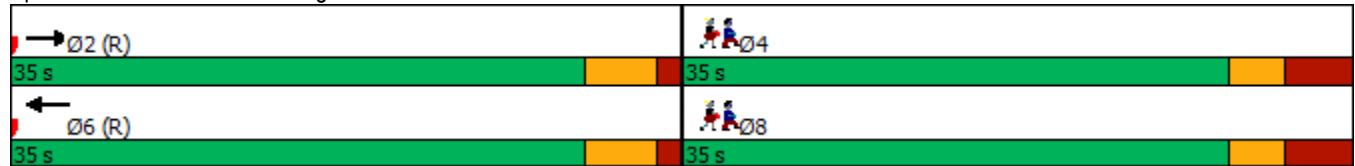
Analysis Period (min) 15

# 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: 17: Carling & Trillium MUP



Lanes, Volumes, Timings  
18: Preston & Carling

2028 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗	↘	↘	↗	↘	↘	↗		↘	↗	
Traffic Volume (vph)	123	536	296	315	991	54	283	359	179	95	285	95
Future Volume (vph)	123	536	296	315	991	54	283	359	179	95	285	95
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1695	3099	0	1695	1660	0
Flt Permitted	0.950			0.950			0.129			0.452		
Satd. Flow (perm)	1629	3390	1517	1633	3390	1242	230	3099	0	769	1660	0
Satd. Flow (RTOR)						179					11	
Lane Group Flow (vph)	123	536	296	315	991	54	283	538	0	95	380	0
Turn Type	Prot	NA	custom	Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	9 2	9 3	1	6		3	8				4
Permitted Phases						6	8			4		
Detector Phase	5	9 2	9 3	1	6	6	3	8		4		4
Switch Phase												
Minimum Initial (s)	5.0			5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2			11.2	25.0	25.0	11.9	38.9		38.9	38.9	
Total Split (s)	20.2			36.0	46.1	46.1	24.8	61.7		38.9	38.9	
Total Split (%)	14.4%			25.7%	32.9%	32.9%	17.7%	44.1%		27.8%	27.8%	
Yellow Time (s)	3.7			3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5			2.5	2.3	2.3	3.6	3.6		3.6	3.6	
Lost Time Adjust (s)	0.0			0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2			6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead			Lead			Lead					
Lead-Lag Optimize?	Yes			Yes			Yes					
Recall Mode	None			None	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	13.1	33.0	29.1	28.4	42.5	42.5	61.2	55.6		32.4	32.4	
Actuated g/C Ratio	0.09	0.24	0.21	0.20	0.30	0.30	0.44	0.40		0.23	0.23	
v/c Ratio	0.78	0.67	0.94	0.92	0.96	0.11	0.99	0.44		0.54	0.97	
Control Delay	91.3	49.4	92.5	83.3	73.1	0.3	108.2	14.1		60.1	90.2	
Queue Delay	0.0	1.0	8.1	0.0	10.7	0.0	17.5	0.0		0.0	40.4	
Total Delay	91.3	50.4	100.6	83.3	83.8	0.3	125.7	14.1		60.1	130.7	
LOS	F	D	F	F	F	A	F	B		E	F	
Approach Delay		71.2			80.4			52.5			116.5	
Approach LOS		E			F			D			F	
Queue Length 50th (m)	33.6	72.8	82.4	91.0	~151.3	0.0	59.0	24.0		23.4	102.9	
Queue Length 95th (m)	#64.3	80.5	#148.4	m104.0	m#170.3	m0.0	#117.0	29.9		42.9	#167.8	
Internal Link Dist (m)		92.8			165.9			145.6			55.2	
Turn Bay Length (m)	70.0		90.0	120.0		95.0				35.0		
Base Capacity (vph)	169	773	315	360	1028	501	287	1230		177	392	
Starvation Cap Reductn	0	79	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	14	0	52	0	17	0		0	69	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.73	0.77	0.98	0.88	1.02	0.11	1.05	0.44		0.54	1.18	

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 6 (4%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated

Lane Group	Ø2	Ø9	Ø10	Ø11	Ø12
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Satd. Flow (RTOR)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	2	9	10	11	12
Permitted Phases					
Detector Phase					
Switch Phase					
Minimum Initial (s)	10.0	1.0	1.0	1.0	1.0
Minimum Split (s)	26.0	5.3	5.0	5.0	5.0
Total Split (s)	29.0	6.3	5.0	5.0	7.0
Total Split (%)	21%	5%	4%	4%	5%
Yellow Time (s)	2.0	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	2.3	0.0	0.0	0.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes		Yes	Yes	
Recall Mode	C-Min	Min	None	None	None
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (m)					
Queue Length 95th (m)					
Internal Link Dist (m)					
Turn Bay Length (m)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					
Intersection Summary					

Maximum v/c Ratio: 0.99

Intersection Signal Delay: 76.4

Intersection LOS: E

Intersection Capacity Utilization 100.8%

ICU Level of Service G

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

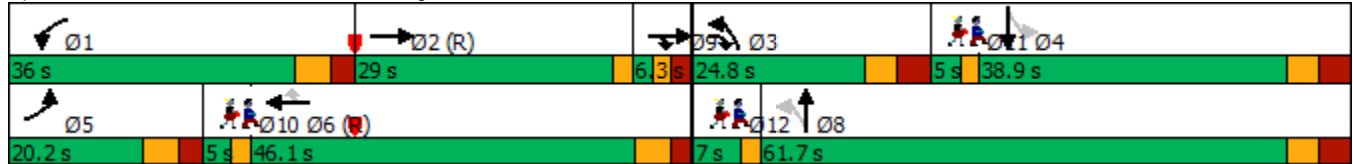
Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 18: Preston & Carling



Lanes, Volumes, Timings  
20: Carling & Booth

2028 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↕	↗↗	↖	↖	↘	↘
Traffic Volume (vph)	214	739	973	90	268	275
Future Volume (vph)	214	739	973	90	268	275
Satd. Flow (prot)	1695	3390	1784	1517	1695	1517
Flt Permitted	0.048				0.950	
Satd. Flow (perm)	86	3390	1784	1141	1663	1187
Satd. Flow (RTOR)				26		171
Lane Group Flow (vph)	214	739	973	90	268	275
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	29.7	29.7	29.7	39.0	39.0
Total Split (s)	19.2	101.0	81.8	81.8	39.0	39.0
Total Split (%)	13.7%	72.1%	58.4%	58.4%	27.9%	27.9%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	97.9	98.1	77.7	77.7	30.2	30.2
Actuated g/C Ratio	0.70	0.70	0.56	0.56	0.22	0.22
v/c Ratio	0.95	0.31	0.98	0.14	0.75	0.71
Control Delay	97.4	7.4	56.0	11.7	64.5	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.4	7.4	56.0	11.7	64.5	28.7
LOS	F	A	E	B	E	C
Approach Delay		27.6	52.3		46.4	
Approach LOS		C	D		D	
Queue Length 50th (m)	~52.7	32.2	~263.9	8.3	68.2	26.1
Queue Length 95th (m)	#100.7	38.7	#359.1	17.4	99.7	59.3
Internal Link Dist (m)		100.4	299.3		220.7	
Turn Bay Length (m)	50.0			30.0		30.0
Base Capacity (vph)	226	2375	990	645	391	410
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.31	0.98	0.14	0.69	0.67

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 41.8

Intersection LOS: D

Intersection Capacity Utilization 108.0%

ICU Level of Service G

Analysis Period (min) 15

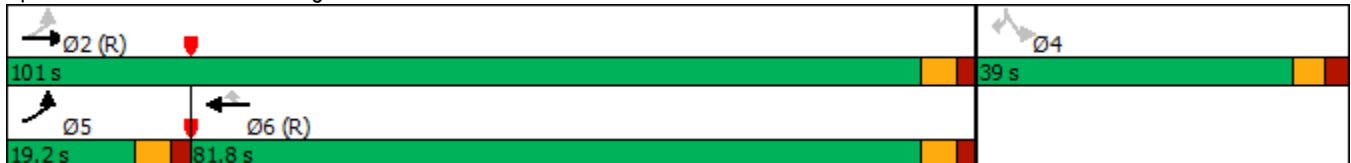
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 20: Carling & Booth



Lanes, Volumes, Timings  
21: Bronson & Carling/Glebe

2028 PM Demand Rationalized Main Hospital SPA  
10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	400	110	528	0	0	0	561	642	14	0	1135	261
Future Volume (vph)	400	110	528	0	0	0	561	642	14	0	1135	261
Satd. Flow (prot)	1610	1651	1517	0	0	0	3288	1770	0	0	3252	0
Flt Permitted	0.950	0.974					0.950					
Satd. Flow (perm)	1511	1597	1413	0	0	0	3243	1770	0	0	3252	0
Satd. Flow (RTOR)			103					2			24	
Lane Group Flow (vph)	276	234	528	0	0	0	561	656	0	0	1396	0
Turn Type	Perm	NA	pm+ov				Prot	NA			NA	
Protected Phases		4	5				5	2			6	
Permitted Phases	4		4									
Detector Phase	4	4	5				5	2			6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0				10.0	10.0			10.0	
Minimum Split (s)	31.0	31.0	16.0				16.0	25.1			33.0	
Total Split (s)	36.0	36.0	33.0				33.0	104.0			71.0	
Total Split (%)	24.5%	24.5%	22.4%				22.4%	70.7%			48.3%	
Yellow Time (s)	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	
Lost Time Adjust (s)	0.0	0.0	0.0				0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0	6.0				6.0	6.0			6.0	
Lead/Lag			Lead				Lead				Lag	
Lead-Lag Optimize?			Yes				Yes				Yes	
Recall Mode	None	None	None				None	C-Min			C-Min	
Act Effct Green (s)	28.9	28.9	55.6				26.7	99.0			66.3	
Actuated g/C Ratio	0.20	0.20	0.38				0.18	0.67			0.45	
v/c Ratio	0.93	0.75	0.86				0.94	0.55			0.94	
Control Delay	94.6	70.9	45.4				83.9	14.8			51.6	
Queue Delay	0.0	0.0	0.0				0.0	0.0			0.0	
Total Delay	94.6	70.9	45.4				83.9	14.8			51.6	
LOS	F	E	D				F	B			D	
Approach Delay		64.2						46.7			51.6	
Approach LOS		E						D			D	
Queue Length 50th (m)	83.3	67.6	105.4				83.9	94.3			202.9	
Queue Length 95th (m)	#137.2	99.8	#160.2				#117.3	126.0			#253.8	
Internal Link Dist (m)		74.7			115.0			394.4			328.4	
Turn Bay Length (m)	40.0						50.0					
Base Capacity (vph)	308	325	620				603	1192			1480	
Starvation Cap Reductn	0	0	0				0	0			0	
Spillback Cap Reductn	0	0	0				0	0			0	
Storage Cap Reductn	0	0	0				0	0			0	
Reduced v/c Ratio	0.90	0.72	0.85				0.93	0.55			0.94	

Intersection Summary

Cycle Length: 147  
 Actuated Cycle Length: 147  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated



Lane Group	Ø10
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	7.0
Total Split (s)	7.0
Total Split (%)	5%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings  
 21: Bronson & Carling/Glebe

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 53.5

Intersection LOS: D

Intersection Capacity Utilization 95.8%

ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 21: Bronson & Carling/Glebe



Lanes, Volumes, Timings  
22: Parkdale & 417 WB on/off

2028 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	284	23	450	84	536	0	0	557	208
Future Volume (vph)	0	0	0	284	23	450	84	536	0	0	557	208
Satd. Flow (prot)	0	0	0	1695	1474	0	1695	1784	0	0	1685	0
Flt Permitted				0.950			0.226					
Satd. Flow (perm)	0	0	0	1695	1474	0	403	1784	0	0	1685	0
Satd. Flow (RTOR)					337						29	
Lane Group Flow (vph)	0	0	0	284	473	0	84	536	0	0	765	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				29.0	29.0		10.3	27.3			25.1	
Total Split (s)				29.0	29.0		11.0	71.0			60.0	
Total Split (%)				29.0%	29.0%		11.0%	71.0%			60.0%	
Yellow Time (s)				3.3	3.3		3.0	3.0			3.0	
All-Red Time (s)				2.2	2.2		2.2	3.3			3.3	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				5.5	5.5		5.2	6.3			6.3	
Lead/Lag							Lag				Lead	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				None	None		None	C-Min			C-Min	
Act Effct Green (s)				20.7	20.7		69.7	67.5			58.4	
Actuated g/C Ratio				0.21	0.21		0.70	0.68			0.58	
v/c Ratio				0.81	0.83		0.23	0.45			0.77	
Control Delay				55.9	24.2		5.1	5.5			23.6	
Queue Delay				0.0	0.0		1.3	1.5			7.9	
Total Delay				55.9	24.2		6.5	7.0			31.5	
LOS				E	C		A	A			C	
Approach Delay					36.1			6.9			31.5	
Approach LOS					D			A			C	
Queue Length 50th (m)				51.3	23.8		4.4	32.0			115.4	
Queue Length 95th (m)				#81.0	#74.2		m1.2	15.2			#179.6	
Internal Link Dist (m)		157.5			140.3			45.3			171.5	
Turn Bay Length (m)												
Base Capacity (vph)				398	604		360	1204			997	
Starvation Cap Reductn				0	0		154	461			0	
Spillback Cap Reductn				0	0		0	0			196	
Storage Cap Reductn				0	0		0	0			0	
Reduced v/c Ratio				0.71	0.78		0.41	0.72			0.96	

**Intersection Summary**  
 Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 39 (39%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 26.0

Intersection LOS: C

Intersection Capacity Utilization 124.1%

ICU Level of Service H

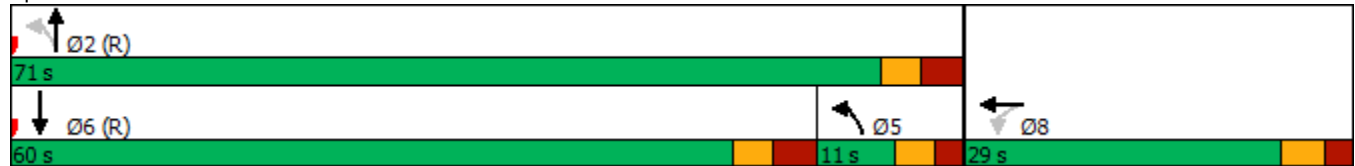
Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 22: Parkdale & 417 WB on/off



Lanes, Volumes, Timings  
23: Parkdale & 417 EB on/off

2028 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗					↕↗		↗	↕	
Traffic Volume (vph)	353	2	167	0	0	0	0	268	217	455	382	0
Future Volume (vph)	353	2	167	0	0	0	0	268	217	455	382	0
Satd. Flow (prot)	0	1700	1517	0	0	0	0	3031	0	1695	1784	0
Flt Permitted		0.953								0.360		
Satd. Flow (perm)	0	1700	1482	0	0	0	0	3031	0	626	1784	0
Satd. Flow (RTOR)			167					217				
Lane Group Flow (vph)	0	355	167	0	0	0	0	485	0	455	382	0
Turn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0					10.0		5.0	10.0	
Minimum Split (s)	25.1	25.1	25.1					25.1		10.3	25.1	
Total Split (s)	30.0	30.0	30.0					38.0		32.0	70.0	
Total Split (%)	30.0%	30.0%	30.0%					38.0%		32.0%	70.0%	
Yellow Time (s)	3.3	3.3	3.3					3.0		3.0	3.0	
All-Red Time (s)	2.6	2.6	2.6					2.8		2.3	2.8	
Lost Time Adjust (s)		0.0	0.0					0.0		0.0	0.0	
Total Lost Time (s)		5.9	5.9					5.8		5.3	5.8	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None	None					C-Min		None	C-Min	
Act Effct Green (s)		26.8	26.8					36.2		62.0	61.5	
Actuated g/C Ratio		0.27	0.27					0.36		0.62	0.62	
v/c Ratio		0.78	0.32					0.39		0.76	0.35	
Control Delay		45.7	5.7					16.0		21.1	13.9	
Queue Delay		0.0	0.0					0.0		40.9	3.3	
Total Delay		45.7	5.7					16.0		62.0	17.1	
LOS		D	A					B		E	B	
Approach Delay		32.9						16.0			41.5	
Approach LOS		C						B			D	
Queue Length 50th (m)		63.1	0.0					18.9		56.5	45.8	
Queue Length 95th (m)		87.3	13.6					40.7		m74.2	m62.2	
Internal Link Dist (m)		109.8			145.0			90.1			45.3	
Turn Bay Length (m)			75.0									
Base Capacity (vph)		472	532					1314		677	1162	
Starvation Cap Reductn		0	0					0		249	665	
Spillback Cap Reductn		0	0					23		0	0	
Storage Cap Reductn		0	0					0		0	0	
Reduced v/c Ratio		0.75	0.31					0.38		1.06	0.77	

Intersection Summary

Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 29 (29%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 32.4

Intersection LOS: C

Intersection Capacity Utilization 124.1%

ICU Level of Service H

Analysis Period (min) 15

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

Splits and Phases: 23: Parkdale & 417 EB on/off



Lanes, Volumes, Timings  
24: Parkdale & Sherwood

2028 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	72	8	7	0	7	140	5	429	7	67	372	68
Future Volume (vph)	72	8	7	0	7	140	5	429	7	67	372	68
Satd. Flow (prot)	0	1683	0	0	1489	0	0	1777	0	0	1726	0
Flt Permitted		0.704						0.995			0.898	
Satd. Flow (perm)	0	1231	0	0	1489	0	0	1769	0	0	1556	0
Satd. Flow (RTOR)		7			140			2			24	
Lane Group Flow (vph)	0	87	0	0	147	0	0	441	0	0	507	0
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	18.0	18.0		18.0	18.0		25.1	25.1		25.1	25.1	
Total Split (s)	18.0	18.0		18.0	18.0		37.0	37.0		37.0	37.0	
Total Split (%)	32.7%	32.7%		32.7%	32.7%		67.3%	67.3%		67.3%	67.3%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.0			4.0			5.6			5.6	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Ped	Ped		Ped	Ped		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		14.0			14.0			31.4			31.4	
Actuated g/C Ratio		0.25			0.25			0.57			0.57	
v/c Ratio		0.27			0.30			0.44			0.56	
Control Delay		18.1			6.1			8.4			10.1	
Queue Delay		0.0			0.0			0.0			0.4	
Total Delay		18.1			6.1			8.4			10.6	
LOS		B			A			A			B	
Approach Delay		18.1			6.1			8.4			10.6	
Approach LOS		B			A			A			B	
Queue Length 50th (m)		6.3			0.5			21.7			26.3	
Queue Length 95th (m)		15.9			11.2			37.9			48.4	
Internal Link Dist (m)		221.3			335.0			289.1			90.1	
Turn Bay Length (m)												
Base Capacity (vph)		318			483			1010			898	
Starvation Cap Reductn		0			0			0			106	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.27			0.30			0.44			0.64	

Intersection Summary

Cycle Length: 55  
 Actuated Cycle Length: 55  
 Offset: 26 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 9.8

Intersection LOS: A

Intersection Capacity Utilization 93.0%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 24: Parkdale & Sherwood





Lanes, Volumes, Timings  
25: Parkdale & Ruskin

2028 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗			↕			↕	
Traffic Volume (vph)	27	29	9	21	33	67	3	213	12	61	238	10
Future Volume (vph)	27	29	9	21	33	67	3	213	12	61	238	10
Satd. Flow (prot)	0	1695	0	1695	1512	0	0	1762	0	0	1757	0
Flt Permitted		0.820		0.807				0.997			0.901	
Satd. Flow (perm)	0	1385	0	1353	1512	0	0	1758	0	0	1584	0
Satd. Flow (RTOR)		7			67			8			5	
Lane Group Flow (vph)	0	65	0	21	100	0	0	228	0	0	309	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	19.4	19.4		19.4	19.4		31.8	31.8		31.8	31.8	
Total Split (s)	20.0	20.0		20.0	20.0		75.0	75.0		75.0	75.0	
Total Split (%)	21.1%	21.1%		21.1%	21.1%		78.9%	78.9%		78.9%	78.9%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.4	2.4		2.4	2.4		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.4		5.4	5.4			5.8			5.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		12.4		12.4	12.4			75.6			75.6	
Actuated g/C Ratio		0.13		0.13	0.13			0.80			0.80	
v/c Ratio		0.35		0.12	0.39			0.16			0.24	
Control Delay		39.0		37.2	20.0			3.5			4.1	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		39.0		37.2	20.0			3.5			4.1	
LOS		D		D	B			A			A	
Approach Delay		39.0			23.0			3.5			4.1	
Approach LOS		D			C			A			A	
Queue Length 50th (m)		9.6		3.4	5.3			10.2			15.3	
Queue Length 95th (m)		21.8		9.9	19.6			16.8			24.2	
Internal Link Dist (m)		220.6			228.6			278.4			289.1	
Turn Bay Length (m)				40.0								
Base Capacity (vph)		218		207	289			1401			1262	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.30		0.10	0.35			0.16			0.24	

Intersection Summary

Cycle Length: 95  
 Actuated Cycle Length: 95  
 Offset: 40 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.39

Intersection Signal Delay: 10.2

Intersection LOS: B

Intersection Capacity Utilization 68.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 25: Parkdale & Ruskin



Lanes, Volumes, Timings  
30: Prince of Wales & Preston

2028 PM Demand Rationalized Main Hospital SPA

10/18/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	491	246	0	3	391	428	1	0	0	426	3	581
Future Volume (vph)	491	246	0	3	391	428	1	0	0	426	3	581
Satd. Flow (prot)	3288	1784	0	1695	1784	1517	0	1695	0	0	1700	1517
Flt Permitted	0.950			0.950				0.478			0.728	
Satd. Flow (perm)	3193	1784	0	1474	1784	1484	0	737	0	0	1157	1348
Satd. Flow (RTOR)						228						
Lane Group Flow (vph)	491	246	0	3	391	428	0	1	0	0	429	581
Turn Type	Prot	NA		Prot	NA	Free	Perm	NA		custom	NA	custom
Protected Phases	5	2		1	6			8		11	4 11	5
Permitted Phases						Free	8			4		4
Detector Phase	5	2		1	6		8	8		11	4 11	5
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0		10.0		5.0
Minimum Split (s)	11.1	27.1		10.3	27.1		24.5	24.5		15.3		11.1
Total Split (s)	47.0	67.0		10.3	30.3		35.7	35.7		22.0		47.0
Total Split (%)	33.6%	47.9%		7.4%	21.6%		25.5%	25.5%		15.7%		33.6%
Yellow Time (s)	3.7	3.7		3.3	3.7		3.3	3.3		3.3		3.7
All-Red Time (s)	2.4	2.4		2.0	2.4		2.2	2.2		2.0		2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0				0.0
Total Lost Time (s)	6.1	6.1		5.3	6.1			5.5				6.1
Lead/Lag	Lead			Lead								Lead
Lead-Lag Optimize?	Yes			Yes								Yes
Recall Mode	None	C-Min		None	C-Min		None	None		None		None
Act Effct Green (s)	34.1	74.3		5.1	36.1	140.0		29.1			45.6	62.6
Actuated g/C Ratio	0.24	0.53		0.04	0.26	1.00		0.21			0.33	0.45
v/c Ratio	0.61	0.26		0.05	0.85	0.29		0.01			0.97	0.90
Control Delay	54.8	16.0		67.0	68.1	0.5		43.0			80.8	49.4
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	54.8	16.0		67.0	68.1	0.5		43.0			80.8	49.4
LOS	D	B		E	E	A		D			F	D
Approach Delay		41.8			32.9			43.0			62.7	
Approach LOS		D			C			D			E	
Queue Length 50th (m)	69.5	27.0		0.8	105.3	0.0		0.2			121.1	105.5
Queue Length 95th (m)	82.6	47.8		4.1	#198.6	0.0		1.8			m#143.0	m106.9
Internal Link Dist (m)		79.9			173.8			12.4			145.6	
Turn Bay Length (m)	45.0			30.0		45.0						
Base Capacity (vph)	960	946		61	459	1484		158			449	717
Starvation Cap Reductn	0	0		0	0	0		0			0	0
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.51	0.26		0.05	0.85	0.29		0.01			0.96	0.81

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 105.9 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated

Lane Group	Ø4	Ø9	Ø10	Ø12
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	4	9	10	12
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	10.0	1.0	1.0	1.0
Minimum Split (s)	15.5	5.0	5.0	20.0
Total Split (s)	35.7	5.0	5.0	22.0
Total Split (%)	26%	4%	4%	16%
Yellow Time (s)	3.3	2.0	2.0	2.0
All-Red Time (s)	2.2	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				
Intersection Summary				

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 47.2

Intersection LOS: D

Intersection Capacity Utilization 92.5%

ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 30: Prince of Wales & Preston

Ø1	Ø9 Ø2 (R)	Ø11	Ø4
10.3 s	5 s 67 s	22 s	35.7 s
Ø5	Ø10 Ø6 (R)	Ø12	Ø8
47 s	5 s 30.3 s	22 s	35.7 s

Lanes, Volumes, Timings  
31: Rochester & 417 WB on/Raymond

2028 PM Demand Rationalized Main Hospital SPA  
10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	190	187	128	188	392	0	0	199	135
Future Volume (vph)	0	0	0	190	187	128	188	392	0	0	199	135
Satd. Flow (prot)	0	0	0	1695	1636	0	1695	1784	0	0	1784	1517
Flt Permitted				0.950			0.520					
Satd. Flow (perm)	0	0	0	1685	1636	0	901	1784	0	0	1784	1414
Satd. Flow (RTOR)					56							135
Lane Group Flow (vph)	0	0	0	190	315	0	188	392	0	0	199	135
Turn Type				Perm	NA		pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8			2					6
Detector Phase				8	8		5	2			6	6
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	10.0
Minimum Split (s)				32.0	32.0		10.9	27.3			24.9	24.9
Total Split (s)				32.0	32.0		13.0	38.0			25.0	25.0
Total Split (%)				45.7%	45.7%		18.6%	54.3%			35.7%	35.7%
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	3.3
All-Red Time (s)				2.4	2.4		2.6	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)				5.7	5.7		5.9	5.9			5.9	5.9
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode				None	None		None	C-Min			C-Min	C-Min
Act Effct Green (s)				16.9	16.9		41.5	41.5			27.0	27.0
Actuated g/C Ratio				0.24	0.24		0.59	0.59			0.39	0.39
v/c Ratio				0.47	0.72		0.30	0.37			0.29	0.21
Control Delay				25.2	28.7		12.7	14.5			18.7	5.1
Queue Delay				0.0	0.0		0.0	0.6			0.0	0.0
Total Delay				25.2	28.7		12.7	15.1			18.7	5.1
LOS				C	C		B	B			B	A
Approach Delay					27.4			14.3			13.2	
Approach LOS					C			B			B	
Queue Length 50th (m)				21.4	31.1		14.5	42.9			17.7	0.0
Queue Length 95th (m)				32.8	47.9		31.3	62.5			38.4	11.3
Internal Link Dist (m)		122.0			89.8			72.3			151.7	
Turn Bay Length (m)												35.0
Base Capacity (vph)				633	649		632	1056			689	628
Starvation Cap Reductn				0	0		0	339			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	0.49		0.30	0.55			0.29	0.21

Intersection Summary

Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 8 (11%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 18.7

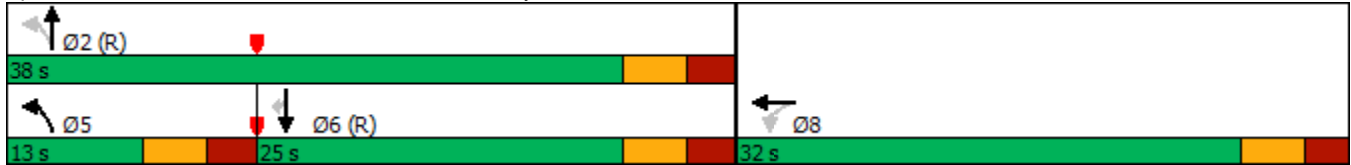
Intersection LOS: B

Intersection Capacity Utilization 60.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 31: Rochester & 417 WB on/Raymond



Lanes, Volumes, Timings  
32: Rochester & 417 EB off/Orangeville

2028 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕						↕↕			↕↕	
Traffic Volume (vph)	235	283	152	0	0	0	0	349	82	31	345	0
Future Volume (vph)	235	283	152	0	0	0	0	349	82	31	345	0
Satd. Flow (prot)	0	3194	0	0	0	0	0	3269	0	0	3377	0
Flt Permitted		0.983									0.901	
Satd. Flow (perm)	0	3187	0	0	0	0	0	3269	0	0	3051	0
Satd. Flow (RTOR)		55						65				
Lane Group Flow (vph)	0	670	0	0	0	0	0	431	0	0	376	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Detector Phase	4	4						2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0						25.1		25.1	25.1	
Total Split (s)	26.0	26.0						44.0		44.0	44.0	
Total Split (%)	37.1%	37.1%						62.9%		62.9%	62.9%	
Yellow Time (s)	3.3	3.3						3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3						2.1		2.1	2.1	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.6						5.4			5.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None						C-Min		C-Min	C-Min	
Act Effct Green (s)		18.9						40.1			40.1	
Actuated g/C Ratio		0.27						0.57			0.57	
v/c Ratio		0.75						0.23			0.21	
Control Delay		26.5						6.8			11.9	
Queue Delay		0.0						0.0			0.0	
Total Delay		26.5						6.8			11.9	
LOS		C						A			B	
Approach Delay		26.5						6.8			11.9	
Approach LOS		C						A			B	
Queue Length 50th (m)		38.7						12.3			5.3	
Queue Length 95th (m)		50.1						m19.6			39.5	
Internal Link Dist (m)		104.8			107.2			99.1			72.3	
Turn Bay Length (m)												
Base Capacity (vph)		1007						1943			1788	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						9			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.67						0.22			0.21	
<b>Intersection Summary</b>												
Cycle Length: 70												
Actuated Cycle Length: 70												
Offset: 67 (96%), Referenced to phase 2:NBT and 6:SBTL, Start of Green												
Natural Cycle: 55												
Control Type: Actuated-Coordinated												



Maximum v/c Ratio: 0.75

Intersection Signal Delay: 17.0

Intersection LOS: B

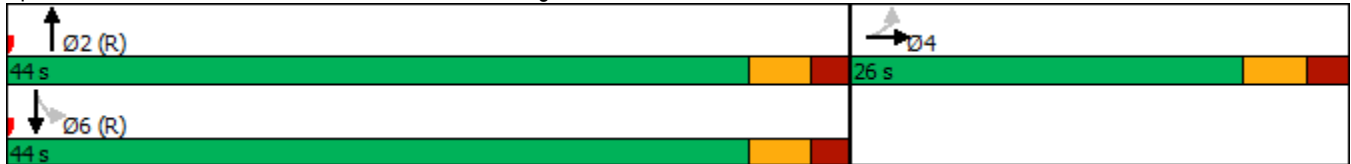
Intersection Capacity Utilization 66.4%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 32: Rochester & 417 EB off/Orangeville



Lanes, Volumes, Timings  
33: Bronson & Catherine 417 WB on

2028 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↔		↗	↕			↕	↗
Traffic Volume (vph)	0	0	0	787	553	256	277	750	0	0	788	157
Future Volume (vph)	0	0	0	787	553	256	277	750	0	0	788	157
Satd. Flow (prot)	0	0	0	1458	4335	0	1695	3390	0	0	3258	0
Flt Permitted				0.950	0.988		0.115					
Satd. Flow (perm)	0	0	0	1458	4335	0	205	3390	0	0	3258	0
Satd. Flow (RTOR)					97						25	
Lane Group Flow (vph)	0	0	0	535	1061	0	277	750	0	0	945	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				25.9	25.9		11.0	25.1			25.1	
Total Split (s)				42.0	42.0		18.0	53.0			35.0	
Total Split (%)				44.2%	44.2%		18.9%	55.8%			36.8%	
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)				2.6	2.6		2.7	2.8			2.8	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				5.9	5.9		6.0	6.1			6.1	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				None	None		None	C-Min			C-Min	
Act Effct Green (s)				36.2	36.2		46.9	46.8			28.7	
Actuated g/C Ratio				0.38	0.38		0.49	0.49			0.30	
v/c Ratio				0.96	0.62		0.96	0.45			0.94	
Control Delay				60.5	23.4		71.9	23.0			50.2	
Queue Delay				23.0	0.1		0.0	3.5			44.8	
Total Delay				83.4	23.4		71.9	26.5			95.1	
LOS				F	C		E	C			F	
Approach Delay					43.5			38.8			95.1	
Approach LOS					D			D			F	
Queue Length 50th (m)				109.7	54.6		47.1	63.4			86.3	
Queue Length 95th (m)				#185.4	69.6		#84.9	79.5			#125.3	
Internal Link Dist (m)		151.3			165.9			71.3			237.2	
Turn Bay Length (m)												
Base Capacity (vph)				556	1713		290	1673			1008	
Starvation Cap Reductn				0	0		0	806			0	
Spillback Cap Reductn				47	49		0	0			189	
Storage Cap Reductn				0	0		0	0			0	
Reduced v/c Ratio				1.05	0.64		0.96	0.87			1.15	

Intersection Summary

Cycle Length: 95  
 Actuated Cycle Length: 95  
 Offset: 59 (62%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 55.8

Intersection LOS: E

Intersection Capacity Utilization 114.3%

ICU Level of Service H

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 33: Bronson & Catherine 417 WB on





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	145	377	0	911	1458	0
Future Volume (vph)	145	377	0	911	1458	0
Satd. Flow (prot)	1695	1517	0	3390	3390	0
Flt Permitted	0.950					
Satd. Flow (perm)	1695	1491	0	3390	3390	0
Satd. Flow (RTOR)	47					
Lane Group Flow (vph)	145	377	0	911	1458	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases	4					
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		10.0	10.0	
Minimum Split (s)	25.1	25.1		34.3	34.3	
Total Split (s)	30.0	30.0		65.0	65.0	
Total Split (%)	31.6%	31.6%		68.4%	68.4%	
Yellow Time (s)	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.1	2.1		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.4	5.4		5.8	5.8	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None		C-Min	C-Min	
Act Effct Green (s)	25.8	25.8		58.0	58.0	
Actuated g/C Ratio	0.27	0.27		0.61	0.61	
v/c Ratio	0.32	0.86		0.44	0.70	
Control Delay	29.2	48.7		11.0	10.5	
Queue Delay	0.0	0.0		0.0	3.6	
Total Delay	29.2	48.7		11.1	14.1	
LOS	C	D		B	B	
Approach Delay	43.3			11.1	14.1	
Approach LOS	D			B	B	
Queue Length 50th (m)	20.1	55.3		47.2	80.6	
Queue Length 95th (m)	38.0	#111.7		53.5	m125.9	
Internal Link Dist (m)	81.4			50.7	71.3	
Turn Bay Length (m)	60.0					
Base Capacity (vph)	477	454		2147	2147	
Starvation Cap Reductn	0	0		0	582	
Spillback Cap Reductn	0	0		126	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.30	0.83		0.45	0.93	

**Intersection Summary**

Cycle Length: 95  
 Actuated Cycle Length: 95  
 Offset: 91 (96%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 18.4

Intersection LOS: B

Intersection Capacity Utilization 114.3%

ICU Level of Service H

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

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

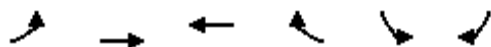
Splits and Phases: 34: Bronson & 417 EB off



Lanes, Volumes, Timings  
39: Prince of Wales & Road B

2028 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	15	693	985	9	84	24	
Future Volume (vph)	15	693	985	9	84	24	
Satd. Flow (prot)	1695	1784	3386	0	1695	1517	
Flt Permitted	0.249				0.950		
Satd. Flow (perm)	444	1784	3386	0	1629	1424	
Satd. Flow (RTOR)						24	
Lane Group Flow (vph)	15	693	994	0	84	24	
Turn Type	pm+pt	NA	NA		Perm	Perm	
Protected Phases	5	2	6				9
Permitted Phases	2				4	4	
Detector Phase	5	2	6		4	4	
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0		10.0	10.0	1.0
Minimum Split (s)	10.3	23.3	23.3		23.3	23.3	15.0
Total Split (s)	12.0	97.0	85.0		28.0	28.0	15.0
Total Split (%)	8.6%	69.3%	60.7%		20.0%	20.0%	11%
Yellow Time (s)	3.3	3.3	3.3		3.3	3.3	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3		5.3	5.3	
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	None	C-Min	C-Min		None	None	None
Act Effct Green (s)	113.3	113.3	108.7		13.1	13.1	
Actuated g/C Ratio	0.81	0.81	0.78		0.09	0.09	
v/c Ratio	0.04	0.48	0.38		0.55	0.15	
Control Delay	4.3	7.3	6.0		73.7	21.5	
Queue Delay	0.0	0.0	0.1		0.0	0.0	
Total Delay	4.3	7.3	6.1		73.7	21.5	
LOS	A	A	A		E	C	
Approach Delay		7.2	6.1		62.1		
Approach LOS		A	A		E		
Queue Length 50th (m)	0.5	37.6	10.0		22.7	0.0	
Queue Length 95th (m)	3.3	110.3	93.8		38.7	8.8	
Internal Link Dist (m)		198.2	95.9		17.7		
Turn Bay Length (m)	45.0						
Base Capacity (vph)	418	1443	2629		264	251	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	352		0	3	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.04	0.48	0.44		0.32	0.10	

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55	Intersection LOS: A
Intersection Signal Delay: 9.8	ICU Level of Service B
Intersection Capacity Utilization 57.6%	
Analysis Period (min) 15	

Splits and Phases: 39: Prince of Wales & Road B

 Ø2 (R) 97 s	 Ø9 15 s	 Ø4 28 s
 Ø5 12 s	 Ø6 (R) 85 s	



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	38	15	3	670	995	14	
Future Volume (vph)	38	15	3	670	995	14	
Satd. Flow (prot)	1601	1446	1300	3390	1784	1279	
Flt Permitted	0.950		0.950				
Satd. Flow (perm)	1601	1446	1287	3390	1784	1190	
Satd. Flow (RTOR)		15				8	
Lane Group Flow (vph)	38	15	3	670	995	14	
Turn Type	Perm	Perm	Prot	NA	NA	Perm	
Protected Phases			5	2	6		9
Permitted Phases	4	4				6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	1.0
Minimum Split (s)	23.3	23.3	10.3	23.3	23.3	23.3	10.0
Total Split (s)	23.3	23.3	10.3	106.7	96.4	96.4	10.0
Total Split (%)	16.6%	16.6%	7.4%	76.2%	68.9%	68.9%	7%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	11.6	11.6	5.6	119.9	117.8	117.8	
Actuated g/C Ratio	0.08	0.08	0.04	0.86	0.84	0.84	
v/c Ratio	0.29	0.11	0.06	0.23	0.66	0.01	
Control Delay	64.8	24.7	67.3	3.1	13.8	2.8	
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	
Total Delay	64.8	24.7	67.3	3.1	14.0	2.8	
LOS	E	C	E	A	B	A	
Approach Delay	53.5			3.4	13.8		
Approach LOS	D			A	B		
Queue Length 50th (m)	10.2	0.0	0.8	13.5	16.9	0.0	
Queue Length 95th (m)	20.6	6.8	4.1	37.7	331.3	m3.8	
Internal Link Dist (m)	165.3			279.2	63.5		
Turn Bay Length (m)	45.0		50.0			50.0	
Base Capacity (vph)	205	198	52	2903	1501	1003	
Starvation Cap Reductn	0	0	0	0	65	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.19	0.08	0.06	0.23	0.69	0.01	

**Intersection Summary**

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated



Maximum v/c Ratio: 0.66

Intersection Signal Delay: 11.0

Intersection LOS: B

Intersection Capacity Utilization 72.4%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 40: Prince of Wales & Road E

 Ø9	 Ø2 (R)	 Ø4
10 s	106.7 s	23.3 s
	 Ø5	
	 Ø6 (R)	
	10.3 s	96.4 s

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↕	↕	↗	↘	↘
Traffic Vol, veh/h	26	785	1500	17	5	14
Future Vol, veh/h	26	785	1500	17	5	14
Conflicting Peds, #/hr	42	0	0	42	4	8
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	25	-	-	20	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	785	1500	17	5	14

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1559	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.22	-	-
Pot Cap-1 Maneuver	420	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	405	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	39.2
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	405	-	-	-	124
HCM Lane V/C Ratio	0.064	-	-	-	0.153
HCM Control Delay (s)	14.5	-	-	-	39.2
HCM Lane LOS	B	-	-	-	E
HCM 95th %tile Q(veh)	0.2	-	-	-	0.5

Intersection						
Int Delay, s/veh	20.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑	↑		↑
Traffic Vol, veh/h	0	864	1101	74	0	264
Future Vol, veh/h	0	864	1101	74	0	264
Conflicting Peds, #/hr	70	0	0	70	1	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	30	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	864	1101	74	0	264

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 1176
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.23
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.319
Pot Cap-1 Maneuver	0	-	- - 0 ~ 232
Stage 1	0	-	- - 0 -
Stage 2	0	-	- - 0 -
Platoon blocked, %	-	-	- - -
Mov Cap-1 Maneuver	-	-	- - ~ 217
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	177.4
HCM LOS			F

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	217
HCM Lane V/C Ratio	-	-	-	1.217
HCM Control Delay (s)	-	-	-	177.4
HCM Lane LOS	-	-	-	F
HCM 95th %tile Q(veh)	-	-	-	13.3

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗			↖			↔				↖
Traffic Vol, veh/h	0	776	1	1	956	26	3	0	6	0	0	28
Future Vol, veh/h	0	776	1	1	956	26	3	0	6	0	0	28
Conflicting Peds, #/hr	8	0	6	6	0	8	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	776	1	1	956	26	3	0	6	0	0	28

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	783	0	0	1769	1775	783	-	-	978
Stage 1	-	-	-	-	-	-	783	783	-	-	-	-
Stage 2	-	-	-	-	-	-	986	992	-	-	-	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	-	-	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	835	-	-	65	83	394	0	0	304
Stage 1	0	-	-	-	-	-	387	404	-	0	0	-
Stage 2	0	-	-	-	-	-	298	324	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	831	-	-	59	82	392	-	-	302
Mov Cap-2 Maneuver	-	-	-	-	-	-	59	82	-	-	-	-
Stage 1	-	-	-	-	-	-	387	402	-	-	-	-
Stage 2	-	-	-	-	-	-	269	321	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			33.3			18.1		
HCM LOS							D			C		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	136	-	-	831	-	-	302
HCM Lane V/C Ratio	0.066	-	-	0.001	-	-	0.093
HCM Control Delay (s)	33.3	-	-	9.3	-	-	18.1
HCM Lane LOS	D	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	0	-	-	0.3

Intersection												
Int Delay, s/veh	6.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	48	18	27	26	5	28	0	159	0	0	5
Future Vol, veh/h	0	48	18	27	26	5	28	0	159	0	0	5
Conflicting Peds, #/hr	10	0	10	10	0	10	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	48	18	27	26	5	28	0	159	0	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	41	0	0	76	0	0	134	162	43	117	169	26
Stage 1	-	-	-	-	-	-	67	67	-	93	93	-
Stage 2	-	-	-	-	-	-	67	95	-	24	76	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1567	-	-	1521	-	-	824	729	1018	847	723	1044
Stage 1	-	-	-	-	-	-	936	838	-	904	817	-
Stage 2	-	-	-	-	-	-	936	815	-	991	831	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1554	-	-	1508	-	-	802	704	1009	698	698	1035
Mov Cap-2 Maneuver	-	-	-	-	-	-	802	704	-	698	698	-
Stage 1	-	-	-	-	-	-	929	831	-	897	796	-
Stage 2	-	-	-	-	-	-	915	794	-	835	824	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			3.5			9.6			8.5		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	971	1554	-	-	1508	-	-	1035
HCM Lane V/C Ratio	0.193	-	-	-	0.018	-	-	0.005
HCM Control Delay (s)	9.6	0	-	-	7.4	0	-	8.5
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.7	0	-	-	0.1	-	-	0

Intersection						
Int Delay, s/veh	7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑	↑		↑↑
Traffic Vol, veh/h	87	38	8	14	14	19
Future Vol, veh/h	87	38	8	14	14	19
Conflicting Peds, #/hr	0	0	0	15	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	0	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	87	38	8	14	14	19

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	61	23	0	0	37
Stage 1	23	-	-	-	-
Stage 2	38	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	942	1053	-	-	1573
Stage 1	999	-	-	-	-
Stage 2	980	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	921	1040	-	-	1553
Mov Cap-2 Maneuver	921	-	-	-	-
Stage 1	986	-	-	-	-
Stage 2	971	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	3.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	954	1553
HCM Lane V/C Ratio	-	-	0.131	0.009
HCM Control Delay (s)	-	-	9.3	7.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	2	2	22	106	0
Future Vol, veh/h	0	2	2	22	106	0
Conflicting Peds, #/hr	0	0	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	100	100	100	2	2	100
Mvmt Flow	0	2	2	22	106	0

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	126	58	111	0	0
Stage 1	111	-	-	-	-
Stage 2	15	-	-	-	-
Critical Hdwy	8.8	8.9	6.1	-	-
Critical Hdwy Stg 1	7.8	-	-	-	-
Critical Hdwy Stg 2	7.8	-	-	-	-
Follow-up Hdwy	4.5	4.3	3.2	-	-
Pot Cap-1 Maneuver	635	751	979	-	-
Stage 1	674	-	-	-	-
Stage 2	782	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	629	748	975	-	-
Mov Cap-2 Maneuver	629	-	-	-	-
Stage 1	670	-	-	-	-
Stage 2	779	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.8	0.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	975	-	748	-	-
HCM Lane V/C Ratio	0.002	-	0.003	-	-
HCM Control Delay (s)	8.7	0	9.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	6.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	8	7	0	20	2
Future Vol, veh/h	0	8	7	0	20	2
Conflicting Peds, #/hr	0	10	10	0	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	8	7	0	20	2

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	18	0	38
Stage 1	-	-	-	-	14
Stage 2	-	-	-	-	24
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1599	-	974
Stage 1	-	-	-	-	1009
Stage 2	-	-	-	-	999
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1585	-	955
Mov Cap-2 Maneuver	-	-	-	-	955
Stage 1	-	-	-	-	1001
Stage 2	-	-	-	-	987

Approach	EB	WB	NB
HCM Control Delay, s	0	7.3	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	962	-	-	1585	-
HCM Lane V/C Ratio	0.023	-	-	0.004	-
HCM Control Delay (s)	8.8	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-



Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	68	4	1	103	101	0	7	2	109	181	47
Future Vol, veh/h	30	68	4	1	103	101	0	7	2	109	181	47
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	68	4	1	103	101	0	7	2	109	181	47
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9	9.3	8.1	11.3
HCM LOS	A	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	29%	0%	32%
Vol Thru, %	78%	67%	50%	54%
Vol Right, %	22%	4%	49%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	102	205	337
LT Vol	0	30	1	109
Through Vol	7	68	103	181
RT Vol	2	4	101	47
Lane Flow Rate	9	102	205	337
Geometry Grp	1	1	1	1
Degree of Util (X)	0.012	0.143	0.263	0.435
Departure Headway (Hd)	4.952	5.057	4.611	4.651
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	717	706	777	772
Service Time	3.024	3.114	2.657	2.697
HCM Lane V/C Ratio	0.013	0.144	0.264	0.437
HCM Control Delay	8.1	9	9.3	11.3
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	0	0.5	1.1	2.2

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	100	0	30	0	0	20	30	100	0	8	52	52
Future Vol, veh/h	100	0	30	0	0	20	30	100	0	8	52	52
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	100	0	30	0	0	20	30	100	0	8	52	52
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.4	7.1	8.3	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	23%	77%	0%	7%
Vol Thru, %	77%	0%	0%	46%
Vol Right, %	0%	23%	100%	46%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	130	130	20	112
LT Vol	30	100	0	8
Through Vol	100	0	0	52
RT Vol	0	30	20	52
Lane Flow Rate	130	130	20	112
Geometry Grp	1	1	1	1
Degree of Util (X)	0.16	0.163	0.022	0.129
Departure Headway (Hd)	4.444	4.509	4.023	4.16
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	810	798	891	864
Service Time	2.459	2.523	2.042	2.175
HCM Lane V/C Ratio	0.16	0.163	0.022	0.13
HCM Control Delay	8.3	8.4	7.1	7.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.6	0.1	0.4

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑	↘	
Traffic Vol, veh/h	40	18	15	39	19	26
Future Vol, veh/h	40	18	15	39	19	26
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	18	15	39	19	26
Number of Lanes	2	0	1	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	2
HCM Control Delay	7.3	7.7	7.1
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	42%	0%	0%	100%	0%
Vol Thru, %	0%	100%	43%	0%	100%
Vol Right, %	58%	0%	57%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	45	27	31	15	39
LT Vol	19	0	0	15	0
Through Vol	0	27	13	0	39
RT Vol	26	0	18	0	0
Lane Flow Rate	45	27	31	15	39
Geometry Grp	2	7	7	7	7
Degree of Util (X)	0.048	0.034	0.037	0.021	0.05
Departure Headway (Hd)	3.858	4.641	4.238	5.144	4.643
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	916	771	844	696	771
Service Time	1.935	2.37	1.968	2.871	2.37
HCM Lane V/C Ratio	0.049	0.035	0.037	0.022	0.051
HCM Control Delay	7.1	7.5	7.1	8	7.6
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.1	0.1	0.2

Lanes, Volumes, Timings  
10: Carling & Parkdale

2028 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø10
Lane Configurations							
Traffic Volume (vph)	96	613	1158	122	26	157	
Future Volume (vph)	96	613	1158	122	26	157	
Satd. Flow (prot)	1695	3390	3390	1517	1526	0	
Flt Permitted	0.950				0.993		
Satd. Flow (perm)	1643	3390	3390	1239	1524	0	
Satd. Flow (RTOR)				122	157		
Lane Group Flow (vph)	96	613	1158	122	183	0	
Turn Type	Prot	NA	NA	Perm	Perm		
Protected Phases	5	2	6				10
Permitted Phases				6	4		
Detector Phase	5	2	6	6	4		
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		1.0
Minimum Split (s)	11.1	26.7	26.7	26.7	37.2		5.0
Total Split (s)	16.0	92.8	76.8	76.8	37.2		5.0
Total Split (%)	11.9%	68.7%	56.9%	56.9%	27.6%		4%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.0		2.0
All-Red Time (s)	2.4	1.9	1.9	1.9	3.2		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.1	5.6	5.6	5.6	6.2		
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Min	C-Min	C-Min	None		Min
Act Effct Green (s)	13.6	104.0	84.3	84.3	11.7		
Actuated g/C Ratio	0.10	0.77	0.62	0.62	0.09		
v/c Ratio	0.56	0.23	0.55	0.15	0.67		
Control Delay	69.9	4.8	16.5	2.6	25.0		
Queue Delay	0.0	0.0	0.7	0.0	0.0		
Total Delay	69.9	4.8	17.2	2.6	25.0		
LOS	E	A	B	A	C		
Approach Delay		13.6	15.8		25.0		
Approach LOS		B	B		C		
Queue Length 50th (m)	24.7	19.3	84.6	0.0	6.6		
Queue Length 95th (m)	41.7	31.7	127.1	8.7	29.5		
Internal Link Dist (m)		297.5	170.5		278.4		
Turn Bay Length (m)	155.0			80.0			
Base Capacity (vph)	173	2612	2116	819	470		
Starvation Cap Reductn	0	0	570	0	0		
Spillback Cap Reductn	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0		
Reduced v/c Ratio	0.55	0.23	0.75	0.15	0.39		

Intersection Summary

Cycle Length: 135  
 Actuated Cycle Length: 135  
 Offset: 66 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 15.9

Intersection LOS: B

Intersection Capacity Utilization 72.1%

ICU Level of Service C

Analysis Period (min) 15

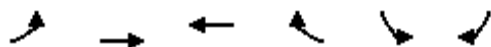
Splits and Phases: 10: Carling & Parkdale



Lanes, Volumes, Timings  
11: Carling & Civic

2028 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	88	568	1263	40	17	16
Future Volume (vph)	88	568	1263	40	17	16
Satd. Flow (prot)	1695	3390	3390	1517	1592	0
Flt Permitted	0.950				0.975	
Satd. Flow (perm)	1680	3390	3390	1394	1580	0
Satd. Flow (RTOR)				40	16	
Lane Group Flow (vph)	88	568	1263	40	33	0
Turn Type	Prot	NA	NA	Perm	Perm	
Protected Phases	5	2	6			
Permitted Phases				6	4	
Detector Phase	5	2	6	6	4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.4	31.3	31.3	31.3	23.3	
Total Split (s)	12.5	106.7	94.2	94.2	23.3	
Total Split (%)	9.6%	82.1%	72.5%	72.5%	17.9%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	
All-Red Time (s)	2.7	2.7	2.7	2.7	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.4	6.4	6.4	6.4	5.3	
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	
Act Effct Green (s)	15.2	115.4	91.2	91.2	11.6	
Actuated g/C Ratio	0.12	0.89	0.70	0.70	0.09	
v/c Ratio	0.44	0.19	0.53	0.04	0.21	
Control Delay	60.9	2.2	9.8	2.6	36.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	60.9	2.2	9.8	2.6	36.3	
LOS	E	A	A	A	D	
Approach Delay		10.1	9.5		36.3	
Approach LOS		B	A		D	
Queue Length 50th (m)	21.4	11.8	63.7	0.0	4.1	
Queue Length 95th (m)	37.8	23.1	78.5	3.2	13.7	
Internal Link Dist (m)		170.5	180.8		39.9	
Turn Bay Length (m)	90.0			140.0		
Base Capacity (vph)	198	3009	2442	1015	232	
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	0.44	0.19	0.52	0.04	0.14	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 10.1

Intersection LOS: B

Intersection Capacity Utilization 68.0%

ICU Level of Service C

Analysis Period (min) 15

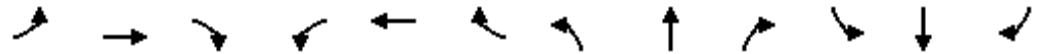
Splits and Phases: 11: Carling & Civic



Lanes, Volumes, Timings  
13: Maple/Old Irvine & Carling

2028 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	470	41	37	1062	7	75	20	44	6	4	14
Future Volume (vph)	40	470	41	37	1062	7	75	20	44	6	4	14
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	0	1643	0	0	1599	0
Flt Permitted	0.240			0.483				0.818			0.921	
Satd. Flow (perm)	415	3390	1293	808	3390	1178	0	1370	0	0	1483	0
Satd. Flow (RTOR)			37			37		18			14	
Lane Group Flow (vph)	40	470	41	37	1062	7	0	139	0	0	24	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	35.0	35.0	35.0	34.3	34.3	34.3	42.4	42.4		42.4	42.4	
Total Split (s)	87.0	87.0	87.0	87.0	87.0	87.0	43.0	43.0		43.0	43.0	
Total Split (%)	66.9%	66.9%	66.9%	66.9%	66.9%	66.9%	33.1%	33.1%		33.1%	33.1%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	4.4	4.4		4.4	4.4	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.7		7.4			7.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	94.7	94.7	94.7	94.7	94.7	94.7		22.2			22.2	
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.73	0.73		0.17			0.17	
v/c Ratio	0.13	0.19	0.04	0.06	0.43	0.01		0.56			0.09	
Control Delay	7.4	5.5	1.8	8.0	8.9	0.0		49.1			23.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	7.4	5.5	1.8	8.0	8.9	0.0		49.1			23.0	
LOS	A	A	A	A	A	A		D			C	
Approach Delay		5.4			8.8			49.1			23.0	
Approach LOS		A			A			D			C	
Queue Length 50th (m)	1.4	8.6	0.1	2.0	40.7	0.0		30.2			2.3	
Queue Length 95th (m)	9.9	20.3	1.0	7.8	85.3	m0.0		44.2			8.7	
Internal Link Dist (m)		236.1			191.5			174.3			220.8	
Turn Bay Length (m)	20.0		15.0	45.0		25.0						
Base Capacity (vph)	302	2470	952	588	2470	868		388			416	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.13	0.19	0.04	0.06	0.43	0.01		0.36			0.06	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 28 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated



Maximum v/c Ratio: 0.56

Intersection Signal Delay: 11.0

Intersection LOS: B

Intersection Capacity Utilization 69.3%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 13: Maple/Old Irvine & Carling



Lanes, Volumes, Timings  
15: Carling & Sherwood

2028 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗↗	↖↖	↗	↘	↘
Traffic Volume (vph)	43	527	951	209	154	9
Future Volume (vph)	43	527	951	209	154	9
Satd. Flow (prot)	1695	3390	3390	1517	1695	1517
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1573	3390	3390	1072	1669	1473
Satd. Flow (RTOR)				209		7
Lane Group Flow (vph)	43	527	951	209	154	9
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.3	25.1	25.1	25.1	25.1	25.1
Total Split (s)	15.0	89.0	74.0	74.0	41.0	41.0
Total Split (%)	11.5%	68.5%	56.9%	56.9%	31.5%	31.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	8.7	102.0	90.2	90.2	17.4	17.4
Actuated g/C Ratio	0.07	0.78	0.69	0.69	0.13	0.13
v/c Ratio	0.38	0.20	0.40	0.26	0.69	0.04
Control Delay	66.7	4.1	2.8	0.7	69.3	27.8
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	66.7	4.1	2.9	0.7	69.3	27.8
LOS	E	A	A	A	E	C
Approach Delay		8.8	2.5		67.0	
Approach LOS		A	A		E	
Queue Length 50th (m)	10.7	15.2	7.9	0.0	38.2	0.5
Queue Length 95th (m)	22.5	25.6	20.0	0.0	57.8	5.4
Internal Link Dist (m)		118.3	141.7		152.1	
Turn Bay Length (m)	30.0			90.0		15.0
Base Capacity (vph)	133	2660	2352	807	458	409
Starvation Cap Reductn	0	0	361	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	0.32	0.20	0.48	0.26	0.34	0.02

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 24 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 10.0

Intersection LOS: A

Intersection Capacity Utilization 55.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 15: Carling & Sherwood



Lanes, Volumes, Timings  
16: Road A/Champagne & Carling

2028 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	550	44	46	908	139	109	0	125	127	0	142
Future Volume (vph)	65	550	44	46	908	139	109	0	125	127	0	142
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1695	1402	0	1695	1417	0
Flt Permitted	0.950			0.950			0.405			0.677		
Satd. Flow (perm)	1555	3390	1356	1634	3390	1019	697	1402	0	1142	1417	0
Satd. Flow (RTOR)						147					309	
Lane Group Flow (vph)	65	550	44	46	908	139	109	125	0	127	142	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8				4
Permitted Phases			2			6	8			4		
Detector Phase	5	2	2	1	6	6	3	8		4		4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	15.3	26.3	26.3	15.3	26.3	26.3	10.3	23.3		37.9	37.9	
Total Split (s)	15.3	48.2	48.2	15.3	53.2	53.2	12.5	56.5		39.0	39.0	
Total Split (%)	11.8%	37.1%	37.1%	11.8%	40.9%	40.9%	9.6%	43.5%		30.0%	30.0%	
Yellow Time (s)	3.3	3.7	3.7	3.3	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	1.6	1.6	2.0	1.6	1.6	2.0	2.0		2.6	2.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3		5.9	5.9	
Lead/Lag	Lead			Lead			Lead					
Lead-Lag Optimize?	Yes			Yes			Yes					
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	10.7	67.6	67.6	10.3	68.2	68.2	37.3	37.3		20.5	20.5	
Actuated g/C Ratio	0.08	0.52	0.52	0.08	0.52	0.52	0.29	0.29		0.16	0.16	
v/c Ratio	0.47	0.31	0.06	0.34	0.51	0.23	0.40	0.31		0.71	0.29	
Control Delay	65.3	21.5	21.9	64.1	24.6	4.5	37.4	36.2		71.1	1.5	
Queue Delay	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0		0.0	0.0	
Total Delay	65.3	21.5	21.9	64.1	26.2	4.5	37.4	36.2		71.1	1.5	
LOS	E	C	C	E	C	A	D	D		E	A	
Approach Delay		25.9			25.1			36.8				34.4
Approach LOS		C			C			D				C
Queue Length 50th (m)	16.7	51.4	5.1	11.4	79.0	0.0	21.3	25.2		31.4	0.0	
Queue Length 95th (m)	24.8	82.1	18.7	24.0	129.0	12.1	31.2	36.4		47.9	0.0	
Internal Link Dist (m)		141.7			98.6			63.9				477.2
Turn Bay Length (m)	55.0		75.0	61.0		35.0				30.0		
Base Capacity (vph)	139	1762	704	134	1778	604	275	552		290	591	
Starvation Cap Reductn	0	0	0	0	653	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.47	0.31	0.06	0.34	0.81	0.23	0.40	0.23		0.44	0.24	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 105  
 Control Type: Actuated-Coordinated

Lane Group	Ø9	Ø10	Ø11
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	9	10	11
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	1.0	1.0	1.0
Minimum Split (s)	10.0	5.0	5.0
Total Split (s)	10.0	5.0	5.0
Total Split (%)	8%	4%	4%
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes
Recall Mode	None	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 27.6











Intersection LOS: C

Intersection Capacity Utilization 83.0%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 16: Road A/Champagne & Carling

 Ø1 15.3 s	 Ø9 10 s	 Ø2 (R) 48.2 s	 Ø3 12.5 s	 Ø1  Ø4 5 s    39 s
 Ø5 15.3 s	 Ø10  Ø6 (R) 5 s    53.2 s	 Ø8 56.5 s		

Lanes, Volumes, Timings  
17: Carling & Trillium MUP

2028 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑							
Traffic Volume (vph)	0	814	0	0	1085	0	0	0	0	0	0	0
Future Volume (vph)	0	814	0	0	1085	0	0	0	0	0	0	0
Satd. Flow (prot)	0	3390	0	0	3390	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3390	0	0	3390	0	0	0	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	814	0	0	1085	0	0	0	0	0	0	0
Turn Type		NA			NA							
Protected Phases		2			6							
Permitted Phases												
Detector Phase		2			6							
Switch Phase												
Minimum Initial (s)		10.0			10.0							
Minimum Split (s)		31.1			31.1							
Total Split (s)		35.0			35.0							
Total Split (%)		50.0%			50.0%							
Yellow Time (s)		3.7			3.7							
All-Red Time (s)		1.4			1.4							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		5.1			5.1							
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Min			C-Min							
Act Effct Green (s)		62.0			62.0							
Actuated g/C Ratio		0.89			0.89							
v/c Ratio		0.27			0.36							
Control Delay		4.7			4.7							
Queue Delay		0.0			0.0							
Total Delay		4.7			4.7							
LOS		A			A							
Approach Delay		4.7			4.7							
Approach LOS		A			A							
Queue Length 50th (m)		0.0			0.0							
Queue Length 95th (m)		56.5			m94.4							
Internal Link Dist (m)		98.6			92.8			53.0			60.9	
Turn Bay Length (m)												
Base Capacity (vph)		3002			3002							
Starvation Cap Reductn		0			32							
Spillback Cap Reductn		0			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.27			0.37							
<b>Intersection Summary</b>												
Cycle Length: 70												
Actuated Cycle Length: 70												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 70												
Control Type: Actuated-Coordinated												

Lane Group	Ø4	Ø8
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	4	8
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	35.6	35.6
Total Split (s)	35.0	35.0
Total Split (%)	50%	50%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	3.6	3.6
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		



Maximum v/c Ratio: 0.36

Intersection Signal Delay: 4.7

Intersection LOS: A

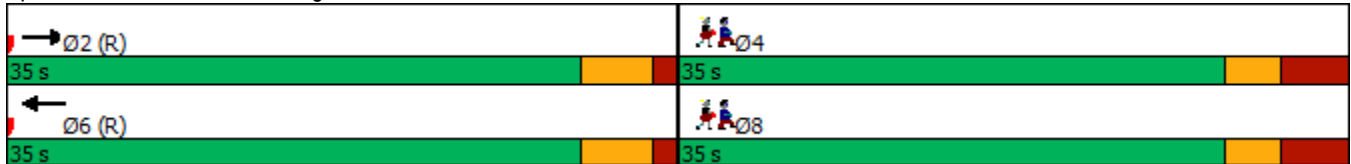
Intersection Capacity Utilization 35.9%

ICU Level of Service A

Analysis Period (min) 15

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

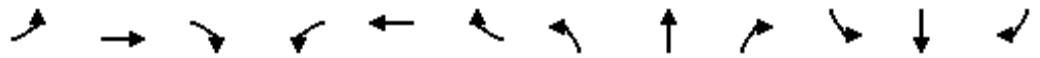
Splits and Phases: 17: Carling & Trillium MUP



Lanes, Volumes, Timings  
18: Preston & Carling

2028 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑		↘	↗	
Traffic Volume (vph)	142	477	195	297	748	68	278	396	171	111	302	67
Future Volume (vph)	142	477	195	297	748	68	278	396	171	111	302	67
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1695	3127	0	1695	1695	0
Flt Permitted	0.950			0.950			0.132			0.439		
Satd. Flow (perm)	1602	3390	1517	1617	3390	1242	236	3127	0	748	1695	0
Satd. Flow (RTOR)						179					7	
Lane Group Flow (vph)	142	477	195	297	748	68	278	567	0	111	369	0
Turn Type	Prot	NA	custom	Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	9 2	9 3	1	6		3	8				4
Permitted Phases						6	8			4		
Detector Phase	5	9 2	9 3	1	6	6	3	8		4		4
Switch Phase												
Minimum Initial (s)	5.0			5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2			11.2	25.0	25.0	11.9	38.9		38.9	38.9	
Total Split (s)	21.0			32.0	45.0	45.0	25.0	64.0		39.0	39.0	
Total Split (%)	15.0%			22.9%	32.1%	32.1%	17.9%	45.7%		27.9%	27.9%	
Yellow Time (s)	3.7			3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5			2.5	2.3	2.3	3.6	3.6		3.6	3.6	
Lost Time Adjust (s)	0.0			0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2			6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead			Lead			Lead					
Lead-Lag Optimize?	Yes			Yes			Yes					
Recall Mode	None			None	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	14.2	36.2	34.0	25.7	41.9	41.9	60.8	56.8		31.5	31.5	
Actuated g/C Ratio	0.10	0.26	0.24	0.18	0.30	0.30	0.43	0.41		0.22	0.22	
v/c Ratio	0.83	0.55	0.53	0.96	0.74	0.14	0.95	0.45		0.66	0.96	
Control Delay	97.2	44.6	56.4	97.6	50.1	0.6	77.6	12.6		69.4	88.0	
Queue Delay	0.0	0.9	2.1	0.0	0.0	0.0	6.3	0.0		0.0	39.3	
Total Delay	97.2	45.4	58.5	97.6	50.1	0.6	83.9	12.6		69.4	127.3	
LOS	F	D	E	F	D	A	F	B		E	F	
Approach Delay		57.6			59.8			36.1			113.9	
Approach LOS		E			E			D			F	
Queue Length 50th (m)	39.0	61.2	47.4	82.2	101.2	0.0	34.2	21.2		28.1	99.5	
Queue Length 95th (m)	#75.3	70.5	82.8	#138.3	125.1	0.0	#108.3	26.2		#53.6	#159.3	
Internal Link Dist (m)		92.8			165.9			145.6			55.2	
Turn Bay Length (m)	70.0		90.0	120.0		95.0				35.0		
Base Capacity (vph)	179	849	369	312	1015	497	294	1275		171	394	
Starvation Cap Reductn	0	153	36	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	79	0	0	0	10	0		0	54	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.79	0.69	0.67	0.95	0.74	0.14	0.98	0.44		0.65	1.09	

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 6 (4%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated

Lane Group	Ø2	Ø9	Ø10	Ø11	Ø12
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Satd. Flow (RTOR)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	2	9	10	11	12
Permitted Phases					
Detector Phase					
Switch Phase					
Minimum Initial (s)	10.0	1.0	1.0	1.0	1.0
Minimum Split (s)	26.0	5.3	5.0	5.0	5.0
Total Split (s)	28.9	10.1	5.0	5.0	5.0
Total Split (%)	21%	7%	4%	4%	4%
Yellow Time (s)	2.0	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	2.3	0.0	0.0	0.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes		Yes	Yes	
Recall Mode	C-Min	Min	None	None	None
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (m)					
Queue Length 95th (m)					
Internal Link Dist (m)					
Turn Bay Length (m)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					
Intersection Summary					

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 61.1

Intersection LOS: E

Intersection Capacity Utilization 94.4%

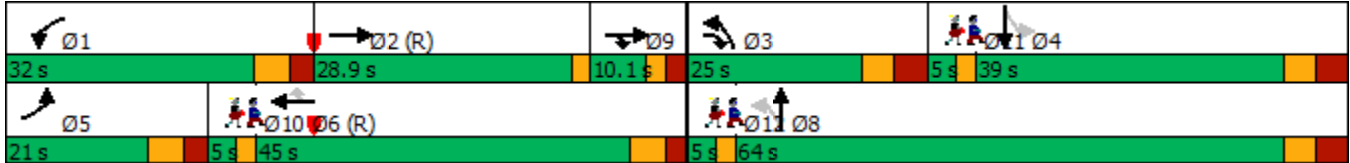
ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 18: Preston & Carling



Lanes, Volumes, Timings  
20: Carling & Booth

2028 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↗	↗↗	↗	↗	↘	↘
Traffic Volume (vph)	197	705	708	109	258	255
Future Volume (vph)	197	705	708	109	258	255
Satd. Flow (prot)	1695	3390	1784	1517	1695	1517
Flt Permitted	0.196				0.950	
Satd. Flow (perm)	350	3390	1784	1161	1665	1209
Satd. Flow (RTOR)				40		183
Lane Group Flow (vph)	197	705	708	109	258	255
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	29.7	29.7	29.7	39.0	39.0
Total Split (s)	23.0	90.0	67.0	67.0	40.0	40.0
Total Split (%)	17.7%	69.2%	51.5%	51.5%	30.8%	30.8%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	88.2	88.4	70.7	70.7	29.9	29.9
Actuated g/C Ratio	0.68	0.68	0.54	0.54	0.23	0.23
v/c Ratio	0.55	0.31	0.73	0.17	0.68	0.61
Control Delay	14.4	9.4	30.1	11.9	54.3	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.4	9.4	30.1	11.9	54.3	19.3
LOS	B	A	C	B	D	B
Approach Delay		10.5	27.7		36.9	
Approach LOS		B	C		D	
Queue Length 50th (m)	18.3	38.2	138.8	8.7	58.7	14.7
Queue Length 95th (m)	28.7	48.6	#213.5	21.2	86.9	43.1
Internal Link Dist (m)		100.4	299.3		220.7	
Turn Bay Length (m)	50.0			30.0		30.0
Base Capacity (vph)	415	2305	969	649	435	451
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.31	0.73	0.17	0.59	0.57

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 110 (85%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 22.9

Intersection LOS: C

Intersection Capacity Utilization 92.3%

ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 20: Carling & Booth



Lanes, Volumes, Timings  
21: Bronson & Carling/Glebe

2028 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	100	443	0	0	0	480	718	20	0	1083	249
Future Volume (vph)	420	100	443	0	0	0	480	718	20	0	1083	249
Satd. Flow (prot)	1610	1649	1517	0	0	0	3288	1766	0	0	3251	0
Flt Permitted	0.950	0.973					0.950					
Satd. Flow (perm)	1511	1592	1415	0	0	0	3239	1766	0	0	3251	0
Satd. Flow (RTOR)			105					2			22	
Lane Group Flow (vph)	290	230	443	0	0	0	480	738	0	0	1332	0
Turn Type	Perm	NA	pm+ov				Prot	NA			NA	
Protected Phases		4	5				5	2			6	
Permitted Phases	4		4									
Detector Phase	4	4	5				5	2			6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0				10.0	10.0			10.0	
Minimum Split (s)	31.0	31.0	16.0				16.0	25.1			33.0	
Total Split (s)	47.0	47.0	29.0				29.0	93.0			64.0	
Total Split (%)	32.0%	32.0%	19.7%				19.7%	63.3%			43.5%	
Yellow Time (s)	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	
Lost Time Adjust (s)	0.0	0.0	0.0				0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0	6.0				6.0	6.0			6.0	
Lead/Lag			Lead				Lead				Lag	
Lead-Lag Optimize?			Yes				Yes				Yes	
Recall Mode	None	None	None				None	C-Min			C-Min	
Act Effct Green (s)	32.9	32.9	58.5				25.6	95.1			63.5	
Actuated g/C Ratio	0.22	0.22	0.40				0.17	0.65			0.43	
v/c Ratio	0.86	0.65	0.69				0.84	0.65			0.94	
Control Delay	77.6	59.6	29.6				72.3	20.3			53.3	
Queue Delay	0.0	0.0	0.0				0.0	0.0			0.0	
Total Delay	77.6	59.6	29.6				72.3	20.3			53.3	
LOS	E	E	C				E	C			D	
Approach Delay		51.2						40.8			53.3	
Approach LOS		D						D			D	
Queue Length 50th (m)	85.7	64.2	71.2				68.4	124.2			~202.5	
Queue Length 95th (m)	115.2	88.3	103.6				#104.2	192.1			#258.5	
Internal Link Dist (m)		74.7			115.0			394.4			328.4	
Turn Bay Length (m)	40.0						50.0					
Base Capacity (vph)	421	444	645				574	1143			1417	
Starvation Cap Reductn	0	0	0				0	0			0	
Spillback Cap Reductn	0	0	0				0	0			0	
Storage Cap Reductn	0	0	0				0	0			0	
Reduced v/c Ratio	0.69	0.52	0.69				0.84	0.65			0.94	

Intersection Summary

Cycle Length: 147  
 Actuated Cycle Length: 147  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated

Lane Group	Ø10
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	7.0
Total Split (s)	7.0
Total Split (%)	5%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	



Maximum v/c Ratio: 0.94

Intersection Signal Delay: 48.4

Intersection LOS: D

Intersection Capacity Utilization 91.7%

ICU Level of Service F

Analysis Period (min) 15

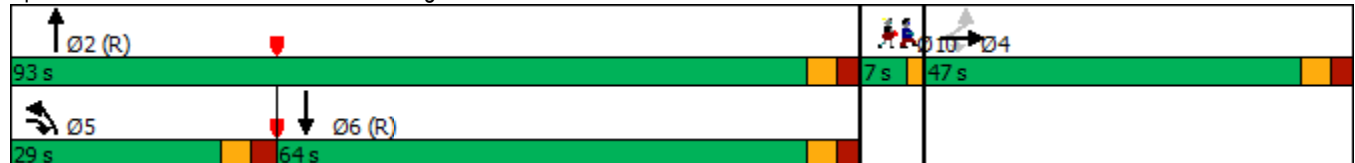
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 21: Bronson & Carling/Glebe



Lanes, Volumes, Timings  
22: Parkdale & 417 WB on/off

2028 PM Demand Rationalized Main Hospital SPA PEAK GEN

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	224	8	416	121	441	0	0	531	191
Future Volume (vph)	0	0	0	224	8	416	121	441	0	0	531	191
Satd. Flow (prot)	0	0	0	1695	1465	0	1695	1784	0	0	1687	0
Flt Permitted				0.950			0.254					
Satd. Flow (perm)	0	0	0	1695	1465	0	453	1784	0	0	1687	0
Satd. Flow (RTOR)					409						28	
Lane Group Flow (vph)	0	0	0	224	424	0	121	441	0	0	722	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				29.0	29.0		10.3	27.3			25.1	
Total Split (s)				29.0	29.0		11.0	71.0			60.0	
Total Split (%)				29.0%	29.0%		11.0%	71.0%			60.0%	
Yellow Time (s)				3.3	3.3		3.0	3.0			3.0	
All-Red Time (s)				2.2	2.2		2.2	3.3			3.3	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				5.5	5.5		5.2	6.3			6.3	
Lead/Lag							Lag				Lead	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				None	None		None	C-Min			C-Min	
Act Effct Green (s)				18.2	18.2		71.1	70.0			57.4	
Actuated g/C Ratio				0.18	0.18		0.71	0.70			0.57	
v/c Ratio				0.72	0.71		0.29	0.35			0.74	
Control Delay				51.7	11.2		4.9	3.6			22.0	
Queue Delay				0.0	0.0		1.5	1.0			2.0	
Total Delay				51.7	11.2		6.4	4.6			24.0	
LOS				D	B		A	A			C	
Approach Delay					25.2			5.0			24.0	
Approach LOS					C			A			C	
Queue Length 50th (m)				41.2	2.4		4.6	18.5			96.6	
Queue Length 95th (m)				62.1	29.1		m2.8	14.1			153.9	
Internal Link Dist (m)		157.5			140.3			45.3			171.5	
Turn Bay Length (m)												
Base Capacity (vph)				398	657		413	1248			987	
Starvation Cap Reductn				0	0		164	541			0	
Spillback Cap Reductn				0	0		0	0			138	
Storage Cap Reductn				0	0		0	0			0	
Reduced v/c Ratio				0.56	0.65		0.49	0.62			0.85	

Intersection Summary

Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 39 (39%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 18.9

Intersection LOS: B

Intersection Capacity Utilization 119.8%

ICU Level of Service H

Analysis Period (min) 15

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

Splits and Phases: 22: Parkdale & 417 WB on/off



Lanes, Volumes, Timings  
23: Parkdale & 417 EB on/off

2028 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗					↕↗		↗	↕	
Traffic Volume (vph)	311	0	150	0	0	0	0	222	358	433	272	0
Future Volume (vph)	311	0	150	0	0	0	0	222	358	433	272	0
Satd. Flow (prot)	0	1695	1517	0	0	0	0	2898	0	1695	1784	0
Flt Permitted		0.950								0.317		
Satd. Flow (perm)	0	1695	1482	0	0	0	0	2898	0	555	1784	0
Satd. Flow (RTOR)			150					358				
Lane Group Flow (vph)	0	311	150	0	0	0	0	580	0	433	272	0
Turn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0					10.0		5.0	10.0	
Minimum Split (s)	25.1	25.1	25.1					25.1		10.3	25.1	
Total Split (s)	30.0	30.0	30.0					38.0		32.0	70.0	
Total Split (%)	30.0%	30.0%	30.0%					38.0%		32.0%	70.0%	
Yellow Time (s)	3.3	3.3	3.3					3.0		3.0	3.0	
All-Red Time (s)	2.6	2.6	2.6					2.8		2.3	2.8	
Lost Time Adjust (s)		0.0	0.0					0.0		0.0	0.0	
Total Lost Time (s)		5.9	5.9					5.8		5.3	5.8	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None	None					C-Min		None	C-Min	
Act Effct Green (s)		23.7	23.7					39.3		65.1	64.6	
Actuated g/C Ratio		0.24	0.24					0.39		0.65	0.65	
v/c Ratio		0.78	0.32					0.43		0.73	0.24	
Control Delay		48.7	6.5					11.1		20.7	11.4	
Queue Delay		0.0	0.0					0.1		24.0	1.9	
Total Delay		48.7	6.5					11.3		44.7	13.3	
LOS		D	A					B		D	B	
Approach Delay		35.0						11.3			32.6	
Approach LOS		C						B			C	
Queue Length 50th (m)		56.5	0.0					14.7		45.8	23.8	
Queue Length 95th (m)		78.6	13.4					37.3		75.6	m48.3	
Internal Link Dist (m)		109.8			145.0			90.1			45.3	
Turn Bay Length (m)			75.0									
Base Capacity (vph)		440	496					1407		674	1186	
Starvation Cap Reductn		0	0					178		244	749	
Spillback Cap Reductn		0	0					1		0	0	
Storage Cap Reductn		0	0					0		0	0	
Reduced v/c Ratio		0.71	0.30					0.47		1.01	0.62	

Intersection Summary

Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 29 (29%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 26.1

Intersection LOS: C

Intersection Capacity Utilization 119.8%

ICU Level of Service H

Analysis Period (min) 15

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

Splits and Phases: 23: Parkdale & 417 EB on/off



Lanes, Volumes, Timings  
24: Parkdale & Sherwood

2028 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	72	8	7	0	7	117	5	408	7	72	372	68
Future Volume (vph)	72	8	7	0	7	117	5	408	7	72	372	68
Satd. Flow (prot)	0	1683	0	0	1493	0	0	1777	0	0	1726	0
Flt Permitted		0.717						0.995			0.894	
Satd. Flow (perm)	0	1254	0	0	1493	0	0	1769	0	0	1548	0
Satd. Flow (RTOR)		7			117			3			23	
Lane Group Flow (vph)	0	87	0	0	124	0	0	420	0	0	512	0
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	18.0	18.0		18.0	18.0		25.1	25.1		25.1	25.1	
Total Split (s)	18.0	18.0		18.0	18.0		37.0	37.0		37.0	37.0	
Total Split (%)	32.7%	32.7%		32.7%	32.7%		67.3%	67.3%		67.3%	67.3%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.0			4.0			5.6			5.6	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Ped	Ped		Ped	Ped		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		14.0			14.0			31.4			31.4	
Actuated g/C Ratio		0.25			0.25			0.57			0.57	
v/c Ratio		0.27			0.27			0.42			0.57	
Control Delay		18.0			6.2			8.2			10.3	
Queue Delay		0.0			0.0			0.0			0.4	
Total Delay		18.0			6.2			8.2			10.8	
LOS		B			A			A			B	
Approach Delay		18.0			6.2			8.2			10.8	
Approach LOS		B			A			A			B	
Queue Length 50th (m)		6.3			0.5			20.3			26.8	
Queue Length 95th (m)		15.8			10.4			35.6			49.6	
Internal Link Dist (m)		221.3			335.0			289.1			90.1	
Turn Bay Length (m)												
Base Capacity (vph)		324			467			1011			893	
Starvation Cap Reductn		0			0			0			101	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.27			0.27			0.42			0.65	

Intersection Summary

Cycle Length: 55  
 Actuated Cycle Length: 55  
 Offset: 26 (47%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 9.9

Intersection LOS: A

Intersection Capacity Utilization 92.1%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 24: Parkdale & Sherwood



Lanes, Volumes, Timings  
25: Parkdale & Ruskin

2028 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗			↕			↕	
Traffic Volume (vph)	27	29	9	21	33	43	3	216	12	56	243	10
Future Volume (vph)	27	29	9	21	33	43	3	216	12	56	243	10
Satd. Flow (prot)	0	1695	0	1695	1554	0	0	1762	0	0	1759	0
Flt Permitted		0.830		0.807				0.997			0.910	
Satd. Flow (perm)	0	1401	0	1353	1554	0	0	1759	0	0	1601	0
Satd. Flow (RTOR)		7			43			8			5	
Lane Group Flow (vph)	0	65	0	21	76	0	0	231	0	0	309	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	19.4	19.4		19.4	19.4		31.8	31.8		31.8	31.8	
Total Split (s)	20.0	20.0		20.0	20.0		75.0	75.0		75.0	75.0	
Total Split (%)	21.1%	21.1%		21.1%	21.1%		78.9%	78.9%		78.9%	78.9%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.4	2.4		2.4	2.4		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.4		5.4	5.4			5.8			5.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		12.4		12.4	12.4			75.6			75.6	
Actuated g/C Ratio		0.13		0.13	0.13			0.80			0.80	
v/c Ratio		0.35		0.12	0.32			0.16			0.24	
Control Delay		38.9		37.2	22.7			3.5			4.0	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		38.9		37.2	22.7			3.5			4.0	
LOS		D		D	C			A			A	
Approach Delay		38.9			25.9			3.5			4.0	
Approach LOS		D			C			A			A	
Queue Length 50th (m)		9.6		3.4	5.4			10.3			15.2	
Queue Length 95th (m)		21.8		9.9	17.8			17.1			24.1	
Internal Link Dist (m)		220.6			228.6			278.4			289.1	
Turn Bay Length (m)				40.0								
Base Capacity (vph)		221		207	275			1402			1275	
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		0.29		0.10	0.28			0.16			0.24	

Intersection Summary

Cycle Length: 95  
 Actuated Cycle Length: 95  
 Offset: 40 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated



Maximum v/c Ratio: 0.35

Intersection Signal Delay: 10.1

Intersection LOS: B

Intersection Capacity Utilization 68.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 25: Parkdale & Ruskin



Lanes, Volumes, Timings  
30: Prince of Wales & Preston

2028 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	569	197	2	3	302	386	4	3	1	279	4	599
Future Volume (vph)	569	197	2	3	302	386	4	3	1	279	4	599
Satd. Flow (prot)	3288	1777	0	1695	1784	1517	0	1683	0	0	1700	1517
Flt Permitted	0.950			0.950				0.834			0.724	
Satd. Flow (perm)	3180	1777	0	1459	1784	1484	0	1313	0	0	1153	1348
Satd. Flow (RTOR)						228						
Lane Group Flow (vph)	569	199	0	3	302	386	0	8	0	0	283	599
Turn Type	Prot	NA		Prot	NA	Free	Perm	NA		custom	NA	custom
Protected Phases	5	2		1	6			8		11	4 11	5
Permitted Phases						Free	8			4		4
Detector Phase	5	2		1	6		8	8		11	4 11	5
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0		10.0		5.0
Minimum Split (s)	11.1	27.1		10.3	27.1		24.5	24.5		15.3		11.1
Total Split (s)	47.0	67.0		10.3	30.3		35.7	35.7		22.0		47.0
Total Split (%)	33.6%	47.9%		7.4%	21.6%		25.5%	25.5%		15.7%		33.6%
Yellow Time (s)	3.7	3.7		3.3	3.7		3.3	3.3		3.3		3.7
All-Red Time (s)	2.4	2.4		2.0	2.4		2.2	2.2		2.0		2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0				0.0
Total Lost Time (s)	6.1	6.1		5.3	6.1			5.5				6.1
Lead/Lag	Lead			Lead								Lead
Lead-Lag Optimize?	Yes			Yes								Yes
Recall Mode	None	C-Min		None	C-Min		None	None		None		None
Act Effct Green (s)	45.5	85.7		5.9	36.5	140.0		17.1			33.8	62.0
Actuated g/C Ratio	0.32	0.61		0.04	0.26	1.00		0.12			0.24	0.44
v/c Ratio	0.53	0.18		0.04	0.65	0.26		0.05			0.83	0.92
Control Delay	40.9	12.6		65.3	55.2	0.4		49.5			60.9	62.5
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	40.9	12.6		65.3	55.2	0.4		49.5			60.9	62.5
LOS	D	B		E	E	A		D			E	E
Approach Delay		33.6			24.7			49.5			62.0	
Approach LOS		C			C			D			E	
Queue Length 50th (m)	59.2	18.1		0.8	72.5	0.0		2.0			82.3	171.4
Queue Length 95th (m)	91.7	43.7		4.1	#142.4	0.0		6.6			m93.8	m153.2
Internal Link Dist (m)		79.9			173.8			12.4			145.6	
Turn Bay Length (m)	45.0			30.0		45.0						
Base Capacity (vph)	1069	1087		71	464	1484		283			452	651
Starvation Cap Reductn	0	0		0	0	0		0			0	0
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.53	0.18		0.04	0.65	0.26		0.03			0.63	0.92

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 105.9 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated

Lane Group	Ø4	Ø9	Ø10	Ø12
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	4	9	10	12
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	10.0	1.0	1.0	1.0
Minimum Split (s)	15.5	5.0	5.0	20.0
Total Split (s)	35.7	5.0	5.0	22.0
Total Split (%)	26%	4%	4%	16%
Yellow Time (s)	3.3	2.0	2.0	2.0
All-Red Time (s)	2.2	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				
Intersection Summary				

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 41.7

Intersection LOS: D

Intersection Capacity Utilization 89.4%

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: 30: Prince of Wales & Preston

Ø1	Ø2 (R)	Ø11	Ø4
10.3 s	5 s 67 s	22 s	35.7 s
Ø5	Ø10 Ø6 (R)	Ø12	Ø8
47 s	5 s 30.3 s	22 s	35.7 s

Lanes, Volumes, Timings 2028 PM Demand Rationalized Main Hospital SPA PEAK GEN  
 31: Rochester & 417 WB on/Raymond 10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	120	170	115	182	337	0	0	151	192
Future Volume (vph)	0	0	0	120	170	115	182	337	0	0	151	192
Satd. Flow (prot)	0	0	0	1695	1636	0	1695	1784	0	0	1784	1517
Flt Permitted				0.950			0.546					
Satd. Flow (perm)	0	0	0	1685	1636	0	944	1784	0	0	1784	1414
Satd. Flow (RTOR)					56							192
Lane Group Flow (vph)	0	0	0	120	285	0	182	337	0	0	151	192
Turn Type				Perm	NA		pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8			2					6
Detector Phase				8	8		5	2			6	6
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	10.0
Minimum Split (s)				32.0	32.0		10.9	27.3			24.9	24.9
Total Split (s)				32.0	32.0		13.0	38.0			25.0	25.0
Total Split (%)				45.7%	45.7%		18.6%	54.3%			35.7%	35.7%
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	3.3
All-Red Time (s)				2.4	2.4		2.6	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)				5.7	5.7		5.9	5.9			5.9	5.9
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode				None	None		None	C-Min			C-Min	C-Min
Act Effct Green (s)				15.7	15.7		42.7	42.7			28.0	28.0
Actuated g/C Ratio				0.22	0.22		0.61	0.61			0.40	0.40
v/c Ratio				0.32	0.70		0.27	0.31			0.21	0.28
Control Delay				23.4	28.4		12.9	14.0			17.3	4.6
Queue Delay				0.0	0.0		0.0	0.5			0.0	0.0
Total Delay				23.4	28.4		12.9	14.5			17.3	4.6
LOS				C	C		B	B			B	A
Approach Delay					26.9			13.9			10.2	
Approach LOS					C			B			B	
Queue Length 50th (m)				13.2	27.6		14.9	33.3			12.5	0.0
Queue Length 95th (m)				22.8	44.7		33.5	58.5			29.8	13.4
Internal Link Dist (m)		122.0			89.8			72.3			151.7	
Turn Bay Length (m)												35.0
Base Capacity (vph)				633	649		671	1087			714	681
Starvation Cap Reductn				0	0		0	395			0	0
Spillback Cap Reductn				0	0		0	0			0	0
Storage Cap Reductn				0	0		0	0			0	0
Reduced v/c Ratio				0.19	0.44		0.27	0.49			0.21	0.28

**Intersection Summary**

Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 8 (11%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 17.1

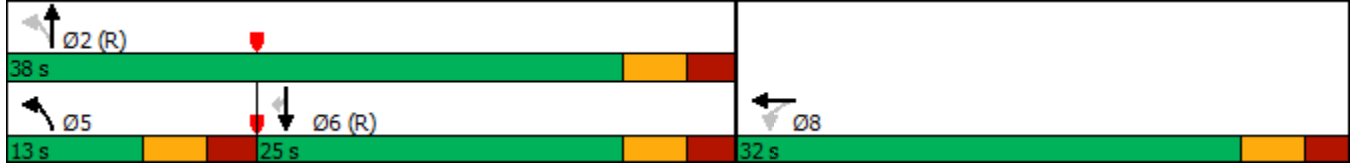
Intersection LOS: B

Intersection Capacity Utilization 58.7%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 31: Rochester & 417 WB on/Raymond



Lanes, Volumes, Timings 2028 PM Demand Rationalized Main Hospital SPA PEAK GEN  
 32: Rochester & 417 EB off/Orangeville 10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕						↕↕			↕↕	
Traffic Volume (vph)	210	230	122	0	0	0	0	304	50	17	232	0
Future Volume (vph)	210	230	122	0	0	0	0	304	50	17	232	0
Satd. Flow (prot)	0	3195	0	0	0	0	0	3302	0	0	3380	0
Flt Permitted		0.982									0.925	
Satd. Flow (perm)	0	3188	0	0	0	0	0	3302	0	0	3133	0
Satd. Flow (RTOR)		51						42				
Lane Group Flow (vph)	0	562	0	0	0	0	0	354	0	0	249	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Detector Phase	4	4						2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0						25.1		25.1	25.1	
Total Split (s)	26.0	26.0						44.0		44.0	44.0	
Total Split (%)	37.1%	37.1%						62.9%		62.9%	62.9%	
Yellow Time (s)	3.3	3.3						3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3						2.1		2.1	2.1	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.6						5.4			5.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None						C-Min		C-Min	C-Min	
Act Effct Green (s)		16.6						42.4			42.4	
Actuated g/C Ratio		0.24						0.61			0.61	
v/c Ratio		0.71						0.18			0.13	
Control Delay		26.9						6.2			9.2	
Queue Delay		0.0						0.0			0.0	
Total Delay		26.9						6.2			9.2	
LOS		C						A			A	
Approach Delay		26.9						6.2			9.2	
Approach LOS		C						A			A	
Queue Length 50th (m)		32.3						8.2			2.7	
Queue Length 95th (m)		43.2						16.4			28.0	
Internal Link Dist (m)		104.8			107.2			99.1			72.3	
Turn Bay Length (m)												
Base Capacity (vph)		977						2028			1909	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.58						0.17			0.13	
<b>Intersection Summary</b>												
Cycle Length: 70												
Actuated Cycle Length: 70												
Offset: 67 (96%), Referenced to phase 2:NBT and 6:SBTL, Start of Green												
Natural Cycle: 55												
Control Type: Actuated-Coordinated												

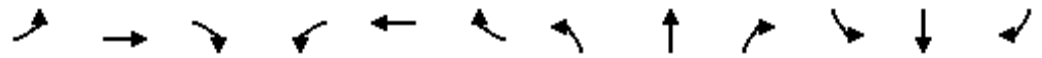
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 16.8	Intersection LOS: B
Intersection Capacity Utilization 50.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 32: Rochester & 417 EB off/Orangeville





Lanes, Volumes, Timings 2028 PM Demand Rationalized Main Hospital SPA PEAK GEN  
 33: Bronson & Catherine 417 WB on 10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↔		↗	↕			↕	↗
Traffic Volume (vph)	0	0	0	805	506	284	284	732	0	0	772	168
Future Volume (vph)	0	0	0	805	506	284	284	732	0	0	772	168
Satd. Flow (prot)	0	0	0	1458	4306	0	1695	3390	0	0	3248	0
Flt Permitted				0.950	0.988		0.116					
Satd. Flow (perm)	0	0	0	1458	4306	0	207	3390	0	0	3248	0
Satd. Flow (RTOR)					114						28	
Lane Group Flow (vph)	0	0	0	547	1048	0	284	732	0	0	940	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				25.9	25.9		11.0	25.1			25.1	
Total Split (s)				42.0	42.0		18.0	53.0			35.0	
Total Split (%)				44.2%	44.2%		18.9%	55.8%			36.8%	
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)				2.6	2.6		2.7	2.8			2.8	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				5.9	5.9		6.0	6.1			6.1	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				None	None		None	C-Min			C-Min	
Act Effct Green (s)				36.4	36.4		46.7	46.6			28.6	
Actuated g/C Ratio				0.38	0.38		0.49	0.49			0.30	
v/c Ratio				0.98	0.61		0.98	0.44			0.94	
Control Delay				64.5	22.7		76.8	24.9			49.7	
Queue Delay				39.3	0.2		0.0	3.4			45.0	
Total Delay				103.8	22.9		76.8	28.3			94.7	
LOS				F	C		E	C			F	
Approach Delay					50.6			41.9			94.7	
Approach LOS					D			D			F	
Queue Length 50th (m)				113.7	52.7		47.1	67.1			85.5	
Queue Length 95th (m)				#191.7	67.4		#88.0	77.4			#124.1	
Internal Link Dist (m)		151.3			165.9			71.3			237.2	
Turn Bay Length (m)												
Base Capacity (vph)				558	1718		289	1673			1007	
Starvation Cap Reductn				0	0		0	820			0	
Spillback Cap Reductn				123	126		0	0			170	
Storage Cap Reductn				0	0		0	0			0	
Reduced v/c Ratio				1.26	0.66		0.98	0.86			1.12	

**Intersection Summary**  
 Cycle Length: 95  
 Actuated Cycle Length: 95  
 Offset: 59 (62%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 59.8 Intersection LOS: E

Intersection Capacity Utilization 116.5% ICU Level of Service H

Analysis Period (min) 15

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

Splits and Phases: 33: Bronson & Catherine 417 WB on



Lanes, Volumes, Timings  
34: Bronson & 417 EB off

2028 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	144	408	0	915	1501	0
Future Volume (vph)	144	408	0	915	1501	0
Satd. Flow (prot)	1695	1517	0	3390	3390	0
Flt Permitted	0.950					
Satd. Flow (perm)	1695	1491	0	3390	3390	0
Satd. Flow (RTOR)	43					
Lane Group Flow (vph)	144	408	0	915	1501	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases	4					
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		10.0	10.0	
Minimum Split (s)	25.1	25.1		34.3	34.3	
Total Split (s)	30.0	30.0		65.0	65.0	
Total Split (%)	31.6%	31.6%		68.4%	68.4%	
Yellow Time (s)	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.1	2.1		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.4	5.4		5.8	5.8	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None		C-Min	C-Min	
Act Effct Green (s)	27.9	27.9		55.9	55.9	
Actuated g/C Ratio	0.29	0.29		0.59	0.59	
v/c Ratio	0.29	0.87		0.46	0.75	
Control Delay	28.4	50.2		11.8	12.5	
Queue Delay	0.0	0.0		0.0	5.5	
Total Delay	28.4	50.2		11.9	18.1	
LOS	C	D		B	B	
Approach Delay	44.5			11.9	18.1	
Approach LOS	D			B	B	
Queue Length 50th (m)	18.9	59.6		52.1	108.5	
Queue Length 95th (m)	37.8	#126.6		53.8	m134.4	
Internal Link Dist (m)	81.4			50.7	71.3	
Turn Bay Length (m)	60.0					
Base Capacity (vph)	497	468		2112	2112	
Starvation Cap Reductn	0	0		0	548	
Spillback Cap Reductn	0	0		113	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.29	0.87		0.46	0.96	

Intersection Summary

Cycle Length: 95  
 Actuated Cycle Length: 95  
 Offset: 91 (96%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 21.1 Intersection LOS: C

Intersection Capacity Utilization 116.5% ICU Level of Service H

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 34: Bronson & 417 EB off



Lanes, Volumes, Timings  
39: Prince of Wales & Road B

2028 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	16	663	828	15	92	27	
Future Volume (vph)	16	663	828	15	92	27	
Satd. Flow (prot)	1695	1784	3377	0	1695	1517	
Flt Permitted	0.298				0.950		
Satd. Flow (perm)	532	1784	3377	0	1629	1424	
Satd. Flow (RTOR)						27	
Lane Group Flow (vph)	16	663	843	0	92	27	
Turn Type	pm+pt	NA	NA		Perm	Perm	
Protected Phases	5	2	6				9
Permitted Phases	2				4	4	
Detector Phase	5	2	6		4	4	
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0		10.0	10.0	1.0
Minimum Split (s)	10.3	23.3	23.3		23.3	23.3	15.0
Total Split (s)	12.0	97.0	85.0		28.0	28.0	15.0
Total Split (%)	8.6%	69.3%	60.7%		20.0%	20.0%	11%
Yellow Time (s)	3.3	3.3	3.3		3.3	3.3	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3		5.3	5.3	
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	None	C-Min	C-Min		None	None	None
Act Effct Green (s)	112.8	112.8	108.2		13.6	13.6	
Actuated g/C Ratio	0.81	0.81	0.77		0.10	0.10	
v/c Ratio	0.03	0.46	0.32		0.58	0.17	
Control Delay	4.4	6.8	6.1		74.7	20.7	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	4.4	6.8	6.1		74.7	20.7	
LOS	A	A	A		E	C	
Approach Delay		6.7	6.1		62.4		
Approach LOS		A	A		E		
Queue Length 50th (m)	0.6	36.0	3.6		24.9	0.0	
Queue Length 95th (m)	3.4	99.2	m92.7		41.8	9.0	
Internal Link Dist (m)		198.2	95.9		17.7		
Turn Bay Length (m)	45.0						
Base Capacity (vph)	484	1437	2609		264	253	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	260		0	2	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.03	0.46	0.36		0.35	0.11	

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 10.5 Intersection LOS: B

Intersection Capacity Utilization 55.9% ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 39: Prince of Wales & Road B

 Ø2 (R)	 Ø9	 Ø4
97 s	15 s	28 s
 Ø5	 Ø6 (R)	
12 s	85 s	

Lanes, Volumes, Timings  
40: Prince of Wales & Road E

2028 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	42	17	4	637	834	21	
Future Volume (vph)	42	17	4	637	834	21	
Satd. Flow (prot)	1616	1459	1383	3390	1784	1357	
Flt Permitted	0.950		0.950				
Satd. Flow (perm)	1616	1459	1366	3390	1784	1263	
Satd. Flow (RTOR)		17				14	
Lane Group Flow (vph)	42	17	4	637	834	21	
Turn Type	Perm	Perm	Prot	NA	NA	Perm	
Protected Phases			5	2	6		9
Permitted Phases	4	4				6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	1.0
Minimum Split (s)	23.3	23.3	10.3	23.3	23.3	23.3	10.0
Total Split (s)	23.3	23.3	10.3	106.7	96.4	96.4	10.0
Total Split (%)	16.6%	16.6%	7.4%	76.2%	68.9%	68.9%	7%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	11.7	11.7	6.0	119.8	117.3	117.3	
Actuated g/C Ratio	0.08	0.08	0.04	0.86	0.84	0.84	
v/c Ratio	0.31	0.12	0.07	0.22	0.56	0.02	
Control Delay	65.5	24.2	66.2	3.1	10.5	1.9	
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	
Total Delay	65.5	24.2	66.2	3.1	10.5	1.9	
LOS	E	C	E	A	B	A	
Approach Delay	53.6			3.5	10.3		
Approach LOS	D			A	B		
Queue Length 50th (m)	11.3	0.0	1.1	12.6	1.4	0.0	
Queue Length 95th (m)	22.3	7.2	5.2	35.7	281.2	4.7	
Internal Link Dist (m)	165.3			279.2	63.5		
Turn Bay Length (m)	45.0		50.0			50.0	
Base Capacity (vph)	207	202	59	2901	1500	1064	
Starvation Cap Reductn	0	0	0	0	59	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.20	0.08	0.07	0.22	0.58	0.02	

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 9.1

Intersection LOS: A

Intersection Capacity Utilization 63.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 40: Prince of Wales & Road E

 Ø9	 Ø2 (R)	 Ø4
10 s	106.7 s	23.3 s
	 Ø5	
	 Ø6 (R)	
	10.3 s	96.4 s



Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	11	531	1230	14	6	17
Future Vol, veh/h	11	531	1230	14	6	17
Conflicting Peds, #/hr	42	0	0	42	4	8
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	25	-	-	20	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	531	1230	14	6	17

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1286	0	-	0	1564 665
Stage 1	-	-	-	-	1272 -
Stage 2	-	-	-	-	292 -
Critical Hdwy	4.14	-	-	-	6.84 6.94
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.22	-	-	-	3.52 3.32
Pot Cap-1 Maneuver	535	-	-	-	102 403
Stage 1	-	-	-	-	227 -
Stage 2	-	-	-	-	732 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	516	-	-	-	93 386
Mov Cap-2 Maneuver	-	-	-	-	93 -
Stage 1	-	-	-	-	214 -
Stage 2	-	-	-	-	706 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	24
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	516	-	-	-	212
HCM Lane V/C Ratio	0.021	-	-	-	0.108
HCM Control Delay (s)	12.1	-	-	-	24
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection						
Int Delay, s/veh	11.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑	↑		↑
Traffic Vol, veh/h	0	817	875	70	0	287
Future Vol, veh/h	0	817	875	70	0	287
Conflicting Peds, #/hr	70	0	0	70	1	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	30	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	817	875	70	0	287

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	-	0	-	0	950
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	3.319
Pot Cap-1 Maneuver	0	-	-	-	0 315
Stage 1	0	-	-	-	0 -
Stage 2	0	-	-	-	0 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	295
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	84.4
HCM LOS			F

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	295
HCM Lane V/C Ratio	-	-	-	0.973
HCM Control Delay (s)	-	-	-	84.4
HCM Lane LOS	-	-	-	F
HCM 95th %tile Q(veh)	-	-	-	9.9

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↶			↷			↷				↶
Traffic Vol, veh/h	0	783	0	0	822	45	1	0	5	0	0	25
Future Vol, veh/h	0	783	0	0	822	45	1	0	5	0	0	25
Conflicting Peds, #/hr	8	0	6	6	0	8	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	783	0	0	822	45	1	0	5	0	0	25

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	-	0	0	-	-	0	1647	1664	789	-	-	854
Stage 1	-	-	-	-	-	-	789	789	-	-	-	-
Stage 2	-	-	-	-	-	-	858	875	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	7.12	6.52	6.22	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	3.518	4.018	3.318	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	0	-	-	79	97	391	0	0	358
Stage 1	0	-	-	0	-	-	384	402	-	0	0	-
Stage 2	0	-	-	0	-	-	352	367	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	73	96	389	-	-	355
Mov Cap-2 Maneuver	-	-	-	-	-	-	73	96	-	-	-	-
Stage 1	-	-	-	-	-	-	384	400	-	-	-	-
Stage 2	-	-	-	-	-	-	327	364	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		0		21.4		15.9	
HCM LOS					C		C	

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	226	-	-	-	-	355
HCM Lane V/C Ratio	0.027	-	-	-	-	0.07
HCM Control Delay (s)	21.4	-	-	-	-	15.9
HCM Lane LOS	C	-	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.2

Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔			↔	
Traffic Vol, veh/h	0	55	30	46	44	5	31	0	180	0	0	5
Future Vol, veh/h	0	55	30	46	44	5	31	0	180	0	0	5
Conflicting Peds, #/hr	10	0	10	10	0	10	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	55	30	46	44	5	31	0	180	0	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	59	0	0	95	0	0	194	231	53	177	244	35
Stage 1	-	-	-	-	-	-	80	80	-	149	149	-
Stage 2	-	-	-	-	-	-	114	151	-	28	95	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1543	-	-	1497	-	-	748	668	1003	769	657	1030
Stage 1	-	-	-	-	-	-	919	828	-	838	773	-
Stage 2	-	-	-	-	-	-	879	771	-	985	815	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1530	-	-	1484	-	-	720	637	995	609	626	1021
Mov Cap-2 Maneuver	-	-	-	-	-	-	720	637	-	609	626	-
Stage 1	-	-	-	-	-	-	912	821	-	831	742	-
Stage 2	-	-	-	-	-	-	847	740	-	807	808	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			3.6			9.9			8.5		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	942	1530	-	-	1484	-	-	1021
HCM Lane V/C Ratio	0.224	-	-	-	0.031	-	-	0.005
HCM Control Delay (s)	9.9	0	-	-	7.5	0	-	8.5
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.9	0	-	-	0.1	-	-	0

Intersection						
Int Delay, s/veh	7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑	↑		↑↑
Traffic Vol, veh/h	95	43	14	15	24	23
Future Vol, veh/h	95	43	14	15	24	23
Conflicting Peds, #/hr	0	0	0	15	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	0	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	95	43	14	15	24	23

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	89	29	0	0	44
Stage 1	29	-	-	-	-
Stage 2	60	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	907	1045	-	-	1564
Stage 1	993	-	-	-	-
Stage 2	956	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	881	1032	-	-	1544
Mov Cap-2 Maneuver	881	-	-	-	-
Stage 1	980	-	-	-	-
Stage 2	941	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	3.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	923	1544
HCM Lane V/C Ratio	-	-	0.15	0.016
HCM Control Delay (s)	-	-	9.6	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	2	2	29	118	0
Future Vol, veh/h	0	2	2	29	118	0
Conflicting Peds, #/hr	0	0	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	100	100	100	2	2	100
Mvmt Flow	0	2	2	29	118	0

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	142	64	123	0	0
Stage 1	123	-	-	-	-
Stage 2	19	-	-	-	-
Critical Hdwy	8.8	8.9	6.1	-	-
Critical Hdwy Stg 1	7.8	-	-	-	-
Critical Hdwy Stg 2	7.8	-	-	-	-
Follow-up Hdwy	4.5	4.3	3.2	-	-
Pot Cap-1 Maneuver	617	742	964	-	-
Stage 1	661	-	-	-	-
Stage 2	777	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	611	739	960	-	-
Mov Cap-2 Maneuver	611	-	-	-	-
Stage 1	657	-	-	-	-
Stage 2	774	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	960	-	739	-	-
HCM Lane V/C Ratio	0.002	-	0.003	-	-
HCM Control Delay (s)	8.8	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	6.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	9	8	0	22	3
Future Vol, veh/h	0	9	8	0	22	3
Conflicting Peds, #/hr	0	10	10	0	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	9	8	0	22	3

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	19	0	41 25
Stage 1	-	-	-	-	15 -
Stage 2	-	-	-	-	26 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1597	-	970 1051
Stage 1	-	-	-	-	1008 -
Stage 2	-	-	-	-	997 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1583	-	950 1033
Mov Cap-2 Maneuver	-	-	-	-	950 -
Stage 1	-	-	-	-	1000 -
Stage 2	-	-	-	-	984 -

Approach	EB	WB	NB
HCM Control Delay, s	0	7.3	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	959	-	-	1583	-
HCM Lane V/C Ratio	0.026	-	-	0.005	-
HCM Control Delay (s)	8.9	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	27	48	10	2	94	112	1	8	0	63	86	35
Future Vol, veh/h	27	48	10	2	94	112	1	8	0	63	86	35
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	48	10	2	94	112	1	8	0	63	86	35
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.2	8.5	7.9	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	32%	1%	34%
Vol Thru, %	89%	56%	45%	47%
Vol Right, %	0%	12%	54%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	85	208	184
LT Vol	1	27	2	63
Through Vol	8	48	94	86
RT Vol	0	10	112	35
Lane Flow Rate	9	85	208	184
Geometry Grp	1	1	1	1
Degree of Util (X)	0.012	0.109	0.241	0.232
Departure Headway (Hd)	4.826	4.608	4.173	4.544
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	741	779	863	791
Service Time	2.859	2.63	2.19	2.568
HCM Lane V/C Ratio	0.012	0.109	0.241	0.233
HCM Control Delay	7.9	8.2	8.5	8.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.4	0.9	0.9



Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	100	0	30	0	0	22	30	100	0	9	52	52
Future Vol, veh/h	100	0	30	0	0	22	30	100	0	9	52	52
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	100	0	30	0	0	22	30	100	0	9	52	52
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.4	7.2	8.3	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	23%	77%	0%	8%
Vol Thru, %	77%	0%	0%	46%
Vol Right, %	0%	23%	100%	46%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	130	130	22	113
LT Vol	30	100	0	9
Through Vol	100	0	0	52
RT Vol	0	30	22	52
Lane Flow Rate	130	130	22	113
Geometry Grp	1	1	1	1
Degree of Util (X)	0.161	0.163	0.025	0.131
Departure Headway (Hd)	4.451	4.516	4.027	4.171
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	809	797	890	862
Service Time	2.466	2.532	2.048	2.186
HCM Lane V/C Ratio	0.161	0.163	0.025	0.131
HCM Control Delay	8.3	8.4	7.2	7.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.6	0.1	0.5

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑	↘	
Traffic Vol, veh/h	51	22	26	49	23	34
Future Vol, veh/h	51	22	26	49	23	34
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	51	22	26	49	23	34
Number of Lanes	2	0	1	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	2
HCM Control Delay	7.4	7.8	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	40%	0%	0%	100%	0%
Vol Thru, %	0%	100%	44%	0%	100%
Vol Right, %	60%	0%	56%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	57	34	39	26	49
LT Vol	23	0	0	26	0
Through Vol	0	34	17	0	49
RT Vol	34	0	22	0	0
Lane Flow Rate	57	34	39	26	49
Geometry Grp	2	7	7	7	7
Degree of Util (X)	0.063	0.044	0.046	0.037	0.064
Departure Headway (Hd)	4.007	4.674	4.279	5.174	4.673
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	899	763	833	691	765
Service Time	2.007	2.419	2.023	2.913	2.412
HCM Lane V/C Ratio	0.063	0.045	0.047	0.038	0.064
HCM Control Delay	7.3	7.6	7.2	8.1	7.7
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.1	0.1	0.2

**Appendix K:  
2028 and 2048 Detailed Intersection Performance**

Table 20: 2048 Intersection Performance

Intersection	Weekday AM Peak (PM Peak of Street) [PM Peak of Generator]					
	Critical Movement			Intersection 'As a Whole'		
	LoS	Max Delay (s) or v/c	Movement	Delay (s)	LoS	Max v/c
<b>Signalized Intersections</b>						
Parkdale/Carling						
Civic/Carling						
Maple/Old Irving/Carling						
Sherwood/Carling						
Road A/Champagne/Carling						
Trillium MUP/Carling						
Preston/Carling	D (E) [E]	0.90 (0.96) [0.94]	WBL (NBL) [NBL]	59.6 (65.1) [54.0]	C (D) [C]	0.78 (0.83) [0.80]
Booth/Carling	D (E) [C]	0.85 (0.95) [0.71]	WBT (WBT) [WBT]	25.9 (35.3) [21.6]	C (D) [B]	0.77 (0.90) [0.66]
Bronson/Carling	D (E) [E]	0.90 (0.96) [0.94]	EBL (EBL) [SBT]	40.0 (53.4) [50.2]	D (E) [E]	0.84 (0.94) [0.92]
Hwy 417 WB on-off/Parkdale						
Hwy 417 EB on-off/Parkdale						
Sherwood/Parkdale						
Ruskin/Parkdale						
Preston/Prince of Wales	E (E) [E]	0.93 (0.95) [0.91]	SBR (SBT) [SBR]	34.6 (45.4) [41.1]	C (C) [C]	0.73 (0.78) [0.71]
Hwy 417 on Raymond/Rochester						
Hwy 417 off Orangeville/Rochester						
Hwy 417 on-off Catherine/Bronson	D (E) [E]	0.88 (0.95) [0.97]	NBL (WBL) [WBL]	33.5 (45.2) [52.0]	C (E) [E]	0.78 (0.91) [0.93]
Hwy 417 EB off/Bronson	D (D) [D]	0.82 (0.86) [0.86]	EBR (EBR) [EBR]	16.1 (16.9) [17.8]	B (B) [C]	0.62 (0.70) [0.74]
Road B/Prince of Wales						
Road E/Prince of Wales <sub>1</sub>						
<b>Unsignalized Intersections</b>						
Melrose/Carling	C (D) [C]	19 (34) [21]	SB (SB) [SB]	0 (0) [0]	A (A) [A]	-
Rochester/Carling	C (F) [F]	19 (150) [79]	SB (SB) [SB]	1 (17) [11]	A (B) [B]	-
Navy/Prince of Wales	C (E) [C]	16 (35) [23]	NB (NB) [NB]	0 (1) [0]	A (A) [A]	-
Bayswater/Sherwood						
Road A/Parking garage						
Road B/Parking garage						
Road B/Road F						
Road E/Road D						
Maple/Road D						
Road A/Road B						
<b>Roundabout Intersections</b>						
NCC Scenic Driveway/Prince of Wales						
Road E/Prince of Wales <sub>1</sub>						

Note: Analysis of intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane; 1. Option as signals or roundabout

Lanes, Volumes, Timings  
10: Carling & Parkdale

2048 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø10
Lane Configurations							
Traffic Volume (vph)	113	1019	483	97	132	91	
Future Volume (vph)	113	1019	483	97	132	91	
Satd. Flow (prot)	1695	3390	3390	1517	1619	0	
Flt Permitted	0.950				0.971		
Satd. Flow (perm)	1596	3390	3390	1273	1600	0	
Satd. Flow (RTOR)				97	29		
Lane Group Flow (vph)	113	1019	483	97	223	0	
Turn Type	Prot	NA	NA	Perm	Perm		
Protected Phases	5	2	6				10
Permitted Phases				6	4		
Detector Phase	5	2	6	6	4		
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		1.0
Minimum Split (s)	11.1	26.7	26.7	26.7	37.2		5.0
Total Split (s)	40.0	73.0	33.0	33.0	47.0		5.0
Total Split (%)	32.0%	58.4%	26.4%	26.4%	37.6%		4%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.0		2.0
All-Red Time (s)	2.4	1.9	1.9	1.9	3.2		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.1	5.6	5.6	5.6	6.2		
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Min	C-Min	C-Min	None		Min
Act Effct Green (s)	13.7	84.8	65.0	65.0	20.9		
Actuated g/C Ratio	0.11	0.68	0.52	0.52	0.17		
v/c Ratio	0.61	0.44	0.27	0.14	0.77		
Control Delay	66.4	10.7	19.0	4.7	59.5		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	66.4	10.7	19.0	4.7	59.5		
LOS	E	B	B	A	E		
Approach Delay		16.3	16.6		59.5		
Approach LOS		B	B		E		
Queue Length 50th (m)	26.9	55.4	33.7	0.0	46.3		
Queue Length 95th (m)	44.1	84.5	55.8	10.4	68.5		
Internal Link Dist (m)		207.1	170.5		278.4		
Turn Bay Length (m)	155.0			80.0			
Base Capacity (vph)	459	2299	1762	708	541		
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	0.25	0.44	0.27	0.14	0.41		

Intersection Summary

Cycle Length: 125  
 Actuated Cycle Length: 125  
 Offset: 106 (85%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 21.4

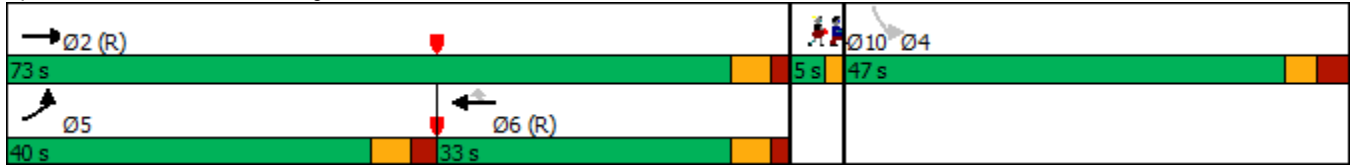
Intersection LOS: C

Intersection Capacity Utilization 57.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 10: Carling & Parkdale



Lanes, Volumes, Timings  
11: Carling & Civic

2048 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	37	1102	595	13	22	10
Future Volume (vph)	37	1102	595	13	22	10
Satd. Flow (prot)	1695	3390	3390	1517	1626	0
Flt Permitted	0.427				0.967	
Satd. Flow (perm)	748	3390	3390	1411	1579	0
Satd. Flow (RTOR)				13	10	
Lane Group Flow (vph)	37	1102	595	13	32	0
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		2	6			
Permitted Phases	2			6	4	
Detector Phase	2	2	6	6	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	31.3	31.3	31.3	31.3	23.3	
Total Split (s)	90.0	90.0	51.0	51.0	30.0	
Total Split (%)	75.0%	75.0%	42.5%	42.5%	25.0%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	
All-Red Time (s)	2.7	2.7	2.7	2.7	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.4	6.4	6.4	6.4	5.3	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	
Act Effct Green (s)	105.4	105.4	105.4	105.4	11.6	
Actuated g/C Ratio	0.88	0.88	0.88	0.88	0.10	
v/c Ratio	0.06	0.37	0.20	0.01	0.20	
Control Delay	2.9	3.1	0.6	0.0	39.6	
Queue Delay	0.0	0.2	0.0	0.0	0.0	
Total Delay	2.9	3.2	0.6	0.0	39.6	
LOS	A	A	A	A	D	
Approach Delay		3.2	0.6		39.6	
Approach LOS		A	A		D	
Queue Length 50th (m)	1.3	28.5	2.3	0.0	4.9	
Queue Length 95th (m)	4.7	52.8	4.5	0.0	13.7	
Internal Link Dist (m)		170.5	180.8		39.9	
Turn Bay Length (m)	90.0			140.0		
Base Capacity (vph)	656	2976	2976	1240	332	
Starvation Cap Reductn	0	904	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.06	0.53	0.20	0.01	0.10	

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 3.0

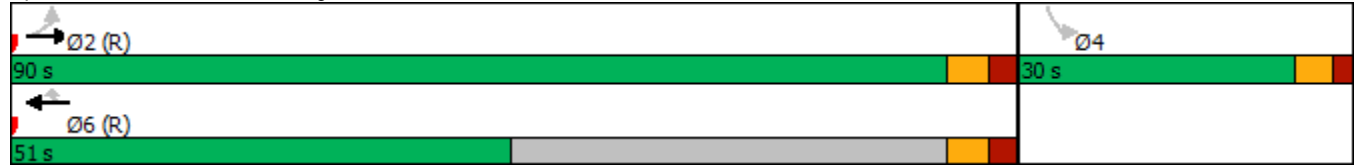
Intersection LOS: A

Intersection Capacity Utilization 53.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 11: Carling & Civic

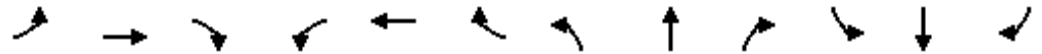




Lanes, Volumes, Timings  
13: Maple/Old Irvine & Carling

2048 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	990	51	77	475	4	20	1	26	4	5	5
Future Volume (vph)	26	990	51	77	475	4	20	1	26	4	5	5
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	0	1587	0	0	1646	0
Flt Permitted	0.479			0.258				0.883			0.939	
Satd. Flow (perm)	823	3390	1323	453	3390	1361	0	1410	0	0	1559	0
Satd. Flow (RTOR)			40			40		26			5	
Lane Group Flow (vph)	26	990	51	77	475	4	0	47	0	0	14	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	35.0	35.0	35.0	34.3	34.3	34.3	42.4	42.4		42.4	42.4	
Total Split (s)	77.0	77.0	77.0	77.0	77.0	77.0	43.0	43.0		43.0	43.0	
Total Split (%)	64.2%	64.2%	64.2%	64.2%	64.2%	64.2%	35.8%	35.8%		35.8%	35.8%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	4.4	4.4		4.4	4.4	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.7		7.4			7.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	86.5	86.5	86.5	86.5	86.5	86.5		25.0			25.0	
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.72	0.72		0.21			0.21	
v/c Ratio	0.04	0.41	0.05	0.24	0.19	0.00		0.15			0.04	
Control Delay	9.8	10.2	4.0	13.5	9.2	0.0		18.6			24.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	9.8	10.2	4.0	13.5	9.2	0.0		18.6			24.1	
LOS	A	B	A	B	A	A		B			C	
Approach Delay		9.9			9.7			18.6			24.1	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	2.4	64.3	0.9	8.8	27.3	0.0		3.6			1.5	
Queue Length 95th (m)	6.2	79.2	5.8	18.8	36.6	m0.0		12.7			6.5	
Internal Link Dist (m)		236.1			191.5			174.3			220.8	
Turn Bay Length (m)	20.0		15.0	45.0		25.0						
Base Capacity (vph)	593	2444	965	326	2444	992		436			466	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.04	0.41	0.05	0.24	0.19	0.00		0.11			0.03	

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 75 (63%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.41

Intersection Signal Delay: 10.2

Intersection LOS: B

Intersection Capacity Utilization 75.6%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 13: Maple/Old Irvine & Carling



Lanes, Volumes, Timings  
15: Carling & Sherwood

2048 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗↗	↖↖	↖	↘	↘
Traffic Volume (vph)	31	931	574	154	184	5
Future Volume (vph)	31	931	574	154	184	5
Satd. Flow (prot)	1695	3390	3390	1517	1695	1517
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1487	3390	3390	1094	1668	1472
Satd. Flow (RTOR)				154		3
Lane Group Flow (vph)	31	931	574	154	184	5
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.3	25.1	25.1	25.1	25.1	25.1
Total Split (s)	13.0	79.0	66.0	66.0	41.0	41.0
Total Split (%)	10.8%	65.8%	55.0%	55.0%	34.2%	34.2%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	7.7	90.8	82.3	82.3	18.6	18.6
Actuated g/C Ratio	0.06	0.76	0.69	0.69	0.16	0.16
v/c Ratio	0.29	0.36	0.25	0.19	0.71	0.02
Control Delay	64.7	4.8	7.0	1.1	62.6	29.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.7	4.8	7.0	1.1	62.6	29.6
LOS	E	A	A	A	E	C
Approach Delay		6.7	5.8		61.7	
Approach LOS		A	A		E	
Queue Length 50th (m)	7.3	24.4	25.1	0.3	41.7	0.4
Queue Length 95th (m)	17.1	38.8	28.5	2.2	61.5	3.8
Internal Link Dist (m)		118.3	141.7		152.1	
Turn Bay Length (m)	30.0			90.0		15.0
Base Capacity (vph)	118	2564	2323	798	496	440
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.36	0.25	0.19	0.37	0.01

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 112 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings  
 15: Carling & Sherwood

2048 AM Demand Rationalized Main Hospital SPA

10/18/2022

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 11.9

Intersection LOS: B

Intersection Capacity Utilization 47.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 15: Carling & Sherwood



Lanes, Volumes, Timings  
16: Road A/Champagne & Carling

2048 AM Demand Rationalized Main Hospital SPA

10/18/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	753	237	237	624	47	90	0	94	176	0	90
Future Volume (vph)	110	753	237	237	624	47	90	0	94	176	0	90
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1695	1414	0	1695	1456	0
Flt Permitted	0.950			0.950			0.699			0.695		
Satd. Flow (perm)	1493	3390	1370	1663	3390	1058	1216	1414	0	1180	1456	0
Satd. Flow (RTOR)						111					363	
Lane Group Flow (vph)	110	753	237	237	624	47	90	94	0	176	90	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases			2			6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	10.3	26.3	26.3	10.3	26.3	26.3	18.3	18.3		32.9	32.9	
Total Split (s)	16.0	32.0	32.0	38.0	59.0	59.0	35.0	35.0		35.0	35.0	
Total Split (%)	13.3%	26.7%	26.7%	31.7%	49.2%	49.2%	29.2%	29.2%		29.2%	29.2%	
Yellow Time (s)	3.3	3.7	3.7	3.3	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	1.6	1.6	2.0	1.6	1.6	2.0	2.0		2.6	2.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3		5.9	5.9	
Lead/Lag	Lead			Lead								
Lead-Lag Optimize?	Yes			Yes								
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	12.0	56.5	56.5	22.1	67.1	67.1	23.0	23.0		22.4	22.4	
Actuated g/C Ratio	0.10	0.47	0.47	0.18	0.56	0.56	0.19	0.19		0.19	0.19	
v/c Ratio	0.65	0.47	0.37	0.76	0.33	0.07	0.39	0.35		0.80	0.16	
Control Delay	63.8	29.5	30.2	64.0	7.9	0.9	45.6	43.9		71.3	0.6	
Queue Delay	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0		0.0	0.0	
Total Delay	63.8	29.5	30.2	64.1	8.1	0.9	45.6	43.9		71.3	0.6	
LOS	E	C	C	E	A	A	D	D		E	A	
Approach Delay		33.1			22.3			44.7			47.4	
Approach LOS		C			C			D			D	
Queue Length 50th (m)	24.3	66.4	38.3	43.7	14.2	0.1	18.5	19.2		39.7	0.0	
Queue Length 95th (m)	#53.2	116.4	80.8	44.5	66.1	2.5	32.3	32.8		61.6	0.0	
Internal Link Dist (m)		141.7			98.6			63.9			477.2	
Turn Bay Length (m)	55.0		75.0	61.0		35.0				30.0		
Base Capacity (vph)	176	1596	645	461	1894	640	300	349		286	628	
Starvation Cap Reductn	0	0	0	9	454	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.63	0.47	0.37	0.52	0.43	0.07	0.30	0.27		0.62	0.14	
<b>Intersection Summary</b>												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												

Lane Group	Ø9	Ø10	Ø11
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	9	10	11
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0
Total Split (s)	10.0	5.0	5.0
Total Split (%)	8%	4%	4%
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	
Recall Mode	None	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Lanes, Volumes, Timings  
 16: Road A/Champagne & Carling

2048 AM Demand Rationalized Main Hospital SPA

10/18/2022

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 31.5

Intersection LOS: C

Intersection Capacity Utilization 69.2%

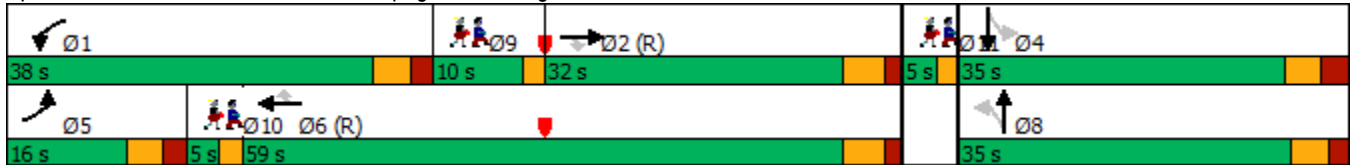
ICU Level of Service C

Analysis Period (min) 15

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













Queue shown is maximum after two cycles.

Splits and Phases: 16: Road A/Champagne & Carling



Lanes, Volumes, Timings  
17: Carling & Trillium MUP

2048 AM Demand Rationalized Main Hospital SPA  
10/18/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑							
Traffic Volume (vph)	0	942	0	0	996	0	0	0	0	0	0	0
Future Volume (vph)	0	942	0	0	996	0	0	0	0	0	0	0
Satd. Flow (prot)	0	3390	0	0	3390	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3390	0	0	3390	0	0	0	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	942	0	0	996	0	0	0	0	0	0	0
Turn Type		NA			NA							
Protected Phases		2			6							
Permitted Phases												
Detector Phase		2			6							
Switch Phase												
Minimum Initial (s)		10.0			10.0							
Minimum Split (s)		31.3			31.3							
Total Split (s)		84.0			84.0							
Total Split (%)		70.0%			70.0%							
Yellow Time (s)		3.7			3.7							
All-Red Time (s)		1.4			1.4							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		5.1			5.1							
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Min			C-Min							
Act Effct Green (s)		87.4			87.4							
Actuated g/C Ratio		0.73			0.73							
v/c Ratio		0.38			0.40							
Control Delay		7.3			9.0							
Queue Delay		0.1			0.7							
Total Delay		7.4			9.7							
LOS		A			A							
Approach Delay		7.4			9.7							
Approach LOS		A			A							
Queue Length 50th (m)		38.3			54.4							
Queue Length 95th (m)		43.0			67.2							
Internal Link Dist (m)		98.6			92.8			53.0			60.9	
Turn Bay Length (m)												
Base Capacity (vph)		2470			2470							
Starvation Cap Reductn		469			1039							
Spillback Cap Reductn		0			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.47			0.70							
<b>Intersection Summary</b>												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 70												
Control Type: Actuated-Coordinated												



Lane Group	Ø4	Ø8
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	4	8
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	35.6	35.6
Total Split (s)	36.0	36.0
Total Split (%)	30%	30%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	3.6	3.6
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

Lanes, Volumes, Timings  
 17: Carling & Trillium MUP

2048 AM Demand Rationalized Main Hospital SPA

10/18/2022

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 8.6




Intersection LOS: A

Intersection Capacity Utilization 33.3%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 17: Carling & Trillium MUP

 Ø2 (R)	 Ø4
84 s	36 s
 Ø6 (R)	 Ø8
84 s	36 s

Lanes, Volumes, Timings  
18: Preston & Carling

2048 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑		↘	↗	
Traffic Volume (vph)	138	717	192	275	518	81	179	444	267	106	247	66
Future Volume (vph)	138	717	192	275	518	81	179	444	267	106	247	66
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1695	3164	0	1695	1688	0
Flt Permitted	0.950			0.950			0.213			0.381		
Satd. Flow (perm)	1589	3390	1517	1646	3390	1272	371	3164	0	676	1688	0
Satd. Flow (RTOR)						193					10	
Lane Group Flow (vph)	138	717	192	275	518	81	179	711	0	106	313	0
Turn Type	Prot	NA	custom	Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	9 2	9 3	1	6		3	8				4
Permitted Phases						6	8			4		
Detector Phase	5	9 2	9 3	1	6	6	3	8		4		4
Switch Phase												
Minimum Initial (s)	5.0			5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2			11.2	30.0	30.0	11.9	43.9		38.9	38.9	
Total Split (s)	23.5			31.0	41.6	41.6	16.0	54.9		38.9	38.9	
Total Split (%)	18.1%			23.8%	32.0%	32.0%	12.3%	42.2%		29.9%	29.9%	
Yellow Time (s)	3.7			3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5			2.5	2.3	2.3	3.6	3.6		3.6	3.6	
Lost Time Adjust (s)	0.0			0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2			6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead			Lead			Lead					
Lead-Lag Optimize?	Yes			Yes			Yes					
Recall Mode	None			None	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	14.7	37.8	19.5	23.6	41.8	41.8	49.5	45.5		29.5	29.5	
Actuated g/C Ratio	0.11	0.29	0.15	0.18	0.32	0.32	0.38	0.35		0.23	0.23	
v/c Ratio	0.72	0.73	0.85	0.90	0.48	0.15	0.77	0.64		0.69	0.80	
Control Delay	76.1	48.1	84.5	82.5	39.2	0.6	74.9	64.2		69.0	61.4	
Queue Delay	0.0	2.4	0.0	3.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	76.1	50.5	84.5	85.5	39.2	0.6	74.9	64.2		69.0	61.5	
LOS	E	D	F	F	D	A	E	E		E	E	
Approach Delay		60.1			50.2			66.4			63.4	
Approach LOS		E			D			E			E	
Queue Length 50th (m)	34.3	91.8	48.7	68.8	60.0	0.0	42.7	91.6		24.4	72.0	
Queue Length 95th (m)	55.8	115.3	#90.6	#114.6	78.1	0.0	#73.0	116.8		#49.4	105.4	
Internal Link Dist (m)		92.8			165.9			145.6			55.2	
Turn Bay Length (m)	70.0		90.0	120.0		95.0				35.0		
Base Capacity (vph)	225	985	227	323	1090	540	233	1168		166	423	
Starvation Cap Reductn	0	153	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	14	0	0	0	0		0	1	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.61	0.86	0.85	0.89	0.48	0.15	0.77	0.61		0.64	0.74	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 116 (89%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 115  
 Control Type: Actuated-Coordinated

Lane Group	Ø2	Ø9	Ø10	Ø11	Ø12
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Satd. Flow (RTOR)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	2	9	10	11	12
Permitted Phases					
Detector Phase					
Switch Phase					
Minimum Initial (s)	10.0	1.0	1.0	1.0	1.0
Minimum Split (s)	30.0	7.0	5.0	5.0	5.0
Total Split (s)	30.1	9.0	5.0	5.0	5.0
Total Split (%)	23%	7%	4%	4%	4%
Yellow Time (s)	3.7	3.7	2.0	2.0	2.0
All-Red Time (s)	2.3	2.3	0.0	0.0	0.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes		Yes	Yes	
Recall Mode	C-Min	Min	None	None	None
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (m)					
Queue Length 95th (m)					
Internal Link Dist (m)					
Turn Bay Length (m)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					
Intersection Summary					

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 59.6

Intersection LOS: E

Intersection Capacity Utilization 94.3%

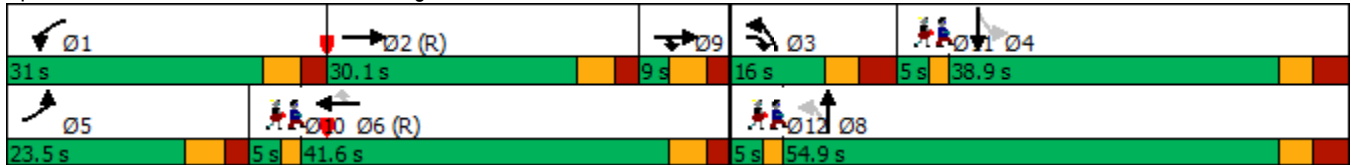
ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 18: Preston & Carling



Lanes, Volumes, Timings  
20: Carling & Booth

2048 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↗	↗↗	↗	↗	↘	↘
Traffic Volume (vph)	330	954	646	174	199	178
Future Volume (vph)	330	954	646	174	199	178
Satd. Flow (prot)	1695	3390	1784	1517	1695	1517
Flt Permitted	0.138				0.950	
Satd. Flow (perm)	246	3390	1784	1197	1658	1187
Satd. Flow (RTOR)				61		178
Lane Group Flow (vph)	330	954	646	174	199	178
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	29.7	29.7	29.7	39.0	39.0
Total Split (s)	34.0	81.0	47.0	47.0	39.0	39.0
Total Split (%)	28.3%	67.5%	39.2%	39.2%	32.5%	32.5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	79.2	79.4	51.4	51.4	28.9	28.9
Actuated g/C Ratio	0.66	0.66	0.43	0.43	0.24	0.24
v/c Ratio	0.77	0.43	0.85	0.32	0.50	0.42
Control Delay	32.2	11.2	45.7	19.4	42.6	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	11.2	45.7	19.4	42.6	8.2
LOS	C	B	D	B	D	A
Approach Delay		16.6	40.1		26.4	
Approach LOS		B	D		C	
Queue Length 50th (m)	45.1	57.2	145.6	18.1	38.7	0.0
Queue Length 95th (m)	76.4	70.8	#235.7	39.0	60.8	17.0
Internal Link Dist (m)		100.4	299.3		220.7	
Turn Bay Length (m)	50.0			30.0		30.0
Base Capacity (vph)	501	2242	764	547	455	455
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.43	0.85	0.32	0.44	0.39

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 116 (97%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 25.9

Intersection LOS: C

Intersection Capacity Utilization 96.6%

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: 20: Carling & Booth



Lanes, Volumes, Timings  
21: Bronson & Carling/Glebe

2048 AM Demand Rationalized Main Hospital SPA  
10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖				↖	↖			↖	↖
Traffic Volume (vph)	516	100	553	0	0	0	537	804	17	0	611	238
Future Volume (vph)	516	100	553	0	0	0	537	804	17	0	611	238
Satd. Flow (prot)	1610	1644	1517	0	0	0	3288	1773	0	0	3190	0
Flt Permitted	0.950	0.970					0.950					
Satd. Flow (perm)	1520	1587	1274	0	0	0	3198	1773	0	0	3190	0
Satd. Flow (RTOR)			187					2			53	
Lane Group Flow (vph)	356	260	553	0	0	0	537	821	0	0	849	0
Turn Type	Perm	NA	pm+ov				Prot	NA			NA	
Protected Phases		4	5				5	2			6	
Permitted Phases	4		4									
Detector Phase	4	4	5				5	2			6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0				10.0	10.0			10.0	
Minimum Split (s)	31.0	31.0	16.0				16.0	25.1			33.0	
Total Split (s)	31.0	31.0	33.0				33.0	79.0			46.0	
Total Split (%)	26.5%	26.5%	28.2%				28.2%	67.5%			39.3%	
Yellow Time (s)	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	
Lost Time Adjust (s)	0.0	0.0	0.0				0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0	6.0				6.0	6.0			6.0	
Lead/Lag			Lead				Lead				Lag	
Lead-Lag Optimize?			Yes				Yes				Yes	
Recall Mode	None	None	None				None	C-Min			C-Min	
Act Effct Green (s)	30.5	30.5	54.5				24.0	67.1			37.1	
Actuated g/C Ratio	0.26	0.26	0.47				0.21	0.57			0.32	
v/c Ratio	0.90	0.63	0.74				0.80	0.81			0.81	
Control Delay	69.7	47.9	22.4				53.3	26.5			41.2	
Queue Delay	0.0	0.0	0.0				0.0	0.0			0.0	
Total Delay	69.7	47.9	22.4				53.3	26.5			41.2	
LOS	E	D	C				D	C			D	
Approach Delay		42.5						37.1			41.2	
Approach LOS		D						D			D	
Queue Length 50th (m)	84.0	56.2	57.4				60.0	139.2			89.0	
Queue Length 95th (m)	#157.0	#98.7	99.5				77.3	173.3			109.0	
Internal Link Dist (m)		74.7			115.0			394.4			328.4	
Turn Bay Length (m)	40.0						50.0					
Base Capacity (vph)	396	413	777				758	1106			1125	
Starvation Cap Reductn	0	0	0				0	0			0	
Spillback Cap Reductn	0	0	0				0	0			0	
Storage Cap Reductn	0	0	0				0	0			0	
Reduced v/c Ratio	0.90	0.63	0.71				0.71	0.74			0.75	

Intersection Summary

Cycle Length: 117  
 Actuated Cycle Length: 117  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated



Lane Group	Ø10
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	7.0
Total Split (s)	7.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 40.0

Intersection LOS: D

Intersection Capacity Utilization 82.5%

ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 21: Bronson & Carling/Glebe



Lanes, Volumes, Timings  
22: Parkdale & 417 WB on/off

2048 AM Demand Rationalized Main Hospital SPA  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	232	0	488	171	315	0	0	406	214
Future Volume (vph)	0	0	0	232	0	488	171	315	0	0	406	214
Satd. Flow (prot)	0	0	0	1695	1481	0	1695	1784	0	0	1660	0
Flt Permitted				0.950			0.295					
Satd. Flow (perm)	0	0	0	1695	1481	0	526	1784	0	0	1660	0
Satd. Flow (RTOR)					497						35	
Lane Group Flow (vph)	0	0	0	232	488	0	171	315	0	0	620	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				29.0	29.0		10.3	27.3			25.1	
Total Split (s)				34.0	34.0		14.0	66.0			52.0	
Total Split (%)				34.0%	34.0%		14.0%	66.0%			52.0%	
Yellow Time (s)				3.3	3.3		3.0	3.0			3.0	
All-Red Time (s)				2.2	2.2		2.2	3.3			3.3	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				5.5	5.5		5.2	6.3			6.3	
Lead/Lag							Lag				Lead	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				None	None		None	C-Min			C-Min	
Act Effct Green (s)				19.6	19.6		69.7	68.6			52.8	
Actuated g/C Ratio				0.20	0.20		0.70	0.69			0.53	
v/c Ratio				0.70	0.71		0.35	0.26			0.70	
Control Delay				48.2	9.0		12.8	7.6			23.5	
Queue Delay				0.0	0.0		3.9	1.3			1.0	
Total Delay				48.2	9.0		16.7	8.9			24.4	
LOS				D	A		B	A			C	
Approach Delay					21.6			11.6			24.4	
Approach LOS					C			B			C	
Queue Length 50th (m)				42.2	0.0		11.4	22.1			84.9	
Queue Length 95th (m)				61.0	23.2		24.4	42.1			138.1	
Internal Link Dist (m)		157.5			140.3			45.3			171.5	
Turn Bay Length (m)												
Base Capacity (vph)				483	777		498	1224			892	
Starvation Cap Reductn				0	0		247	691			0	
Spillback Cap Reductn				0	0		0	0			95	
Storage Cap Reductn				0	0		0	0			0	
Reduced v/c Ratio				0.48	0.63		0.68	0.59			0.78	

Intersection Summary

Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 69 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 19.9

Intersection LOS: B

Intersection Capacity Utilization 114.3%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 22: Parkdale & 417 WB on/off



Lanes, Volumes, Timings  
23: Parkdale & 417 EB on/off

2048 AM Demand Rationalized Main Hospital SPA

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗					↕↗		↗	↕	
Traffic Volume (vph)	199	0	163	0	0	0	0	290	362	395	247	0
Future Volume (vph)	199	0	163	0	0	0	0	290	362	395	247	0
Satd. Flow (prot)	0	1695	1517	0	0	0	0	2933	0	1695	1784	0
Flt Permitted		0.950								0.308		
Satd. Flow (perm)	0	1692	1474	0	0	0	0	2933	0	539	1784	0
Satd. Flow (RTOR)			163					341				
Lane Group Flow (vph)	0	199	163	0	0	0	0	652	0	395	247	0
Turn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0					10.0		5.0	10.0	
Minimum Split (s)	25.1	25.1	25.1					25.1		10.3	25.1	
Total Split (s)	34.0	34.0	34.0					40.0		26.0	66.0	
Total Split (%)	34.0%	34.0%	34.0%					40.0%		26.0%	66.0%	
Yellow Time (s)	3.3	3.3	3.3					3.0		3.0	3.0	
All-Red Time (s)	2.6	2.6	2.6					2.8		2.3	2.8	
Lost Time Adjust (s)		0.0	0.0					0.0		0.0	0.0	
Total Lost Time (s)		5.9	5.9					5.8		5.3	5.8	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None	None					C-Min		None	C-Min	
Act Effct Green (s)		17.0	17.0					46.1		71.8	71.3	
Actuated g/C Ratio		0.17	0.17					0.46		0.72	0.71	
v/c Ratio		0.69	0.42					0.42		0.64	0.19	
Control Delay		51.0	8.8					13.6		17.5	8.0	
Queue Delay		0.0	0.0					0.2		56.6	2.0	
Total Delay		51.0	8.8					13.8		74.1	9.9	
LOS		D	A					B		E	A	
Approach Delay		32.0						13.8			49.4	
Approach LOS		C						B			D	
Queue Length 50th (m)		36.6	0.0					23.6		37.5	18.8	
Queue Length 95th (m)		55.2	15.5					48.0		71.5	m39.4	
Internal Link Dist (m)		109.8			145.0			90.1			45.3	
Turn Bay Length (m)			75.0									
Base Capacity (vph)		475	531					1540		646	1271	
Starvation Cap Reductn		0	0					276		287	866	
Spillback Cap Reductn		0	0					67		0	0	
Storage Cap Reductn		0	0					0		0	0	
Reduced v/c Ratio		0.42	0.31					0.52		1.10	0.61	

Intersection Summary

Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 53 (53%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 31.6

Intersection LOS: C

Intersection Capacity Utilization 114.3%

ICU Level of Service H

Analysis Period (min) 15

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

Splits and Phases: 23: Parkdale & 417 EB on/off



Lanes, Volumes, Timings  
24: Parkdale & Sherwood

2048 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	91	2	8	0	0	139	8	369	12	116	328	61
Future Volume (vph)	91	2	8	0	0	139	8	369	12	116	328	61
Satd. Flow (prot)	0	1665	0	0	1441	0	0	1769	0	0	1722	0
Flt Permitted		0.537						0.991			0.822	
Satd. Flow (perm)	0	930	0	0	1441	0	0	1754	0	0	1413	0
Satd. Flow (RTOR)		4			561			5			21	
Lane Group Flow (vph)	0	101	0	0	139	0	0	389	0	0	505	0
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	18.0	18.0		18.0	18.0		25.1	25.1		25.1	25.1	
Total Split (s)	18.0	18.0		18.0	18.0		82.0	82.0		82.0	82.0	
Total Split (%)	18.0%	18.0%		18.0%	18.0%		82.0%	82.0%		82.0%	82.0%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.0			4.0			5.6			5.6	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Ped	Ped		Ped	Ped		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		16.8			16.8			73.6			73.6	
Actuated g/C Ratio		0.17			0.17			0.74			0.74	
v/c Ratio		0.64			0.20			0.30			0.48	
Control Delay		54.7			0.6			5.5			7.6	
Queue Delay		0.0			0.0			0.0			0.5	
Total Delay		54.7			0.6			5.5			8.1	
LOS		D			A			A			A	
Approach Delay		54.7			0.6			5.5			8.1	
Approach LOS		D			A			A			A	
Queue Length 50th (m)		18.0			0.0			19.9			32.5	
Queue Length 95th (m)		33.2			0.0			40.0			44.4	
Internal Link Dist (m)		221.3			335.0			289.1			90.1	
Turn Bay Length (m)												
Base Capacity (vph)		159			709			1341			1084	
Starvation Cap Reductn		0			0			0			233	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.64			0.20			0.29			0.59	
Intersection Summary												
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 25 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 50												
Control Type: Actuated-Coordinated												

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 10.4

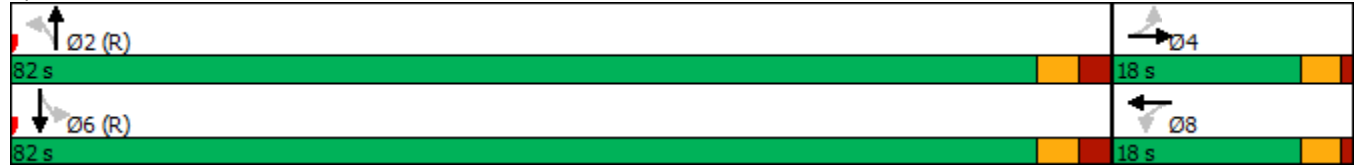
Intersection LOS: B

Intersection Capacity Utilization 90.1%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 24: Parkdale & Sherwood





Lanes, Volumes, Timings  
25: Parkdale & Ruskin

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗			↕			↕	
Traffic Volume (vph)	24	63	11	7	9	75	5	268	7	16	221	21
Future Volume (vph)	24	63	11	7	9	75	5	268	7	16	221	21
Satd. Flow (prot)	0	1714	0	1695	1472	0	0	1775	0	0	1754	0
Flt Permitted		0.898		0.716				0.996			0.977	
Satd. Flow (perm)	0	1546	0	1184	1472	0	0	1769	0	0	1717	0
Satd. Flow (RTOR)		6			75			4			12	
Lane Group Flow (vph)	0	98	0	7	84	0	0	280	0	0	258	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	19.4	19.4		19.4	19.4		31.8	31.8		31.8	31.8	
Total Split (s)	20.0	20.0		20.0	20.0		65.0	65.0		65.0	65.0	
Total Split (%)	23.5%	23.5%		23.5%	23.5%		76.5%	76.5%		76.5%	76.5%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.4	2.4		2.4	2.4		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.4		5.4	5.4			5.8			5.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		13.3		13.3	13.3			64.7			64.7	
Actuated g/C Ratio		0.16		0.16	0.16			0.76			0.76	
v/c Ratio		0.40		0.04	0.29			0.21			0.20	
Control Delay		35.0		30.3	12.3			4.5			4.3	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		35.0		30.3	12.3			4.5			4.3	
LOS		C		C	B			A			A	
Approach Delay		35.0			13.7			4.5			4.3	
Approach LOS		C			B			A			A	
Queue Length 50th (m)		13.4		1.0	1.2			13.3			11.7	
Queue Length 95th (m)		27.4		4.5	12.9			22.1			20.0	
Internal Link Dist (m)		220.6			228.6			278.4			289.1	
Turn Bay Length (m)				40.0								
Base Capacity (vph)		270		203	314			1348			1310	
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		0.36		0.03	0.27			0.21			0.20	

**Intersection Summary**  
 Cycle Length: 85  
 Actuated Cycle Length: 85  
 Offset: 45 (53%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 9.7

Intersection LOS: A

Intersection Capacity Utilization 45.0%

ICU Level of Service A

Analysis Period (min) 15

























Splits and Phases: 25: Parkdale & Ruskin



Lanes, Volumes, Timings  
30: Prince of Wales & Preston

2048 AM Demand Rationalized Main Hospital SPA

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	 			 				 			 		
Traffic Volume (vph)	723	263	1	0	229	301	0	2	1	229	1	614	
Future Volume (vph)	723	263	1	0	229	301	0	2	1	229	1	614	
Satd. Flow (prot)	3288	1782	0	1784	1784	1517	0	1633	0	0	1700	1517	
Flt Permitted	0.950										0.726		
Satd. Flow (perm)	3222	1782	0	1784	1784	1483	0	1633	0	0	1203	1417	
Satd. Flow (RTOR)						252							
Lane Group Flow (vph)	723	264	0	0	229	301	0	3	0	0	230	614	
Turn Type	Prot	NA		Prot	NA	Free		NA		custom	NA	custom	
Protected Phases	5	2		1	6			8		11	4 11	5	
Permitted Phases						Free	8			4		4	
Detector Phase	5	2		1	6		8	8		11	4 11	5	
Switch Phase													
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0		10.0		5.0	
Minimum Split (s)	11.1	27.1		10.3	27.1		23.5	23.5		20.0		11.1	
Total Split (s)	50.9	69.9		10.3	29.3		24.8	24.8		20.0		50.9	
Total Split (%)	39.2%	53.8%		7.9%	22.5%		19.1%	19.1%		15.4%		39.2%	
Yellow Time (s)	3.7	3.7		3.3	3.7		3.3	3.3		2.0		3.7	
All-Red Time (s)	2.4	2.4		2.0	2.4		2.2	2.2		0.0		2.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0				0.0	
Total Lost Time (s)	6.1	6.1		5.3	6.1			5.5				6.1	
Lead/Lag	Lead			Lead								Lead	
Lead-Lag Optimize?	Yes			Yes								Yes	
Recall Mode	None	C-Min		None	C-Min		None	None		None		None	
Act Effct Green (s)	44.6	83.8			33.6	130.0		13.5				27.6	57.4
Actuated g/C Ratio	0.34	0.64			0.26	1.00		0.10				0.21	0.44
v/c Ratio	0.64	0.23			0.50	0.20		0.02				0.74	0.93
Control Delay	39.9	12.4			48.7	0.3		49.0				59.8	39.5
Queue Delay	0.0	0.0			0.0	0.0		0.0				0.0	0.6
Total Delay	39.9	12.4			48.7	0.3		49.0				59.8	40.1
LOS	D	B			D	A		D				E	D
Approach Delay		32.5			21.2			49.0				45.5	
Approach LOS		C			C			D				D	
Queue Length 50th (m)	65.9	23.1			54.8	0.0		0.7				52.1	76.4
Queue Length 95th (m)	113.2	58.4			#87.7	0.0		3.6				m64.0 m#118.9	
Internal Link Dist (m)		79.9			173.8			12.4				145.6	
Turn Bay Length (m)	45.0					45.0							
Base Capacity (vph)	1188	1148			461	1483		242				375	688
Starvation Cap Reductn	0	0			0	0		0				0	8
Spillback Cap Reductn	0	0			0	0		0				0	0
Storage Cap Reductn	0	0			0	0		0				0	0
Reduced v/c Ratio	0.61	0.23			0.50	0.20		0.01				0.61	0.90

**Intersection Summary**  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated

Lane Group	Ø4	Ø9	Ø10	Ø12
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	4	9	10	12
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	10.0	1.0	1.0	1.0
Minimum Split (s)	15.5	5.0	5.0	20.0
Total Split (s)	24.8	5.0	5.0	20.0
Total Split (%)	19%	4%	4%	15%
Yellow Time (s)	3.3	2.0	2.0	2.0
All-Red Time (s)	2.2	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				
Intersection Summary				

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 34.6

Intersection LOS: C

Intersection Capacity Utilization 85.9%

ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 30: Prince of Wales & Preston

Ø1	Ø9 → Ø2 (R)	Ø11	Ø4
10.3 s	5 s   69.9 s	20 s	24.8 s
Ø5	Ø10 ← Ø6 (R)	Ø12	Ø8
50.9 s	5 s   29.3 s	20 s	24.8 s

Lanes, Volumes, Timings  
31: Rochester & 417 WB on/Raymond

2048 AM Demand Rationalized Main Hospital SPA

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	202	124	97	164	306	0	0	142	221
Future Volume (vph)	0	0	0	202	124	97	164	306	0	0	142	221
Satd. Flow (prot)	0	0	0	1695	1621	0	1695	1784	0	0	1784	1517
Flt Permitted				0.950			0.533					
Satd. Flow (perm)	0	0	0	1678	1621	0	930	1784	0	0	1784	1436
Satd. Flow (RTOR)					68							221
Lane Group Flow (vph)	0	0	0	202	221	0	164	306	0	0	142	221
Turn Type				Perm	NA		pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8			2					6
Detector Phase				8	8		5	2			6	6
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	10.0
Minimum Split (s)				23.7	23.7		10.9	27.3			24.9	24.9
Total Split (s)				24.0	24.0		11.0	36.0			25.0	25.0
Total Split (%)				40.0%	40.0%		18.3%	60.0%			41.7%	41.7%
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	3.3
All-Red Time (s)				2.4	2.4		2.6	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)				5.7	5.7		5.9	5.9			5.9	5.9
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode				None	None		None	C-Min			C-Min	C-Min
Act Effct Green (s)				13.0	13.0		35.4	35.4			24.7	24.7
Actuated g/C Ratio				0.22	0.22		0.59	0.59			0.41	0.41
v/c Ratio				0.55	0.55		0.26	0.29			0.19	0.31
Control Delay				26.3	18.9		5.9	5.8			14.9	4.0
Queue Delay				0.0	0.0		0.0	0.2			0.0	0.0
Total Delay				26.3	18.9		5.9	6.1			14.9	4.0
LOS				C	B		A	A			B	A
Approach Delay					22.4			6.0			8.3	
Approach LOS					C			A			A	
Queue Length 50th (m)				20.2	14.8		7.5	14.4			10.4	0.0
Queue Length 95th (m)				33.0	28.5		11.6	20.1			23.0	12.2
Internal Link Dist (m)		122.0			89.8			72.3			151.7	
Turn Bay Length (m)												35.0
Base Capacity (vph)				511	541		639	1051			736	722
Starvation Cap Reductn				0	0		0	271			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	0.41		0.26	0.39			0.19	0.31

**Intersection Summary**  
 Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 53 (88%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 12.2

Intersection LOS: B

Intersection Capacity Utilization 55.2%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 31: Rochester & 417 WB on/Raymond



Lanes, Volumes, Timings  
32: Rochester & 417 EB off/Orangeville

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕						↕↕			↕↕	
Traffic Volume (vph)	156	210	301	0	0	0	0	310	45	18	318	0
Future Volume (vph)	156	210	301	0	0	0	0	310	45	18	318	0
Satd. Flow (prot)	0	3070	0	0	0	0	0	3311	0	0	3380	0
Flt Permitted		0.988									0.931	
Satd. Flow (perm)	0	3067	0	0	0	0	0	3311	0	0	3154	0
Satd. Flow (RTOR)		301						32				
Lane Group Flow (vph)	0	667	0	0	0	0	0	355	0	0	336	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Detector Phase	4	4						2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0						25.1		25.1	25.1	
Total Split (s)	30.0	30.0						30.0		30.0	30.0	
Total Split (%)	50.0%	50.0%						50.0%		50.0%	50.0%	
Yellow Time (s)	3.3	3.3						3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3						2.1		2.1	2.1	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.6						5.4			5.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None						C-Min		C-Min	C-Min	
Act Effct Green (s)		14.0						35.0			35.0	
Actuated g/C Ratio		0.23						0.58			0.58	
v/c Ratio		0.71						0.18			0.18	
Control Delay		15.2						6.7			7.3	
Queue Delay		0.0						0.0			0.0	
Total Delay		15.2						6.7			7.3	
LOS		B						A			A	
Approach Delay		15.2						6.7			7.3	
Approach LOS		B						A			A	
Queue Length 50th (m)		18.8						14.1			13.5	
Queue Length 95th (m)		29.5						m18.5			21.4	
Internal Link Dist (m)		104.8			107.2			99.1			72.3	
Turn Bay Length (m)												
Base Capacity (vph)		1425						1946			1840	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.47						0.18			0.18	
<b>Intersection Summary</b>												
Cycle Length: 60												
Actuated Cycle Length: 60												
Offset: 52 (87%), Referenced to phase 2:NBT and 6:SBTL, Start of Green												
Natural Cycle: 55												
Control Type: Actuated-Coordinated												



Maximum v/c Ratio: 0.71

Intersection Signal Delay: 11.0

Intersection LOS: B

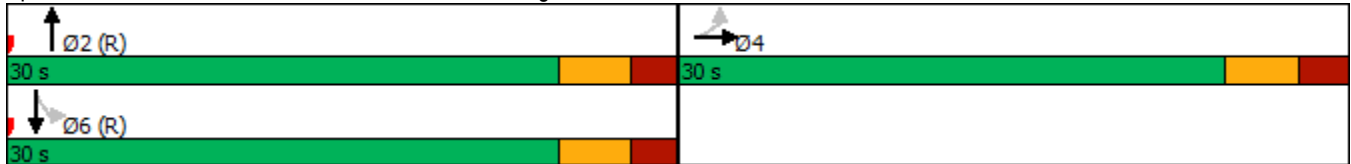
Intersection Capacity Utilization 58.2%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 32: Rochester & 417 EB off/Orangeville



Lanes, Volumes, Timings  
33: Bronson & Catherine 417 WB on

2048 AM Demand Rationalized Main Hospital SPA

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↶	↷		↶	↷			↷	
Traffic Volume (vph)	0	0	0	613	513	312	467	973	0	0	399	106
Future Volume (vph)	0	0	0	613	513	312	467	973	0	0	399	106
Satd. Flow (prot)	0	0	0	1458	4248	0	1695	3390	0	0	3243	0
Flt Permitted				0.950	0.990		0.266					
Satd. Flow (perm)	0	0	0	1458	4248	0	468	3390	0	0	3243	0
Satd. Flow (RTOR)					64						33	
Lane Group Flow (vph)	0	0	0	417	1021	0	467	973	0	0	505	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				25.9	25.9		11.0	25.1			25.1	
Total Split (s)				41.0	41.0		26.0	54.0			28.0	
Total Split (%)				43.2%	43.2%		27.4%	56.8%			29.5%	
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)				2.6	2.6		2.7	2.8			2.8	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				5.9	5.9		6.0	6.1			6.1	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				None	None		None	C-Min			C-Min	
Act Effct Green (s)				32.3	32.3		50.8	50.7			22.9	
Actuated g/C Ratio				0.34	0.34		0.53	0.53			0.24	
v/c Ratio				0.84	0.69		0.88	0.54			0.63	
Control Delay				45.0	27.5		41.7	19.6			34.8	
Queue Delay				3.5	0.1		13.2	2.6			0.0	
Total Delay				48.5	27.5		55.0	22.2			34.9	
LOS				D	C		D	C			C	
Approach Delay					33.6			32.8			34.9	
Approach LOS					C			C			C	
Queue Length 50th (m)				77.0	55.0		70.2	66.0			43.1	
Queue Length 95th (m)				#130.8	70.3		#116.5	101.2			58.4	
Internal Link Dist (m)		151.3			165.9			71.3			230.9	
Turn Bay Length (m)												
Base Capacity (vph)				541	1617		531	1815			840	
Starvation Cap Reductn				0	0		58	691			0	
Spillback Cap Reductn				62	61		0	0			1	
Storage Cap Reductn				0	0		0	0			0	
Reduced v/c Ratio				0.87	0.66		0.99	0.87			0.60	

Intersection Summary

Cycle Length: 95  
 Actuated Cycle Length: 95  
 Offset: 35 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 33.5

Intersection LOS: C

Intersection Capacity Utilization 108.1%

ICU Level of Service G

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 33: Bronson & Catherine 417 WB on



Lanes, Volumes, Timings  
34: Bronson & 417 EB off

2048 AM Demand Rationalized Main Hospital SPA

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Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	292	363	0	1223	1056	0
Future Volume (vph)	292	363	0	1223	1056	0
Satd. Flow (prot)	1695	1517	0	3390	3390	0
Flt Permitted	0.950					
Satd. Flow (perm)	1695	1474	0	3390	3390	0
Satd. Flow (RTOR)		116				
Lane Group Flow (vph)	292	363	0	1223	1056	0
Turn Type	Perm	Perm		NA	NA	
Protected Phases				2	6	
Permitted Phases	4	4				
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		10.0	10.0	
Minimum Split (s)	25.1	25.1		34.3	34.3	
Total Split (s)	30.0	30.0		65.0	65.0	
Total Split (%)	31.6%	31.6%		68.4%	68.4%	
Yellow Time (s)	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.1	2.1		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.4	5.4		5.8	5.8	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None		C-Min	C-Min	
Act Effct Green (s)	22.9	22.9		60.9	60.9	
Actuated g/C Ratio	0.24	0.24		0.64	0.64	
v/c Ratio	0.71	0.82		0.56	0.49	
Control Delay	42.1	37.4		12.0	5.5	
Queue Delay	0.4	0.0		0.1	0.5	
Total Delay	42.6	37.4		12.1	6.0	
LOS	D	D		B	A	
Approach Delay	39.7			12.1	6.0	
Approach LOS	D			B	A	
Queue Length 50th (m)	49.1	43.7		60.1	3.6	
Queue Length 95th (m)	67.6	68.2		99.8	105.1	
Internal Link Dist (m)	81.4			50.7	71.3	
Turn Bay Length (m)		60.0				
Base Capacity (vph)	472	494		2238	2238	
Starvation Cap Reductn	0	0		0	665	
Spillback Cap Reductn	26	0		157	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.65	0.73		0.59	0.67	

Intersection Summary

Cycle Length: 95  
 Actuated Cycle Length: 95  
 Offset: 72 (76%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 16.1

Intersection LOS: B

Intersection Capacity Utilization 108.1%

ICU Level of Service G

Analysis Period (min) 15

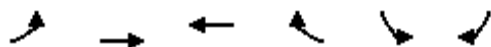
Splits and Phases: 34: Bronson & 417 EB off



Lanes, Volumes, Timings  
39: Prince of Wales & Road B

2048 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	73	880	628	67	60	37	
Future Volume (vph)	73	880	628	67	60	37	
Satd. Flow (prot)	1695	1784	3330	0	1695	1517	
Flt Permitted	0.351				0.950		
Satd. Flow (perm)	623	1784	3330	0	1634	1419	
Satd. Flow (RTOR)						37	
Lane Group Flow (vph)	73	880	695	0	60	37	
Turn Type	pm+pt	NA	NA		Perm	Perm	
Protected Phases	5	2	6				9
Permitted Phases	2				4	4	
Detector Phase	5	2	6		4	4	
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0		10.0	10.0	1.0
Minimum Split (s)	10.3	23.3	23.3		23.3	23.3	15.0
Total Split (s)	10.4	91.7	81.3		23.3	23.3	15.0
Total Split (%)	8.0%	70.5%	62.5%		17.9%	17.9%	12%
Yellow Time (s)	3.3	3.3	3.3		3.3	3.3	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3		5.3	5.3	
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	None	C-Min	C-Min		None	None	None
Act Effct Green (s)	107.5	108.5	98.6		12.0	12.0	
Actuated g/C Ratio	0.83	0.83	0.76		0.09	0.09	
v/c Ratio	0.13	0.59	0.28		0.40	0.23	
Control Delay	3.4	7.0	7.3		62.7	18.8	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	3.4	7.0	7.3		62.7	18.8	
LOS	A	A	A		E	B	
Approach Delay		6.8	7.3		46.0		
Approach LOS		A	A		D		
Queue Length 50th (m)	2.3	49.8	10.2		15.0	0.0	
Queue Length 95th (m)	6.2	199.3	m78.3		27.5	10.2	
Internal Link Dist (m)		198.2	95.9		17.7		
Turn Bay Length (m)	45.0						
Base Capacity (vph)	570	1489	2546		226	228	
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	0.13	0.59	0.27		0.27	0.16	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 9.2

Intersection LOS: A

Intersection Capacity Utilization 67.9%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 39: Prince of Wales & Road B

 Ø2 (R)	 Ø9	 Ø4
91.7 s	15 s	23.3 s
 Ø5	 Ø6 (R)	
10.4 s	81.3 s	

Lanes, Volumes, Timings  
40: Prince of Wales & Road E

2048 AM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	41	18	18	912	555	112	
Future Volume (vph)	41	18	18	912	555	112	
Satd. Flow (prot)	1616	1459	1631	3390	1784	1218	
Flt Permitted	0.950		0.950				
Satd. Flow (perm)	1616	1459	1604	3390	1784	1136	
Satd. Flow (RTOR)							
Lane Group Flow (vph)	41	18	18	912	555	112	
Turn Type	Perm	Perm	Prot	NA	NA	Perm	
Protected Phases			5	2	6		9
Permitted Phases	4	4				6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	1.0
Minimum Split (s)	23.3	23.3	10.3	23.3	23.3	23.3	10.0
Total Split (s)	25.0	25.0	12.0	95.0	83.0	83.0	10.0
Total Split (%)	19.2%	19.2%	9.2%	73.1%	63.8%	63.8%	8%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	11.6	11.6	7.0	109.9	104.4	104.4	
Actuated g/C Ratio	0.09	0.09	0.05	0.85	0.80	0.80	
v/c Ratio	0.28	0.14	0.20	0.32	0.39	0.12	
Control Delay	59.4	55.4	63.5	3.7	3.2	1.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	59.4	55.4	63.5	3.7	3.2	1.3	
LOS	E	E	E	A	A	A	
Approach Delay	58.2			4.9	2.9		
Approach LOS	E			A	A		
Queue Length 50th (m)	10.1	4.4	4.5	20.2	5.6	1.1	
Queue Length 95th (m)	20.3	11.6	12.5	55.5	58.8	4.2	
Internal Link Dist (m)	165.3			279.2	63.5		
Turn Bay Length (m)	45.0		50.0			50.0	
Base Capacity (vph)	244	221	93	2865	1434	913	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.17	0.08	0.19	0.32	0.39	0.12	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 22 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated



Maximum v/c Ratio: 0.39

Intersection Signal Delay: 6.0

Intersection LOS: A

Intersection Capacity Utilization 48.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 40: Prince of Wales & Road E



Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	1125	562	1	12	15
Future Vol, veh/h	18	1125	562	1	12	15
Conflicting Peds, #/hr	40	0	0	40	3	9
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	25	-	-	20	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	1125	562	1	12	15

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	603	0	-	0	1204 330
Stage 1	-	-	-	-	602 -
Stage 2	-	-	-	-	602 -
Critical Hdwy	4.14	-	-	-	6.84 6.94
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.22	-	-	-	3.52 3.32
Pot Cap-1 Maneuver	971	-	-	-	177 666
Stage 1	-	-	-	-	510 -
Stage 2	-	-	-	-	510 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	938	-	-	-	162 639
Mov Cap-2 Maneuver	-	-	-	-	162 -
Stage 1	-	-	-	-	483 -
Stage 2	-	-	-	-	493 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	19.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	938	-	-	-	277
HCM Lane V/C Ratio	0.019	-	-	-	0.097
HCM Control Delay (s)	8.9	-	-	-	19.4
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑	↑		↑
Traffic Vol, veh/h	0	1181	646	245	0	172
Future Vol, veh/h	0	1181	646	245	0	172
Conflicting Peds, #/hr	36	0	0	36	1	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	30	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1181	646	245	0	172

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	-	0	-	0	684
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	3.319
Pot Cap-1 Maneuver	0	-	-	-	448
Stage 1	0	-	-	-	-
Stage 2	0	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	434
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	18.6
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	434
HCM Lane V/C Ratio	-	-	-	0.396
HCM Control Delay (s)	-	-	-	18.6
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	1.9

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻			↻			↻				↻
Traffic Vol, veh/h	0	928	4	3	706	89	0	0	1	0	0	7
Future Vol, veh/h	0	928	4	3	706	89	0	0	1	0	0	7
Conflicting Peds, #/hr	2	0	7	7	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	928	4	3	706	89	0	0	1	0	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	939	0	0	1697	1740	937	-	-	753
Stage 1	-	-	-	-	-	-	937	937	-	-	-	-
Stage 2	-	-	-	-	-	-	760	803	-	-	-	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	-	-	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	730	-	-	73	87	321	0	0	410
Stage 1	0	-	-	-	-	-	318	343	-	0	0	-
Stage 2	0	-	-	-	-	-	398	396	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	726	-	-	71	86	319	-	-	409
Mov Cap-2 Maneuver	-	-	-	-	-	-	71	86	-	-	-	-
Stage 1	-	-	-	-	-	-	318	341	-	-	-	-
Stage 2	-	-	-	-	-	-	388	392	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			16.3			14		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	319	-	-	726	-	-	409
HCM Lane V/C Ratio	0.003	-	-	0.004	-	-	0.017
HCM Control Delay (s)	16.3	-	-	10	0	-	14
HCM Lane LOS	C	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔			↔	
Traffic Vol, veh/h	0	45	164	237	237	5	26	0	138	0	0	5
Future Vol, veh/h	0	45	164	237	237	5	26	0	138	0	0	5
Conflicting Peds, #/hr	10	0	10	10	0	10	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	45	164	237	237	5	26	0	138	0	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	252	0	0	219	0	0	730	863	115	747	943	131
Stage 1	-	-	-	-	-	-	137	137	-	724	724	-
Stage 2	-	-	-	-	-	-	593	726	-	23	219	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1310	-	-	1348	-	-	310	291	916	301	261	894
Stage 1	-	-	-	-	-	-	852	782	-	383	429	-
Stage 2	-	-	-	-	-	-	459	428	-	992	721	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1299	-	-	1337	-	-	257	228	908	213	204	886
Mov Cap-2 Maneuver	-	-	-	-	-	-	257	228	-	213	204	-
Stage 1	-	-	-	-	-	-	845	776	-	380	338	-
Stage 2	-	-	-	-	-	-	363	338	-	841	715	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			4.2			12.4			9.1		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	648	1299	-	-	1337	-	-	886
HCM Lane V/C Ratio	0.253	-	-	-	0.177	-	-	0.006
HCM Control Delay (s)	12.4	0	-	-	8.3	0.3	-	9.1
HCM Lane LOS	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	1	0	-	-	0.6	-	-	0

Intersection						
Int Delay, s/veh	5.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑	↑		↑↑
Traffic Vol, veh/h	61	35	74	63	131	32
Future Vol, veh/h	61	35	74	63	131	32
Conflicting Peds, #/hr	0	0	0	15	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	0	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	61	35	74	63	131	32

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	367	89	0	0	152
Stage 1	89	-	-	-	-
Stage 2	278	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	619	969	-	-	1428
Stage 1	934	-	-	-	-
Stage 2	745	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	553	957	-	-	1410
Mov Cap-2 Maneuver	553	-	-	-	-
Stage 1	922	-	-	-	-
Stage 2	674	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	6.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	654	1410
HCM Lane V/C Ratio	-	-	0.147	0.093
HCM Control Delay (s)	-	-	11.4	7.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.5	0.3

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	4	4	137	93	0
Future Vol, veh/h	0	4	4	137	93	0
Conflicting Peds, #/hr	0	0	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	100	100	100	2	2	100
Mvmt Flow	0	4	4	137	93	0

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	175	52	98	0	0
Stage 1	98	-	-	-	-
Stage 2	77	-	-	-	-
Critical Hdwy	8.8	8.9	6.1	-	-
Critical Hdwy Stg 1	7.8	-	-	-	-
Critical Hdwy Stg 2	7.8	-	-	-	-
Follow-up Hdwy	4.5	4.3	3.2	-	-
Pot Cap-1 Maneuver	581	759	995	-	-
Stage 1	687	-	-	-	-
Stage 2	710	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	574	756	991	-	-
Mov Cap-2 Maneuver	574	-	-	-	-
Stage 1	682	-	-	-	-
Stage 2	707	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.8	0.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	991	-	756	-	-
HCM Lane V/C Ratio	0.004	-	0.005	-	-
HCM Control Delay (s)	8.6	0	9.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	4.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	37	6	0	18	16
Future Vol, veh/h	0	37	6	0	18	16
Conflicting Peds, #/hr	0	10	10	0	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	37	6	0	18	16

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	47	0	51
Stage 1	-	-	-	-	29
Stage 2	-	-	-	-	22
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1560	-	958
Stage 1	-	-	-	-	994
Stage 2	-	-	-	-	1001
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1547	-	939
Mov Cap-2 Maneuver	-	-	-	-	939
Stage 1	-	-	-	-	986
Stage 2	-	-	-	-	989

Approach	EB	WB	NB
HCM Control Delay, s	0	7.3	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	974	-	-	1547	-
HCM Lane V/C Ratio	0.035	-	-	0.004	-
HCM Control Delay (s)	8.8	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-



Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	42	120	16	2	85	80	3	5	2	66	65	20
Future Vol, veh/h	42	120	16	2	85	80	3	5	2	66	65	20
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	42	120	16	2	85	80	3	5	2	66	65	20
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.8	8.3	7.9	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	30%	24%	1%	44%
Vol Thru, %	50%	67%	51%	43%
Vol Right, %	20%	9%	48%	13%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	178	167	151
LT Vol	3	42	2	66
Through Vol	5	120	85	65
RT Vol	2	16	80	20
Lane Flow Rate	10	178	167	151
Geometry Grp	1	1	1	1
Degree of Util (X)	0.013	0.222	0.197	0.198
Departure Headway (Hd)	4.837	4.498	4.242	4.72
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	739	799	847	761
Service Time	2.874	2.522	2.265	2.747
HCM Lane V/C Ratio	0.014	0.223	0.197	0.198
HCM Control Delay	7.9	8.8	8.3	8.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.8	0.7	0.7

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	32	0	30	0	0	18	30	32	0	37	72	73
Future Vol, veh/h	32	0	30	0	0	18	30	32	0	37	72	73
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	32	0	30	0	0	18	30	32	0	37	72	73
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.6	7	7.7	8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	48%	52%	0%	20%
Vol Thru, %	52%	0%	0%	40%
Vol Right, %	0%	48%	100%	40%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	62	62	18	182
LT Vol	30	32	0	37
Through Vol	32	0	0	72
RT Vol	0	30	18	73
Lane Flow Rate	62	62	18	182
Geometry Grp	1	1	1	1
Degree of Util (X)	0.074	0.074	0.02	0.198
Departure Headway (Hd)	4.31	4.287	3.923	3.92
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	822	841	917	906
Service Time	2.388	2.288	1.925	1.982
HCM Lane V/C Ratio	0.075	0.074	0.02	0.201
HCM Control Delay	7.7	7.6	7	8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.2	0.1	0.7

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑	↘	
Traffic Vol, veh/h	132	24	139	124	32	76
Future Vol, veh/h	132	24	139	124	32	76
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	132	24	139	124	32	76
Number of Lanes	2	0	1	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	2
HCM Control Delay	8.3	9.1	8.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	30%	0%	0%	100%	0%
Vol Thru, %	0%	100%	65%	0%	100%
Vol Right, %	70%	0%	35%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	108	88	68	139	124
LT Vol	32	0	0	139	0
Through Vol	0	88	44	0	124
RT Vol	76	0	24	0	0
Lane Flow Rate	108	88	68	139	124
Geometry Grp	2	7	7	7	7
Degree of Util (X)	0.136	0.123	0.09	0.209	0.169
Departure Headway (Hd)	4.544	5.033	4.784	5.422	4.92
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	791	713	749	663	730
Service Time	2.565	2.758	2.509	3.146	2.644
HCM Lane V/C Ratio	0.137	0.123	0.091	0.21	0.17
HCM Control Delay	8.3	8.5	8	9.6	8.6
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.5	0.4	0.3	0.8	0.6

Lanes, Volumes, Timings  
10: Carling & Parkdale

2048 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø10
Lane Configurations							
Traffic Volume (vph)	87	611	1301	112	20	166	
Future Volume (vph)	87	611	1301	112	20	166	
Satd. Flow (prot)	1695	3390	3390	1517	1521	0	
Flt Permitted	0.950				0.995		
Satd. Flow (perm)	1652	3390	3390	1239	1519	0	
Satd. Flow (RTOR)				106	166		
Lane Group Flow (vph)	87	611	1301	112	186	0	
Turn Type	Prot	NA	NA	Perm	Perm		
Protected Phases	5	2	6				10
Permitted Phases				6	4		
Detector Phase	5	2	6	6	4		
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		1.0
Minimum Split (s)	11.1	26.7	26.7	26.7	37.2		5.0
Total Split (s)	16.0	92.8	76.8	76.8	37.2		5.0
Total Split (%)	11.9%	68.7%	56.9%	56.9%	27.6%		4%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.0		2.0
All-Red Time (s)	2.4	1.9	1.9	1.9	3.2		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.1	5.6	5.6	5.6	6.2		
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Min	C-Min	C-Min	None		Min
Act Effct Green (s)	12.6	104.2	85.5	85.5	11.5		
Actuated g/C Ratio	0.09	0.77	0.63	0.63	0.09		
v/c Ratio	0.55	0.23	0.61	0.14	0.66		
Control Delay	70.9	4.7	17.1	2.9	23.3		
Queue Delay	0.0	0.0	1.1	0.0	0.0		
Total Delay	70.9	4.7	18.1	2.9	23.3		
LOS	E	A	B	A	C		
Approach Delay		12.9	16.9		23.3		
Approach LOS		B	B		C		
Queue Length 50th (m)	22.5	19.3	98.7	0.5	5.1		
Queue Length 95th (m)	38.6	31.1	147.7	9.0	28.1		
Internal Link Dist (m)		297.5	170.5		278.4		
Turn Bay Length (m)	155.0			80.0			
Base Capacity (vph)	163	2617	2146	823	476		
Starvation Cap Reductn	0	0	550	0	0		
Spillback Cap Reductn	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0		
Reduced v/c Ratio	0.53	0.23	0.82	0.14	0.39		

Intersection Summary

Cycle Length: 135  
 Actuated Cycle Length: 135  
 Offset: 66 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 16.2

Intersection LOS: B

Intersection Capacity Utilization 75.9%

ICU Level of Service D

Analysis Period (min) 15

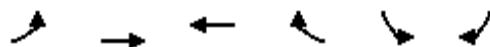
Splits and Phases: 10: Carling & Parkdale



Lanes, Volumes, Timings  
11: Carling & Civic

2048 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↗	↗↗	↗↗	↗	↘↘	
Traffic Volume (vph)	16	685	1546	42	16	16
Future Volume (vph)	16	685	1546	42	16	16
Satd. Flow (prot)	1695	3390	3390	1517	1587	0
Flt Permitted	0.950				0.976	
Satd. Flow (perm)	1685	3390	3390	1394	1575	0
Satd. Flow (RTOR)				42	16	
Lane Group Flow (vph)	16	685	1546	42	32	0
Turn Type	Prot	NA	NA	Perm	Perm	
Protected Phases	5	2	6			
Permitted Phases				6	4	
Detector Phase	5	2	6	6	4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.4	31.3	31.3	31.3	23.3	
Total Split (s)	12.5	106.7	94.2	94.2	23.3	
Total Split (%)	9.6%	82.1%	72.5%	72.5%	17.9%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	
All-Red Time (s)	2.7	2.7	2.7	2.7	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.4	6.4	6.4	6.4	5.3	
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	
Act Effct Green (s)	6.8	115.4	109.6	109.6	11.6	
Actuated g/C Ratio	0.05	0.89	0.84	0.84	0.09	
v/c Ratio	0.18	0.23	0.54	0.04	0.21	
Control Delay	62.9	2.3	5.7	1.7	35.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	62.9	2.3	5.7	1.7	35.6	
LOS	E	A	A	A	D	
Approach Delay		3.7	5.6		35.6	
Approach LOS		A	A		D	
Queue Length 50th (m)	4.0	14.9	44.5	0.0	3.9	
Queue Length 95th (m)	11.5	28.5	84.5	m2.1	13.2	
Internal Link Dist (m)		170.5	180.8		39.9	
Turn Bay Length (m)	90.0			140.0		
Base Capacity (vph)	91	3009	2871	1187	231	
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	0.18	0.23	0.54	0.04	0.14	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings  
 11: Carling & Civic

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 5.4

Intersection LOS: A

Intersection Capacity Utilization 65.8%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 11: Carling & Civic



Lanes, Volumes, Timings  
13: Maple/Old Irvine & Carling

2048 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	605	57	54	1105	7	125	10	48	10	9	11
Future Volume (vph)	38	605	57	54	1105	7	125	10	48	10	9	11
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	0	1648	0	0	1652	0
Flt Permitted	0.223			0.412				0.777			0.891	
Satd. Flow (perm)	386	3390	1293	699	3390	1178	0	1312	0	0	1486	0
Satd. Flow (RTOR)			39			37		14			11	
Lane Group Flow (vph)	38	605	57	54	1105	7	0	183	0	0	30	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	35.0	35.0	35.0	34.3	34.3	34.3	42.4	42.4		42.4	42.4	
Total Split (s)	87.0	87.0	87.0	87.0	87.0	87.0	43.0	43.0		43.0	43.0	
Total Split (%)	66.9%	66.9%	66.9%	66.9%	66.9%	66.9%	33.1%	33.1%		33.1%	33.1%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	4.4	4.4		4.4	4.4	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.7		7.4			7.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	92.1	92.1	92.1	92.1	92.1	92.1		24.8			24.8	
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.71	0.71		0.19			0.19	
v/c Ratio	0.14	0.25	0.06	0.11	0.46	0.01		0.70			0.10	
Control Delay	7.9	6.5	2.7	8.8	10.0	0.0		58.1			28.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	7.9	6.5	2.7	8.8	10.0	0.0		58.1			28.0	
LOS	A	A	A	A	A	A		E			C	
Approach Delay		6.2			9.9			58.1			28.0	
Approach LOS		A			A			E			C	
Queue Length 50th (m)	2.6	24.6	1.0	3.6	52.6	0.0		42.0			4.1	
Queue Length 95th (m)	5.1	24.2	3.0	m11.0	90.8	m0.0		60.4			11.3	
Internal Link Dist (m)		236.1			191.5			174.3			220.8	
Turn Bay Length (m)	20.0		15.0	45.0		25.0						
Base Capacity (vph)	273	2401	927	495	2401	845		369			414	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.14	0.25	0.06	0.11	0.46	0.01		0.50			0.07	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 28 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated



Maximum v/c Ratio: 0.70

Intersection Signal Delay: 13.2

Intersection LOS: B

Intersection Capacity Utilization 80.7%

ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 13: Maple/Old Irvine & Carling



Lanes, Volumes, Timings  
15: Carling & Sherwood

2048 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	619	1217	200	154	7
Future Volume (vph)	65	619	1217	200	154	7
Satd. Flow (prot)	1695	3390	3390	1517	1695	1517
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1610	3390	3390	1072	1669	1473
Satd. Flow (RTOR)				200		5
Lane Group Flow (vph)	65	619	1217	200	154	7
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.3	25.1	25.1	25.1	25.1	25.1
Total Split (s)	15.0	89.0	74.0	74.0	41.0	41.0
Total Split (%)	11.5%	68.5%	56.9%	56.9%	31.5%	31.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	10.3	102.0	88.7	88.7	17.4	17.4
Actuated g/C Ratio	0.08	0.78	0.68	0.68	0.13	0.13
v/c Ratio	0.49	0.23	0.53	0.25	0.69	0.04
Control Delay	69.0	4.3	3.3	0.6	69.3	30.7
Queue Delay	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	69.0	4.3	3.6	0.6	69.3	30.7
LOS	E	A	A	A	E	C
Approach Delay		10.4	3.1		67.6	
Approach LOS		B	A		E	
Queue Length 50th (m)	16.3	18.3	17.3	0.0	38.2	0.5
Queue Length 95th (m)	30.5	30.2	18.7	0.0	57.8	4.7
Internal Link Dist (m)		118.3	141.7		152.1	
Turn Bay Length (m)	30.0			90.0		15.0
Base Capacity (vph)	146	2660	2314	795	458	408
Starvation Cap Reductn	0	0	391	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	0.45	0.23	0.63	0.25	0.34	0.02

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 24 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated

Lanes, Volumes, Timings  
 15: Carling & Sherwood

2048 PM Demand Rationalized Main Hospital SPA

10/18/2022

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 9.9

Intersection LOS: A

Intersection Capacity Utilization 63.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 15: Carling & Sherwood



Lanes, Volumes, Timings  
16: Road A/Champagne & Carling

2048 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗↗	↗	↘	↗↗	↗	↘	↗		↘	↗	
Traffic Volume (vph)	88	581	48	48	1033	150	165	0	171	182	0	98
Future Volume (vph)	88	581	48	48	1033	150	165	0	171	182	0	98
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1695	1402	0	1695	1417	0
Flt Permitted	0.950			0.950			0.531			0.649		
Satd. Flow (perm)	1577	3390	1356	1636	3390	1019	909	1402	0	1099	1417	0
Satd. Flow (RTOR)						147					295	
Lane Group Flow (vph)	88	581	48	48	1033	150	165	171	0	182	98	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8				4
Permitted Phases			2			6	8			4		
Detector Phase	5	2	2	1	6	6	3	8		4		4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	15.3	26.3	26.3	15.3	26.3	26.3	10.3	23.3		37.9	37.9	
Total Split (s)	15.3	47.8	47.8	15.3	52.8	52.8	14.0	56.9		37.9	37.9	
Total Split (%)	11.8%	36.8%	36.8%	11.8%	40.6%	40.6%	10.8%	43.8%		29.2%	29.2%	
Yellow Time (s)	3.3	3.7	3.7	3.3	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	1.6	1.6	2.0	1.6	1.6	2.0	2.0		2.6	2.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3		5.9	5.9	
Lead/Lag	Lead			Lead			Lead					
Lead-Lag Optimize?	Yes			Yes			Yes					
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	11.5	61.6	61.6	10.1	58.2	58.2	43.4	43.4		25.7	25.7	
Actuated g/C Ratio	0.09	0.47	0.47	0.08	0.45	0.45	0.33	0.33		0.20	0.20	
v/c Ratio	0.59	0.36	0.07	0.37	0.68	0.28	0.45	0.37		0.84	0.19	
Control Delay	70.3	24.1	22.5	65.3	33.1	5.9	34.9	33.9		80.1	0.8	
Queue Delay	0.0	0.0	0.0	0.0	12.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	70.3	24.1	22.5	65.3	45.1	5.9	34.9	33.9		80.1	0.8	
LOS	E	C	C	E	D	A	C	C		F	A	
Approach Delay		29.7			41.1			34.4				52.4
Approach LOS		C			D			C				D
Queue Length 50th (m)	18.7	59.1	8.3	11.9	114.6	0.5	29.7	31.6		44.7	0.0	
Queue Length 95th (m)	#47.5	85.8	19.6	24.8	153.8	14.9	44.4	47.9		69.2	0.0	
Internal Link Dist (m)		141.7			98.6			63.9				477.2
Turn Bay Length (m)	55.0		75.0	61.0		35.0				30.0		
Base Capacity (vph)	149	1607	642	131	1517	537	369	556		270	571	
Starvation Cap Reductn	0	0	0	0	472	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.59	0.36	0.07	0.37	0.99	0.28	0.45	0.31		0.67	0.17	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 105  
 Control Type: Actuated-Coordinated

Lane Group	Ø9	Ø10	Ø11
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	9	10	11
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	1.0	1.0	1.0
Minimum Split (s)	10.0	5.0	5.0
Total Split (s)	10.0	5.0	5.0
Total Split (%)	8%	4%	4%
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes
Recall Mode	None	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Lanes, Volumes, Timings  
 16: Road A/Champagne & Carling

2048 PM Demand Rationalized Main Hospital SPA

10/18/2022

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 38.3

Intersection LOS: D

Intersection Capacity Utilization 89.3%

ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.













Splits and Phases: 16: Road A/Champagne & Carling

Ø1	Ø9	Ø2 (R)	Ø3	Ø10	Ø4
15.3 s	10 s	47.8 s	14 s	5 s	37.9 s
Ø5	Ø10	Ø6 (R)	Ø8		
15.3 s	5 s	52.8 s	56.9 s		

Lanes, Volumes, Timings  
17: Carling & Trillium MUP

2048 PM Demand Rationalized Main Hospital SPA

10/18/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑							
Traffic Volume (vph)	0	930	0	0	1359	0	0	0	0	0	0	0
Future Volume (vph)	0	930	0	0	1359	0	0	0	0	0	0	0
Satd. Flow (prot)	0	3390	0	0	3390	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3390	0	0	3390	0	0	0	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	930	0	0	1359	0	0	0	0	0	0	0
Turn Type		NA			NA							
Protected Phases		2			6							
Permitted Phases												
Detector Phase		2			6							
Switch Phase												
Minimum Initial (s)		10.0			10.0							
Minimum Split (s)		31.1			31.1							
Total Split (s)		35.0			35.0							
Total Split (%)		50.0%			50.0%							
Yellow Time (s)		3.7			3.7							
All-Red Time (s)		1.4			1.4							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		5.1			5.1							
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Min			C-Min							
Act Effct Green (s)		62.0			62.0							
Actuated g/C Ratio		0.89			0.89							
v/c Ratio		0.31			0.45							
Control Delay		4.9			5.9							
Queue Delay		0.0			0.0							
Total Delay		4.9			5.9							
LOS		A			A							
Approach Delay		4.9			5.9							
Approach LOS		A			A							
Queue Length 50th (m)		0.0			1.7							
Queue Length 95th (m)		66.8			m#120.1							
Internal Link Dist (m)		98.6			92.8			53.0			60.9	
Turn Bay Length (m)												
Base Capacity (vph)		3002			3002							
Starvation Cap Reductn		45			29							
Spillback Cap Reductn		46			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.31			0.46							
<b>Intersection Summary</b>												
Cycle Length: 70												
Actuated Cycle Length: 70												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 75												
Control Type: Actuated-Coordinated												

Lane Group	Ø4	Ø8
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	4	8
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	35.6	35.6
Total Split (s)	35.0	35.0
Total Split (%)	50%	50%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	3.6	3.6
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		



Maximum v/c Ratio: 0.45

Intersection Signal Delay: 5.5

Intersection LOS: A

Intersection Capacity Utilization 43.9%

ICU Level of Service A

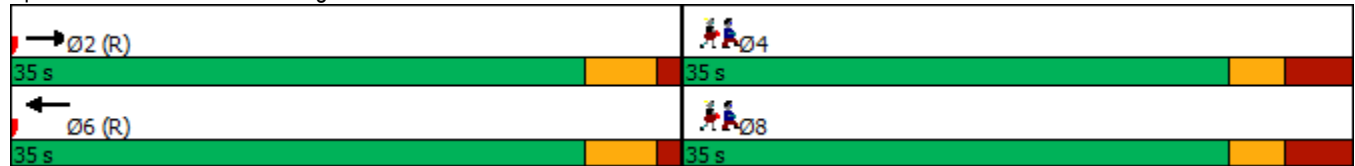
Analysis Period (min) 15

# 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: 17: Carling & Trillium MUP



Lanes, Volumes, Timings  
18: Preston & Carling

2048 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗	↘	↘	↗	↘	↘	↗		↘	↗	
Traffic Volume (vph)	124	550	273	315	960	52	267	356	204	91	272	88
Future Volume (vph)	124	550	273	315	960	52	267	356	204	91	272	88
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1695	3072	0	1695	1663	0
Flt Permitted	0.950			0.950			0.140			0.442		
Satd. Flow (perm)	1626	3390	1517	1636	3390	1243	242	3072	0	753	1663	0
Satd. Flow (RTOR)						179					11	
Lane Group Flow (vph)	124	550	273	315	960	52	267	560	0	91	360	0
Turn Type	Prot	NA	custom	Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	9 2	9 3	1	6		3	8				4
Permitted Phases						6	8			4		
Detector Phase	5	9 2	9 3	1	6	6	3	8		4		4
Switch Phase												
Minimum Initial (s)	5.0			5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2			11.2	25.0	25.0	11.9	38.9		38.9	38.9	
Total Split (s)	20.2			37.0	47.1	47.1	23.8	61.7		38.9	38.9	
Total Split (%)	14.4%			26.4%	33.6%	33.6%	17.0%	44.1%		27.8%	27.8%	
Yellow Time (s)	3.7			3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5			2.5	2.3	2.3	3.6	3.6		3.6	3.6	
Lost Time Adjust (s)	0.0			0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2			6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead			Lead			Lead					
Lead-Lag Optimize?	Yes			Yes			Yes					
Recall Mode	None			None	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	13.2	34.8	28.0	28.8	44.6	44.6	59.0	54.2		31.2	31.2	
Actuated g/C Ratio	0.09	0.25	0.20	0.21	0.32	0.32	0.42	0.39		0.22	0.22	
v/c Ratio	0.78	0.65	0.90	0.91	0.89	0.10	0.96	0.47		0.54	0.95	
Control Delay	91.4	48.1	87.1	88.5	49.5	0.3	101.7	14.1		61.2	87.0	
Queue Delay	0.0	0.8	5.2	0.0	1.6	0.0	8.1	0.0		0.0	46.3	
Total Delay	91.4	48.9	92.3	88.5	51.1	0.3	109.8	14.1		61.2	133.3	
LOS	F	D	F	F	D	A	F	B		E	F	
Approach Delay		67.0			58.0			45.0			118.7	
Approach LOS		E			E			D			F	
Queue Length 50th (m)	33.9	75.1	75.8	81.7	128.9	0.0	54.1	23.3		22.3	95.7	
Queue Length 95th (m)	#65.4	84.8	#136.3	m97.2 m	#163.8	m0.0	#108.0	30.5		41.7	#154.2	
Internal Link Dist (m)		92.8			165.9			145.6			55.2	
Turn Bay Length (m)	70.0		90.0	120.0		95.0				35.0		
Base Capacity (vph)	169	805	303	372	1081	518	277	1202		172	388	
Starvation Cap Reductn	0	78	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	13	0	39	0	10	0		0	69	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.73	0.76	0.94	0.85	0.92	0.10	1.00	0.47		0.53	1.13	

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 6 (4%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated

Lane Group	Ø2	Ø9	Ø10	Ø11	Ø12
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Satd. Flow (RTOR)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	2	9	10	11	12
Permitted Phases					
Detector Phase					
Switch Phase					
Minimum Initial (s)	10.0	1.0	1.0	1.0	1.0
Minimum Split (s)	26.0	5.3	5.0	5.0	5.0
Total Split (s)	29.0	6.3	5.0	5.0	6.0
Total Split (%)	21%	5%	4%	4%	4%
Yellow Time (s)	2.0	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	2.3	0.0	0.0	0.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes		Yes	Yes	
Recall Mode	C-Min	Min	None	None	None
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (m)					
Queue Length 95th (m)					
Internal Link Dist (m)					
Turn Bay Length (m)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					
Intersection Summary					

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 65.1

Intersection LOS: E

Intersection Capacity Utilization 98.9%

ICU Level of Service F

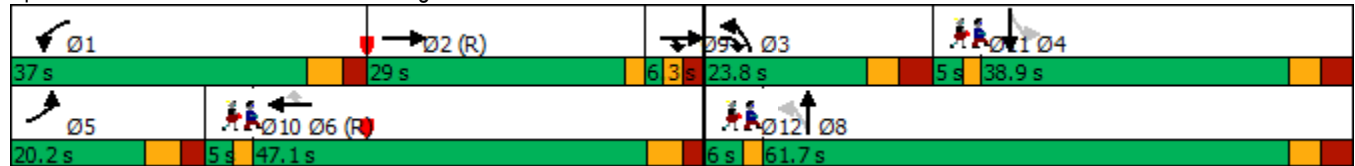
Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

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

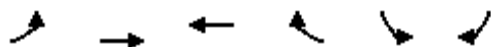
Splits and Phases: 18: Preston & Carling



Lanes, Volumes, Timings  
20: Carling & Booth

2048 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↗	↗↗	↖	↗	↘	↘
Traffic Volume (vph)	208	771	945	85	254	266
Future Volume (vph)	208	771	945	85	254	266
Satd. Flow (prot)	1695	3390	1784	1517	1695	1517
Flt Permitted	0.061				0.950	
Satd. Flow (perm)	109	3390	1784	1141	1663	1187
Satd. Flow (RTOR)				25		174
Lane Group Flow (vph)	208	771	945	85	254	266
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	29.7	29.7	29.7	39.0	39.0
Total Split (s)	19.2	101.0	81.8	81.8	39.0	39.0
Total Split (%)	13.7%	72.1%	58.4%	58.4%	27.9%	27.9%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	98.1	98.3	78.5	78.5	30.0	30.0
Actuated g/C Ratio	0.70	0.70	0.56	0.56	0.21	0.21
v/c Ratio	0.89	0.32	0.95	0.13	0.72	0.68
Control Delay	69.4	7.1	48.1	11.6	62.3	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.4	7.1	48.1	11.6	62.3	26.3
LOS	E	A	D	B	E	C
Approach Delay		20.4	45.1		43.9	
Approach LOS		C	D		D	
Queue Length 50th (m)	45.8	24.1	245.7	7.7	63.9	22.4
Queue Length 95th (m)	#85.5	52.0	#342.5	16.6	93.9	54.5
Internal Link Dist (m)		100.4	299.3		220.7	
Turn Bay Length (m)	50.0			30.0		30.0
Base Capacity (vph)	234	2380	999	650	391	412
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.32	0.95	0.13	0.65	0.65

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 110 (79%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 35.3

Intersection LOS: D

Intersection Capacity Utilization 106.1%

ICU Level of Service G

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 20: Carling & Booth



Lanes, Volumes, Timings  
21: Bronson & Carling/Glebe

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	462	102	492	0	0	0	532	604	13	0	1070	270
Future Volume (vph)	462	102	492	0	0	0	532	604	13	0	1070	270
Satd. Flow (prot)	1610	1648	1517	0	0	0	3288	1770	0	0	3242	0
Flt Permitted	0.950	0.972					0.950					
Satd. Flow (perm)	1511	1588	1413	0	0	0	3240	1770	0	0	3242	0
Satd. Flow (RTOR)			108					1			27	
Lane Group Flow (vph)	319	245	492	0	0	0	532	617	0	0	1340	0
Turn Type	Perm	NA	pm+ov				Prot	NA			NA	
Protected Phases		4	5				5	2			6	
Permitted Phases	4		4									
Detector Phase	4	4	5				5	2			6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0				10.0	10.0			10.0	
Minimum Split (s)	31.0	31.0	16.0				16.0	25.1			33.0	
Total Split (s)	39.0	39.0	31.0				31.0	101.0			70.0	
Total Split (%)	26.5%	26.5%	21.1%				21.1%	68.7%			47.6%	
Yellow Time (s)	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	
Lost Time Adjust (s)	0.0	0.0	0.0				0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0	6.0				6.0	6.0			6.0	
Lead/Lag			Lead				Lead				Lag	
Lead-Lag Optimize?			Yes				Yes				Yes	
Recall Mode	None	None	None				None	C-Min			C-Min	
Act Effct Green (s)	32.4	32.4	57.4				25.0	95.5			64.5	
Actuated g/C Ratio	0.22	0.22	0.39				0.17	0.65			0.44	
v/c Ratio	0.96	0.70	0.77				0.95	0.54			0.93	
Control Delay	95.9	64.6	36.8				87.6	16.1			51.0	
Queue Delay	0.0	0.0	0.0				0.0	0.0			0.0	
Total Delay	95.9	64.6	36.8				87.6	16.1			51.0	
LOS	F	E	D				F	B			D	
Approach Delay		61.1						49.2			51.0	
Approach LOS		E						D			D	
Queue Length 50th (m)	97.0	69.4	90.3				80.1	91.8			191.1	
Queue Length 95th (m)	#157.8	101.8	132.6				#114.6	122.6			#239.5	
Internal Link Dist (m)		74.7			115.0			394.4			328.4	
Turn Bay Length (m)	40.0						50.0					
Base Capacity (vph)	339	356	635				559	1150			1437	
Starvation Cap Reductn	0	0	0				0	0			0	
Spillback Cap Reductn	0	0	0				0	0			0	
Storage Cap Reductn	0	0	0				0	0			0	
Reduced v/c Ratio	0.94	0.69	0.77				0.95	0.54			0.93	

Intersection Summary

Cycle Length: 147  
 Actuated Cycle Length: 147  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated

Lane Group	Ø10
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	7.0
Total Split (s)	7.0
Total Split (%)	5%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	



Maximum v/c Ratio: 0.96

Intersection Signal Delay: 53.4

Intersection LOS: D

Intersection Capacity Utilization 95.0%

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: 21: Bronson & Carling/Glebe



Lanes, Volumes, Timings  
22: Parkdale & 417 WB on/off

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	266	22	426	101	516	0	0	529	197
Future Volume (vph)	0	0	0	266	22	426	101	516	0	0	529	197
Satd. Flow (prot)	0	0	0	1695	1474	0	1695	1784	0	0	1685	0
Flt Permitted				0.950			0.252					
Satd. Flow (perm)	0	0	0	1695	1474	0	450	1784	0	0	1685	0
Satd. Flow (RTOR)					351						29	
Lane Group Flow (vph)	0	0	0	266	448	0	101	516	0	0	726	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				29.0	29.0		10.3	27.3			25.1	
Total Split (s)				29.0	29.0		11.0	71.0			60.0	
Total Split (%)				29.0%	29.0%		11.0%	71.0%			60.0%	
Yellow Time (s)				3.3	3.3		3.0	3.0			3.0	
All-Red Time (s)				2.2	2.2		2.2	3.3			3.3	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				5.5	5.5		5.2	6.3			6.3	
Lead/Lag							Lag				Lead	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				None	None		None	C-Min			C-Min	
Act Effct Green (s)				20.0	20.0		70.4	68.2			58.5	
Actuated g/C Ratio				0.20	0.20		0.70	0.68			0.58	
v/c Ratio				0.78	0.78		0.25	0.42			0.73	
Control Delay				54.1	18.9		5.7	6.1			21.7	
Queue Delay				0.0	0.0		1.2	1.3			1.2	
Total Delay				54.1	18.9		7.0	7.3			22.9	
LOS				D	B		A	A			C	
Approach Delay					32.0			7.3			22.9	
Approach LOS					C			A			C	
Queue Length 50th (m)				48.2	15.9		5.6	32.8			102.1	
Queue Length 95th (m)				74.0	52.2		m1.8	37.2			155.8	
Internal Link Dist (m)		157.5			140.3			45.3			171.5	
Turn Bay Length (m)												
Base Capacity (vph)				398	614		399	1216			1006	
Starvation Cap Reductn				0	0		162	471			0	
Spillback Cap Reductn				0	0		0	0			113	
Storage Cap Reductn				0	0		0	0			0	
Reduced v/c Ratio				0.67	0.73		0.43	0.69			0.81	

**Intersection Summary**  
 Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 39 (39%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 21.4

Intersection LOS: C

Intersection Capacity Utilization 118.3%

ICU Level of Service H

Analysis Period (min) 15

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

Splits and Phases: 22: Parkdale & 417 WB on/off



Lanes, Volumes, Timings  
23: Parkdale & 417 EB on/off

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗					↕↗		↗	↕	
Traffic Volume (vph)	334	2	163	0	0	0	0	282	186	431	361	0
Future Volume (vph)	334	2	163	0	0	0	0	282	186	431	361	0
Satd. Flow (prot)	0	1700	1517	0	0	0	0	3068	0	1695	1784	0
Flt Permitted		0.953								0.383		
Satd. Flow (perm)	0	1700	1482	0	0	0	0	3068	0	666	1784	0
Satd. Flow (RTOR)			163					165				
Lane Group Flow (vph)	0	336	163	0	0	0	0	468	0	431	361	0
Turn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0					10.0		5.0	10.0	
Minimum Split (s)	25.1	25.1	25.1					25.1		10.3	25.1	
Total Split (s)	30.0	30.0	30.0					38.0		32.0	70.0	
Total Split (%)	30.0%	30.0%	30.0%					38.0%		32.0%	70.0%	
Yellow Time (s)	3.3	3.3	3.3					3.0		3.0	3.0	
All-Red Time (s)	2.6	2.6	2.6					2.8		2.3	2.8	
Lost Time Adjust (s)		0.0	0.0					0.0		0.0	0.0	
Total Lost Time (s)		5.9	5.9					5.8		5.3	5.8	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None	None					C-Min		None	C-Min	
Act Effct Green (s)		25.2	25.2					38.9		63.6	63.1	
Actuated g/C Ratio		0.25	0.25					0.39		0.64	0.63	
v/c Ratio		0.78	0.33					0.36		0.70	0.32	
Control Delay		47.6	6.1					17.0		17.6	12.4	
Queue Delay		0.0	0.0					0.0		8.3	2.6	
Total Delay		47.6	6.1					17.0		25.9	14.9	
LOS		D	A					B		C	B	
Approach Delay		34.0						17.0			20.9	
Approach LOS		C						B			C	
Queue Length 50th (m)		60.5	0.0					20.3		43.4	35.6	
Queue Length 95th (m)		83.9	13.6					43.2		70.3	60.9	
Internal Link Dist (m)		109.8			145.0			90.1			45.3	
Turn Bay Length (m)			75.0									
Base Capacity (vph)		456	517					1352		701	1174	
Starvation Cap Reductn		0	0					0		228	675	
Spillback Cap Reductn		0	0					31		0	0	
Storage Cap Reductn		0	0					0		0	0	
Reduced v/c Ratio		0.74	0.32					0.35		0.91	0.72	

Intersection Summary

Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 29 (29%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 23.6

Intersection LOS: C

Intersection Capacity Utilization 118.3%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 23: Parkdale & 417 EB on/off



Lanes, Volumes, Timings  
24: Parkdale & Sherwood

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	72	8	7	0	7	154	5	400	7	71	352	68
Future Volume (vph)	72	8	7	0	7	154	5	400	7	71	352	68
Satd. Flow (prot)	0	1683	0	0	1489	0	0	1776	0	0	1724	0
Flt Permitted		0.697						0.995			0.893	
Satd. Flow (perm)	0	1219	0	0	1489	0	0	1769	0	0	1544	0
Satd. Flow (RTOR)		7			154			3			25	
Lane Group Flow (vph)	0	87	0	0	161	0	0	412	0	0	491	0
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	18.0	18.0		18.0	18.0		25.1	25.1		25.1	25.1	
Total Split (s)	18.0	18.0		18.0	18.0		37.0	37.0		37.0	37.0	
Total Split (%)	32.7%	32.7%		32.7%	32.7%		67.3%	67.3%		67.3%	67.3%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.0			4.0			5.6			5.6	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Ped	Ped		Ped	Ped		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		14.0			14.0			31.4			31.4	
Actuated g/C Ratio		0.25			0.25			0.57			0.57	
v/c Ratio		0.28			0.33			0.41			0.55	
Control Delay		18.2			6.0			8.1			9.9	
Queue Delay		0.0			0.0			0.0			0.4	
Total Delay		18.2			6.0			8.1			10.3	
LOS		B			A			A			B	
Approach Delay		18.2			6.0			8.1			10.3	
Approach LOS		B			A			A			B	
Queue Length 50th (m)		6.3			0.5			19.8			25.0	
Queue Length 95th (m)		15.9			11.7			34.7			46.3	
Internal Link Dist (m)		221.3			335.0			289.1			90.1	
Turn Bay Length (m)												
Base Capacity (vph)		315			493			1011			892	
Starvation Cap Reductn		0			0			0			103	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.28			0.33			0.41			0.62	
Intersection Summary												
Cycle Length: 55												
Actuated Cycle Length: 55												
Offset: 26 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green												
Natural Cycle: 45												
Control Type: Actuated-Coordinated												

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 9.5

Intersection LOS: A

Intersection Capacity Utilization 90.5%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 24: Parkdale & Sherwood



Lanes, Volumes, Timings  
25: Parkdale & Ruskin

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗			↕			↕	
Traffic Volume (vph)	27	29	9	7	33	47	3	221	7	55	233	10
Future Volume (vph)	27	29	9	7	33	47	3	221	7	55	233	10
Satd. Flow (prot)	0	1695	0	1695	1546	0	0	1771	0	0	1757	0
Flt Permitted		0.829		0.807				0.997			0.909	
Satd. Flow (perm)	0	1399	0	1353	1546	0	0	1767	0	0	1598	0
Satd. Flow (RTOR)		7			47			4			5	
Lane Group Flow (vph)	0	65	0	7	80	0	0	231	0	0	298	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	19.4	19.4		19.4	19.4		31.8	31.8		31.8	31.8	
Total Split (s)	20.0	20.0		20.0	20.0		75.0	75.0		75.0	75.0	
Total Split (%)	21.1%	21.1%		21.1%	21.1%		78.9%	78.9%		78.9%	78.9%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.4	2.4		2.4	2.4		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.4		5.4	5.4			5.8			5.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		12.4		12.4	12.4			75.6			75.6	
Actuated g/C Ratio		0.13		0.13	0.13			0.80			0.80	
v/c Ratio		0.35		0.04	0.33			0.16			0.23	
Control Delay		38.9		35.6	22.1			3.6			4.0	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		38.9		35.6	22.1			3.6			4.0	
LOS		D		D	C			A			A	
Approach Delay		38.9			23.2			3.6			4.0	
Approach LOS		D			C			A			A	
Queue Length 50th (m)		9.6		1.1	5.4			10.6			14.6	
Queue Length 95th (m)		21.8		5.0	18.2			17.3			23.3	
Internal Link Dist (m)		220.6			228.6			278.4			289.1	
Turn Bay Length (m)				40.0								
Base Capacity (vph)		220		207	277			1407			1273	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.30		0.03	0.29			0.16			0.23	

Intersection Summary

Cycle Length: 95  
 Actuated Cycle Length: 95  
 Offset: 40 (42%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated



Maximum v/c Ratio: 0.35

Intersection Signal Delay: 9.6

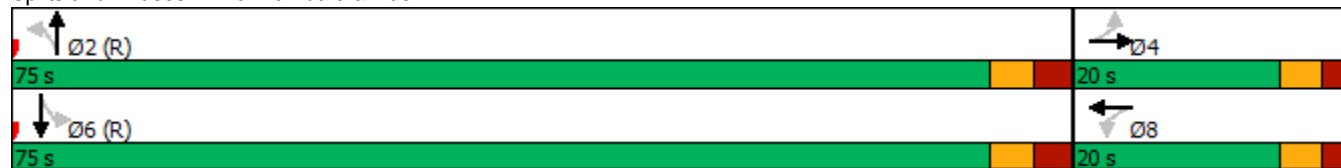
Intersection LOS: A

Intersection Capacity Utilization 68.7%

ICU Level of Service C

Analysis Period (min) 15





















Splits and Phases: 25: Parkdale & Ruskin



Lanes, Volumes, Timings  
30: Prince of Wales & Preston

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	521	260	0	3	377	402	1	0	0	402	3	569
Future Volume (vph)	521	260	0	3	377	402	1	0	0	402	3	569
Satd. Flow (prot)	3288	1784	0	1695	1784	1517	0	1695	0	0	1700	1517
Flt Permitted	0.950			0.950				0.517			0.728	
Satd. Flow (perm)	3191	1784	0	1479	1784	1484	0	787	0	0	1157	1348
Satd. Flow (RTOR)						228						
Lane Group Flow (vph)	521	260	0	3	377	402	0	1	0	0	405	569
Turn Type	Prot	NA		Prot	NA	Free	Perm	NA		custom	NA	custom
Protected Phases	5	2		1	6			8		11	4 11	5
Permitted Phases						Free	8			4		4
Detector Phase	5	2		1	6		8	8		11	4 11	5
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0		10.0		5.0
Minimum Split (s)	11.1	27.1		10.3	27.1		24.5	24.5		15.3		11.1
Total Split (s)	47.0	67.0		10.3	30.3		35.7	35.7		22.0		47.0
Total Split (%)	33.6%	47.9%		7.4%	21.6%		25.5%	25.5%		15.7%		33.6%
Yellow Time (s)	3.7	3.7		3.3	3.7		3.3	3.3		3.3		3.7
All-Red Time (s)	2.4	2.4		2.0	2.4		2.2	2.2		2.0		2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0				0.0
Total Lost Time (s)	6.1	6.1		5.3	6.1			5.5				6.1
Lead/Lag	Lead			Lead								Lead
Lead-Lag Optimize?	Yes			Yes								Yes
Recall Mode	None	C-Min		None	C-Min		None	None		None		None
Act Effct Green (s)	34.8	76.0		5.2	37.1	140.0		27.3			43.8	61.6
Actuated g/C Ratio	0.25	0.54		0.04	0.26	1.00		0.20			0.31	0.44
v/c Ratio	0.64	0.27		0.05	0.80	0.27		0.01			0.95	0.90
Control Delay	49.3	16.5		67.0	62.6	0.5		43.0			79.8	50.9
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	49.3	16.5		67.0	62.6	0.5		43.0			79.8	50.9
LOS	D	B		E	E	A		D			E	D
Approach Delay		38.4			30.7			43.0			62.9	
Approach LOS		D			C			D			E	
Queue Length 50th (m)	60.9	31.4		0.8	99.3	0.0		0.2			114.7	105.3
Queue Length 95th (m)	82.5	56.5		4.1	#190.0	0.0		1.8			m#136.9	m109.5
Internal Link Dist (m)		79.9			173.8			12.4			145.6	
Turn Bay Length (m)	45.0			30.0		45.0						
Base Capacity (vph)	960	968		62	472	1484		169			449	700
Starvation Cap Reductn	0	0		0	0	0		0			0	0
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.54	0.27		0.05	0.80	0.27		0.01			0.90	0.81

**Intersection Summary**  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 105.9 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated

Lane Group	Ø4	Ø9	Ø10	Ø12
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	4	9	10	12
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	10.0	1.0	1.0	1.0
Minimum Split (s)	15.5	5.0	5.0	20.0
Total Split (s)	35.7	5.0	5.0	22.0
Total Split (%)	26%	4%	4%	16%
Yellow Time (s)	3.3	2.0	2.0	2.0
All-Red Time (s)	2.2	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				
Intersection Summary				

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 45.4

Intersection LOS: D

Intersection Capacity Utilization 90.9%

ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

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

Splits and Phases: 30: Prince of Wales & Preston

Ø1	Ø2 (R)	Ø11	Ø4
10.3 s	5 s 67 s	22 s	35.7 s
Ø5	Ø10 Ø6 (R)	Ø12	Ø8
47 s	5 s 30.3 s	22 s	35.7 s

Lanes, Volumes, Timings  
31: Rochester & 417 WB on/Raymond

2048 PM Demand Rationalized Main Hospital SPA

10/18/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	186	177	121	194	373	0	0	193	128
Future Volume (vph)	0	0	0	186	177	121	194	373	0	0	193	128
Satd. Flow (prot)	0	0	0	1695	1636	0	1695	1784	0	0	1784	1517
Flt Permitted				0.950			0.524					
Satd. Flow (perm)	0	0	0	1685	1636	0	907	1784	0	0	1784	1414
Satd. Flow (RTOR)					56							134
Lane Group Flow (vph)	0	0	0	186	298	0	194	373	0	0	193	128
Turn Type				Perm	NA		pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8			2					6
Detector Phase				8	8		5	2			6	6
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	10.0
Minimum Split (s)				32.0	32.0		10.9	27.3			24.9	24.9
Total Split (s)				32.0	32.0		13.0	38.0			25.0	25.0
Total Split (%)				45.7%	45.7%		18.6%	54.3%			35.7%	35.7%
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	3.3
All-Red Time (s)				2.4	2.4		2.6	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)				5.7	5.7		5.9	5.9			5.9	5.9
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode				None	None		None	C-Min			C-Min	C-Min
Act Effct Green (s)				16.4	16.4		42.0	42.0			27.4	27.4
Actuated g/C Ratio				0.23	0.23		0.60	0.60			0.39	0.39
v/c Ratio				0.47	0.70		0.30	0.35			0.28	0.20
Control Delay				25.9	28.2		12.3	13.7			18.3	4.7
Queue Delay				0.0	0.0		0.0	0.5			0.0	0.0
Total Delay				25.9	28.2		12.3	14.2			18.3	4.7
LOS				C	C		B	B			B	A
Approach Delay					27.3			13.6			12.9	
Approach LOS					C			B			B	
Queue Length 50th (m)				21.2	29.1		13.3	38.2			16.7	0.0
Queue Length 95th (m)				32.7	45.7		31.8	59.7			37.2	10.3
Internal Link Dist (m)		122.0			89.8			72.3			151.7	
Turn Bay Length (m)												35.0
Base Capacity (vph)				633	649		644	1071			699	636
Starvation Cap Reductn				0	0		0	355			0	0
Spillback Cap Reductn				0	0		0	0			0	0
Storage Cap Reductn				0	0		0	0			0	0
Reduced v/c Ratio				0.29	0.46		0.30	0.52			0.28	0.20
<b>Intersection Summary</b>												
Cycle Length: 70												
Actuated Cycle Length: 70												
Offset: 8 (11%), Referenced to phase 2:NBTL and 6:SBT, Start of Green												
Natural Cycle: 70												
Control Type: Actuated-Coordinated												

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 18.3

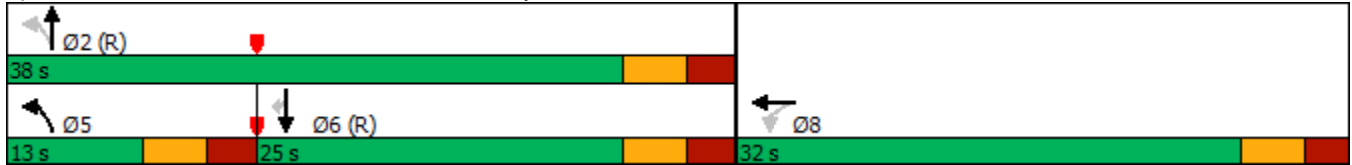
Intersection LOS: B

Intersection Capacity Utilization 60.2%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 31: Rochester & 417 WB on/Raymond



Lanes, Volumes, Timings  
32: Rochester & 417 EB off/Orangeville

2048 PM Demand Rationalized Main Hospital SPA

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕						↕↕			↕↕	
Traffic Volume (vph)	223	268	149	0	0	0	0	348	78	29	337	0
Future Volume (vph)	223	268	149	0	0	0	0	348	78	29	337	0
Satd. Flow (prot)	0	3190	0	0	0	0	0	3277	0	0	3377	0
Flt Permitted		0.983									0.905	
Satd. Flow (perm)	0	3183	0	0	0	0	0	3277	0	0	3065	0
Satd. Flow (RTOR)		58						61				
Lane Group Flow (vph)	0	640	0	0	0	0	0	426	0	0	366	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Detector Phase	4	4						2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0						25.1		25.1	25.1	
Total Split (s)	26.0	26.0						44.0		44.0	44.0	
Total Split (%)	37.1%	37.1%						62.9%		62.9%	62.9%	
Yellow Time (s)	3.3	3.3						3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3						2.1		2.1	2.1	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.6						5.4			5.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None						C-Min		C-Min	C-Min	
Act Effct Green (s)		18.2						40.8			40.8	
Actuated g/C Ratio		0.26						0.58			0.58	
v/c Ratio		0.73						0.22			0.21	
Control Delay		26.4						6.8			11.0	
Queue Delay		0.0						0.0			0.0	
Total Delay		26.4						6.8			11.0	
LOS		C						A			B	
Approach Delay		26.4						6.8			11.0	
Approach LOS		C						A			B	
Queue Length 50th (m)		36.6						10.7			3.8	
Queue Length 95th (m)		47.8						m18.6			38.6	
Internal Link Dist (m)		104.8			107.2			99.1			72.3	
Turn Bay Length (m)												
Base Capacity (vph)		997						1963			1812	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.64						0.22			0.20	

Intersection Summary

Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 67 (96%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 16.6

Intersection LOS: B

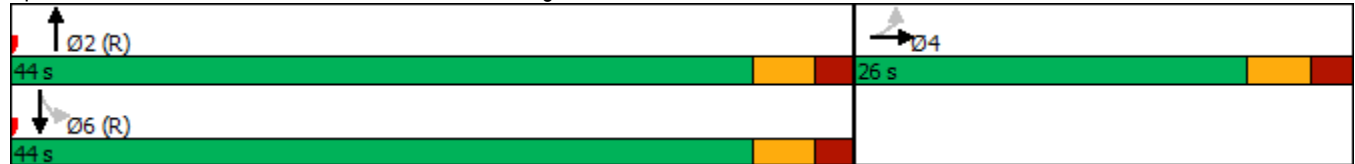
Intersection Capacity Utilization 65.5%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 32: Rochester & 417 EB off/Orangeville





Lanes, Volumes, Timings  
33: Bronson & Catherine 417 WB on

2048 PM Demand Rationalized Main Hospital SPA

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↔		↗	↕			↕	↗
Traffic Volume (vph)	0	0	0	768	532	242	262	722	0	0	750	149
Future Volume (vph)	0	0	0	768	532	242	262	722	0	0	750	149
Satd. Flow (prot)	0	0	0	1458	4336	0	1695	3390	0	0	3258	0
Flt Permitted				0.950	0.988		0.114					
Satd. Flow (perm)	0	0	0	1458	4336	0	203	3390	0	0	3258	0
Satd. Flow (RTOR)					95						25	
Lane Group Flow (vph)	0	0	0	522	1020	0	262	722	0	0	899	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				25.9	25.9		11.0	25.1			25.1	
Total Split (s)				42.0	42.0		18.0	53.0			35.0	
Total Split (%)				44.2%	44.2%		18.9%	55.8%			36.8%	
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)				2.6	2.6		2.7	2.8			2.8	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				5.9	5.9		6.0	6.1			6.1	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				None	None		None	C-Min			C-Min	
Act Effct Green (s)				35.7	35.7		47.4	47.3			29.3	
Actuated g/C Ratio				0.38	0.38		0.50	0.50			0.31	
v/c Ratio				0.95	0.60		0.90	0.43			0.88	
Control Delay				59.0	23.3		62.6	21.4			42.1	
Queue Delay				18.7	0.1		0.0	1.5			22.0	
Total Delay				77.8	23.3		62.6	22.9			64.1	
LOS				E	C		E	C			E	
Approach Delay					41.7			33.5			64.1	
Approach LOS					D			C			E	
Queue Length 50th (m)				105.6	51.8		41.6	41.6			80.3	
Queue Length 95th (m)				#179.3	66.2		#78.1	76.5			#115.5	
Internal Link Dist (m)		151.3			165.9			71.3			237.2	
Turn Bay Length (m)												
Base Capacity (vph)				554	1706		290	1689			1020	
Starvation Cap Reductn				0	0		0	740			0	
Spillback Cap Reductn				47	48		0	0			149	
Storage Cap Reductn				0	0		0	0			0	
Reduced v/c Ratio				1.03	0.62		0.90	0.76			1.03	

Intersection Summary

Cycle Length: 95  
 Actuated Cycle Length: 95  
 Offset: 59 (62%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 45.2

Intersection LOS: D

Intersection Capacity Utilization 109.6%

ICU Level of Service H

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 33: Bronson & Catherine 417 WB on





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	137	357	0	874	1408	0
Future Volume (vph)	137	357	0	874	1408	0
Satd. Flow (prot)	1695	1517	0	3390	3390	0
Flt Permitted	0.950					
Satd. Flow (perm)	1695	1491	0	3390	3390	0
Satd. Flow (RTOR)	53					
Lane Group Flow (vph)	137	357	0	874	1408	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases	4					
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		10.0	10.0	
Minimum Split (s)	25.1	25.1		34.3	34.3	
Total Split (s)	30.0	30.0		65.0	65.0	
Total Split (%)	31.6%	31.6%		68.4%	68.4%	
Yellow Time (s)	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.1	2.1		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.4	5.4		5.8	5.8	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None		C-Min	C-Min	
Act Effct Green (s)	24.1	24.1		59.7	59.7	
Actuated g/C Ratio	0.25	0.25		0.63	0.63	
v/c Ratio	0.32	0.86		0.41	0.66	
Control Delay	30.2	49.0		10.0	8.6	
Queue Delay	0.0	0.0		0.0	3.1	
Total Delay	30.2	49.0		10.0	11.7	
LOS	C	D		B	B	
Approach Delay	43.8			10.0	11.7	
Approach LOS	D			B	B	
Queue Length 50th (m)	19.7	51.9		41.3	47.5	
Queue Length 95th (m)	36.2	#100.5		50.7	m127.6	
Internal Link Dist (m)	81.4			50.7	71.3	
Turn Bay Length (m)	60.0					
Base Capacity (vph)	462	445		2179	2179	
Starvation Cap Reductn	0	0		0	645	
Spillback Cap Reductn	0	0		107	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.30	0.80		0.42	0.92	

**Intersection Summary**

Cycle Length: 95  
 Actuated Cycle Length: 95  
 Offset: 91 (96%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 16.9

Intersection LOS: B

Intersection Capacity Utilization 109.6%

ICU Level of Service H

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

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

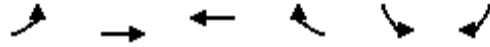
Splits and Phases: 34: Bronson & 417 EB off



Lanes, Volumes, Timings  
39: Prince of Wales & Road B

2048 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	22	692	951	15	129	40	
Future Volume (vph)	22	692	951	15	129	40	
Satd. Flow (prot)	1695	1784	3381	0	1695	1517	
Flt Permitted	0.251				0.950		
Satd. Flow (perm)	448	1784	3381	0	1629	1424	
Satd. Flow (RTOR)						40	
Lane Group Flow (vph)	22	692	966	0	129	40	
Turn Type	pm+pt	NA	NA		Perm	Perm	
Protected Phases	5	2	6				9
Permitted Phases	2				4	4	
Detector Phase	5	2	6		4	4	
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0		10.0	10.0	1.0
Minimum Split (s)	10.3	23.3	23.3		23.3	23.3	15.0
Total Split (s)	12.0	97.0	85.0		28.0	28.0	15.0
Total Split (%)	8.6%	69.3%	60.7%		20.0%	20.0%	11%
Yellow Time (s)	3.3	3.3	3.3		3.3	3.3	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3		5.3	5.3	
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	None	C-Min	C-Min		None	None	None
Act Effct Green (s)	110.1	110.1	103.1		16.3	16.3	
Actuated g/C Ratio	0.79	0.79	0.74		0.12	0.12	
v/c Ratio	0.05	0.49	0.39		0.68	0.20	
Control Delay	5.1	7.8	8.9		76.6	17.1	
Queue Delay	0.0	0.0	0.1		0.0	0.0	
Total Delay	5.1	7.8	9.0		76.6	17.1	
LOS	A	A	A		E	B	
Approach Delay		7.7	9.0		62.5		
Approach LOS		A	A		E		
Queue Length 50th (m)	0.9	41.6	45.8		34.8	0.0	
Queue Length 95th (m)	4.6	105.9	98.1		54.3	10.7	
Internal Link Dist (m)		198.2	95.9		17.7		
Turn Bay Length (m)	45.0						
Base Capacity (vph)	412	1403	2490		264	264	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	315		0	4	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.05	0.49	0.44		0.49	0.15	

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 13.4

Intersection LOS: B

Intersection Capacity Utilization 57.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 39: Prince of Wales & Road B

 Ø2 (R)	 Ø9	 Ø4
97 s	15 s	28 s
 Ø5	 Ø6 (R)	
12 s	85 s	

Lanes, Volumes, Timings  
40: Prince of Wales & Road E

2048 PM Demand Rationalized Main Hospital SPA

10/18/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	71	32	5	643	962	27	
Future Volume (vph)	71	32	5	643	962	27	
Satd. Flow (prot)	1558	1459	1235	3390	1784	1190	
Flt Permitted	0.950		0.950				
Satd. Flow (perm)	1558	1459	1222	3390	1784	1108	
Satd. Flow (RTOR)		32				16	
Lane Group Flow (vph)	71	32	5	643	962	27	
Turn Type	Perm	Perm	Prot	NA	NA	Perm	
Protected Phases			5	2	6		9
Permitted Phases	4	4				6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	1.0
Minimum Split (s)	23.3	23.3	10.3	23.3	23.3	23.3	10.0
Total Split (s)	23.3	23.3	10.3	106.7	96.4	96.4	10.0
Total Split (%)	16.6%	16.6%	7.4%	76.2%	68.9%	68.9%	7%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	12.7	12.7	5.7	118.9	116.8	116.8	
Actuated g/C Ratio	0.09	0.09	0.04	0.85	0.83	0.83	
v/c Ratio	0.50	0.20	0.10	0.22	0.65	0.03	
Control Delay	72.5	20.2	69.2	3.3	13.1	1.3	
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	
Total Delay	72.5	20.2	69.2	3.3	13.3	1.3	
LOS	E	C	E	A	B	A	
Approach Delay	56.2			3.8	12.9		
Approach LOS	E			A	B		
Queue Length 50th (m)	19.2	0.0	1.4	14.4	96.1	0.0	
Queue Length 95th (m)	33.9	9.8	6.1	36.1	318.6	4.2	
Internal Link Dist (m)	165.3			279.2	63.5		
Turn Bay Length (m)	45.0		50.0			50.0	
Base Capacity (vph)	200	215	50	2878	1488	927	
Starvation Cap Reductn	0	0	0	0	64	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.35	0.15	0.10	0.22	0.68	0.03	

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 12.1

Intersection LOS: B

Intersection Capacity Utilization 70.6%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 40: Prince of Wales & Road E

 Ø9	 Ø2 (R)	 Ø4
10 s	106.7 s	23.3 s
	 Ø5	
	 Ø6 (R)	
	10.3 s	96.4 s



Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑	↑	↘	
Traffic Vol, veh/h	23	751	1449	13	3	8
Future Vol, veh/h	23	751	1449	13	3	8
Conflicting Peds, #/hr	42	0	0	42	4	8
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	25	-	-	20	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	751	1449	13	3	8

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1504	0	-	0	1917 775
Stage 1	-	-	-	-	1491 -
Stage 2	-	-	-	-	426 -
Critical Hdwy	4.14	-	-	-	6.84 6.94
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.22	-	-	-	3.52 3.32
Pot Cap-1 Maneuver	441	-	-	-	59 341
Stage 1	-	-	-	-	173 -
Stage 2	-	-	-	-	627 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	425	-	-	-	52 327
Mov Cap-2 Maneuver	-	-	-	-	52 -
Stage 1	-	-	-	-	158 -
Stage 2	-	-	-	-	604 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	34.3
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	425	-	-	-	134
HCM Lane V/C Ratio	0.054	-	-	-	0.082
HCM Control Delay (s)	14	-	-	-	34.3
HCM Lane LOS	B	-	-	-	D
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3

Intersection						
Int Delay, s/veh	17					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑	↑		↑
Traffic Vol, veh/h	0	894	1072	70	0	259
Future Vol, veh/h	0	894	1072	70	0	259
Conflicting Peds, #/hr	70	0	0	70	1	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	30	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	894	1072	70	0	259

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 1147
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.23
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.319
Pot Cap-1 Maneuver	0	-	- - 0 ~ 241
Stage 1	0	-	- - 0 -
Stage 2	0	-	- - 0 -
Platoon blocked, %	-	-	- - -
Mov Cap-1 Maneuver	-	-	- - ~ 226
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	150.2
HCM LOS			F

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	226
HCM Lane V/C Ratio	-	-	-	1.146
HCM Control Delay (s)	-	-	-	150.2
HCM Lane LOS	-	-	-	F
HCM 95th %tile Q(veh)	-	-	-	12.1

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻			↑			↻				↻
Traffic Vol, veh/h	0	820	1	1	924	31	3	0	6	0	0	33
Future Vol, veh/h	0	820	1	1	924	31	3	0	6	0	0	33
Conflicting Peds, #/hr	8	0	6	6	0	8	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	820	1	1	924	31	3	0	6	0	0	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	827	0	0	1786	1792	827	-	-	949
Stage 1	-	-	-	-	-	-	827	827	-	-	-	-
Stage 2	-	-	-	-	-	-	959	965	-	-	-	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	-	-	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	804	-	-	63	81	371	0	0	316
Stage 1	0	-	-	-	-	-	366	386	-	0	0	-
Stage 2	0	-	-	-	-	-	309	333	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	800	-	-	56	80	369	-	-	314
Mov Cap-2 Maneuver	-	-	-	-	-	-	56	80	-	-	-	-
Stage 1	-	-	-	-	-	-	366	384	-	-	-	-
Stage 2	-	-	-	-	-	-	275	330	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			35			17.8		
HCM LOS							E			C		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	129	-	-	800	-	-	314
HCM Lane V/C Ratio	0.07	-	-	0.001	-	-	0.105
HCM Control Delay (s)	35	-	-	9.5	-	-	17.8
HCM Lane LOS	E	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	0	-	-	0.3

Intersection												
Int Delay, s/veh	7.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔			↔	
Traffic Vol, veh/h	0	83	33	47	48	5	47	0	254	0	0	5
Future Vol, veh/h	0	83	33	47	48	5	47	0	254	0	0	5
Conflicting Peds, #/hr	10	0	10	10	0	10	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	83	33	47	48	5	47	0	254	0	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	63	0	0	126	0	0	228	267	68	197	281	37
Stage 1	-	-	-	-	-	-	110	110	-	155	155	-
Stage 2	-	-	-	-	-	-	118	157	-	42	126	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1538	-	-	1458	-	-	708	638	981	744	626	1027
Stage 1	-	-	-	-	-	-	883	803	-	832	768	-
Stage 2	-	-	-	-	-	-	874	767	-	967	791	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1525	-	-	1446	-	-	680	607	973	531	595	1018
Mov Cap-2 Maneuver	-	-	-	-	-	-	680	607	-	531	595	-
Stage 1	-	-	-	-	-	-	876	797	-	825	736	-
Stage 2	-	-	-	-	-	-	840	735	-	715	785	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			3.6			10.9			8.6		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	912	1525	-	-	1446	-	-	1018
HCM Lane V/C Ratio	0.33	-	-	-	0.033	-	-	0.005
HCM Control Delay (s)	10.9	0	-	-	7.6	0	-	8.6
HCM Lane LOS	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	1.4	0	-	-	0.1	-	-	0

Intersection						
Int Delay, s/veh	7.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑	↑		↑↑
Traffic Vol, veh/h	133	65	15	19	26	33
Future Vol, veh/h	133	65	15	19	26	33
Conflicting Peds, #/hr	0	0	0	15	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	0	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	133	65	15	19	26	33

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	99	30	0	0	49
Stage 1	30	-	-	-	-
Stage 2	69	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	894	1044	-	-	1557
Stage 1	992	-	-	-	-
Stage 2	946	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	867	1031	-	-	1537
Mov Cap-2 Maneuver	867	-	-	-	-
Stage 1	979	-	-	-	-
Stage 2	930	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	3.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	915	1537
HCM Lane V/C Ratio	-	-	0.216	0.017
HCM Control Delay (s)	-	-	10	7.4
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.8	0.1

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	4	4	33	166	0
Future Vol, veh/h	0	4	4	33	166	0
Conflicting Peds, #/hr	0	0	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	100	100	100	2	2	100
Mvmt Flow	0	4	4	33	166	0

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	196	88	171	0	0
Stage 1	171	-	-	-	-
Stage 2	25	-	-	-	-
Critical Hdwy	8.8	8.9	6.1	-	-
Critical Hdwy Stg 1	7.8	-	-	-	-
Critical Hdwy Stg 2	7.8	-	-	-	-
Follow-up Hdwy	4.5	4.3	3.2	-	-
Pot Cap-1 Maneuver	559	710	908	-	-
Stage 1	613	-	-	-	-
Stage 2	770	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	552	707	904	-	-
Mov Cap-2 Maneuver	552	-	-	-	-
Stage 1	607	-	-	-	-
Stage 2	767	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	904	-	707	-	-
HCM Lane V/C Ratio	0.004	-	0.006	-	-
HCM Control Delay (s)	9	0	10.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	5.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	0	17	12	0	24	3
Future Vol, veh/h	0	17	12	0	24	3
Conflicting Peds, #/hr	0	10	10	0	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	17	12	0	24	3

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	27	0	53
Stage 1	-	-	-	-	19
Stage 2	-	-	-	-	34
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1587	-	955
Stage 1	-	-	-	-	1004
Stage 2	-	-	-	-	988
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1574	-	932
Mov Cap-2 Maneuver	-	-	-	-	932
Stage 1	-	-	-	-	996
Stage 2	-	-	-	-	972

Approach	EB	WB	NB
HCM Control Delay, s	0	7.3	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	942	-	-	1574	-
HCM Lane V/C Ratio	0.029	-	-	0.008	-
HCM Control Delay (s)	8.9	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	67	4	1	120	101	0	7	2	109	181	47
Future Vol, veh/h	30	67	4	1	120	101	0	7	2	109	181	47
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	67	4	1	120	101	0	7	2	109	181	47
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9	9.6	8.1	11.4
HCM LOS	A	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	30%	0%	32%
Vol Thru, %	78%	66%	54%	54%
Vol Right, %	22%	4%	45%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	101	222	337
LT Vol	0	30	1	109
Through Vol	7	67	120	181
RT Vol	2	4	101	47
Lane Flow Rate	9	101	222	337
Geometry Grp	1	1	1	1
Degree of Util (X)	0.012	0.143	0.286	0.439
Departure Headway (Hd)	4.999	5.087	4.638	4.691
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	709	701	770	765
Service Time	3.077	3.147	2.688	2.74
HCM Lane V/C Ratio	0.013	0.144	0.288	0.441
HCM Control Delay	8.1	9	9.6	11.4
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	0	0.5	1.2	2.3



Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	100	0	30	0	0	24	30	100	0	17	52	52
Future Vol, veh/h	100	0	30	0	0	24	30	100	0	17	52	52
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	100	0	30	0	0	24	30	100	0	17	52	52
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.4	7.2	8.3	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	23%	77%	0%	14%
Vol Thru, %	77%	0%	0%	43%
Vol Right, %	0%	23%	100%	43%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	130	130	24	121
LT Vol	30	100	0	17
Through Vol	100	0	0	52
RT Vol	0	30	24	52
Lane Flow Rate	130	130	24	121
Geometry Grp	1	1	1	1
Degree of Util (X)	0.161	0.164	0.027	0.141
Departure Headway (Hd)	4.466	4.537	4.048	4.207
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	805	793	885	854
Service Time	2.482	2.553	2.068	2.223
HCM Lane V/C Ratio	0.161	0.164	0.027	0.142
HCM Control Delay	8.3	8.4	7.2	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.6	0.1	0.5

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑	↘	
Traffic Vol, veh/h	68	32	28	67	33	47
Future Vol, veh/h	68	32	28	67	33	47
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	68	32	28	67	33	47
Number of Lanes	2	0	1	1	1	0

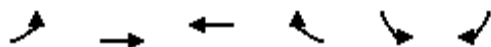
Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	2
HCM Control Delay	7.6	8.1	7.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	41%	0%	0%	100%	0%
Vol Thru, %	0%	100%	41%	0%	100%
Vol Right, %	59%	0%	59%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	80	45	55	28	67
LT Vol	33	0	0	28	0
Through Vol	0	45	23	0	67
RT Vol	47	0	32	0	0
Lane Flow Rate	80	45	55	28	67
Geometry Grp	2	7	7	7	7
Degree of Util (X)	0.092	0.06	0.066	0.041	0.088
Departure Headway (Hd)	4.125	4.726	4.315	5.229	4.728
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	874	751	822	680	752
Service Time	2.125	2.496	2.085	2.996	2.495
HCM Lane V/C Ratio	0.092	0.06	0.067	0.041	0.089
HCM Control Delay	7.5	7.8	7.4	8.2	8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.3	0.2	0.2	0.1	0.3

Lanes, Volumes, Timings  
10: Carling & Parkdale

2048 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø10
Lane Configurations							
Traffic Volume (vph)	85	590	1112	141	19	129	
Future Volume (vph)	85	590	1112	141	19	129	
Satd. Flow (prot)	1695	3390	3390	1517	1524	0	
Flt Permitted	0.950				0.994		
Satd. Flow (perm)	1639	3390	3390	1239	1521	0	
Satd. Flow (RTOR)				141	129		
Lane Group Flow (vph)	85	590	1112	141	148	0	
Turn Type	Prot	NA	NA	Perm	Perm		
Protected Phases	5	2	6				10
Permitted Phases				6	4		
Detector Phase	5	2	6	6	4		
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		1.0
Minimum Split (s)	11.1	26.7	26.7	26.7	37.2		5.0
Total Split (s)	16.0	92.8	76.8	76.8	37.2		5.0
Total Split (%)	11.9%	68.7%	56.9%	56.9%	27.6%		4%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.0		2.0
All-Red Time (s)	2.4	1.9	1.9	1.9	3.2		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.1	5.6	5.6	5.6	6.2		
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Min	C-Min	C-Min	None		Min
Act Effct Green (s)	12.4	104.6	86.1	86.1	11.1		
Actuated g/C Ratio	0.09	0.77	0.64	0.64	0.08		
v/c Ratio	0.55	0.22	0.51	0.17	0.61		
Control Delay	71.0	4.5	14.9	2.3	24.3		
Queue Delay	0.0	0.0	0.6	0.0	0.0		
Total Delay	71.0	4.5	15.5	2.3	24.3		
LOS	E	A	B	A	C		
Approach Delay		12.9	14.0		24.3		
Approach LOS		B	B		C		
Queue Length 50th (m)	22.0	18.5	77.0	0.0	4.8		
Queue Length 95th (m)	38.1	28.5	113.5	8.9	25.5		
Internal Link Dist (m)		297.5	170.5		278.4		
Turn Bay Length (m)	155.0			80.0			
Base Capacity (vph)	161	2627	2162	841	448		
Starvation Cap Reductn	0	0	612	0	0		
Spillback Cap Reductn	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0		
Reduced v/c Ratio	0.53	0.22	0.72	0.17	0.33		

Intersection Summary

Cycle Length: 135  
 Actuated Cycle Length: 135  
 Offset: 66 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 14.4

Intersection LOS: B

Intersection Capacity Utilization 68.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 10: Carling & Parkdale



Lanes, Volumes, Timings  
11: Carling & Civic

2048 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	75	556	1247	21	11	12
Future Volume (vph)	75	556	1247	21	11	12
Satd. Flow (prot)	1695	3390	3390	1517	1584	0
Flt Permitted	0.950				0.977	
Satd. Flow (perm)	1680	3390	3390	1394	1573	0
Satd. Flow (RTOR)				21	12	
Lane Group Flow (vph)	75	556	1247	21	23	0
Turn Type	Prot	NA	NA	Perm	Perm	
Protected Phases	5	2	6			
Permitted Phases				6	4	
Detector Phase	5	2	6	6	4	
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.4	31.3	31.3	31.3	23.3	
Total Split (s)	12.5	106.7	94.2	94.2	23.3	
Total Split (%)	9.6%	82.1%	72.5%	72.5%	17.9%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	
All-Red Time (s)	2.7	2.7	2.7	2.7	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.4	6.4	6.4	6.4	5.3	
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	
Act Effct Green (s)	12.8	115.4	93.6	93.6	11.6	
Actuated g/C Ratio	0.10	0.89	0.72	0.72	0.09	
v/c Ratio	0.45	0.18	0.51	0.02	0.15	
Control Delay	63.6	2.2	9.4	3.7	35.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	63.6	2.2	9.4	3.7	35.1	
LOS	E	A	A	A	D	
Approach Delay		9.5	9.3		35.1	
Approach LOS		A	A		D	
Queue Length 50th (m)	18.4	11.5	61.5	0.0	2.7	
Queue Length 95th (m)	33.6	22.6	81.3	m2.4	10.9	
Internal Link Dist (m)		170.5	180.8		39.9	
Turn Bay Length (m)	90.0			140.0		
Base Capacity (vph)	167	3009	2489	1029	228	
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	0.45	0.18	0.50	0.02	0.10	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 9.6

Intersection LOS: A

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: 11: Carling & Civic



Lanes, Volumes, Timings  
13: Maple/Old Irvine & Carling

2048 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	450	47	39	1045	7	73	20	48	6	4	14
Future Volume (vph)	40	450	47	39	1045	7	73	20	48	6	4	14
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	0	1637	0	0	1599	0
Flt Permitted	0.246			0.492				0.825			0.920	
Satd. Flow (perm)	424	3390	1293	821	3390	1178	0	1376	0	0	1481	0
Satd. Flow (RTOR)			44			37		20			14	
Lane Group Flow (vph)	40	450	47	39	1045	7	0	141	0	0	24	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	35.0	35.0	35.0	34.3	34.3	34.3	42.4	42.4		42.4	42.4	
Total Split (s)	87.0	87.0	87.0	87.0	87.0	87.0	43.0	43.0		43.0	43.0	
Total Split (%)	66.9%	66.9%	66.9%	66.9%	66.9%	66.9%	33.1%	33.1%		33.1%	33.1%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	4.4	4.4		4.4	4.4	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.7		7.4			7.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	94.7	94.7	94.7	94.7	94.7	94.7		22.2			22.2	
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.73	0.73		0.17			0.17	
v/c Ratio	0.13	0.18	0.05	0.07	0.42	0.01		0.56			0.09	
Control Delay	7.1	5.4	1.7	7.7	8.6	0.0		48.5			23.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	7.1	5.4	1.7	7.7	8.6	0.0		48.5			23.0	
LOS	A	A	A	A	A	A		D			C	
Approach Delay		5.2			8.5			48.5			23.0	
Approach LOS		A			A			D			C	
Queue Length 50th (m)	1.2	7.3	0.1	2.0	39.0	0.0		30.2			2.3	
Queue Length 95th (m)	9.8	30.1	0.9	7.9	79.3	m0.0		44.5			8.7	
Internal Link Dist (m)		236.1			191.5			174.3			220.8	
Turn Bay Length (m)	20.0		15.0	45.0		25.0						
Base Capacity (vph)	309	2470	954	598	2470	868		391			415	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.13	0.18	0.05	0.07	0.42	0.01		0.36			0.06	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 28 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 10.8

Intersection LOS: B

Intersection Capacity Utilization 69.4%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 13: Maple/Old Irvine & Carling

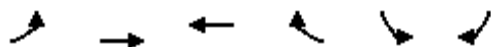




Lanes, Volumes, Timings  
15: Carling & Sherwood

2048 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗↗	↖↖	↗	↘	↘
Traffic Volume (vph)	43	507	942	233	155	9
Future Volume (vph)	43	507	942	233	155	9
Satd. Flow (prot)	1695	3390	3390	1517	1695	1517
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1571	3390	3390	1072	1669	1473
Satd. Flow (RTOR)				233		7
Lane Group Flow (vph)	43	507	942	233	155	9
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.3	25.1	25.1	25.1	25.1	25.1
Total Split (s)	15.0	89.0	74.0	74.0	41.0	41.0
Total Split (%)	11.5%	68.5%	56.9%	56.9%	31.5%	31.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	8.7	102.0	90.1	90.1	17.4	17.4
Actuated g/C Ratio	0.07	0.78	0.69	0.69	0.13	0.13
v/c Ratio	0.38	0.19	0.40	0.29	0.69	0.04
Control Delay	66.7	4.1	3.3	0.8	69.2	27.8
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	66.7	4.1	3.5	0.8	69.2	27.8
LOS	E	A	A	A	E	C
Approach Delay		9.0	2.9		66.9	
Approach LOS		A	A		E	
Queue Length 50th (m)	10.7	14.6	12.0	0.0	38.5	0.5
Queue Length 95th (m)	22.5	24.6	21.7	0.0	58.3	5.4
Internal Link Dist (m)		118.3	141.7		152.1	
Turn Bay Length (m)	30.0			90.0		15.0
Base Capacity (vph)	133	2658	2350	814	458	409
Starvation Cap Reductn	0	0	429	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	0.32	0.19	0.49	0.29	0.34	0.02

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 24 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 10.3

Intersection LOS: B

Intersection Capacity Utilization 55.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 15: Carling & Sherwood



Lanes, Volumes, Timings 2048 PM Demand Rationalized Main Hospital SPA PEAK GEN  
 16: Road A/Champagne & Carling 10/18/2022



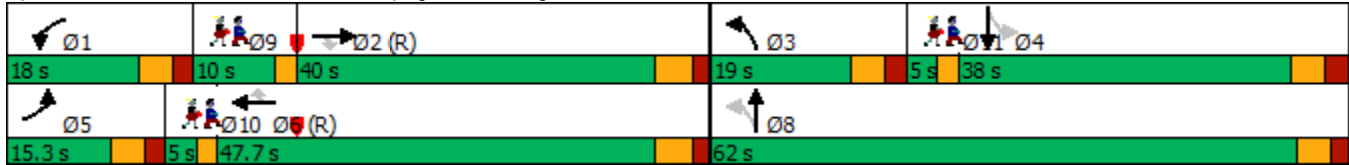
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	492	77	77	843	139	203	0	210	118	0	129
Future Volume (vph)	65	492	77	77	843	139	203	0	210	118	0	129
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1695	1402	0	1695	1417	0
Flt Permitted	0.950			0.950			0.430			0.626		
Satd. Flow (perm)	1541	3390	1350	1628	3390	1015	739	1402	0	1063	1417	0
Satd. Flow (RTOR)						147					282	
Lane Group Flow (vph)	65	492	77	77	843	139	203	210	0	118	129	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	2		1	6		3	8				4
Permitted Phases			2			6	8			4		
Detector Phase	5	2	2	1	6	6	3	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	15.3	26.3	26.3	15.3	26.3	26.3	10.3	23.3		37.9	37.9	
Total Split (s)	15.3	40.0	40.0	18.0	47.7	47.7	19.0	62.0		38.0	38.0	
Total Split (%)	11.8%	30.8%	30.8%	13.8%	36.7%	36.7%	14.6%	47.7%		29.2%	29.2%	
Yellow Time (s)	3.3	3.7	3.7	3.3	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	1.6	1.6	2.0	1.6	1.6	2.0	2.0		2.6	2.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3		5.9	5.9	
Lead/Lag	Lead			Lead			Lead					
Lead-Lag Optimize?	Yes			Yes			Yes					
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	10.5	61.2	61.2	11.4	63.1	63.1	42.6	42.6		20.4	20.4	
Actuated g/C Ratio	0.08	0.47	0.47	0.09	0.49	0.49	0.33	0.33		0.16	0.16	
v/c Ratio	0.48	0.31	0.12	0.52	0.51	0.24	0.57	0.46		0.71	0.28	
Control Delay	64.8	25.3	25.7	69.2	27.9	5.2	38.3	36.1		72.7	1.5	
Queue Delay	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0		0.0	0.0	
Total Delay	64.8	25.3	25.7	69.2	29.3	5.2	38.3	36.1		72.7	1.5	
LOS	E	C	C	E	C	A	D	D		E	A	
Approach Delay		29.4			29.0			37.2			35.5	
Approach LOS		C			C			D			D	
Queue Length 50th (m)	17.5	48.7	13.1	19.2	78.1	0.0	39.7	42.6		29.2	0.0	
Queue Length 95th (m)	26.2	78.6	31.3	35.3	125.9	13.0	50.5	54.8		45.2	0.0	
Internal Link Dist (m)		141.7			98.6			63.9			477.2	
Turn Bay Length (m)	55.0		75.0	61.0		35.0				30.0		
Base Capacity (vph)	136	1594	635	166	1644	568	357	611		262	562	
Starvation Cap Reductn	0	0	0	0	569	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.48	0.31	0.12	0.46	0.78	0.24	0.57	0.34		0.45	0.23	

**Intersection Summary**  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 105  
 Control Type: Actuated-Coordinated

Lane Group	Ø9	Ø10	Ø11
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	9	10	11
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	1.0	1.0	1.0
Minimum Split (s)	10.0	5.0	5.0
Total Split (s)	10.0	5.0	5.0
Total Split (%)	8%	4%	4%
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes
Recall Mode	None	None	None
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			

Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 31.2	Intersection LOS: C
Intersection Capacity Utilization 86.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 16: Road A/Champagne & Carling



Lanes, Volumes, Timings  
17: Carling & Trillium MUP

2048 PM Demand Rationalized Main Hospital SPA PEAK GEN

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑							
Traffic Volume (vph)	0	824	0	0	1050	0	0	0	0	0	0	0
Future Volume (vph)	0	824	0	0	1050	0	0	0	0	0	0	0
Satd. Flow (prot)	0	3390	0	0	3390	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3390	0	0	3390	0	0	0	0	0	0	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	0	824	0	0	1050	0	0	0	0	0	0	0
Turn Type		NA			NA							
Protected Phases		2			6							
Permitted Phases												
Detector Phase		2			6							
Switch Phase												
Minimum Initial (s)		10.0			10.0							
Minimum Split (s)		31.1			31.1							
Total Split (s)		35.0			35.0							
Total Split (%)		50.0%			50.0%							
Yellow Time (s)		3.7			3.7							
All-Red Time (s)		1.4			1.4							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		5.1			5.1							
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Min			C-Min							
Act Effct Green (s)		62.0			62.0							
Actuated g/C Ratio		0.89			0.89							
v/c Ratio		0.27			0.35							
Control Delay		4.7			3.4							
Queue Delay		0.0			0.0							
Total Delay		4.7			3.4							
LOS		A			A							
Approach Delay		4.7			3.4							
Approach LOS		A			A							
Queue Length 50th (m)		0.0			0.0							
Queue Length 95th (m)		57.4			m69.1							
Internal Link Dist (m)		98.6			92.8			53.0			60.9	
Turn Bay Length (m)												
Base Capacity (vph)		3002			3002							
Starvation Cap Reductn		0			32							
Spillback Cap Reductn		16			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.28			0.35							
<b>Intersection Summary</b>												
Cycle Length: 70												
Actuated Cycle Length: 70												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 70												
Control Type: Actuated-Coordinated												

Lane Group	Ø4	Ø8
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	4	8
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	35.6	35.6
Total Split (s)	35.0	35.0
Total Split (%)	50%	50%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	3.6	3.6
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

Maximum v/c Ratio: 0.35

Intersection Signal Delay: 4.0

Intersection LOS: A

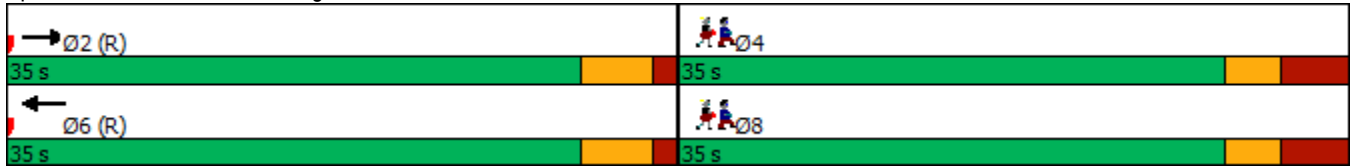
Intersection Capacity Utilization 34.9%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 17: Carling & Trillium MUP

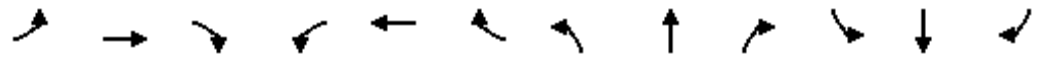




Lanes, Volumes, Timings  
18: Preston & Carling

2048 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	143	506	176	308	734	65	264	397	206	106	290	60
Future Volume (vph)	143	506	176	308	734	65	264	397	206	106	290	60
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1695	3093	0	1695	1699	0
Flt Permitted	0.950			0.950			0.148			0.424		
Satd. Flow (perm)	1600	3390	1517	1632	3390	1243	255	3093	0	724	1699	0
Satd. Flow (RTOR)						179					7	
Lane Group Flow (vph)	143	506	176	308	734	65	264	603	0	106	350	0
Turn Type	Prot	NA	custom	Prot	NA	Perm	pm+pt	NA		Perm	NA	
Protected Phases	5	9 2	9 3	1	6		3	8				4
Permitted Phases						6	8			4		
Detector Phase	5	9 2	9 3	1	6	6	3	8		4		4
Switch Phase												
Minimum Initial (s)	5.0			5.0	10.0	10.0	5.0	10.0		10.0	10.0	
Minimum Split (s)	11.2			11.2	25.0	25.0	11.9	38.9		38.9	38.9	
Total Split (s)	20.2			37.0	47.1	47.1	23.8	61.7		38.9	38.9	
Total Split (%)	14.4%			26.4%	33.6%	33.6%	17.0%	44.1%		27.8%	27.8%	
Yellow Time (s)	3.7			3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5			2.5	2.3	2.3	3.6	3.6		3.6	3.6	
Lost Time Adjust (s)	0.0			0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2			6.2	6.0	6.0	6.9	6.9		6.9	6.9	
Lead/Lag	Lead			Lead			Lead					
Lead-Lag Optimize?	Yes			Yes			Yes					
Recall Mode	None			None	C-Min	C-Min	None	None		None	None	
Act Effct Green (s)	13.7	35.5	28.8	28.5	44.7	44.7	58.6	53.8		30.8	30.8	
Actuated g/C Ratio	0.10	0.25	0.21	0.20	0.32	0.32	0.42	0.38		0.22	0.22	
v/c Ratio	0.87	0.59	0.57	0.90	0.68	0.13	0.94	0.51		0.67	0.93	
Control Delay	103.1	46.1	61.1	82.1	46.3	0.5	80.7	13.9		71.0	82.9	
Queue Delay	0.0	0.4	3.2	0.0	0.0	0.0	0.0	0.0		0.0	1.9	
Total Delay	103.1	46.5	64.2	82.1	46.3	0.5	80.7	13.9		71.0	84.8	
LOS	F	D	E	F	D	A	F	B		E	F	
Approach Delay		60.1			53.6			34.3				81.6
Approach LOS		E			D			C				F
Queue Length 50th (m)	39.6	68.1	44.5	82.0	96.6	0.0	33.9	21.3		26.8	93.0	
Queue Length 95th (m)	#79.3	79.1	76.1	#127.9	119.7	0.0	#103.8	29.6		#51.9	#147.2	
Internal Link Dist (m)		92.8			165.9			145.6				55.2
Turn Bay Length (m)	70.0		90.0	120.0		95.0				35.0		
Base Capacity (vph)	169	851	311	372	1081	518	280	1210		165	393	
Starvation Cap Reductn	0	79	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	66	0	0	0	0	0		0	9	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.85	0.66	0.72	0.83	0.68	0.13	0.94	0.50		0.64	0.91	

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 6 (4%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated

Lane Group	Ø2	Ø9	Ø10	Ø11	Ø12
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Satd. Flow (RTOR)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	2	9	10	11	12
Permitted Phases					
Detector Phase					
Switch Phase					
Minimum Initial (s)	10.0	1.0	1.0	1.0	1.0
Minimum Split (s)	26.0	5.3	5.0	5.0	5.0
Total Split (s)	29.0	6.3	5.0	5.0	6.0
Total Split (%)	21%	5%	4%	4%	4%
Yellow Time (s)	2.0	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	2.3	0.0	0.0	0.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes		Yes	Yes	
Recall Mode	C-Min	Min	None	None	None
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (m)					
Queue Length 95th (m)					
Internal Link Dist (m)					
Turn Bay Length (m)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					
Intersection Summary					

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 54.0

Intersection LOS: D

Intersection Capacity Utilization 94.7%

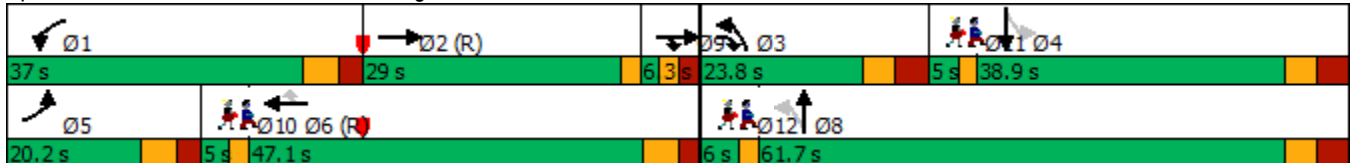
ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 18: Preston & Carling



Lanes, Volumes, Timings  
20: Carling & Booth

2048 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↗	↗↗	↗	↗	↘	↘
Traffic Volume (vph)	192	759	699	104	244	250
Future Volume (vph)	192	759	699	104	244	250
Satd. Flow (prot)	1695	3390	1784	1517	1695	1517
Flt Permitted	0.206				0.950	
Satd. Flow (perm)	368	3390	1784	1161	1665	1209
Satd. Flow (RTOR)				39		190
Lane Group Flow (vph)	192	759	699	104	244	250
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.9	29.7	29.7	29.7	39.0	39.0
Total Split (s)	23.0	90.0	67.0	67.0	40.0	40.0
Total Split (%)	17.7%	69.2%	51.5%	51.5%	30.8%	30.8%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.7	5.7	5.7	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	88.5	88.7	71.3	71.3	29.6	29.6
Actuated g/C Ratio	0.68	0.68	0.55	0.55	0.23	0.23
v/c Ratio	0.52	0.33	0.71	0.16	0.64	0.59
Control Delay	13.6	9.5	29.0	11.5	53.0	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	9.5	29.0	11.5	53.0	17.5
LOS	B	A	C	B	D	B
Approach Delay		10.4	26.7		35.0	
Approach LOS		B	C		D	
Queue Length 50th (m)	17.8	42.0	135.6	8.1	54.9	12.1
Queue Length 95th (m)	27.7	52.4	202.3	19.7	82.4	39.3
Internal Link Dist (m)		100.4	299.3		220.7	
Turn Bay Length (m)	50.0			30.0		30.0
Base Capacity (vph)	425	2312	978	654	435	456
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.33	0.71	0.16	0.56	0.55

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 110 (85%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 21.6

Intersection LOS: C

Intersection Capacity Utilization 91.4%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 20: Carling & Booth



Lanes, Volumes, Timings  
21: Bronson & Carling/Glebe

2048 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	503	92	410	0	0	0	454	676	18	0	1021	265
Future Volume (vph)	503	92	410	0	0	0	454	676	18	0	1021	265
Satd. Flow (prot)	1610	1644	1517	0	0	0	3288	1767	0	0	3237	0
Flt Permitted	0.950	0.970					0.950					
Satd. Flow (perm)	1511	1580	1415	0	0	0	3236	1767	0	0	3237	0
Satd. Flow (RTOR)			110					2			26	
Lane Group Flow (vph)	347	248	410	0	0	0	454	694	0	0	1286	0
Turn Type	Perm	NA	pm+ov				Prot	NA			NA	
Protected Phases		4	5				5	2			6	
Permitted Phases	4		4									
Detector Phase	4	4	5				5	2			6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0				10.0	10.0			10.0	
Minimum Split (s)	31.0	31.0	16.0				16.0	25.1			33.0	
Total Split (s)	47.0	47.0	29.0				29.0	93.0			64.0	
Total Split (%)	32.0%	32.0%	19.7%				19.7%	63.3%			43.5%	
Yellow Time (s)	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	
Lost Time Adjust (s)	0.0	0.0	0.0				0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0	6.0				6.0	6.0			6.0	
Lead/Lag			Lead				Lead				Lag	
Lead-Lag Optimize?			Yes				Yes				Yes	
Recall Mode	None	None	None				None	C-Min			C-Min	
Act Effct Green (s)	37.2	37.2	60.1				23.0	90.7			61.8	
Actuated g/C Ratio	0.25	0.25	0.41				0.16	0.62			0.42	
v/c Ratio	0.91	0.62	0.62				0.88	0.64			0.94	
Control Delay	80.8	55.4	25.5				80.1	21.8			53.6	
Queue Delay	0.0	0.0	0.0				0.0	0.0			0.0	
Total Delay	80.8	55.4	25.5				80.1	21.8			53.6	
LOS	F	E	C				F	C			D	
Approach Delay		52.0						44.9			53.6	
Approach LOS		D						D			D	
Queue Length 50th (m)	101.3	66.2	59.7				66.8	126.9			192.5	
Queue Length 95th (m)	#151.4	95.5	90.8				#95.5	172.8			#243.8	
Internal Link Dist (m)		74.7			115.0			394.4			328.4	
Turn Bay Length (m)	40.0						50.0					
Base Capacity (vph)	421	440	664				524	1091			1374	
Starvation Cap Reductn	0	0	0				0	0			0	
Spillback Cap Reductn	0	0	0				0	0			0	
Storage Cap Reductn	0	0	0				0	0			0	
Reduced v/c Ratio	0.82	0.56	0.62				0.87	0.64			0.94	

Intersection Summary

Cycle Length: 147  
 Actuated Cycle Length: 147  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated

Lane Group	Ø10
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	7.0
Total Split (s)	7.0
Total Split (%)	5%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 50.2

Intersection LOS: D

Intersection Capacity Utilization 91.9%

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: 21: Bronson & Carling/Glebe





Lanes, Volumes, Timings  
22: Parkdale & 417 WB on/off

2048 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	217	8	416	147	450	0	0	531	191
Future Volume (vph)	0	0	0	217	8	416	147	450	0	0	531	191
Satd. Flow (prot)	0	0	0	1695	1465	0	1695	1784	0	0	1687	0
Flt Permitted				0.950			0.250					
Satd. Flow (perm)	0	0	0	1695	1465	0	446	1784	0	0	1687	0
Satd. Flow (RTOR)					402						28	
Lane Group Flow (vph)	0	0	0	217	424	0	147	450	0	0	722	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				29.0	29.0		10.3	27.3			25.1	
Total Split (s)				29.0	29.0		11.0	71.0			60.0	
Total Split (%)				29.0%	29.0%		11.0%	71.0%			60.0%	
Yellow Time (s)				3.3	3.3		3.0	3.0			3.0	
All-Red Time (s)				2.2	2.2		2.2	3.3			3.3	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				5.5	5.5		5.2	6.3			6.3	
Lead/Lag							Lag				Lead	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				None	None		None	C-Min			C-Min	
Act Effct Green (s)				17.9	17.9		71.4	70.3			56.7	
Actuated g/C Ratio				0.18	0.18		0.71	0.70			0.57	
v/c Ratio				0.71	0.72		0.35	0.36			0.75	
Control Delay				51.3	12.0		7.7	4.9			22.9	
Queue Delay				0.0	0.0		2.6	1.3			1.3	
Total Delay				51.3	12.0		10.3	6.2			24.2	
LOS				D	B		B	A			C	
Approach Delay					25.3			7.2			24.2	
Approach LOS					C			A			C	
Queue Length 50th (m)				39.9	3.6		6.5	22.3			99.7	
Queue Length 95th (m)				60.1	31.0		m9.3	39.9			153.9	
Internal Link Dist (m)		157.5			140.3			45.3			171.5	
Turn Bay Length (m)												
Base Capacity (vph)				398	651		422	1253			980	
Starvation Cap Reductn				0	0		178	572			0	
Spillback Cap Reductn				0	0		0	0			106	
Storage Cap Reductn				0	0		0	0			0	
Reduced v/c Ratio				0.55	0.65		0.60	0.66			0.83	

Intersection Summary

Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 39 (39%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 19.4

Intersection LOS: B

Intersection Capacity Utilization 117.6%

ICU Level of Service H

Analysis Period (min) 15

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

Splits and Phases: 22: Parkdale & 417 WB on/off



Lanes, Volumes, Timings  
23: Parkdale & 417 EB on/off

2048 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗					↕↗		↗	↕	
Traffic Volume (vph)	295	0	147	0	0	0	0	244	306	410	248	0
Future Volume (vph)	295	0	147	0	0	0	0	244	306	410	248	0
Satd. Flow (prot)	0	1695	1517	0	0	0	0	2947	0	1695	1784	0
Flt Permitted		0.950								0.349		
Satd. Flow (perm)	0	1695	1482	0	0	0	0	2947	0	610	1784	0
Satd. Flow (RTOR)			147					306				
Lane Group Flow (vph)	0	295	147	0	0	0	0	550	0	410	248	0
Turn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0					10.0		5.0	10.0	
Minimum Split (s)	25.1	25.1	25.1					25.1		10.3	25.1	
Total Split (s)	30.0	30.0	30.0					38.0		32.0	70.0	
Total Split (%)	30.0%	30.0%	30.0%					38.0%		32.0%	70.0%	
Yellow Time (s)	3.3	3.3	3.3					3.0		3.0	3.0	
All-Red Time (s)	2.6	2.6	2.6					2.8		2.3	2.8	
Lost Time Adjust (s)		0.0	0.0					0.0		0.0	0.0	
Total Lost Time (s)		5.9	5.9					5.8		5.3	5.8	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None	None					C-Min		None	C-Min	
Act Effct Green (s)		22.5	22.5					42.8		66.3	65.8	
Actuated g/C Ratio		0.22	0.22					0.43		0.66	0.66	
v/c Ratio		0.78	0.33					0.38		0.69	0.21	
Control Delay		50.1	6.9					11.0		17.6	10.8	
Queue Delay		0.0	0.0					0.1		7.9	1.9	
Total Delay		50.1	6.9					11.1		25.5	12.7	
LOS		D	A					B		C	B	
Approach Delay		35.7						11.1			20.7	
Approach LOS		D						B			C	
Queue Length 50th (m)		53.8	0.0					15.1		41.4	22.1	
Queue Length 95th (m)		76.2	13.6					36.5		73.5	m44.2	
Internal Link Dist (m)		109.8			145.0			90.1			45.3	
Turn Bay Length (m)			75.0									
Base Capacity (vph)		430	486					1465		695	1198	
Starvation Cap Reductn		0	0					254		240	791	
Spillback Cap Reductn		0	0					38		0	0	
Storage Cap Reductn		0	0					0		0	0	
Reduced v/c Ratio		0.69	0.30					0.45		0.90	0.61	

Intersection Summary

Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 29 (29%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 21.5

Intersection LOS: C

Intersection Capacity Utilization 117.6%

ICU Level of Service H

Analysis Period (min) 15

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

Splits and Phases: 23: Parkdale & 417 EB on/off



Lanes, Volumes, Timings  
24: Parkdale & Sherwood

2048 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	72	8	7	0	7	134	5	383	7	77	342	68
Future Volume (vph)	72	8	7	0	7	134	5	383	7	77	342	68
Satd. Flow (prot)	0	1683	0	0	1491	0	0	1776	0	0	1722	0
Flt Permitted		0.707						0.995			0.885	
Satd. Flow (perm)	0	1236	0	0	1491	0	0	1769	0	0	1529	0
Satd. Flow (RTOR)		7			134			3			25	
Lane Group Flow (vph)	0	87	0	0	141	0	0	395	0	0	487	0
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	18.0	18.0		18.0	18.0		25.1	25.1		25.1	25.1	
Total Split (s)	18.0	18.0		18.0	18.0		37.0	37.0		37.0	37.0	
Total Split (%)	32.7%	32.7%		32.7%	32.7%		67.3%	67.3%		67.3%	67.3%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.6	2.6		2.6	2.6	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.0			4.0			5.6			5.6	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Ped	Ped		Ped	Ped		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		14.0			14.0			31.4			31.4	
Actuated g/C Ratio		0.25			0.25			0.57			0.57	
v/c Ratio		0.27			0.29			0.39			0.55	
Control Delay		18.1			6.1			7.9			9.9	
Queue Delay		0.0			0.0			0.0			0.4	
Total Delay		18.1			6.1			7.9			10.3	
LOS		B			A			A			B	
Approach Delay		18.1			6.1			7.9			10.3	
Approach LOS		B			A			A			B	
Queue Length 50th (m)		6.3			0.5			18.8			24.7	
Queue Length 95th (m)		15.9			11.0			33.0			46.2	
Internal Link Dist (m)		221.3			335.0			289.1			90.1	
Turn Bay Length (m)												
Base Capacity (vph)		319			479			1011			883	
Starvation Cap Reductn		0			0			0			96	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.27			0.29			0.39			0.62	
Intersection Summary												
Cycle Length: 55												
Actuated Cycle Length: 55												
Offset: 26 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 45												
Control Type: Actuated-Coordinated												

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 9.5

Intersection LOS: A

Intersection Capacity Utilization 89.4%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 24: Parkdale & Sherwood



Lanes, Volumes, Timings  
25: Parkdale & Ruskin

2048 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗			↕			↕	
Traffic Volume (vph)	27	29	9	7	33	20	3	231	7	38	240	10
Future Volume (vph)	27	29	9	7	33	20	3	231	7	38	240	10
Satd. Flow (prot)	0	1695	0	1695	1628	0	0	1771	0	0	1760	0
Flt Permitted		0.841		0.807				0.997			0.939	
Satd. Flow (perm)	0	1418	0	1353	1628	0	0	1767	0	0	1655	0
Satd. Flow (RTOR)		7			20			4			5	
Lane Group Flow (vph)	0	65	0	7	53	0	0	241	0	0	288	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	19.4	19.4		19.4	19.4		31.8	31.8		31.8	31.8	
Total Split (s)	20.0	20.0		20.0	20.0		75.0	75.0		75.0	75.0	
Total Split (%)	21.1%	21.1%		21.1%	21.1%		78.9%	78.9%		78.9%	78.9%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.4	2.4		2.4	2.4		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.4		5.4	5.4			5.8			5.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		12.4		12.4	12.4			75.6			75.6	
Actuated g/C Ratio		0.13		0.13	0.13			0.80			0.80	
v/c Ratio		0.34		0.04	0.23			0.17			0.22	
Control Delay		38.7		35.6	27.8			3.6			3.9	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		38.7		35.6	27.8			3.6			3.9	
LOS		D		D	C			A			A	
Approach Delay		38.7			28.7			3.6			3.9	
Approach LOS		D			C			A			A	
Queue Length 50th (m)		9.6		1.1	5.3			11.1			13.9	
Queue Length 95th (m)		21.7		5.0	15.8			18.0			22.1	
Internal Link Dist (m)		220.6			228.6			278.4			289.1	
Turn Bay Length (m)				40.0								
Base Capacity (vph)		223		207	267			1407			1318	
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		0.29		0.03	0.20			0.17			0.22	

Intersection Summary

Cycle Length: 95  
 Actuated Cycle Length: 95  
 Offset: 40 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.34

Intersection Signal Delay: 9.5

Intersection LOS: A

Intersection Capacity Utilization 60.2%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 25: Parkdale & Ruskin





Lanes, Volumes, Timings  
30: Prince of Wales & Preston

2048 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	614	223	2	3	295	363	4	3	1	260	4	597
Future Volume (vph)	614	223	2	3	295	363	4	3	1	260	4	597
Satd. Flow (prot)	3288	1779	0	1695	1784	1517	0	1683	0	0	1700	1517
Flt Permitted	0.950			0.950				0.831			0.724	
Satd. Flow (perm)	3179	1779	0	1468	1784	1484	0	1305	0	0	1153	1348
Satd. Flow (RTOR)						228						
Lane Group Flow (vph)	614	225	0	3	295	363	0	8	0	0	264	597
Turn Type	Prot	NA		Prot	NA	Free	Perm	NA		custom	NA	custom
Protected Phases	5	2		1	6			8		11	4 11	5
Permitted Phases						Free	8			4		4
Detector Phase	5	2		1	6		8	8		11	4 11	5
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0		10.0		5.0
Minimum Split (s)	11.1	27.1		10.3	27.1		24.5	24.5		15.3		11.1
Total Split (s)	47.0	67.0		10.3	30.3		35.7	35.7		22.0		47.0
Total Split (%)	33.6%	47.9%		7.4%	21.6%		25.5%	25.5%		15.7%		33.6%
Yellow Time (s)	3.7	3.7		3.3	3.7		3.3	3.3		3.3		3.7
All-Red Time (s)	2.4	2.4		2.0	2.4		2.2	2.2		2.0		2.4
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0				0.0
Total Lost Time (s)	6.1	6.1		5.3	6.1			5.5				6.1
Lead/Lag	Lead			Lead								Lead
Lead-Lag Optimize?	Yes			Yes								Yes
Recall Mode	None	C-Min		None	C-Min		None	None		None		None
Act Effct Green (s)	47.1	86.9		5.9	36.6	140.0		15.7			32.1	62.2
Actuated g/C Ratio	0.34	0.62		0.04	0.26	1.00		0.11			0.23	0.44
v/c Ratio	0.56	0.20		0.04	0.63	0.24		0.05			0.80	0.91
Control Delay	39.3	13.1		65.3	54.8	0.4		51.4			61.5	61.1
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	1.1
Total Delay	39.3	13.1		65.3	54.8	0.4		51.4			61.5	62.2
LOS	D	B		E	D	A		D			E	E
Approach Delay		32.3			25.0			51.4			62.0	
Approach LOS		C			C			D			E	
Queue Length 50th (m)	64.4	15.1		0.8	71.5	0.0		2.1			77.0	163.6
Queue Length 95th (m)	93.4	49.2		4.1	#137.8	0.0		6.8			m93.9	m159.8
Internal Link Dist (m)		79.9			173.8			12.4			145.6	
Turn Bay Length (m)	45.0			30.0		45.0						
Base Capacity (vph)	1109	1104		71	465	1484		281			449	657
Starvation Cap Reductn	0	0		0	0	0		0			0	10
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	0.55	0.20		0.04	0.63	0.24		0.03			0.59	0.92

**Intersection Summary**  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 105.9 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated

Lane Group	Ø4	Ø9	Ø10	Ø12
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	4	9	10	12
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	10.0	1.0	1.0	1.0
Minimum Split (s)	15.5	5.0	5.0	20.0
Total Split (s)	35.7	5.0	5.0	22.0
Total Split (%)	26%	4%	4%	16%
Yellow Time (s)	3.3	2.0	2.0	2.0
All-Red Time (s)	2.2	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				
Intersection Summary				

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 41.1

Intersection LOS: D

Intersection Capacity Utilization 89.3%

ICU Level of Service E

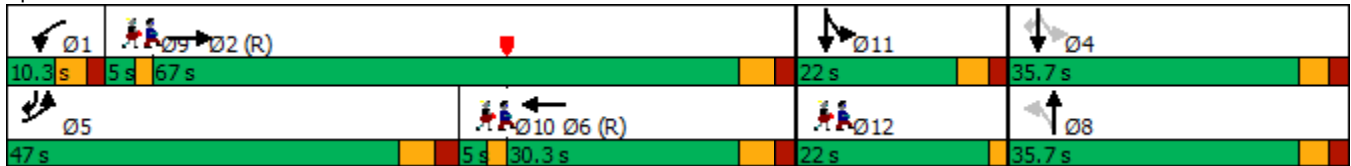
Analysis Period (min) 15

# 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: 30: Prince of Wales & Preston



Lanes, Volumes, Timings 2048 PM Demand Rationalized Main Hospital SPA PEAK GEN  
 31: Rochester & 417 WB on/Raymond 10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	120	161	109	191	321	0	0	149	182
Future Volume (vph)	0	0	0	120	161	109	191	321	0	0	149	182
Satd. Flow (prot)	0	0	0	1695	1636	0	1695	1784	0	0	1784	1517
Flt Permitted				0.950			0.548					
Satd. Flow (perm)	0	0	0	1685	1636	0	947	1784	0	0	1784	1414
Satd. Flow (RTOR)					56							182
Lane Group Flow (vph)	0	0	0	120	270	0	191	321	0	0	149	182
Turn Type				Perm	NA		pm+pt	NA			NA	Perm
Protected Phases					8		5	2				6
Permitted Phases				8			2					6
Detector Phase				8	8		5	2				6
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	10.0
Minimum Split (s)				32.0	32.0		10.9	27.3			24.9	24.9
Total Split (s)				32.0	32.0		13.0	38.0			25.0	25.0
Total Split (%)				45.7%	45.7%		18.6%	54.3%			35.7%	35.7%
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	3.3
All-Red Time (s)				2.4	2.4		2.6	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)				5.7	5.7		5.9	5.9			5.9	5.9
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode				None	None		None	C-Min			C-Min	C-Min
Act Effct Green (s)				15.2	15.2		43.2	43.2			28.3	28.3
Actuated g/C Ratio				0.22	0.22		0.62	0.62			0.40	0.40
v/c Ratio				0.33	0.68		0.28	0.29			0.21	0.27
Control Delay				24.2	27.9		12.2	13.0			17.1	4.6
Queue Delay				0.0	0.0		0.0	0.5			0.0	0.0
Total Delay				24.2	27.9		12.2	13.5			17.1	4.6
LOS				C	C		B	B			B	A
Approach Delay					26.8			13.0			10.2	
Approach LOS					C			B			B	
Queue Length 50th (m)				13.4	25.8		14.8	30.4			12.1	0.0
Queue Length 95th (m)				23.2	42.8		34.3	54.7			29.5	13.0
Internal Link Dist (m)		122.0			89.8			72.3			151.7	
Turn Bay Length (m)												35.0
Base Capacity (vph)				633	649		682	1101			721	680
Starvation Cap Reductn				0	0		0	412			0	0
Spillback Cap Reductn				0	0		0	0			0	0
Storage Cap Reductn				0	0		0	0			0	0
Reduced v/c Ratio				0.19	0.42		0.28	0.47			0.21	0.27

**Intersection Summary**

Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 8 (11%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 16.6

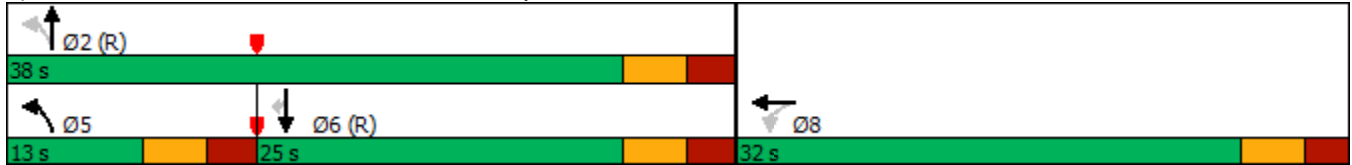
Intersection LOS: B

Intersection Capacity Utilization 58.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 31: Rochester & 417 WB on/Raymond



Lanes, Volumes, Timings 2048 PM Demand Rationalized Main Hospital SPA PEAK GEN  
 32: Rochester & 417 EB off/Orangeville 10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕						↕↕			↕↕	
Traffic Volume (vph)	199	218	123	0	0	0	0	308	48	16	232	0
Future Volume (vph)	199	218	123	0	0	0	0	308	48	16	232	0
Satd. Flow (prot)	0	3190	0	0	0	0	0	3306	0	0	3380	0
Flt Permitted		0.982									0.927	
Satd. Flow (perm)	0	3184	0	0	0	0	0	3306	0	0	3140	0
Satd. Flow (RTOR)		55						40				
Lane Group Flow (vph)	0	540	0	0	0	0	0	356	0	0	248	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Detector Phase	4	4						2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0						25.1		25.1	25.1	
Total Split (s)	26.0	26.0						44.0		44.0	44.0	
Total Split (%)	37.1%	37.1%						62.9%		62.9%	62.9%	
Yellow Time (s)	3.3	3.3						3.3		3.3	3.3	
All-Red Time (s)	2.3	2.3						2.1		2.1	2.1	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		5.6						5.4			5.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None						C-Min		C-Min	C-Min	
Act Effct Green (s)		16.1						42.9			42.9	
Actuated g/C Ratio		0.23						0.61			0.61	
v/c Ratio		0.70						0.17			0.13	
Control Delay		26.8						6.0			8.5	
Queue Delay		0.0						0.0			0.0	
Total Delay		26.8						6.0			8.5	
LOS		C						A			A	
Approach Delay		26.8						6.0			8.5	
Approach LOS		C						A			A	
Queue Length 50th (m)		30.7						8.1			2.7	
Queue Length 95th (m)		41.5						16.3			27.8	
Internal Link Dist (m)		104.8			107.2			99.1			72.3	
Turn Bay Length (m)												
Base Capacity (vph)		972						2049			1932	
Starvation Cap Reductn		0						0			0	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.56						0.17			0.13	
<b>Intersection Summary</b>												
Cycle Length: 70												
Actuated Cycle Length: 70												
Offset: 67 (96%), Referenced to phase 2:NBT and 6:SBTL, Start of Green												
Natural Cycle: 55												
Control Type: Actuated-Coordinated												

Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 16.4      Intersection LOS: B  
 Intersection Capacity Utilization 49.1%      ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases:    32: Rochester & 417 EB off/Orangeville



Lanes, Volumes, Timings 2048 PM Demand Rationalized Main Hospital SPA PEAK GEN  
 33: Bronson & Catherine 417 WB on 10/18/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↔		↗	↕			↕	↗
Traffic Volume (vph)	0	0	0	792	492	269	269	707	0	0	734	159
Future Volume (vph)	0	0	0	792	492	269	269	707	0	0	734	159
Satd. Flow (prot)	0	0	0	1458	4312	0	1695	3390	0	0	3248	0
Flt Permitted				0.950	0.988		0.116					
Satd. Flow (perm)	0	0	0	1458	4312	0	207	3390	0	0	3248	0
Satd. Flow (RTOR)					110						28	
Lane Group Flow (vph)	0	0	0	539	1014	0	269	707	0	0	893	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				25.9	25.9		11.0	25.1			25.1	
Total Split (s)				42.0	42.0		18.0	53.0			35.0	
Total Split (%)				44.2%	44.2%		18.9%	55.8%			36.8%	
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)				2.6	2.6		2.7	2.8			2.8	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				5.9	5.9		6.0	6.1			6.1	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				None	None		None	C-Min			C-Min	
Act Effct Green (s)				36.3	36.3		46.8	46.7			28.3	
Actuated g/C Ratio				0.38	0.38		0.49	0.49			0.30	
v/c Ratio				0.97	0.59		0.91	0.42			0.90	
Control Delay				61.3	22.4		63.6	23.5			44.7	
Queue Delay				23.7	0.0		0.0	3.3			37.3	
Total Delay				85.0	22.4		63.6	26.8			82.0	
LOS				F	C		E	C			F	
Approach Delay					44.1			37.0			82.0	
Approach LOS					D			D			F	
Queue Length 50th (m)				111.0	50.5		46.8	64.6			79.4	
Queue Length 95th (m)				#187.7	64.7		#81.0	74.7			#114.0	
Internal Link Dist (m)		151.3			165.9			71.3			237.2	
Turn Bay Length (m)												
Base Capacity (vph)				558	1717		294	1673			1007	
Starvation Cap Reductn				0	0		0	843			0	
Spillback Cap Reductn				47	50		0	0			176	
Storage Cap Reductn				0	0		0	0			0	
Reduced v/c Ratio				1.05	0.61		0.91	0.85			1.07	

**Intersection Summary**  
 Cycle Length: 95  
 Actuated Cycle Length: 95  
 Offset: 59 (62%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated



Maximum v/c Ratio: 0.97

Intersection Signal Delay: 52.0 Intersection LOS: D

Intersection Capacity Utilization 112.0% ICU Level of Service H

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 33: Bronson & Catherine 417 WB on





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	136	387	0	880	1455	0
Future Volume (vph)	136	387	0	880	1455	0
Satd. Flow (prot)	1695	1517	0	3390	3390	0
Flt Permitted	0.950					
Satd. Flow (perm)	1695	1491	0	3390	3390	0
Satd. Flow (RTOR)	47					
Lane Group Flow (vph)	136	387	0	880	1455	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases	4					
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		10.0	10.0	
Minimum Split (s)	25.1	25.1		34.3	34.3	
Total Split (s)	30.0	30.0		65.0	65.0	
Total Split (%)	31.6%	31.6%		68.4%	68.4%	
Yellow Time (s)	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.1	2.1		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.4	5.4		5.8	5.8	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None		C-Min	C-Min	
Act Effct Green (s)	26.4	26.4		57.4	57.4	
Actuated g/C Ratio	0.28	0.28		0.60	0.60	
v/c Ratio	0.29	0.86		0.43	0.71	
Control Delay	28.6	49.0		11.1	10.5	
Queue Delay	0.0	0.0		0.0	2.1	
Total Delay	28.6	49.0		11.1	12.5	
LOS	C	D		B	B	
Approach Delay	43.7			11.1	12.5	
Approach LOS	D			B	B	
Queue Length 50th (m)	18.5	56.5		46.4	76.5	
Queue Length 95th (m)	36.0	#115.6		51.2	m133.7	
Internal Link Dist (m)	81.4			50.7	71.3	
Turn Bay Length (m)	60.0					
Base Capacity (vph)	483	458		2136	2136	
Starvation Cap Reductn	0	0		0	505	
Spillback Cap Reductn	14	0		95	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.29	0.84		0.43	0.89	

**Intersection Summary**

Cycle Length: 95  
 Actuated Cycle Length: 95  
 Offset: 91 (96%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 17.8 Intersection LOS: B

Intersection Capacity Utilization 112.0% ICU Level of Service H

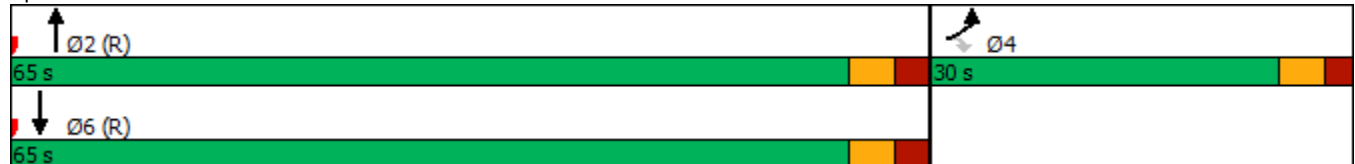
Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

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

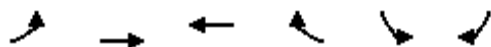
Splits and Phases: 34: Bronson & 417 EB off



Lanes, Volumes, Timings  
39: Prince of Wales & Road B

2048 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations	↖	↗	↖↗		↘	↘	
Traffic Volume (vph)	26	675	810	23	153	50	
Future Volume (vph)	26	675	810	23	153	50	
Satd. Flow (prot)	1695	1784	3373	0	1695	1517	
Flt Permitted	0.293				0.950		
Satd. Flow (perm)	523	1784	3373	0	1629	1424	
Satd. Flow (RTOR)						50	
Lane Group Flow (vph)	26	675	833	0	153	50	
Turn Type	pm+pt	NA	NA		Perm	Perm	
Protected Phases	5	2	6				9
Permitted Phases	2				4	4	
Detector Phase	5	2	6		4	4	
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0		10.0	10.0	1.0
Minimum Split (s)	10.3	23.3	23.3		23.3	23.3	15.0
Total Split (s)	12.0	97.0	85.0		28.0	28.0	15.0
Total Split (%)	8.6%	69.3%	60.7%		20.0%	20.0%	11%
Yellow Time (s)	3.3	3.3	3.3		3.3	3.3	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3		5.3	5.3	
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	None	C-Min	C-Min		None	None	None
Act Effct Green (s)	108.1	108.1	101.0		18.3	18.3	
Actuated g/C Ratio	0.77	0.77	0.72		0.13	0.13	
v/c Ratio	0.06	0.49	0.34		0.72	0.22	
Control Delay	5.5	8.1	9.4		76.4	15.0	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	5.5	8.1	9.4		76.4	15.0	
LOS	A	A	A		E	B	
Approach Delay		8.0	9.4		61.3		
Approach LOS		A	A		E		
Queue Length 50th (m)	1.1	33.5	41.6		41.2	0.0	
Queue Length 95th (m)	m5.4	108.5	m94.2		61.7	11.4	
Internal Link Dist (m)		198.2	95.9		17.7		
Turn Bay Length (m)	45.0						
Base Capacity (vph)	460	1383	2447		269	277	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	49		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.06	0.49	0.35		0.57	0.18	

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 14.9

Intersection LOS: B

Intersection Capacity Utilization 57.0%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 39: Prince of Wales & Road B

 Ø2 (R)	 Ø9	 Ø4
97 s	15 s	28 s
 Ø5	 Ø6 (R)	
12 s	85 s	

Lanes, Volumes, Timings  
40: Prince of Wales & Road E

2048 PM Demand Rationalized Main Hospital SPA PEAK GEN

10/18/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	86	38	7	615	818	41	
Future Volume (vph)	86	38	7	615	818	41	
Satd. Flow (prot)	1586	1473	1340	3390	1784	1289	
Flt Permitted	0.950		0.950				
Satd. Flow (perm)	1586	1473	1324	3390	1784	1200	
Satd. Flow (RTOR)		38				28	
Lane Group Flow (vph)	86	38	7	615	818	41	
Turn Type	Perm	Perm	Prot	NA	NA	Perm	
Protected Phases			5	2	6		9
Permitted Phases	4	4				6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	1.0
Minimum Split (s)	23.3	23.3	10.3	23.3	23.3	23.3	10.0
Total Split (s)	23.3	23.3	10.3	106.7	96.4	96.4	10.0
Total Split (%)	16.6%	16.6%	7.4%	76.2%	68.9%	68.9%	7%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	13.4	13.4	6.4	114.0	111.4	111.4	
Actuated g/C Ratio	0.10	0.10	0.05	0.81	0.80	0.80	
v/c Ratio	0.57	0.22	0.11	0.22	0.58	0.04	
Control Delay	74.6	18.9	67.6	3.7	8.7	0.1	
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	
Total Delay	74.6	18.9	67.6	3.7	8.7	0.1	
LOS	E	B	E	A	A	A	
Approach Delay	57.5			4.4	8.3		
Approach LOS	E			A	A		
Queue Length 50th (m)	23.3	0.0	1.9	14.6	90.4	0.0	
Queue Length 95th (m)	39.6	10.6	7.1	34.4	254.2	0.0	
Internal Link Dist (m)	165.3			279.2	63.5		
Turn Bay Length (m)	45.0		50.0			50.0	
Base Capacity (vph)	203	222	61	2761	1427	965	
Starvation Cap Reductn	0	0	0	0	56	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.42	0.17	0.11	0.22	0.60	0.04	

Intersection Summary

Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 10.6

Intersection LOS: B

Intersection Capacity Utilization 62.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 40: Prince of Wales & Road E

 Ø9	 Ø2 (R)	 Ø4
10 s	106.7 s	23.3 s
	 Ø5	
	 Ø6 (R)	
	10.3 s	96.4 s

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗↗	↗↗	↘	↘↘	
Traffic Vol, veh/h	8	517	1204	10	3	10
Future Vol, veh/h	8	517	1204	10	3	10
Conflicting Peds, #/hr	42	0	0	42	4	8
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	25	-	-	20	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	517	1204	10	3	10

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1256	0	-	0	1525 652
Stage 1	-	-	-	-	1246 -
Stage 2	-	-	-	-	279 -
Critical Hdwy	4.14	-	-	-	6.84 6.94
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.22	-	-	-	3.52 3.32
Pot Cap-1 Maneuver	550	-	-	-	109 411
Stage 1	-	-	-	-	234 -
Stage 2	-	-	-	-	743 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	530	-	-	-	100 394
Mov Cap-2 Maneuver	-	-	-	-	100 -
Stage 1	-	-	-	-	222 -
Stage 2	-	-	-	-	716 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	21.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	530	-	-	-	235
HCM Lane V/C Ratio	0.015	-	-	-	0.055
HCM Control Delay (s)	11.9	-	-	-	21.2
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2



Intersection						
Int Delay, s/veh	10.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑	↑		↑
Traffic Vol, veh/h	0	872	865	67	0	285
Future Vol, veh/h	0	872	865	67	0	285
Conflicting Peds, #/hr	70	0	0	70	1	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	30	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	872	865	67	0	285

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	-	0	-	0	- 940
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	-	-	- 6.23
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	- 3.319
Pot Cap-1 Maneuver	0	-	-	-	0 319
Stage 1	0	-	-	-	0 -
Stage 2	0	-	-	-	0 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	- 299
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	79.1
HCM LOS			F

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	299
HCM Lane V/C Ratio	-	-	-	0.953
HCM Control Delay (s)	-	-	-	79.1
HCM Lane LOS	-	-	-	F
HCM 95th %tile Q(veh)	-	-	-	9.5

**Intersection**

Int Delay, s/veh 0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗			↖			↔				↖
Traffic Vol, veh/h	0	854	0	0	807	54	1	0	5	0	0	31
Future Vol, veh/h	0	854	0	0	807	54	1	0	5	0	0	31
Conflicting Peds, #/hr	8	0	6	6	0	8	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	854	0	0	807	54	1	0	5	0	0	31

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	- 0 0	- - 0	1711 1729	860 - - 843
Stage 1	- - -	- - -	860 860	- - - -
Stage 2	- - -	- - -	851 869	- - - -
Critical Hdwy	- - -	- - -	7.12 6.52	6.22 - - 6.22
Critical Hdwy Stg 1	- - -	- - -	6.12 5.52	- - - -
Critical Hdwy Stg 2	- - -	- - -	6.12 5.52	- - - -
Follow-up Hdwy	- - -	- - -	3.518 4.018	3.318 - - 3.318
Pot Cap-1 Maneuver	0 - - 0	- - - 0	71 88	356 0 0 364
Stage 1	0 - - 0	- - - 0	351 373	- 0 0 -
Stage 2	0 - - 0	- - - 0	355 369	- 0 0 -
Platoon blocked, %	- - -	- - -	- - -	- - - -
Mov Cap-1 Maneuver	- - -	- - -	65 87	354 - - 361
Mov Cap-2 Maneuver	- - -	- - -	65 87	- - - -
Stage 1	- - -	- - -	351 371	- - - -
Stage 2	- - -	- - -	324 366	- - - -

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	23.3	15.9
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	203	-	-	-	-	361
HCM Lane V/C Ratio	0.03	-	-	-	-	0.086
HCM Control Delay (s)	23.3	-	-	-	-	15.9
HCM Lane LOS	C	-	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.3

Intersection												
Int Delay, s/veh	7.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	101	53	77	77	5	58	0	311	0	0	5
Future Vol, veh/h	0	101	53	77	77	5	58	0	311	0	0	5
Conflicting Peds, #/hr	10	0	10	10	0	10	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	101	53	77	77	5	58	0	311	0	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	92	0	0	164	0	0	331	384	87	295	408	51
Stage 1	-	-	-	-	-	-	138	138	-	244	244	-
Stage 2	-	-	-	-	-	-	193	246	-	51	164	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1501	-	-	1412	-	-	599	548	954	635	531	1006
Stage 1	-	-	-	-	-	-	851	781	-	738	703	-
Stage 2	-	-	-	-	-	-	790	701	-	956	761	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1488	-	-	1400	-	-	565	508	946	404	492	997
Mov Cap-2 Maneuver	-	-	-	-	-	-	565	508	-	404	492	-
Stage 1	-	-	-	-	-	-	844	775	-	732	657	-
Stage 2	-	-	-	-	-	-	740	655	-	642	755	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			3.8			12.4			8.6		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	855	1488	-	-	1400	-	-	997
HCM Lane V/C Ratio	0.432	-	-	-	0.055	-	-	0.005
HCM Control Delay (s)	12.4	0	-	-	7.7	0.1	-	8.6
HCM Lane LOS	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	2.2	0	-	-	0.2	-	-	0

Intersection						
Int Delay, s/veh	7.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑	↑		↑↑
Traffic Vol, veh/h	159	80	24	22	43	41
Future Vol, veh/h	159	80	24	22	43	41
Conflicting Peds, #/hr	0	0	0	15	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	0	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	159	80	24	22	43	41

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	146	39	0	0	61	0
Stage 1	39	-	-	-	-	-
Stage 2	107	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	839	1032	-	-	1541	-
Stage 1	983	-	-	-	-	-
Stage 2	906	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	804	1019	-	-	1521	-
Mov Cap-2 Maneuver	804	-	-	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	880	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	3.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	865	1521
HCM Lane V/C Ratio	-	-	0.276	0.028
HCM Control Delay (s)	-	-	10.7	7.4
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	1.1	0.1

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	4	4	46	200	0
Future Vol, veh/h	0	4	4	46	200	0
Conflicting Peds, #/hr	0	0	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	100	100	100	2	2	100
Mvmt Flow	0	4	4	46	200	0

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	236	105	205	0	0
Stage 1	205	-	-	-	-
Stage 2	31	-	-	-	-
Critical Hdwy	8.8	8.9	6.1	-	-
Critical Hdwy Stg 1	7.8	-	-	-	-
Critical Hdwy Stg 2	7.8	-	-	-	-
Follow-up Hdwy	4.5	4.3	3.2	-	-
Pot Cap-1 Maneuver	519	687	869	-	-
Stage 1	582	-	-	-	-
Stage 2	763	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	512	684	865	-	-
Mov Cap-2 Maneuver	512	-	-	-	-
Stage 1	577	-	-	-	-
Stage 2	760	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.3	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	865	-	684	-	-
HCM Lane V/C Ratio	0.005	-	0.006	-	-
HCM Control Delay (s)	9.2	0	10.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	5.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	20	14	0	26	5
Future Vol, veh/h	0	20	14	0	26	5
Conflicting Peds, #/hr	0	10	10	0	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	20	14	0	26	5

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	30	0	58
Stage 1	-	-	-	-	20
Stage 2	-	-	-	-	38
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1583	-	949
Stage 1	-	-	-	-	1003
Stage 2	-	-	-	-	984
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1570	-	925
Mov Cap-2 Maneuver	-	-	-	-	925
Stage 1	-	-	-	-	995
Stage 2	-	-	-	-	967

Approach	EB	WB	NB
HCM Control Delay, s	0	7.3	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	940	-	-	1570	-
HCM Lane V/C Ratio	0.033	-	-	0.009	-
HCM Control Delay (s)	9	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	27	51	10	2	118	112	1	8	0	63	86	35
Future Vol, veh/h	27	51	10	2	118	112	1	8	0	63	86	35
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	51	10	2	118	112	1	8	0	63	86	35
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.3	8.8	8	9.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	31%	1%	34%
Vol Thru, %	89%	58%	51%	47%
Vol Right, %	0%	11%	48%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	88	232	184
LT Vol	1	27	2	63
Through Vol	8	51	118	86
RT Vol	0	10	112	35
Lane Flow Rate	9	88	232	184
Geometry Grp	1	1	1	1
Degree of Util (X)	0.012	0.113	0.272	0.235
Departure Headway (Hd)	4.894	4.639	4.214	4.606
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	730	773	854	780
Service Time	2.932	2.666	2.233	2.634
HCM Lane V/C Ratio	0.012	0.114	0.272	0.236
HCM Control Delay	8	8.3	8.8	9.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.4	1.1	0.9

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	100	0	30	0	0	26	30	100	0	20	52	52
Future Vol, veh/h	100	0	30	0	0	26	30	100	0	20	52	52
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	100	0	30	0	0	26	30	100	0	20	52	52
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.5	7.2	8.4	8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	23%	77%	0%	16%
Vol Thru, %	77%	0%	0%	42%
Vol Right, %	0%	23%	100%	42%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	130	130	26	124
LT Vol	30	100	0	20
Through Vol	100	0	0	52
RT Vol	0	30	26	52
Lane Flow Rate	130	130	26	124
Geometry Grp	1	1	1	1
Degree of Util (X)	0.162	0.164	0.029	0.145
Departure Headway (Hd)	4.473	4.546	4.055	4.221
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	803	790	883	852
Service Time	2.489	2.564	2.078	2.238
HCM Lane V/C Ratio	0.162	0.165	0.029	0.146
HCM Control Delay	8.4	8.5	7.2	8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.6	0.1	0.5



Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑	↘	
Traffic Vol, veh/h	93	39	45	90	41	62
Future Vol, veh/h	93	39	45	90	41	62
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	93	39	45	90	41	62
Number of Lanes	2	0	1	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	2
HCM Control Delay	7.8	8.4	7.9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	40%	0%	0%	100%	0%
Vol Thru, %	0%	100%	44%	0%	100%
Vol Right, %	60%	0%	56%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	103	62	70	45	90
LT Vol	41	0	0	45	0
Through Vol	0	62	31	0	90
RT Vol	62	0	39	0	0
Lane Flow Rate	103	62	70	45	90
Geometry Grp	2	7	7	7	7
Degree of Util (X)	0.123	0.084	0.088	0.066	0.12
Departure Headway (Hd)	4.282	4.898	4.507	5.391	4.889
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	842	736	800	668	738
Service Time	2.287	2.598	2.207	3.091	2.589
HCM Lane V/C Ratio	0.122	0.084	0.087	0.067	0.122
HCM Control Delay	7.9	8	7.6	8.5	8.3
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.4	0.3	0.3	0.2	0.4

**Appendix L:  
Summary Queueing Analysis and SimTraffic Outputs**

Table 21: Queue Length Summary

Intersection	Capacity (meters)	Weekday AM Peak (PM Peak of Street) [PM Peak of Generator]						
		2028 Opening Day			2048 Full Buildout			
		SimTraffic 50 <sup>th</sup> %	SimTraffic 95 <sup>th</sup> %	Synchro 95 <sup>th</sup> %	SimTraffic 50 <sup>th</sup> %	SimTraffic 95 <sup>th</sup> %	Synchro 95 <sup>th</sup> %	
<b>Signalized Intersections</b>								
Road A/Champagne/Carling <sub>1</sub>	WBL	75 m	37 (9) [13]	61 (25) [37]	46 (16) [24]	45 (16) [22]	71 (47) [49]	45 (25) [35]
Preston/Carling <sub>1</sub>	WBL	120 m	45 (66) [75]	75 (102) [118]	89 (m104) [138]	55 (67) [66]	90 (108) [102]	115 (m97) [128]
	NBL	130 m	47 (51) [53]	90 (91) [94]	53 (117) [108]	41 (49) [49]	79 (91) [87]	49 (108) [104]
	NBTR	130 m	68 (36) [43]	121 (75) [90]	116 (30) [26]	72 (34) [37]	125 (75) [72]	105 (31) [30]
Preston/Prince of Wales	EBL	75 m	77 (67) [79]	108 (102) [107]	119 (83) [92]	77 (72) [85]	105 (105) [107]	113 (83) [93]
	SBR	130 m	54 (82) [91]	98 (118) [128]	113 (m107) [m153]	58 (82) [89]	100 (120) [127]	m119 (m110) [m160]
	SBTL	130 m	41 (65) [35]	70 (105) [64]	m69 (143) [m94]	40 (68) [41]	68 (109) [77]	m64 (m137) [m94]
Road B/Prince of Wales <sub>2</sub>	WBT	120 m	19 (30) [25]	44 (74) [54]	m68 (94) [m93]	24 (50) [39]	52 (110) [84]	m78 (98) [m94]
Road E/Prince of Wales <sub>2</sub>	NBT	110 m	19 (16) [21]	47 (37) [45]	58 (38) [36]	21 (21) [24]	48 (42) [43]	56 (36) [34]

1. Road A/Champagne/Carling and Preston/Carling were both modelled with a time separated bi-directional cycling crossing of the south leg and the addition of an eastbound right-turn lane. This scenario is more conservative than a scenario that assumes uni-directional cross-rides only.
2. Based on two through lanes for WBT at Road B and NBT at Road E
3. m = Volume for 95th percentile queue is metered by upstream signal

## 2028 Peak AM SimTraffic Results

Queuing and Blocking Report  
Baseline

10/18/2022

Intersection: 10: Carling & Parkdale

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	L	T	T	T	T	R	LR
Maximum Queue (m)	58.1	215.4	213.2	63.2	61.2	27.0	246.0
Average Queue (m)	23.8	102.5	94.0	24.7	24.9	7.5	99.6
95th Queue (m)	53.8	236.5	230.8	52.4	53.4	19.9	257.2
Link Distance (m)		225.6	225.6	174.6	174.6		272.5
Upstream Blk Time (%)		27	18				18
Queuing Penalty (veh)		0	0				42
Storage Bay Dist (m)	155.0					80.0	
Storage Blk Time (%)		28			0		
Queuing Penalty (veh)		39			0		

Intersection: 11: Carling & Civic

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	T	LR
Maximum Queue (m)	23.2	166.7	166.1	39.5	47.6	47.0
Average Queue (m)	4.9	79.9	80.2	15.4	17.4	17.4
95th Queue (m)	17.5	196.2	195.9	32.0	38.8	45.4
Link Distance (m)		174.6	174.6	189.4	189.4	49.6
Upstream Blk Time (%)		30	29			15
Queuing Penalty (veh)		179	173			0
Storage Bay Dist (m)	90.0					
Storage Blk Time (%)		33				
Queuing Penalty (veh)		17				

Intersection: 12: Carling & Melrose

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	L	T	T	T	T	R	LR
Maximum Queue (m)	10.3	191.9	192.1	10.5	11.1	2.4	69.3
Average Queue (m)	1.5	74.3	74.2	0.6	0.7	0.1	19.9
95th Queue (m)	7.2	223.1	223.1	5.0	5.4	1.7	68.5
Link Distance (m)		189.4	189.4	239.5	239.5		211.1
Upstream Blk Time (%)		34	29				
Queuing Penalty (veh)		195	168				
Storage Bay Dist (m)	25.0					20.0	
Storage Blk Time (%)		39			0		
Queuing Penalty (veh)		9			0		

Queuing and Blocking Report  
Baseline

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Intersection: 13: Maple/Old Irvine & Carling

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	LTR	LTR
Maximum Queue (m)	20.7	242.6	244.0	21.8	31.5	47.2	41.3	3.0	123.7	34.4
Average Queue (m)	3.0	131.2	133.9	2.6	9.5	21.4	15.8	0.2	41.8	10.6
95th Queue (m)	12.7	289.2	290.4	12.9	22.7	40.4	33.9	1.4	128.6	39.8
Link Distance (m)		239.5	239.5			191.1	191.1		166.9	225.8
Upstream Blk Time (%)		39	40						7	
Queuing Penalty (veh)		227	227						6	
Storage Bay Dist (m)	20.0			15.0	45.0			25.0		
Storage Blk Time (%)	0	55	57	0	0	0	3			
Queuing Penalty (veh)	0	15	28	0	0	0	0			

Intersection: 14: Carling & Bayswater

Movement	EB	EB	WB	WB
Directions Served	T	T	T	T
Maximum Queue (m)	193.7	195.8	5.2	5.5
Average Queue (m)	111.7	102.9	0.9	1.1
95th Queue (m)	248.8	251.8	10.5	12.4
Link Distance (m)	191.1	191.1	114.2	114.2
Upstream Blk Time (%)	46	46		
Queuing Penalty (veh)	237	232		
Storage Bay Dist (m)				
Storage Blk Time (%)				2
Queuing Penalty (veh)				0

Intersection: 15: Carling & Sherwood

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (m)	35.6	115.8	88.9	36.2	36.2	23.1	64.8	20.4
Average Queue (m)	35.5	109.0	63.8	10.1	13.1	6.5	34.7	3.0
95th Queue (m)	36.7	135.9	153.6	24.7	27.9	17.0	56.9	14.1
Link Distance (m)		114.2	114.2	143.4	143.4		138.3	
Upstream Blk Time (%)		83	49					
Queuing Penalty (veh)		63	37					
Storage Bay Dist (m)	30.0					90.0		15.0
Storage Blk Time (%)	100	0					44	0
Queuing Penalty (veh)	462	0					2	0

Queuing and Blocking Report  
Baseline

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Intersection: 16: Road A/Champagne & Carling

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (m)	24.5	44.5	43.0	26.0	65.3	83.1	70.1	38.9	28.6	36.3	37.3	93.1
Average Queue (m)	4.6	14.2	15.7	8.1	36.9	17.1	17.6	5.0	11.8	14.0	31.8	29.6
95th Queue (m)	16.8	33.7	33.6	21.0	61.2	53.1	48.8	20.8	23.5	29.6	42.5	74.2
Link Distance (m)		143.4	143.4			103.7	103.7		58.9	58.9		481.7
Upstream Blk Time (%)						0	0					
Queuing Penalty (veh)						0	0					
Storage Bay Dist (m)	55.0			75.0	61.0			35.0			30.0	
Storage Blk Time (%)		0	0		3	0	4	0			22	0
Queuing Penalty (veh)		0	0		9	1	3	0			20	0

Intersection: 17: Carling & Trillium MUP

Movement	EB	EB	WB	WB
Directions Served	T	T	T	T
Maximum Queue (m)	61.3	58.1	77.8	78.5
Average Queue (m)	22.6	21.4	39.9	41.1
95th Queue (m)	47.3	46.3	71.1	73.9
Link Distance (m)	103.7	103.7	93.8	93.8
Upstream Blk Time (%)	0	0		0
Queuing Penalty (veh)	0	0		0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

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Intersection: 18: Preston & Carling

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	55.6	72.7	65.8	63.7	86.0	58.3	58.8	26.0	96.2	117.7	132.0	42.4
Average Queue (m)	15.9	34.5	27.3	25.9	44.8	30.9	34.7	8.9	47.4	75.1	68.1	36.4
95th Queue (m)	36.9	63.7	60.1	55.9	74.5	52.7	54.9	19.2	89.8	113.8	120.7	53.3
Link Distance (m)		93.8	93.8			165.0	165.0		129.7	129.7	129.7	
Upstream Blk Time (%)		0	1	0						0	1	
Queuing Penalty (veh)		2	4	0						0	2	
Storage Bay Dist (m)	70.0			90.0	120.0			95.0				35.0
Storage Blk Time (%)		1	1	1								29
Queuing Penalty (veh)		2	2	2								93

Intersection: 18: Preston & Carling

Movement	SB	B57
Directions Served	TR	T
Maximum Queue (m)	79.0	276.1
Average Queue (m)	69.3	136.3
95th Queue (m)	84.2	346.6
Link Distance (m)	50.0	416.8
Upstream Blk Time (%)	61	1
Queuing Penalty (veh)	0	0
Storage Bay Dist (m)		
Storage Blk Time (%)	54	
Queuing Penalty (veh)	59	

Intersection: 19: Carling & Rochester

Movement	EB	EB	WB	WB	SB
Directions Served	T	T	T	R	R
Maximum Queue (m)	22.7	23.9	15.5	18.1	25.9
Average Queue (m)	6.0	5.3	0.7	2.0	11.9
95th Queue (m)	50.6	47.7	7.3	10.5	20.6
Link Distance (m)	165.0	165.0	104.1		396.1
Upstream Blk Time (%)	0	0			
Queuing Penalty (veh)	2	2			
Storage Bay Dist (m)				30.0	
Storage Blk Time (%)			0		
Queuing Penalty (veh)			0		



Intersection: 20: Carling & Booth

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	R	L	R
Maximum Queue (m)	57.2	85.4	75.5	145.4	37.5	107.8	37.5
Average Queue (m)	36.0	36.0	32.8	84.5	20.8	48.9	26.2
95th Queue (m)	59.6	80.1	73.2	146.6	44.8	106.2	45.3
Link Distance (m)		104.1	104.1	302.7		229.2	
Upstream Blk Time (%)		3	2			1	
Queuing Penalty (veh)		16	13			0	
Storage Bay Dist (m)	50.0				30.0		30.0
Storage Blk Time (%)	4	6		33	0	21	2
Queuing Penalty (veh)	19	20		61	1	35	4

Intersection: 21: Bronson & Carling/Glebe

Movement	EB	EB	EB	B1	B1	NB	NB	NB	SB	SB
Directions Served	L	LT	R	T	T	L	L	TR	T	TR
Maximum Queue (m)	47.4	100.8	90.5	181.6	160.5	57.4	402.1	408.7	105.1	118.0
Average Queue (m)	44.3	79.3	44.0	89.6	69.5	57.3	390.5	389.6	65.3	76.3
95th Queue (m)	55.6	115.5	82.4	263.8	252.0	57.6	422.2	440.6	97.1	109.8
Link Distance (m)		71.5	71.5	302.7	302.7		390.8	390.8	332.5	332.5
Upstream Blk Time (%)		46	5	3	3		30	23		
Queuing Penalty (veh)		270	29	17	16		267	208		
Storage Bay Dist (m)	40.0					50.0				
Storage Blk Time (%)	32	60				79	2			
Queuing Penalty (veh)	112	150				228	6			

Intersection: 22: Parkdale & 417 WB on/off

Movement	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	TR
Maximum Queue (m)	104.2	94.9	59.5	49.1	198.1
Average Queue (m)	47.1	47.1	33.4	18.6	171.2
95th Queue (m)	89.7	86.9	57.7	41.1	235.1
Link Distance (m)	152.4	152.4	55.6	55.6	183.6
Upstream Blk Time (%)	2	2	2	0	55
Queuing Penalty (veh)	0	0	4	0	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

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Intersection: 23: Parkdale & 417 EB on/off

Movement	EB	EB	NB	NB	SB	SB
Directions Served	LT	R	T	TR	L	T
Maximum Queue (m)	95.8	62.3	96.9	37.5	60.8	53.8
Average Queue (m)	42.8	19.5	66.2	34.8	50.5	22.0
95th Queue (m)	80.6	49.4	118.7	44.8	75.3	48.4
Link Distance (m)	121.0		90.9		55.6	55.6
Upstream Blk Time (%)	3		9		14	6
Queuing Penalty (veh)	0		57		50	19
Storage Bay Dist (m)		75.0		30.0		
Storage Blk Time (%)	1	4	1	36		
Queuing Penalty (veh)	2	7	4	52		

Intersection: 24: Parkdale & Sherwood

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	64.5	35.9	77.0	88.6
Average Queue (m)	22.2	14.9	29.6	44.9
95th Queue (m)	58.9	28.8	63.4	82.0
Link Distance (m)	236.5	344.4	294.1	90.9
Upstream Blk Time (%)				7
Queuing Penalty (veh)				30
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 25: Parkdale & Ruskin

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	LTR	LTR
Maximum Queue (m)	85.2	18.0	25.1	51.2	221.2
Average Queue (m)	24.5	4.4	10.4	17.0	56.8
95th Queue (m)	84.2	14.6	19.6	40.1	201.8
Link Distance (m)	236.1		243.9	272.5	294.1
Upstream Blk Time (%)	0				8
Queuing Penalty (veh)	0				31
Storage Bay Dist (m)		40.0			
Storage Blk Time (%)			0		
Queuing Penalty (veh)			0		

Intersection: 27: Bayswater & Sherwood

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	22.3	14.0	7.7	19.3
Average Queue (m)	10.1	5.2	2.1	9.8
95th Queue (m)	18.5	11.3	7.3	15.8
Link Distance (m)	602.2	138.3		93.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 28: Driveway & Prince of Wales

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	35.0	10.7	257.1	65.0
Average Queue (m)	13.2	2.1	247.6	18.7
95th Queue (m)	26.7	8.4	254.2	45.5
Link Distance (m)	203.0	214.2	239.9	278.2
Upstream Blk Time (%)			93	
Queuing Penalty (veh)			0	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 29: Navy/Navy Parking Access & Prince of Wales

Movement	EB	WB	NB	SB
Directions Served	TR	LTR	LTR	R
Maximum Queue (m)	93.7	44.4	4.8	8.5
Average Queue (m)	27.5	3.1	0.2	1.3
95th Queue (m)	82.7	24.6	2.4	6.3
Link Distance (m)	92.6	85.9	39.1	34.1
Upstream Blk Time (%)	1	0		
Queuing Penalty (veh)	9	1		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

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Intersection: 30: Prince of Wales & Preston

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	L	TR	T	R	LTR	LT	R
Maximum Queue (m)	52.5	92.8	42.4	130.9	52.5	10.1	77.4	110.8
Average Queue (m)	38.1	77.0	13.8	55.5	21.8	1.0	41.4	54.0
95th Queue (m)	67.3	107.6	33.5	111.7	64.2	5.4	69.8	97.5
Link Distance (m)		85.9	85.9	178.4		18.1	129.7	129.7
Upstream Blk Time (%)		13		0		0		0
Queuing Penalty (veh)		61		0		0		0
Storage Bay Dist (m)	45.0				45.0			
Storage Blk Time (%)	2	34		29	0			
Queuing Penalty (veh)	9	128		92	0			

Intersection: 31: Rochester & 417 WB on/Raymond

Movement	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	T	R
Maximum Queue (m)	49.3	58.7	37.0	49.8	41.6	35.6
Average Queue (m)	26.3	25.1	14.4	19.7	15.7	17.0
95th Queue (m)	42.5	44.0	27.5	39.2	32.6	29.7
Link Distance (m)	102.6	102.6	82.9	82.9	166.0	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						35.0
Storage Blk Time (%)					0	0
Queuing Penalty (veh)					1	0

Intersection: 32: Rochester & 417 EB off/Orangeville

Movement	EB	EB	NB	NB	SB	SB
Directions Served	LT	TR	T	TR	LT	T
Maximum Queue (m)	63.2	58.0	32.3	47.3	61.2	48.5
Average Queue (m)	34.8	23.9	10.2	20.2	30.4	8.0
95th Queue (m)	54.8	43.3	24.5	38.3	49.1	29.7
Link Distance (m)	116.5	116.5	101.7	101.7	82.9	82.9
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Queuing and Blocking Report  
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Intersection: 33: Bronson & Catherine 417 WB on

Movement	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	LT	T	TR	L	T	T	T	TR
Maximum Queue (m)	96.9	95.7	81.8	67.3	86.0	70.8	71.3	75.9	74.0
Average Queue (m)	58.3	64.5	42.9	34.3	55.3	45.3	46.2	44.7	39.2
95th Queue (m)	85.7	88.5	74.9	59.9	88.8	67.0	68.4	66.1	65.6
Link Distance (m)	174.4	174.4	174.4	174.4	81.8	81.8	81.8	236.0	236.0
Upstream Blk Time (%)					3	0	0		
Queuing Penalty (veh)					16	0	0		
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 34: Bronson & 417 EB off

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	T	T	T	T
Maximum Queue (m)	96.2	67.5	66.6	67.8	79.3	80.1
Average Queue (m)	57.6	46.0	34.9	51.1	37.2	33.9
95th Queue (m)	98.4	75.5	64.6	73.7	72.3	70.1
Link Distance (m)	91.1		57.4	57.4	81.8	81.8
Upstream Blk Time (%)	3		2	8	0	0
Queuing Penalty (veh)	0		15	50	1	1
Storage Bay Dist (m)		60.0				
Storage Blk Time (%)	7	3				
Queuing Penalty (veh)	26	9				

Intersection: 35: Bronson & Plymouth/Imperial Chamberlain

Movement	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	T	TR
Maximum Queue (m)	340.0	344.4	37.0	46.5	34.9
Average Queue (m)	280.4	299.6	21.9	3.7	1.4
95th Queue (m)	373.1	373.5	36.0	25.4	14.0
Link Distance (m)	332.5	332.5		57.4	57.4
Upstream Blk Time (%)	5	15		0	0
Queuing Penalty (veh)	32	102		1	0
Storage Bay Dist (m)			30.0		
Storage Blk Time (%)			5		
Queuing Penalty (veh)			24		

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Intersection: 36: Bronson & Madawaska/Fifth

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (m)	28.7	74.8	212.1	211.8	92.6	95.8
Average Queue (m)	9.5	32.2	190.8	190.6	36.2	40.3
95th Queue (m)	22.1	60.5	252.7	253.9	78.8	82.6
Link Distance (m)	182.2	118.1	195.0	195.0	390.8	390.8
Upstream Blk Time (%)		0	79	81		
Queuing Penalty (veh)		0	0	0		
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 37: Road L & Road M/Road A

Movement	EB	NB
Directions Served	T	R
Maximum Queue (m)	1.5	2.6
Average Queue (m)	0.1	0.1
95th Queue (m)	1.2	1.5
Link Distance (m)	34.2	24.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 38: Maple & Winding/Road D

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	39.1	7.2	27.4	21.6
Average Queue (m)	11.4	1.9	11.8	10.6
95th Queue (m)	48.6	7.1	48.4	17.1
Link Distance (m)	183.3	13.9	131.4	166.9
Upstream Blk Time (%)		3	2	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

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Intersection: 39: Prince of Wales & Road B

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	TR	L	R
Maximum Queue (m)	36.9	88.1	54.6	42.3	21.4	16.0
Average Queue (m)	6.8	33.8	19.2	10.1	8.4	4.5
95th Queue (m)	20.5	68.8	43.6	32.3	19.8	13.0
Link Distance (m)		205.7	92.6		20.9	20.9
Upstream Blk Time (%)					2	0
Queuing Penalty (veh)					1	0
Storage Bay Dist (m)	45.0			35.0		
Storage Blk Time (%)		3	1	0		
Queuing Penalty (veh)		1	5	0		

Intersection: 40: Prince of Wales & Road E

Movement	EB	EB	NB	NB	NB	SB	SB	B86
Directions Served	L	R	L	T	T	T	R	T
Maximum Queue (m)	20.6	23.2	13.0	52.7	29.3	55.7	23.0	2.4
Average Queue (m)	6.0	4.0	3.1	19.3	1.3	11.7	2.6	0.1
95th Queue (m)	15.9	15.6	10.7	47.1	14.6	36.5	13.3	2.4
Link Distance (m)		167.7			278.2	70.6		205.7
Upstream Blk Time (%)						0		
Queuing Penalty (veh)						0		
Storage Bay Dist (m)	45.0		50.0	50.0			50.0	
Storage Blk Time (%)		0		0		0		
Queuing Penalty (veh)		0		2		0		

Intersection: 41: Road B & Road A

Movement	EB	EB	WB	WB	NB
Directions Served	T	TR	L	T	LR
Maximum Queue (m)	9.2	20.4	21.6	19.4	13.1
Average Queue (m)	2.6	10.3	9.6	9.1	8.3
95th Queue (m)	9.2	16.1	17.7	16.2	13.5
Link Distance (m)	51.4	51.4	40.4	40.4	45.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 42: A Parking Access & Road A

Movement	EB	WB	NB	SB
Directions Served	TR	LT	LTR	LTR
Maximum Queue (m)	5.9	34.9	22.2	8.4
Average Queue (m)	0.4	7.0	11.4	1.2
95th Queue (m)	2.9	23.1	19.2	6.0
Link Distance (m)	40.4	58.9	36.6	41.4
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 43: Road B & B Parking Access

Movement	WB	NB	SB
Directions Served	LR	R	LT
Maximum Queue (m)	18.9	1.3	13.7
Average Queue (m)	6.8	0.0	2.5
95th Queue (m)	13.4	0.9	9.7
Link Distance (m)	32.1	46.2	45.7
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 44: Road B & Road F

Movement	EB	SB
Directions Served	LR	T
Maximum Queue (m)	19.2	5.0
Average Queue (m)	1.1	0.2
95th Queue (m)	8.4	2.7
Link Distance (m)	105.3	46.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		



# Queuing and Blocking Report

## Baseline

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### Intersection: 45: Road E & Road D

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	0.9	1.9	10.9
Average Queue (m)	0.0	0.1	4.0
95th Queue (m)	0.9	1.3	11.3
Link Distance (m)	13.9	131.9	199.2
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

### Network Summary

Network wide Queuing Penalty: 4881

## 2028 Peak PM of Street SimTraffic Results

Queuing and Blocking Report  
Baseline

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Intersection: 10: Carling & Parkdale

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	L	T	T	T	T	R	LR
Maximum Queue (m)	53.2	63.1	54.1	166.7	167.7	87.5	79.3
Average Queue (m)	24.4	27.7	19.3	73.8	76.7	20.2	36.4
95th Queue (m)	45.0	53.2	43.5	142.6	146.7	69.8	65.3
Link Distance (m)		316.0	316.0	174.6	174.6		272.5
Upstream Blk Time (%)				0	0		
Queuing Penalty (veh)				1	1		
Storage Bay Dist (m)	155.0					80.0	
Storage Blk Time (%)					8	0	
Queuing Penalty (veh)					8	0	

Intersection: 11: Carling & Civic

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	L	T	T	T	T	R	LR
Maximum Queue (m)	20.2	50.3	51.9	116.2	117.5	14.5	28.8
Average Queue (m)	6.3	14.0	11.8	41.4	42.0	0.5	9.7
95th Queue (m)	15.9	36.6	34.7	90.4	92.9	14.3	21.6
Link Distance (m)		174.6	174.6	189.4	189.4		49.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	90.0					140.0	
Storage Blk Time (%)					0	0	
Queuing Penalty (veh)					0	0	

Intersection: 12: Carling & Melrose

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	L	T	T	T	T	R	LR
Maximum Queue (m)	16.3	12.9	16.6	31.7	34.6	5.9	14.2
Average Queue (m)	4.5	1.1	1.2	2.8	3.3	0.2	4.0
95th Queue (m)	13.1	6.4	8.1	15.9	18.2	3.2	11.0
Link Distance (m)		189.4	189.4	239.5	239.5		211.1
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	25.0					20.0	
Storage Blk Time (%)	0				0		
Queuing Penalty (veh)	0				0		

Queuing and Blocking Report  
Baseline

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Intersection: 13: Maple/Old Irvine & Carling

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	LTR	LTR
Maximum Queue (m)	24.0	60.7	61.1	22.5	52.4	100.8	86.0	8.6	69.2	19.7
Average Queue (m)	7.7	22.1	23.2	4.5	10.3	53.4	39.2	0.5	33.0	6.0
95th Queue (m)	18.7	47.0	49.2	17.0	32.6	90.1	73.2	5.6	58.8	15.6
Link Distance (m)		239.5	239.5						166.9	225.8
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	20.0			15.0	45.0			25.0		
Storage Blk Time (%)	1	8	12	0	0	10	12	0		
Queuing Penalty (veh)	4	3	6	0	0	5	1	0		

Intersection: 14: Carling & Bayswater

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 15: Carling & Sherwood

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (m)	35.9	74.7	16.3	69.4	76.3	42.7	64.4	19.1
Average Queue (m)	35.9	63.8	7.1	20.3	21.9	7.3	29.3	2.3
95th Queue (m)	36.5	76.2	40.8	49.5	54.9	25.3	51.7	11.9
Link Distance (m)		114.2	114.2	143.4	143.4		138.3	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)	30.0					90.0		15.0
Storage Blk Time (%)	100				0	0	40	0
Queuing Penalty (veh)	324				0	0	3	0

Queuing and Blocking Report  
Baseline

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Intersection: 16: Road A/Champagne & Carling

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (m)	17.6	26.2	34.3	9.3	43.1	107.9	109.0	42.5	40.6	46.5	37.2	104.2
Average Queue (m)	4.2	8.3	10.7	0.9	6.8	61.4	66.9	23.9	16.2	19.6	30.7	34.3
95th Queue (m)	12.3	20.9	25.9	5.3	24.8	109.9	113.0	53.8	32.1	39.4	43.3	83.3
Link Distance (m)		143.4	143.4			103.7	103.7		58.9	58.9		481.7
Upstream Blk Time (%)						1	2		0	0		
Queuing Penalty (veh)						8	13		0	0		
Storage Bay Dist (m)	55.0			75.0	61.0			35.0			30.0	
Storage Blk Time (%)						11	23	0			23	1
Queuing Penalty (veh)						3	34	1			26	1

Intersection: 17: Carling & Trillium MUP

Movement	EB	EB	WB	WB
Directions Served	T	T	T	T
Maximum Queue (m)	52.2	51.8	89.6	92.7
Average Queue (m)	16.2	18.6	50.1	54.9
95th Queue (m)	39.9	43.0	84.4	88.5
Link Distance (m)	103.7	103.7	93.8	93.8
Upstream Blk Time (%)			0	0
Queuing Penalty (veh)			1	3
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report  
Baseline

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Intersection: 18: Preston & Carling

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	38.2	51.2	56.5	66.8	112.1	114.5	114.4	59.8	104.7	107.4	92.5	42.4
Average Queue (m)	14.0	23.1	20.8	34.7	66.0	73.6	81.1	9.0	50.8	36.0	20.5	32.5
95th Queue (m)	30.9	45.5	42.8	58.6	102.2	103.9	109.8	35.8	91.3	75.0	56.1	57.2
Link Distance (m)		93.8	93.8			165.0	165.0		129.7	129.7	129.7	
Upstream Blk Time (%)									0	0	0	
Queuing Penalty (veh)									0	0	1	
Storage Bay Dist (m)	70.0			90.0	120.0			95.0				35.0
Storage Blk Time (%)					0	0	3	0				9
Queuing Penalty (veh)					1	0	2	0				33

Intersection: 18: Preston & Carling

Movement	SB	B57
Directions Served	TR	T
Maximum Queue (m)	81.4	381.3
Average Queue (m)	72.3	276.0
95th Queue (m)	76.6	506.8
Link Distance (m)	50.0	416.8
Upstream Blk Time (%)	76	28
Queuing Penalty (veh)	0	0
Storage Bay Dist (m)		
Storage Blk Time (%)	74	
Queuing Penalty (veh)	70	

Intersection: 19: Carling & Rochester

Movement	EB	EB	WB	WB	SB
Directions Served	T	T	T	R	R
Maximum Queue (m)	12.0	8.8	28.1	4.4	66.1
Average Queue (m)	0.5	0.5	1.8	0.2	28.3
95th Queue (m)	5.1	4.7	12.5	2.4	53.8
Link Distance (m)	165.0	165.0	104.1		396.1
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)				30.0	
Storage Blk Time (%)			0		
Queuing Penalty (veh)			0		

Queuing and Blocking Report  
Baseline

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Intersection: 20: Carling & Booth

Movement	EB	EB	EB	WB	WB	B1	SB	SB
Directions Served	L	T	T	T	R	T	L	R
Maximum Queue (m)	55.4	60.8	53.8	233.1	37.5	9.9	236.8	37.5
Average Queue (m)	28.7	26.3	25.0	141.9	10.1	0.3	153.3	34.5
95th Queue (m)	48.7	50.3	45.0	227.7	34.2	9.7	264.9	46.1
Link Distance (m)		104.1	104.1	302.7		71.5	229.2	
Upstream Blk Time (%)						0	18	
Queuing Penalty (veh)						0	0	
Storage Bay Dist (m)	50.0				30.0			30.0
Storage Blk Time (%)	1	0		39	0		50	21
Queuing Penalty (veh)	4	1		35	1		138	56

Intersection: 21: Bronson & Carling/Glebe

Movement	EB	EB	EB	B1	B1	NB	NB	NB	SB	SB
Directions Served	L	LT	R	T	T	L	L	TR	T	TR
Maximum Queue (m)	47.8	93.1	88.6	55.3	30.8	57.4	398.5	405.0	310.8	313.6
Average Queue (m)	41.1	64.2	49.6	10.1	1.7	57.1	392.6	388.9	222.7	231.2
95th Queue (m)	57.1	100.2	83.6	52.7	21.6	58.0	412.2	439.9	357.8	364.4
Link Distance (m)		71.5	71.5	302.7	302.7		390.8	390.8	332.5	332.5
Upstream Blk Time (%)		14	4				56	37	1	2
Queuing Penalty (veh)		72	20				363	243	10	18
Storage Bay Dist (m)	40.0					50.0				
Storage Blk Time (%)	15	39				83	1			
Queuing Penalty (veh)	47	79				234	4			

Intersection: 22: Parkdale & 417 WB on/off

Movement	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	TR
Maximum Queue (m)	114.8	133.8	39.5	52.8	196.9
Average Queue (m)	51.4	64.8	18.3	22.6	175.6
95th Queue (m)	93.8	120.0	35.4	46.8	230.1
Link Distance (m)	152.4	152.4	55.6	55.6	183.6
Upstream Blk Time (%)	0	1		0	50
Queuing Penalty (veh)	0	0		1	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Queuing and Blocking Report  
Baseline

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Intersection: 23: Parkdale & 417 EB on/off

Movement	EB	EB	NB	NB	SB	SB
Directions Served	LT	R	T	TR	L	T
Maximum Queue (m)	116.3	77.0	96.2	37.5	61.2	59.7
Average Queue (m)	61.5	22.6	57.5	34.6	54.0	33.5
95th Queue (m)	100.7	60.3	115.8	43.7	68.8	59.0
Link Distance (m)	121.0		90.9		55.6	55.6
Upstream Blk Time (%)	0		5		13	1
Queuing Penalty (veh)	0		30		53	5
Storage Bay Dist (m)		75.0		30.0		
Storage Blk Time (%)	5	0	0	31		
Queuing Penalty (veh)	8	0	1	42		

Intersection: 24: Parkdale & Sherwood

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	31.7	34.9	75.3	86.8
Average Queue (m)	13.7	13.8	31.7	43.3
95th Queue (m)	25.9	26.9	60.1	76.9
Link Distance (m)	236.5	344.4	294.1	90.9
Upstream Blk Time (%)				0
Queuing Penalty (veh)				2
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 25: Parkdale & Ruskin

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	LTR	LTR
Maximum Queue (m)	26.6	17.9	29.2	58.9	56.5
Average Queue (m)	12.0	5.0	12.9	16.4	23.2
95th Queue (m)	23.6	13.9	24.4	38.2	47.2
Link Distance (m)	236.1		243.9	272.5	294.1
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)		40.0			
Storage Blk Time (%)					
Queuing Penalty (veh)					



Intersection: 27: Bayswater & Sherwood

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	18.9	17.7	7.0	35.3
Average Queue (m)	7.8	5.9	2.1	15.6
95th Queue (m)	15.1	13.0	7.3	26.5
Link Distance (m)	602.2	138.3		93.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 28: Driveway & Prince of Wales

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	30.6	11.9	218.0	278.7
Average Queue (m)	12.7	3.6	175.4	252.9
95th Queue (m)	23.4	11.2	281.2	329.3
Link Distance (m)	203.0	214.2	202.3	278.2
Upstream Blk Time (%)			63	2
Queuing Penalty (veh)			0	25
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 29: Navy/Navy Parking Access & Prince of Wales

Movement	EB	WB	NB	SB
Directions Served	TR	LTR	LTR	R
Maximum Queue (m)	84.1	32.2	10.0	17.9
Average Queue (m)	12.0	2.9	2.2	5.9
95th Queue (m)	50.9	23.9	8.2	14.6
Link Distance (m)	92.6	85.9	39.1	34.1
Upstream Blk Time (%)	0	0		0
Queuing Penalty (veh)	2	1		0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report  
Baseline

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Intersection: 30: Prince of Wales & Preston

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	L	T	L	T	R	LTR	LT	R
Maximum Queue (m)	52.4	92.4	56.1	12.3	192.7	52.5	6.2	114.3	124.4
Average Queue (m)	38.2	66.5	24.1	1.0	183.5	44.6	1.0	64.7	81.9
95th Queue (m)	63.2	101.6	46.2	8.4	192.0	74.8	4.2	104.7	117.6
Link Distance (m)		85.9	85.9		178.4		18.1	129.7	129.7
Upstream Blk Time (%)		7			65			0	0
Queuing Penalty (veh)		27			0			1	1
Storage Bay Dist (m)	45.0			30.0		45.0			
Storage Blk Time (%)	3	25			65	0			
Queuing Penalty (veh)	8	60			282	2			

Intersection: 31: Rochester & 417 WB on/Raymond

Movement	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	T	R
Maximum Queue (m)	48.1	72.6	38.3	61.7	53.4	38.9
Average Queue (m)	24.4	34.9	17.5	29.8	22.2	13.8
95th Queue (m)	41.1	60.0	31.8	51.8	41.2	28.0
Link Distance (m)	102.6	102.6	82.9	82.9	166.0	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						35.0
Storage Blk Time (%)					2	0
Queuing Penalty (veh)					3	0

Intersection: 32: Rochester & 417 EB off/Orangeville

Movement	EB	EB	NB	NB	SB	SB
Directions Served	LT	TR	T	TR	LT	T
Maximum Queue (m)	82.4	62.1	38.2	56.0	65.7	49.1
Average Queue (m)	49.4	27.3	11.3	27.2	34.7	9.1
95th Queue (m)	74.2	52.8	26.0	48.3	56.8	31.6
Link Distance (m)	116.5	116.5	101.7	101.7	82.9	82.9
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Queuing and Blocking Report  
Baseline

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Intersection: 33: Bronson & Catherine 417 WB on

Movement	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	LT	T	TR	L	T	T	T	TR
Maximum Queue (m)	129.7	125.0	104.1	63.6	73.0	60.7	59.9	184.7	181.3
Average Queue (m)	80.8	83.0	60.8	28.2	38.4	34.3	34.1	129.2	125.7
95th Queue (m)	115.5	115.6	95.8	50.9	65.5	56.6	55.9	234.9	231.3
Link Distance (m)	174.4	174.4	174.4	174.4	81.8	81.8	81.8	242.3	242.3
Upstream Blk Time (%)					0	0		8	8
Queuing Penalty (veh)					0	0		0	0
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 34: Bronson & 417 EB off

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	T	T	T	T
Maximum Queue (m)	98.0	67.5	60.9	65.5	87.1	87.8
Average Queue (m)	41.1	51.6	18.8	40.6	60.9	60.0
95th Queue (m)	91.6	76.0	44.4	68.5	95.0	94.7
Link Distance (m)	91.1		57.4	57.4	81.8	81.8
Upstream Blk Time (%)	4		0	3	1	1
Queuing Penalty (veh)	0		2	15	12	11
Storage Bay Dist (m)		60.0				
Storage Blk Time (%)	0	12				
Queuing Penalty (veh)	0	18				

Intersection: 35: Bronson & Plymouth/Imperial Chamberlain

Movement	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	T	TR
Maximum Queue (m)	270.1	292.9	37.6	65.4	59.9
Average Queue (m)	174.2	207.3	26.5	12.1	10.3
95th Queue (m)	293.8	309.6	40.4	48.3	43.2
Link Distance (m)	332.5	332.5		57.4	57.4
Upstream Blk Time (%)	0	0		1	1
Queuing Penalty (veh)	0	0		7	5
Storage Bay Dist (m)			30.0		
Storage Blk Time (%)			8	1	
Queuing Penalty (veh)			62	4	

Queuing and Blocking Report  
Baseline

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Intersection: 36: Bronson & Madawaska/Fifth

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (m)	95.8	128.4	246.4	247.5	153.2	160.3
Average Queue (m)	35.6	91.4	225.7	225.2	69.0	74.5
95th Queue (m)	100.0	152.2	292.8	291.0	137.0	143.8
Link Distance (m)	182.2	118.1	232.0	232.0	390.8	390.8
Upstream Blk Time (%)	2	44	81	83		
Queuing Penalty (veh)	0	0	0	0		
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 37: Road L & Road M/Road A

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 38: Maple & Winding/Road D

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	20.0	5.3	17.7	18.2
Average Queue (m)	8.9	1.8	9.0	9.2
95th Queue (m)	15.7	5.4	14.6	14.7
Link Distance (m)	183.3	13.9	131.4	166.9
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report  
Baseline

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Intersection: 39: Prince of Wales & Road B

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	TR	L	R
Maximum Queue (m)	16.7	67.7	80.0	42.5	22.7	11.7
Average Queue (m)	2.7	28.0	30.4	16.9	15.6	4.0
95th Queue (m)	11.1	53.5	74.0	47.5	25.9	11.6
Link Distance (m)		205.7	92.6		20.9	20.9
Upstream Blk Time (%)			1		13	0
Queuing Penalty (veh)			13		7	0
Storage Bay Dist (m)	45.0			35.0		
Storage Blk Time (%)		1	9	2		
Queuing Penalty (veh)		0	43	8		

Intersection: 40: Prince of Wales & Road E

Movement	EB	EB	NB	NB	NB	SB	SB	B86	B86
Directions Served	L	R	L	T	T	T	R	T	
Maximum Queue (m)	29.8	21.0	11.3	45.9	15.6	104.0	57.4	205.0	184.4
Average Queue (m)	10.7	4.2	1.2	15.6	1.3	66.2	8.9	85.8	57.6
95th Queue (m)	23.6	14.3	7.5	37.0	8.6	127.8	42.6	239.9	200.4
Link Distance (m)		167.7			278.2	70.6		205.7	205.7
Upstream Blk Time (%)						44		9	2
Queuing Penalty (veh)						447		44	9
Storage Bay Dist (m)	45.0		50.0	50.0			50.0		
Storage Blk Time (%)				0		48	0		
Queuing Penalty (veh)				0		7	1		

Intersection: 41: Road B & Road A

Movement	EB	EB	WB	WB	NB
Directions Served	T	TR	L	T	LR
Maximum Queue (m)	9.8	14.5	9.3	12.4	15.9
Average Queue (m)	3.0	7.3	2.9	6.0	7.6
95th Queue (m)	10.0	14.2	9.8	13.4	14.4
Link Distance (m)	51.4	51.4	39.0	39.0	45.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 42: A Parking Access & Road A

Movement	EB	WB	NB	SB
Directions Served	TR	LT	LTR	LTR
Maximum Queue (m)	1.7	2.5	28.4	8.4
Average Queue (m)	0.1	0.1	13.8	1.4
95th Queue (m)	1.2	1.5	22.4	6.4
Link Distance (m)	39.0	58.9	36.7	41.4
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 43: Road B & B Parking Access

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	21.9	2.7
Average Queue (m)	9.6	0.1
95th Queue (m)	17.2	1.8
Link Distance (m)	32.5	45.7
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 44: Road B & Road F

Movement	EB	NB	SB	SB
Directions Served	LR	LT	T	TR
Maximum Queue (m)	16.9	1.4	27.9	0.6
Average Queue (m)	1.1	0.0	3.9	0.0
95th Queue (m)	8.1	1.4	16.5	0.6
Link Distance (m)	105.3	20.9	42.5	42.5
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

# Queuing and Blocking Report

## Baseline

10/18/2022

### Intersection: 45: Road E & Road D

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	3.5	7.1
Average Queue (m)	0.1	3.0
95th Queue (m)	1.8	8.5
Link Distance (m)	131.9	199.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

### Network Summary

Network wide Queuing Penalty: 3144

## 2028 Peak PM of Generator SimTraffic Results



**Intersection: 10: Carling & Parkdale**

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	L	T	T	T	T	R	LR
Maximum Queue (m)	55.4	61.6	51.1	145.4	150.3	87.5	76.9
Average Queue (m)	25.5	27.3	16.4	61.2	62.5	18.8	30.1
95th Queue (m)	46.0	54.8	39.2	126.8	129.1	65.2	58.9
Link Distance (m)		316.0	316.0	174.6	174.6		272.5
Upstream Blk Time (%)				0	0		
Queuing Penalty (veh)				0	0		
Storage Bay Dist (m)	155.0					80.0	
Storage Blk Time (%)					6	0	
Queuing Penalty (veh)					8	0	

**Intersection: 11: Carling & Civic**

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	T	LR
Maximum Queue (m)	52.6	42.5	43.4	103.4	103.5	25.6
Average Queue (m)	22.2	12.0	11.0	43.6	44.6	8.2
95th Queue (m)	40.9	31.9	32.1	85.8	88.1	19.7
Link Distance (m)		174.6	174.6	189.4	189.4	49.6
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)	90.0					
Storage Blk Time (%)						
Queuing Penalty (veh)						

**Intersection: 12: Carling & Melrose**

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	L	T	T	T	T	R	LR
Maximum Queue (m)	10.6	6.2	8.5	19.8	19.4	3.3	13.8
Average Queue (m)	1.9	0.4	0.5	1.9	1.5	0.1	4.5
95th Queue (m)	7.9	3.6	5.1	10.4	9.7	2.7	11.6
Link Distance (m)		189.4	189.4	239.5	239.5		211.1
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	25.0					20.0	
Storage Blk Time (%)					0		
Queuing Penalty (veh)					0		

**Intersection: 13: Maple/Old Irvine & Carling**

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	LTR	LTR
Maximum Queue (m)	24.9	47.5	51.2	20.7	34.1	96.7	83.0	14.7	54.6	15.8
Average Queue (m)	9.0	15.6	17.4	4.2	5.5	48.9	35.9	0.8	26.6	3.8
95th Queue (m)	20.4	36.0	40.5	16.1	19.7	84.5	67.1	8.1	47.5	11.2
Link Distance (m)		239.5	239.5			191.1	191.1		166.9	225.8
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	20.0			15.0	45.0			25.0		
Storage Blk Time (%)	2	5	9	0		8	11	0		
Queuing Penalty (veh)	5	2	4	0		3	1	0		

**Intersection: 14: Carling & Bayswater**

Movement	WB
Directions Served	T
Maximum Queue (m)	0.9
Average Queue (m)	0.0
95th Queue (m)	0.9
Link Distance (m)	114.2
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

**Intersection: 15: Carling & Sherwood**

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (m)	35.4	56.1	11.2	53.4	59.9	27.2	67.4	20.5
Average Queue (m)	35.4	55.7	10.9	16.3	20.6	8.1	30.3	4.5
95th Queue (m)	36.7	59.3	47.0	39.1	44.9	20.5	54.5	17.3
Link Distance (m)				143.4	143.4		138.3	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)	30.0					90.0		15.0
Storage Blk Time (%)	100	0					37	0
Queuing Penalty (veh)	263	0					3	0

Intersection: 16: Road A/Champagne & Carling

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (m)	21.7	36.2	33.8	11.9	56.4	102.1	107.4	42.5	41.2	52.3	37.0	80.9
Average Queue (m)	4.0	10.2	10.3	1.9	13.3	49.1	56.8	20.6	18.2	22.6	24.9	22.1
95th Queue (m)	13.8	25.9	25.7	8.0	37.4	91.8	101.3	50.3	35.2	43.5	40.8	52.3
Link Distance (m)		143.4	143.4			103.7	103.7		58.9	58.9		481.7
Upstream Blk Time (%)						0	1			0		
Queuing Penalty (veh)						1	4			0		
Storage Bay Dist (m)	55.0			75.0	61.0			35.0			30.0	
Storage Blk Time (%)		0				6	21	0			10	1
Queuing Penalty (veh)		0				3	29	0			14	2

Intersection: 17: Carling & Trillium MUP

Movement	EB	EB	WB	WB
Directions Served	T	T	T	T
Maximum Queue (m)	49.6	56.0	72.9	81.2
Average Queue (m)	18.1	18.0	30.5	40.7
95th Queue (m)	40.3	41.1	60.3	72.0
Link Distance (m)	103.7	103.7	93.8	93.8
Upstream Blk Time (%)			0	0
Queuing Penalty (veh)			0	0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: Preston & Carling

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	44.0	55.0	46.8	56.3	115.8	106.2	104.4	27.1	107.1	116.1	98.3	42.3
Average Queue (m)	18.8	22.4	18.9	25.0	74.9	58.5	65.3	7.8	52.9	42.7	23.0	36.7
95th Queue (m)	40.2	47.5	42.1	48.2	118.1	101.5	93.5	19.9	94.0	89.5	64.5	54.5
Link Distance (m)		93.8	93.8			165.0	165.0		129.7	129.7	129.7	
Upstream Blk Time (%)		0	0	0		0			0	0	0	
Queuing Penalty (veh)		1	1	0		1			1	1	1	
Storage Bay Dist (m)	70.0			90.0	120.0			95.0				35.0
Storage Blk Time (%)	1	0	0	0	3		1					23
Queuing Penalty (veh)	2	0	1	0	12		0					85

Intersection: 18: Preston & Carling

Movement	SB	B57
Directions Served	TR	T
Maximum Queue (m)	79.5	419.4
Average Queue (m)	71.6	271.5
95th Queue (m)	79.8	497.5
Link Distance (m)	50.0	416.8
Upstream Blk Time (%)	76	22
Queuing Penalty (veh)	0	0
Storage Bay Dist (m)		
Storage Blk Time (%)	67	
Queuing Penalty (veh)	74	

Intersection: 19: Carling & Rochester

Movement	EB	EB	WB	WB	SB
Directions Served	T	T	T	R	R
Maximum Queue (m)	7.4	6.6	27.1	9.5	69.9
Average Queue (m)	0.4	0.5	2.3	0.3	29.8
95th Queue (m)	4.2	4.4	20.3	4.6	57.3
Link Distance (m)	165.0	165.0	104.1		396.1
Upstream Blk Time (%)			0		
Queuing Penalty (veh)			0		
Storage Bay Dist (m)				30.0	
Storage Blk Time (%)			0		
Queuing Penalty (veh)			0		

**Intersection: 20: Carling & Booth**

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	R	L	R
Maximum Queue (m)	56.0	60.7	59.2	182.3	37.5	152.7	37.5
Average Queue (m)	24.3	27.4	25.6	96.1	13.1	71.6	33.0
95th Queue (m)	45.4	51.4	48.6	172.6	36.4	129.3	46.7
Link Distance (m)		104.1	104.1	302.7		229.2	
Upstream Blk Time (%)						0	
Queuing Penalty (veh)						0	
Storage Bay Dist (m)	50.0				30.0		30.0
Storage Blk Time (%)	0	1		30	0	28	11
Queuing Penalty (veh)	2	2		33	0	71	29

**Intersection: 21: Bronson & Carling/Glebe**

Movement	EB	EB	EB	B1	B1	NB	NB	NB	SB	SB
Directions Served	L	LT	R	T	T	L	L	TR	T	TR
Maximum Queue (m)	47.5	94.4	80.5	46.9	2.2	57.4	398.2	407.2	343.5	344.2
Average Queue (m)	41.7	65.8	37.5	5.3	0.1	57.1	390.6	381.6	307.2	310.4
95th Queue (m)	56.7	102.4	67.9	26.1	1.8	58.0	415.6	469.4	393.2	392.8
Link Distance (m)		71.5	71.5	302.7	302.7		390.8	390.8	332.5	332.5
Upstream Blk Time (%)		11	1				47	31	15	18
Queuing Penalty (veh)		53	6				314	207	110	138
Storage Bay Dist (m)	40.0					50.0				
Storage Blk Time (%)	13	34				83	1			
Queuing Penalty (veh)	41	71				198	3			

**Intersection: 22: Parkdale & 417 WB on/off**

Movement	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	TR
Maximum Queue (m)	76.8	98.7	49.0	53.8	199.0
Average Queue (m)	37.9	43.2	21.7	19.4	175.6
95th Queue (m)	63.8	77.7	41.6	44.3	234.9
Link Distance (m)	152.4	152.4	55.6	55.6	183.6
Upstream Blk Time (%)			0	0	54
Queuing Penalty (veh)			1	1	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 23: Parkdale & 417 EB on/off

Movement	EB	EB	NB	NB	SB	SB
Directions Served	LT	R	T	TR	L	T
Maximum Queue (m)	100.0	65.4	96.5	37.5	61.2	52.2
Average Queue (m)	53.7	16.0	70.4	36.1	56.1	20.4
95th Queue (m)	85.8	41.1	119.7	42.1	67.4	45.2
Link Distance (m)	121.0		90.9		55.6	55.6
Upstream Blk Time (%)	0		8		19	0
Queuing Penalty (veh)	0		49		70	1
Storage Bay Dist (m)		75.0		30.0		
Storage Blk Time (%)	2	0	0	40		
Queuing Penalty (veh)	3	0	1	44		

Intersection: 24: Parkdale & Sherwood

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	31.3	32.2	89.4	79.3
Average Queue (m)	14.0	14.6	34.5	40.6
95th Queue (m)	27.2	27.6	69.0	71.5
Link Distance (m)	236.5	344.4	294.1	90.9
Upstream Blk Time (%)				0
Queuing Penalty (veh)				1
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 25: Parkdale & Ruskin

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	LTR	LTR
Maximum Queue (m)	29.5	16.9	25.1	45.8	57.5
Average Queue (m)	10.9	4.9	10.7	15.8	22.3
95th Queue (m)	23.0	13.7	21.3	36.2	44.3
Link Distance (m)	236.1		243.9	272.5	294.1
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)		40.0			
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 27: Bayswater & Sherwood**

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	16.4	19.1	7.1	24.0
Average Queue (m)	7.2	6.7	1.9	10.4
95th Queue (m)	14.4	14.5	7.1	17.7
Link Distance (m)	602.2	138.3		93.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 28: Driveway & Prince of Wales**

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	36.7	11.8	130.4	219.5
Average Queue (m)	12.8	3.0	31.5	100.8
95th Queue (m)	26.2	10.4	96.1	198.9
Link Distance (m)	203.0	214.2	202.3	278.2
Upstream Blk Time (%)			0	0
Queuing Penalty (veh)			0	0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 29: Navy/Navy Parking Access & Prince of Wales**

Movement	EB	WB	NB	SB
Directions Served	TR	TR	LTR	R
Maximum Queue (m)	93.2	15.1	11.2	15.8
Average Queue (m)	34.1	0.7	2.2	5.6
95th Queue (m)	96.1	7.9	9.1	13.6
Link Distance (m)	92.6	85.9	39.1	34.1
Upstream Blk Time (%)	3			
Queuing Penalty (veh)	20			
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 30: Prince of Wales & Preston

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	L	TR	L	T	R	LTR	LT	R
Maximum Queue (m)	52.4	92.8	50.9	19.1	191.2	52.5	16.8	78.7	128.8
Average Queue (m)	42.4	79.3	18.5	1.2	147.5	43.3	6.2	34.7	91.1
95th Queue (m)	66.3	106.5	38.9	9.3	230.5	75.8	17.8	64.3	127.5
Link Distance (m)		85.9	85.9		178.4		18.1	129.7	129.7
Upstream Blk Time (%)		17			30		16		1
Queuing Penalty (veh)		66			0		0		3
Storage Bay Dist (m)	45.0			30.0		45.0			
Storage Blk Time (%)	5	37			59	0			
Queuing Penalty (veh)	13	104			231	1			

Intersection: 31: Rochester & 417 WB on/Raymond

Movement	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	T	R
Maximum Queue (m)	38.8	69.1	42.9	55.6	44.7	39.3
Average Queue (m)	17.9	33.0	17.3	26.0	16.7	15.3
95th Queue (m)	32.6	57.7	33.0	45.6	33.5	29.4
Link Distance (m)	102.6	102.6	82.9	82.9	166.0	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						35.0
Storage Blk Time (%)					1	0
Queuing Penalty (veh)					2	0

Intersection: 32: Rochester & 417 EB off/Orangeville

Movement	EB	EB	NB	NB	SB	SB
Directions Served	LT	TR	T	TR	LT	T
Maximum Queue (m)	82.8	55.4	27.7	49.9	44.8	28.8
Average Queue (m)	45.4	21.3	9.8	20.1	22.9	3.5
95th Queue (m)	69.3	44.8	22.3	40.2	39.8	16.6
Link Distance (m)	116.5	116.5	101.7	101.7	82.9	82.9
Upstream Blk Time (%)	0					
Queuing Penalty (veh)	0					
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						



**Intersection: 33: Bronson & Catherine 417 WB on**

Movement	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	LT	T	TR	L	T	T	T	TR
Maximum Queue (m)	167.1	163.4	147.8	99.9	74.4	64.0	64.3	249.4	247.1
Average Queue (m)	111.4	108.7	84.6	40.0	38.1	39.3	39.4	183.7	179.2
95th Queue (m)	177.9	169.9	153.7	91.9	64.8	59.5	59.5	292.6	289.4
Link Distance (m)	174.4	174.4	174.4	174.4	81.8	81.8	81.8	242.3	242.3
Upstream Blk Time (%)	8	7	3	0	0			23	23
Queuing Penalty (veh)	0	0	0	0	0			0	0
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

**Intersection: 34: Bronson & 417 EB off**

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	T	T	T	T
Maximum Queue (m)	101.7	67.5	64.2	65.3	90.9	91.1
Average Queue (m)	71.7	61.4	22.7	41.8	74.4	73.8
95th Queue (m)	127.2	79.0	49.3	69.7	100.7	100.5
Link Distance (m)	91.1		57.4	57.4	81.8	81.8
Upstream Blk Time (%)	37		1	3	7	7
Queuing Penalty (veh)	0		3	14	56	52
Storage Bay Dist (m)		60.0				
Storage Blk Time (%)	1	45				
Queuing Penalty (veh)	2	65				

**Intersection: 35: Bronson & Plymouth/Imperial Chamberlain**

Movement	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	T	TR
Maximum Queue (m)	333.3	337.1	37.4	67.8	67.1
Average Queue (m)	254.5	278.6	30.3	39.7	39.7
95th Queue (m)	387.2	391.3	44.6	84.8	85.0
Link Distance (m)	332.5	332.5		57.4	57.4
Upstream Blk Time (%)	2	10		7	9
Queuing Penalty (veh)	12	56		63	81
Storage Bay Dist (m)			30.0		
Storage Blk Time (%)			8	17	
Queuing Penalty (veh)			62	46	

**Intersection: 36: Bronson & Madawaska/Fifth**

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (m)	76.2	106.7	246.9	247.1	132.8	137.4
Average Queue (m)	25.9	50.4	213.6	213.9	59.0	62.0
95th Queue (m)	66.6	97.7	313.3	311.9	122.3	126.6
Link Distance (m)	182.2	118.1	232.0	232.0	390.8	390.8
Upstream Blk Time (%)		2	73	76		
Queuing Penalty (veh)		0	0	0		
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

**Intersection: 37: Road L & Road M/Road A**

Movement	EB	NB
Directions Served	T	R
Maximum Queue (m)	0.6	0.6
Average Queue (m)	0.0	0.0
95th Queue (m)	0.6	0.6
Link Distance (m)	34.2	24.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 38: Maple & Winding/Road D**

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	18.2	6.0	18.8	17.2
Average Queue (m)	8.9	2.4	9.5	9.8
95th Queue (m)	15.0	6.2	15.9	15.1
Link Distance (m)	183.3	13.9	131.4	166.9
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 39: Prince of Wales & Road B**

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	TR	L	R
Maximum Queue (m)	24.2	106.8	63.0	42.4	22.7	13.3
Average Queue (m)	3.7	37.5	25.2	15.1	16.2	4.5
95th Queue (m)	14.6	84.3	54.4	43.3	25.8	12.2
Link Distance (m)		205.7	92.6		20.9	20.9
Upstream Blk Time (%)		0	0		13	0
Queuing Penalty (veh)		0	1		8	0
Storage Bay Dist (m)	45.0			35.0		
Storage Blk Time (%)		4	3	0		
Queuing Penalty (veh)		1	11	1		

**Intersection: 40: Prince of Wales & Road E**

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	R
Maximum Queue (m)	21.4	14.1	14.6	51.1	22.7	67.0	15.7
Average Queue (m)	8.9	3.5	1.6	20.6	1.4	19.6	1.3
95th Queue (m)	19.5	10.7	8.2	45.1	11.7	53.2	8.7
Link Distance (m)		167.7			278.2	70.6	
Upstream Blk Time (%)						0	
Queuing Penalty (veh)						1	
Storage Bay Dist (m)	45.0		50.0	50.0			50.0
Storage Blk Time (%)				0		1	
Queuing Penalty (veh)				1		0	

**Intersection: 41: Road B & Road A**

Movement	EB	EB	WB	WB	NB
Directions Served	T	TR	L	T	LR
Maximum Queue (m)	9.8	16.2	12.8	15.8	15.7
Average Queue (m)	3.5	8.5	4.3	6.9	8.1
95th Queue (m)	10.8	14.5	12.4	14.7	14.1
Link Distance (m)	51.4	51.4	39.0	39.0	45.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 42: A Parking Access & Road A**

Movement	WB	NB	SB
Directions Served	LT	LTR	LTR
Maximum Queue (m)	6.7	28.3	9.2
Average Queue (m)	0.5	15.0	1.4
95th Queue (m)	4.0	23.7	6.7
Link Distance (m)	58.9	36.7	41.4
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 43: Road B & B Parking Access**

Movement	WB	NB	SB
Directions Served	LR	R	LT
Maximum Queue (m)	22.5	0.9	2.8
Average Queue (m)	10.2	0.0	0.1
95th Queue (m)	18.1	0.9	1.9
Link Distance (m)	32.5	42.5	45.7
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 44: Road B & Road F**

Movement	EB	SB
Directions Served	LR	T
Maximum Queue (m)	15.4	27.0
Average Queue (m)	1.2	3.8
95th Queue (m)	8.1	15.5
Link Distance (m)	105.3	42.5
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Intersection: 45: Road E & Road D

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Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	1.8	9.0
Average Queue (m)	0.1	3.9
95th Queue (m)	1.5	9.6
Link Distance (m)	131.9	199.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Network Summary

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Network wide Queuing Penalty: 2949

## 2048 Peak AM SimTraffic Results

**Intersection: 10: Carling & Parkdale**

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	L	T	T	T	T	R	LR
Maximum Queue (m)	79.0	229.3	229.0	57.3	57.8	23.2	261.5
Average Queue (m)	19.6	120.0	113.5	23.7	23.7	7.0	122.2
95th Queue (m)	54.2	262.1	261.7	49.7	51.4	17.7	291.6
Link Distance (m)		225.6	225.6	174.6	174.6		272.5
Upstream Blk Time (%)		36	34				25
Queuing Penalty (veh)		0	0				60
Storage Bay Dist (m)	155.0					80.0	
Storage Blk Time (%)		37					
Queuing Penalty (veh)		42					

**Intersection: 11: Carling & Civic**

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	T	LR
Maximum Queue (m)	24.3	176.5	176.9	39.1	43.1	46.1
Average Queue (m)	3.2	93.2	93.2	15.8	17.0	19.2
95th Queue (m)	15.3	214.6	215.0	33.3	37.9	48.9
Link Distance (m)		174.6	174.6	189.4	189.4	49.6
Upstream Blk Time (%)		41	41			21
Queuing Penalty (veh)		234	235			0
Storage Bay Dist (m)	90.0					
Storage Blk Time (%)		43				
Queuing Penalty (veh)		16				

**Intersection: 12: Carling & Melrose**

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	T	LR
Maximum Queue (m)	10.1	193.8	192.8	10.2	11.6	83.4
Average Queue (m)	0.9	94.5	94.4	0.6	0.7	28.0
95th Queue (m)	5.3	247.8	246.8	5.5	6.8	87.6
Link Distance (m)		189.4	189.4	239.5	239.5	211.1
Upstream Blk Time (%)		44	45			
Queuing Penalty (veh)		247	255			
Storage Bay Dist (m)	25.0					
Storage Blk Time (%)		49			0	
Queuing Penalty (veh)		9			0	

**Intersection: 13: Maple/Old Irvine & Carling**

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	LTR	LTR
Maximum Queue (m)	18.4	241.9	242.9	20.2	25.6	45.5	39.2	5.2	136.8	44.2
Average Queue (m)	2.2	150.2	153.3	2.4	8.4	21.2	14.9	0.3	56.6	12.9
95th Queue (m)	10.4	309.6	309.1	12.9	20.9	40.2	33.0	3.6	162.2	48.1
Link Distance (m)		239.5	239.5			191.1	191.1		166.9	225.8
Upstream Blk Time (%)		50	50						17	
Queuing Penalty (veh)		283	284						14	
Storage Bay Dist (m)	20.0			15.0	45.0			25.0		
Storage Blk Time (%)	0	64	66	0	0	0	2			
Queuing Penalty (veh)	0	17	34	0	0	0	0			

**Intersection: 14: Carling & Bayswater**

Movement	EB	EB	WB
Directions Served	T	T	T
Maximum Queue (m)	194.4	195.0	0.9
Average Queue (m)	128.5	121.0	0.0
95th Queue (m)	259.9	265.3	0.9
Link Distance (m)	191.1	191.1	114.2
Upstream Blk Time (%)	56	56	
Queuing Penalty (veh)	287	286	
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 15: Carling & Sherwood**

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (m)	35.8	116.0	99.4	35.4	37.9	17.8	65.3	20.8
Average Queue (m)	35.7	109.0	61.6	10.9	13.3	7.0	33.2	2.4
95th Queue (m)	37.2	134.7	151.9	26.3	29.2	16.1	56.9	12.7
Link Distance (m)		114.2	114.2	143.4	143.4		138.3	
Upstream Blk Time (%)		83	45					
Queuing Penalty (veh)		84	45					
Storage Bay Dist (m)	30.0					90.0		15.0
Storage Blk Time (%)	100	0					41	0
Queuing Penalty (veh)	465	0					2	0



Intersection: 16: Road A/Champagne & Carling

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (m)	25.1	40.1	45.2	38.9	68.3	102.9	83.1	28.8	43.9	45.1	37.3	82.2
Average Queue (m)	4.7	14.4	15.2	10.6	45.0	21.9	19.6	3.5	18.4	18.3	31.4	26.4
95th Queue (m)	16.6	31.3	34.0	29.5	70.7	69.7	55.9	14.9	35.8	35.1	41.9	66.7
Link Distance (m)		143.4	143.4			103.7	103.7		58.9	58.9		481.7
Upstream Blk Time (%)						1	0			0		
Queuing Penalty (veh)						3	0			0		
Storage Bay Dist (m)	55.0			75.0	61.0			35.0			30.0	
Storage Blk Time (%)		0	0		7	0	3	0			21	0
Queuing Penalty (veh)		0	0		22	1	2	0			19	0

Intersection: 17: Carling & Trillium MUP

Movement	EB	EB	WB	WB
Directions Served	T	T	T	T
Maximum Queue (m)	50.3	45.9	77.2	80.0
Average Queue (m)	22.3	21.2	39.9	38.2
95th Queue (m)	44.2	41.7	72.2	72.6
Link Distance (m)	103.7	103.7	93.8	93.8
Upstream Blk Time (%)			0	0
Queuing Penalty (veh)			0	0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: Preston & Carling

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	49.1	73.5	67.0	54.1	100.1	64.8	63.4	20.3	94.3	121.1	135.9	42.4
Average Queue (m)	16.0	36.2	29.1	23.4	55.0	34.4	36.1	7.9	40.7	71.6	67.8	34.7
95th Queue (m)	35.5	64.6	57.3	44.7	89.5	57.0	57.2	16.6	78.5	112.7	124.6	52.5
Link Distance (m)		93.8	93.8			165.0	165.0		129.7	129.7	129.7	
Upstream Blk Time (%)		0								0	1	
Queuing Penalty (veh)		1								1	3	
Storage Bay Dist (m)	70.0			90.0	120.0			95.0				35.0
Storage Blk Time (%)	0	1			0							19
Queuing Penalty (veh)	0	1			0							58

Intersection: 18: Preston & Carling

Movement	SB	B57
Directions Served	TR	T
Maximum Queue (m)	76.0	162.0
Average Queue (m)	64.6	69.2
95th Queue (m)	86.8	248.7
Link Distance (m)	50.0	416.8
Upstream Blk Time (%)	43	3
Queuing Penalty (veh)	0	0
Storage Bay Dist (m)		
Storage Blk Time (%)	44	
Queuing Penalty (veh)	47	

Intersection: 19: Carling & Rochester

Movement	EB	EB	WB	WB	SB
Directions Served	T	T	T	R	R
Maximum Queue (m)	36.2	22.1	7.5	15.2	31.8
Average Queue (m)	8.2	6.4	0.5	1.8	13.1
95th Queue (m)	54.2	46.1	4.6	8.9	23.7
Link Distance (m)	165.0	165.0	104.1		396.1
Upstream Blk Time (%)	0				
Queuing Penalty (veh)	0				
Storage Bay Dist (m)				30.0	
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 20: Carling & Booth**

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	R	L	R
Maximum Queue (m)	57.1	90.5	76.1	170.8	37.5	133.2	37.5
Average Queue (m)	36.7	41.8	38.9	93.3	21.8	65.8	29.5
95th Queue (m)	61.8	90.7	86.1	164.6	46.8	160.3	48.0
Link Distance (m)		104.1	104.1	302.7		229.2	
Upstream Blk Time (%)		5	4			7	
Queuing Penalty (veh)		28	21			0	
Storage Bay Dist (m)	50.0				30.0		30.0
Storage Blk Time (%)	4	11		36	0	29	3
Queuing Penalty (veh)	20	37		62	1	51	7

**Intersection: 21: Bronson & Carling/Glebe**

Movement	EB	EB	EB	B1	B1	NB	NB	NB	SB	SB
Directions Served	L	LT	R	T	T	L	L	TR	T	TR
Maximum Queue (m)	47.5	101.3	89.9	211.2	195.5	57.4	400.8	407.2	103.7	116.7
Average Queue (m)	46.1	85.4	46.0	124.8	102.0	57.3	390.4	384.3	63.3	75.0
95th Queue (m)	52.0	113.0	87.5	310.3	303.8	57.8	419.0	460.9	94.5	108.1
Link Distance (m)		71.5	71.5	302.7	302.7		390.8	390.8	332.5	332.5
Upstream Blk Time (%)		56	5	6	6		31	22		
Queuing Penalty (veh)		325	31	35	33		259	184		
Storage Bay Dist (m)	40.0					50.0				
Storage Blk Time (%)	37	67				80	2			
Queuing Penalty (veh)	131	173				214	5			

**Intersection: 22: Parkdale & 417 WB on/off**

Movement	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	TR
Maximum Queue (m)	113.6	105.8	58.7	54.0	193.9
Average Queue (m)	50.5	49.9	30.5	21.7	132.2
95th Queue (m)	109.7	103.2	55.7	45.8	224.0
Link Distance (m)	152.4	152.4	55.6	55.6	183.6
Upstream Blk Time (%)	8	3	2	0	26
Queuing Penalty (veh)	0	0	6	1	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 23: Parkdale & 417 EB on/off**

Movement	EB	EB	NB	NB	SB	SB
Directions Served	LT	R	T	TR	L	T
Maximum Queue (m)	109.3	75.8	95.9	37.5	60.6	55.3
Average Queue (m)	45.1	23.7	54.7	33.0	44.1	21.3
95th Queue (m)	95.0	62.6	110.9	46.2	74.8	51.1
Link Distance (m)	121.0		90.9		55.6	55.6
Upstream Blk Time (%)	9		5		10	12
Queuing Penalty (veh)	0		31		33	39
Storage Bay Dist (m)		75.0		30.0		
Storage Blk Time (%)	4	10	1	28		
Queuing Penalty (veh)	6	19	6	40		

**Intersection: 24: Parkdale & Sherwood**

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	79.4	36.6	71.1	88.0
Average Queue (m)	25.0	14.7	25.7	47.0
95th Queue (m)	80.9	29.3	56.6	87.2
Link Distance (m)	236.5	344.4	294.1	90.9
Upstream Blk Time (%)	1			15
Queuing Penalty (veh)	0			60
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 25: Parkdale & Ruskin**

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	LTR	LTR
Maximum Queue (m)	117.2	22.4	25.9	51.5	219.7
Average Queue (m)	33.3	5.3	11.1	16.1	77.6
95th Queue (m)	115.5	20.6	21.8	37.2	258.2
Link Distance (m)	236.1		243.9	272.5	294.1
Upstream Blk Time (%)	2				16
Queuing Penalty (veh)	0				55
Storage Bay Dist (m)		40.0			
Storage Blk Time (%)		3	0		
Queuing Penalty (veh)		3	0		

**Intersection: 27: Bayswater & Sherwood**

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	20.5	13.7	7.9	20.3
Average Queue (m)	9.8	5.0	1.8	10.0
95th Queue (m)	17.8	10.7	6.9	16.6
Link Distance (m)	602.2	138.3		93.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 28: Driveway & Prince of Wales**

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	32.0	9.3	258.4	53.2
Average Queue (m)	12.7	2.0	242.9	17.3
95th Queue (m)	25.4	8.1	293.1	41.7
Link Distance (m)	203.0	214.2	239.9	278.2
Upstream Blk Time (%)			89	
Queuing Penalty (veh)			0	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 29: Navy/Navy Parking Access & Prince of Wales**

Movement	EB	WB	NB	SB
Directions Served	TR	LTR	LTR	R
Maximum Queue (m)	94.8	46.2	5.6	8.5
Average Queue (m)	28.1	2.8	0.4	1.6
95th Queue (m)	86.6	23.9	3.1	7.0
Link Distance (m)	92.6	85.9	39.1	34.1
Upstream Blk Time (%)	2	0		
Queuing Penalty (veh)	20	1		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 30: Prince of Wales & Preston**

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	L	TR	T	R	LTR	LT	R
Maximum Queue (m)	52.4	92.9	38.1	134.7	52.5	7.8	74.1	115.6
Average Queue (m)	39.0	77.1	12.9	52.7	19.5	1.0	39.9	57.8
95th Queue (m)	66.5	105.1	30.6	104.2	60.8	4.9	68.0	99.5
Link Distance (m)		85.9	85.9	178.4		18.1	129.7	129.7
Upstream Blk Time (%)		13		0				0
Queuing Penalty (veh)		62		0				1
Storage Bay Dist (m)	45.0				45.0			
Storage Blk Time (%)	1	34		26	1			
Queuing Penalty (veh)	5	122		80	1			

**Intersection: 31: Rochester & 417 WB on/Raymond**

Movement	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	T	R
Maximum Queue (m)	51.4	56.0	33.4	42.6	33.1	37.2
Average Queue (m)	26.6	23.9	14.1	18.0	15.2	16.0
95th Queue (m)	43.2	44.3	26.3	34.6	29.5	28.9
Link Distance (m)	102.6	102.6	82.9	82.9	166.0	
Upstream Blk Time (%)				0		
Queuing Penalty (veh)				0		
Storage Bay Dist (m)						35.0
Storage Blk Time (%)					0	0
Queuing Penalty (veh)					1	1

**Intersection: 32: Rochester & 417 EB off/Orangeville**

Movement	EB	EB	NB	NB	SB	SB
Directions Served	LT	TR	T	TR	LT	T
Maximum Queue (m)	59.7	58.6	29.9	42.5	54.1	35.0
Average Queue (m)	32.4	24.5	9.7	20.0	29.0	6.0
95th Queue (m)	50.7	44.1	22.4	36.8	47.5	21.6
Link Distance (m)	116.5	116.5	101.7	101.7	82.9	82.9
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

**Intersection: 33: Bronson & Catherine 417 WB on**

Movement	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	LT	T	TR	L	T	T	T	TR
Maximum Queue (m)	93.1	99.6	86.0	69.2	84.4	72.6	73.1	71.0	67.9
Average Queue (m)	59.7	65.1	44.8	31.7	54.1	44.7	45.4	41.9	38.4
95th Queue (m)	86.4	89.8	77.1	55.9	85.3	67.1	67.8	62.5	61.4
Link Distance (m)	174.4	174.4	174.4	174.4	81.8	81.8	81.8	236.0	236.0
Upstream Blk Time (%)					2	0	0		
Queuing Penalty (veh)					9	0	0		
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

**Intersection: 34: Bronson & 417 EB off**

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	T	T	T	T
Maximum Queue (m)	97.0	67.5	68.5	66.1	75.2	76.5
Average Queue (m)	52.9	42.8	33.8	50.1	33.0	30.7
95th Queue (m)	90.3	72.4	66.4	74.9	65.8	64.6
Link Distance (m)	91.1		57.4	57.4	81.8	81.8
Upstream Blk Time (%)	2		2	8	0	0
Queuing Penalty (veh)	0		15	47	0	0
Storage Bay Dist (m)		60.0				
Storage Blk Time (%)	5	2				
Queuing Penalty (veh)	19	6				

**Intersection: 35: Bronson & Plymouth/Imperial Chamberlain**

Movement	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	T	TR
Maximum Queue (m)	346.7	346.9	36.2	46.6	33.5
Average Queue (m)	291.0	308.6	20.0	3.6	1.6
95th Queue (m)	374.4	372.3	33.9	25.6	15.6
Link Distance (m)	332.5	332.5		57.4	57.4
Upstream Blk Time (%)	5	15		0	0
Queuing Penalty (veh)	32	97		2	0
Storage Bay Dist (m)			30.0		
Storage Blk Time (%)			4		
Queuing Penalty (veh)			20		

**Intersection: 36: Bronson & Madawaska/Fifth**

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (m)	32.5	73.7	208.7	211.4	82.9	84.2
Average Queue (m)	9.8	32.0	184.6	185.6	36.3	39.8
95th Queue (m)	23.8	59.0	258.0	257.1	72.5	74.7
Link Distance (m)	182.2	118.1	195.0	195.0	390.8	390.8
Upstream Blk Time (%)			74	75		
Queuing Penalty (veh)			0	0		
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

**Intersection: 37: Road L & Road M/Road A**

Movement	EB	NB
Directions Served	T	R
Maximum Queue (m)	2.1	3.7
Average Queue (m)	0.1	0.2
95th Queue (m)	1.2	1.9
Link Distance (m)	34.2	24.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 38: Maple & Winding/Road D**

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	69.1	9.0	74.5	21.0
Average Queue (m)	15.8	2.7	17.1	10.4
95th Queue (m)	56.9	9.2	64.0	16.7
Link Distance (m)	183.3	13.9	131.4	166.9
Upstream Blk Time (%)		7	2	
Queuing Penalty (veh)		1	0	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				



**Intersection: 39: Prince of Wales & Road B**

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	TR	L	R
Maximum Queue (m)	40.1	118.1	69.8	42.5	22.0	17.5
Average Queue (m)	10.0	40.8	23.6	13.0	10.9	5.9
95th Queue (m)	27.2	87.9	52.0	37.4	21.9	14.8
Link Distance (m)		205.7	92.6		20.9	20.9
Upstream Blk Time (%)			0		3	0
Queuing Penalty (veh)			1		2	0
Storage Bay Dist (m)	45.0			35.0		
Storage Blk Time (%)		5	2	0		
Queuing Penalty (veh)		3	10	1		

**Intersection: 40: Prince of Wales & Road E**

Movement	EB	EB	NB	NB	NB	SB	SB	B86
Directions Served	L	R	L	T	T	T	R	T
Maximum Queue (m)	22.0	23.1	15.3	53.0	14.3	67.2	42.1	1.3
Average Queue (m)	7.4	5.8	4.2	21.4	0.7	13.7	5.7	0.0
95th Queue (m)	17.7	16.8	12.5	48.3	8.2	42.7	22.8	1.2
Link Distance (m)		167.7			278.2	70.6		205.7
Upstream Blk Time (%)						0		
Queuing Penalty (veh)						1		
Storage Bay Dist (m)	45.0		50.0	50.0			50.0	
Storage Blk Time (%)				0		0	0	
Queuing Penalty (veh)				1		1	0	

**Intersection: 41: Road B & Road A**

Movement	EB	EB	WB	WB	NB
Directions Served	T	TR	L	T	LR
Maximum Queue (m)	9.3	22.2	24.0	20.6	19.2
Average Queue (m)	3.1	11.3	10.9	9.5	9.9
95th Queue (m)	10.1	18.0	19.1	16.9	15.7
Link Distance (m)	51.4	51.4	40.4	40.4	45.7
Upstream Blk Time (%)			0		
Queuing Penalty (veh)			0		
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 42: A Parking Access & Road A**

Movement	EB	WB	NB	SB
Directions Served	TR	LT	LTR	LTR
Maximum Queue (m)	6.6	42.7	28.6	8.5
Average Queue (m)	0.8	10.9	13.9	1.3
95th Queue (m)	4.0	30.0	23.2	6.2
Link Distance (m)	40.4	58.9	36.6	41.4
Upstream Blk Time (%)		0	0	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 43: Road B & B Parking Access**

Movement	WB	NB	SB
Directions Served	LR	R	LT
Maximum Queue (m)	20.5	3.5	17.8
Average Queue (m)	8.8	0.1	3.7
95th Queue (m)	16.4	1.7	12.4
Link Distance (m)	32.1	46.2	45.7
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 44: Road B & Road F**

Movement	EB	NB	NB	SB	SB
Directions Served	LR	LT	T	T	TR
Maximum Queue (m)	18.9	9.0	1.4	12.5	0.9
Average Queue (m)	2.4	0.6	0.0	0.9	0.0
95th Queue (m)	11.9	5.5	1.3	6.2	0.9
Link Distance (m)	105.3	20.9	20.9	46.2	46.2
Upstream Blk Time (%)		0			
Queuing Penalty (veh)		0			
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 45: Road E & Road D

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	1.8	0.9	15.5
Average Queue (m)	0.1	0.0	5.6
95th Queue (m)	1.3	0.9	22.4
Link Distance (m)	13.9	131.9	199.2
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 5530

## 2048 Peak PM of Street SimTraffic Results

**Intersection: 10: Carling & Parkdale**

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	L	T	T	T	T	R	LR
Maximum Queue (m)	51.1	58.9	47.8	146.4	150.2	87.5	70.9
Average Queue (m)	23.9	24.5	15.4	66.5	68.7	19.5	30.6
95th Queue (m)	43.5	49.4	37.0	130.6	134.8	67.9	56.7
Link Distance (m)		316.0	316.0	174.6	174.6		272.5
Upstream Blk Time (%)				0	0		
Queuing Penalty (veh)				1	1		
Storage Bay Dist (m)	155.0					80.0	
Storage Blk Time (%)					7	0	
Queuing Penalty (veh)					8	0	

**Intersection: 11: Carling & Civic**

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	T	LR
Maximum Queue (m)	21.0	49.2	54.0	104.1	102.2	25.3
Average Queue (m)	5.0	14.0	11.2	36.8	37.6	8.3
95th Queue (m)	14.8	36.4	33.5	81.2	82.3	19.6
Link Distance (m)		174.6	174.6	189.4	189.4	49.6
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)	90.0					
Storage Blk Time (%)					0	
Queuing Penalty (veh)					0	

**Intersection: 12: Carling & Melrose**

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	T	LR
Maximum Queue (m)	16.3	14.2	13.3	20.8	32.9	10.8
Average Queue (m)	5.0	1.0	0.7	2.6	2.9	2.7
95th Queue (m)	13.6	6.9	6.1	12.1	16.4	9.0
Link Distance (m)		189.4	189.4	239.5	239.5	211.1
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)	25.0					
Storage Blk Time (%)	0	0			0	
Queuing Penalty (veh)	0	0			0	

**Intersection: 13: Maple/Old Irvine & Carling**

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	LTR	LTR
Maximum Queue (m)	25.6	55.6	60.1	22.4	46.8	94.3	79.4	15.4	64.9	22.0
Average Queue (m)	8.1	21.0	23.3	6.1	10.7	52.5	39.2	0.6	33.6	5.9
95th Queue (m)	19.6	43.5	49.6	19.6	33.6	86.8	70.1	6.8	58.5	16.3
Link Distance (m)		239.5	239.5			191.1	191.1		166.9	225.8
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	20.0			15.0	45.0			25.0		
Storage Blk Time (%)	1	8	13	0		9	12	0		
Queuing Penalty (veh)	3	3	7	0		5	1	0		

**Intersection: 14: Carling & Bayswater**

Movement	EB	EB
Directions Served	T	T
Maximum Queue (m)	2.4	1.6
Average Queue (m)	0.2	0.2
95th Queue (m)	2.4	2.5
Link Distance (m)	191.1	191.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 15: Carling & Sherwood**

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (m)	35.4	94.7	34.8	64.0	68.5	30.3	60.0	20.7
Average Queue (m)	35.3	76.9	17.1	20.1	20.7	7.6	30.4	3.3
95th Queue (m)	36.7	103.8	73.4	44.6	48.7	21.3	51.8	14.7
Link Distance (m)		114.2	114.2	143.4	143.4		138.3	
Upstream Blk Time (%)		5	2					
Queuing Penalty (veh)		0	0					
Storage Bay Dist (m)	30.0					90.0		15.0
Storage Blk Time (%)	100				0		39	0
Queuing Penalty (veh)	309				0		3	0

Intersection: 16: Road A/Champagne & Carling

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (m)	17.4	28.2	33.4	14.9	68.3	109.9	108.6	42.5	54.8	59.4	37.3	90.9
Average Queue (m)	4.6	10.2	12.6	2.8	16.2	63.7	69.6	23.2	24.9	28.8	31.6	31.9
95th Queue (m)	13.5	23.1	27.9	10.6	47.4	112.3	115.8	52.2	45.9	51.4	43.0	77.7
Link Distance (m)		143.4	143.4			103.7	103.7		58.9	58.9		481.7
Upstream Blk Time (%)						2	3		0	0		
Queuing Penalty (veh)						13	19		0	0		
Storage Bay Dist (m)	55.0			75.0	61.0			35.0			30.0	
Storage Blk Time (%)					0	12	27	0			25	0
Queuing Penalty (veh)					0	6	41	1			24	1

Intersection: 17: Carling & Trillium MUP

Movement	EB	EB	WB	WB
Directions Served	T	T	T	T
Maximum Queue (m)	54.4	59.2	84.7	88.5
Average Queue (m)	20.9	23.4	42.5	48.2
95th Queue (m)	47.4	51.1	76.3	79.7
Link Distance (m)	103.7	103.7	93.8	93.8
Upstream Blk Time (%)			0	0
Queuing Penalty (veh)			1	3
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: Preston & Carling

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	39.6	57.0	58.6	67.9	111.7	105.5	99.8	44.0	98.0	90.5	78.7	42.4
Average Queue (m)	16.1	27.0	24.1	37.5	67.2	59.4	67.7	7.5	49.3	34.4	22.3	31.8
95th Queue (m)	32.4	50.6	48.7	63.0	107.5	90.3	95.3	29.6	90.9	74.5	57.6	55.7
Link Distance (m)		93.8	93.8			165.0	165.0		129.7	129.7	129.7	
Upstream Blk Time (%)			0	0		0			0	0	0	
Queuing Penalty (veh)			0	0		0			0	0	0	
Storage Bay Dist (m)	70.0			90.0	120.0			95.0				35.0
Storage Blk Time (%)		0	0	0	1		1					7
Queuing Penalty (veh)		0	0	0	3		0					25

Intersection: 18: Preston & Carling

Movement	SB	B57
Directions Served	TR	T
Maximum Queue (m)	81.5	273.9
Average Queue (m)	71.6	153.0
95th Queue (m)	79.5	340.4
Link Distance (m)	50.0	416.8
Upstream Blk Time (%)	72	4
Queuing Penalty (veh)	0	0
Storage Bay Dist (m)		
Storage Blk Time (%)	72	
Queuing Penalty (veh)	66	

Intersection: 19: Carling & Rochester

Movement	EB	EB	WB	WB	SB	B66
Directions Served	T	T	T	R	R	T
Maximum Queue (m)	13.6	7.2	26.4	4.3	80.3	11.2
Average Queue (m)	0.8	0.6	2.5	0.1	29.2	0.4
95th Queue (m)	6.0	4.8	17.2	2.3	57.8	11.0
Link Distance (m)	165.0	165.0	104.1		396.1	101.7
Upstream Blk Time (%)						0
Queuing Penalty (veh)						0
Storage Bay Dist (m)				30.0		
Storage Blk Time (%)			0			
Queuing Penalty (veh)			0			



Intersection: 20: Carling & Booth

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	R	L	R
Maximum Queue (m)	56.3	75.1	68.5	205.0	37.5	211.3	37.5
Average Queue (m)	30.5	30.7	28.9	126.4	10.3	103.8	34.5
95th Queue (m)	53.9	63.7	59.6	199.9	33.2	183.7	46.1
Link Distance (m)		104.1	104.1	302.7		229.2	
Upstream Blk Time (%)		0	0			1	
Queuing Penalty (veh)		0	0			0	
Storage Bay Dist (m)	50.0				30.0		30.0
Storage Blk Time (%)	2	2		37	0	36	19
Queuing Penalty (veh)	8	5		32	0	95	49

Intersection: 21: Bronson & Carling/Glebe

Movement	EB	EB	EB	B1	B1	NB	NB	NB	SB	SB
Directions Served	L	LT	R	T	T	L	L	TR	T	TR
Maximum Queue (m)	47.4	96.1	90.1	114.7	61.0	57.4	398.5	403.2	205.8	226.6
Average Queue (m)	44.6	79.9	46.4	34.9	9.9	57.1	391.1	380.1	139.6	148.3
95th Queue (m)	54.2	110.0	82.9	117.6	70.9	58.3	418.5	469.5	206.8	220.0
Link Distance (m)		71.5	71.5	302.7	302.7		390.8	390.8	332.5	332.5
Upstream Blk Time (%)		35	4				56	36		0
Queuing Penalty (veh)		178	18				348	227		0
Storage Bay Dist (m)	40.0					50.0				
Storage Blk Time (%)	27	56				85	4			
Queuing Penalty (veh)	91	129				226	9			

Intersection: 22: Parkdale & 417 WB on/off

Movement	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	TR
Maximum Queue (m)	89.6	115.1	44.8	59.5	195.8
Average Queue (m)	47.1	54.7	20.6	27.2	161.7
95th Queue (m)	78.1	95.6	38.6	55.4	236.3
Link Distance (m)	152.4	152.4	55.6	55.6	183.6
Upstream Blk Time (%)		0	0	1	40
Queuing Penalty (veh)		0	0	3	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 23: Parkdale & 417 EB on/off

Movement	EB	EB	NB	NB	SB	SB
Directions Served	LT	R	T	TR	L	T
Maximum Queue (m)	119.0	82.4	93.2	37.5	60.8	58.4
Average Queue (m)	61.4	23.2	53.5	34.2	51.7	31.7
95th Queue (m)	101.5	61.1	109.6	45.1	69.7	56.5
Link Distance (m)	121.0		90.9		55.6	55.6
Upstream Blk Time (%)	1		3		12	1
Queuing Penalty (veh)	0		21		47	4
Storage Bay Dist (m)		75.0		30.0		
Storage Blk Time (%)	5	0	0	29		
Queuing Penalty (veh)	8	0	1	41		

Intersection: 24: Parkdale & Sherwood

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	33.2	34.0	68.5	87.9
Average Queue (m)	12.9	14.6	28.8	41.1
95th Queue (m)	26.5	27.2	55.4	76.6
Link Distance (m)	236.5	344.4	294.1	90.9
Upstream Blk Time (%)				0
Queuing Penalty (veh)				3
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 25: Parkdale & Ruskin

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	LTR	LTR
Maximum Queue (m)	26.8	10.9	26.2	48.8	56.8
Average Queue (m)	10.4	2.2	10.7	16.0	22.3
95th Queue (m)	22.0	8.5	21.6	36.6	44.5
Link Distance (m)	236.1		243.9	272.5	294.1
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)		40.0			
Storage Blk Time (%)			0		
Queuing Penalty (veh)			0		

**Intersection: 27: Bayswater & Sherwood**

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	15.8	17.4	7.0	30.7
Average Queue (m)	7.2	6.2	1.8	16.6
95th Queue (m)	13.6	13.4	6.9	26.5
Link Distance (m)	602.2	138.3		93.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 28: Driveway & Prince of Wales**

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	27.7	10.0	188.6	279.1
Average Queue (m)	12.3	2.6	91.7	269.3
95th Queue (m)	21.7	9.5	223.4	307.6
Link Distance (m)	203.0	214.2	202.3	278.2
Upstream Blk Time (%)			12	3
Queuing Penalty (veh)			0	33
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 29: Navy/Navy Parking Access & Prince of Wales**

Movement	EB	WB	NB	SB
Directions Served	TR	LTR	LTR	R
Maximum Queue (m)	83.5	80.0	12.4	28.4
Average Queue (m)	18.5	21.2	2.3	9.6
95th Queue (m)	66.1	77.4	9.0	23.6
Link Distance (m)	92.6	85.9	39.1	34.1
Upstream Blk Time (%)	0	2		4
Queuing Penalty (veh)	3	21		0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 30: Prince of Wales & Preston**

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	L	T	L	T	R	LTR	LT	R
Maximum Queue (m)	52.4	92.8	67.3	11.2	192.4	52.5	7.0	122.3	128.0
Average Queue (m)	39.3	71.6	28.8	0.7	183.8	46.2	0.9	67.9	81.6
95th Queue (m)	64.0	104.8	54.6	6.1	187.9	73.9	4.6	109.0	119.5
Link Distance (m)		85.9	85.9		178.4		18.1	129.7	129.7
Upstream Blk Time (%)		8	0		70		0	0	0
Queuing Penalty (veh)		34	0		0		0	0	2
Storage Bay Dist (m)	45.0			30.0		45.0			
Storage Blk Time (%)	2	26			69	0			
Queuing Penalty (veh)	6	68			281	1			

**Intersection: 31: Rochester & 417 WB on/Raymond**

Movement	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	T	R
Maximum Queue (m)	53.5	74.8	36.9	62.3	53.8	39.3
Average Queue (m)	25.2	34.2	17.5	27.7	21.7	13.0
95th Queue (m)	43.3	58.5	31.2	49.6	40.6	27.2
Link Distance (m)	102.6	102.6	82.9	82.9	166.0	
Upstream Blk Time (%)				0		
Queuing Penalty (veh)				0		
Storage Bay Dist (m)						35.0
Storage Blk Time (%)					2	0
Queuing Penalty (veh)					2	0

**Intersection: 32: Rochester & 417 EB off/Orangeville**

Movement	EB	EB	NB	NB	SB	SB
Directions Served	LT	TR	T	TR	LT	T
Maximum Queue (m)	84.0	63.5	32.6	53.7	64.4	44.8
Average Queue (m)	49.2	25.1	11.9	26.4	33.5	9.1
95th Queue (m)	73.7	50.4	25.4	47.4	56.1	30.9
Link Distance (m)	116.5	116.5	101.7	101.7	82.9	82.9
Upstream Blk Time (%)	0					
Queuing Penalty (veh)	0					
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

**Intersection: 33: Bronson & Catherine 417 WB on**

Movement	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	LT	T	TR	L	T	T	T	TR
Maximum Queue (m)	113.9	117.1	91.8	61.6	67.0	56.6	56.5	145.5	141.1
Average Queue (m)	73.5	76.5	53.0	25.6	31.2	28.6	28.7	79.6	77.4
95th Queue (m)	105.2	106.4	84.9	47.3	54.8	48.9	50.5	132.9	131.6
Link Distance (m)	174.4	174.4	174.4	174.4	81.8	81.8	81.8	242.3	242.3
Upstream Blk Time (%)					0			0	0
Queuing Penalty (veh)					1			0	0
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

**Intersection: 34: Bronson & 417 EB off**

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	T	T	T	T
Maximum Queue (m)	91.3	67.2	51.0	62.9	86.6	89.4
Average Queue (m)	31.7	46.3	15.1	35.1	58.6	56.5
95th Queue (m)	72.6	71.4	36.0	63.5	90.2	89.0
Link Distance (m)	91.1		57.4	57.4	81.8	81.8
Upstream Blk Time (%)	1		0	2	1	1
Queuing Penalty (veh)	0		0	7	11	10
Storage Bay Dist (m)		60.0				
Storage Blk Time (%)	0	5				
Queuing Penalty (veh)	0	7				

**Intersection: 35: Bronson & Plymouth/Imperial Chamberlain**

Movement	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	T	TR
Maximum Queue (m)	314.6	327.3	36.9	44.4	32.4
Average Queue (m)	245.4	270.5	23.5	4.0	1.8
95th Queue (m)	338.6	349.9	37.7	26.7	15.8
Link Distance (m)	332.5	332.5		57.4	57.4
Upstream Blk Time (%)	1	5		0	0
Queuing Penalty (veh)	5	24		2	0
Storage Bay Dist (m)			30.0		
Storage Blk Time (%)			6		
Queuing Penalty (veh)			42		

**Intersection: 36: Bronson & Madawaska/Fifth**

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (m)	71.5	128.3	247.3	246.5	134.9	144.5
Average Queue (m)	23.6	89.3	218.6	218.3	66.4	70.8
95th Queue (m)	58.7	148.4	306.8	305.7	128.9	134.8
Link Distance (m)	182.2	118.1	232.0	232.0	390.8	390.8
Upstream Blk Time (%)		41	76	79		
Queuing Penalty (veh)		0	0	0		
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

**Intersection: 37: Road L & Road M/Road A**

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

**Intersection: 38: Maple & Winding/Road D**

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	19.3	5.4	21.0	19.2
Average Queue (m)	8.6	2.3	9.3	9.8
95th Queue (m)	14.8	6.1	15.4	15.3
Link Distance (m)	183.3	13.9	131.4	166.9
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 39: Prince of Wales & Road B**

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	TR	L	R
Maximum Queue (m)	22.0	80.4	100.2	42.5	23.6	17.5
Average Queue (m)	4.9	32.1	50.1	25.0	19.2	7.0
95th Queue (m)	17.2	65.2	110.4	56.1	27.1	16.0
Link Distance (m)		205.7	92.6		20.9	20.9
Upstream Blk Time (%)			10		30	0
Queuing Penalty (veh)			99		25	0
Storage Bay Dist (m)	45.0			35.0		
Storage Blk Time (%)		3	26	6		
Queuing Penalty (veh)		1	126	28		

**Intersection: 40: Prince of Wales & Road E**

Movement	EB	EB	NB	NB	NB	SB	SB	B86	B86
Directions Served	L	R	L	T	T	T	R	T	
Maximum Queue (m)	47.2	38.4	14.3	50.9	19.2	103.9	57.5	220.8	213.3
Average Queue (m)	21.2	8.8	1.7	21.0	1.6	82.5	18.5	132.8	103.4
95th Queue (m)	40.0	24.6	8.6	42.0	12.6	125.7	62.2	282.5	264.6
Link Distance (m)		167.7			278.2	70.6		205.7	205.7
Upstream Blk Time (%)						63		18	5
Queuing Penalty (veh)						621		90	23
Storage Bay Dist (m)	45.0		50.0	50.0			50.0		
Storage Blk Time (%)	2	0		0		65	0		
Queuing Penalty (veh)	0	0		1		17	1		

**Intersection: 41: Road B & Road A**

Movement	EB	EB	WB	WB	NB
Directions Served	T	TR	L	T	LR
Maximum Queue (m)	11.9	19.8	9.8	16.8	18.3
Average Queue (m)	4.8	9.3	4.5	7.9	9.0
95th Queue (m)	12.5	15.2	11.9	14.6	14.6
Link Distance (m)	51.4	51.4	39.0	39.0	45.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 42: A Parking Access & Road A**

Movement	EB	EB	WB	NB	SB
Directions Served	LT	TR	LT	LTR	LTR
Maximum Queue (m)	0.9	2.7	10.8	39.5	8.4
Average Queue (m)	0.0	0.1	0.7	19.4	1.2
95th Queue (m)	0.9	1.6	5.5	31.4	6.1
Link Distance (m)	39.0	39.0	58.9	36.7	41.4
Upstream Blk Time (%)				0	
Queuing Penalty (veh)				0	
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 43: Road B & B Parking Access**

Movement	WB	SB	SB
Directions Served	LR	LT	T
Maximum Queue (m)	31.5	11.8	1.9
Average Queue (m)	13.0	0.8	0.1
95th Queue (m)	24.3	6.7	1.9
Link Distance (m)	32.5	45.7	45.7
Upstream Blk Time (%)	1		
Queuing Penalty (veh)	0		
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 44: Road B & Road F**

Movement	EB	NB	SB
Directions Served	LR	LT	T
Maximum Queue (m)	18.4	8.4	42.4
Average Queue (m)	2.1	0.4	12.3
95th Queue (m)	10.9	4.5	36.3
Link Distance (m)	105.3	20.9	42.5
Upstream Blk Time (%)		0	3
Queuing Penalty (veh)		0	3
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			



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Intersection: 45: Road E & Road D

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Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	3.5	8.5
Average Queue (m)	0.1	4.0
95th Queue (m)	2.0	9.6
Link Distance (m)	131.9	199.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

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Network wide Queuing Penalty: 3686

## 2048 Peak PM of Generator SimTraffic Results

**Intersection: 10: Carling & Parkdale**

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	L	T	T	T	T	R	LR
Maximum Queue (m)	50.6	56.6	49.9	136.9	142.4	87.1	58.6
Average Queue (m)	22.9	25.4	15.5	54.0	55.5	15.6	23.5
95th Queue (m)	42.9	51.6	37.7	112.7	116.4	53.6	46.4
Link Distance (m)		316.0	316.0	174.6	174.6		272.5
Upstream Blk Time (%)				0	0		
Queuing Penalty (veh)				0	0		
Storage Bay Dist (m)	155.0					80.0	
Storage Blk Time (%)					4	0	
Queuing Penalty (veh)					6	0	

**Intersection: 11: Carling & Civic**

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	T	LR
Maximum Queue (m)	41.4	38.3	40.2	111.6	113.8	19.9
Average Queue (m)	18.7	10.7	9.3	42.4	43.3	6.3
95th Queue (m)	34.8	29.4	27.9	87.9	89.5	16.1
Link Distance (m)		174.6	174.6	189.4	189.4	49.6
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)	90.0					
Storage Blk Time (%)					0	
Queuing Penalty (veh)					0	

**Intersection: 12: Carling & Melrose**

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	L	T	T	T	T	R	LR
Maximum Queue (m)	9.4	14.2	15.4	17.2	18.8	3.7	9.0
Average Queue (m)	1.5	1.0	0.8	1.7	1.4	0.1	2.7
95th Queue (m)	6.9	7.1	6.6	9.0	9.5	2.9	8.7
Link Distance (m)		189.4	189.4	239.5	239.5		211.1
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	25.0					20.0	
Storage Blk Time (%)		0			0		
Queuing Penalty (veh)		0			0		

**Intersection: 13: Maple/Old Irvine & Carling**

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	LTR	LTR
Maximum Queue (m)	27.0	42.1	44.3	22.1	44.7	93.3	81.2	17.0	54.2	15.7
Average Queue (m)	8.1	15.4	16.9	3.8	6.5	44.3	34.8	0.9	23.6	4.7
95th Queue (m)	20.1	34.1	37.7	14.8	23.6	77.3	65.8	8.1	44.0	13.0
Link Distance (m)		239.5	239.5			191.1	191.1		166.9	225.8
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	20.0			15.0	45.0			25.0		
Storage Blk Time (%)	1	5	9	0	0	6	10	0		
Queuing Penalty (veh)	3	2	4	0	0	2	1	0		

**Intersection: 14: Carling & Bayswater**

Movement	WB
Directions Served	T
Maximum Queue (m)	0.9
Average Queue (m)	0.0
95th Queue (m)	0.9
Link Distance (m)	114.2
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

**Intersection: 15: Carling & Sherwood**

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (m)	34.2	55.8	33.9	54.2	53.8	26.5	66.5	21.1
Average Queue (m)	34.2	55.0	28.1	17.4	19.3	8.9	30.8	4.4
95th Queue (m)	39.9	59.8	74.2	39.7	42.2	20.7	55.0	17.3
Link Distance (m)				143.4	143.4		138.3	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)	30.0					90.0		15.0
Storage Blk Time (%)	90						38	0
Queuing Penalty (veh)	228						3	0

Intersection: 16: Road A/Champagne & Carling

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (m)	14.3	39.2	29.0	19.2	65.8	105.3	107.4	42.5	59.8	61.2	37.0	67.4
Average Queue (m)	3.2	11.3	10.7	4.0	21.7	48.1	56.8	21.5	33.3	32.6	23.8	18.2
95th Queue (m)	10.4	27.6	24.9	13.8	49.0	91.5	102.8	49.2	55.4	56.8	39.0	44.5
Link Distance (m)		143.4	143.4			103.7	103.7		58.9	58.9		481.7
Upstream Blk Time (%)						0	1		1	1		
Queuing Penalty (veh)						1	4		2	3		
Storage Bay Dist (m)	55.0			75.0	61.0			35.0			30.0	
Storage Blk Time (%)		0			0	6	22	0			9	1
Queuing Penalty (veh)		0			0	5	30	1			11	1

Intersection: 17: Carling & Trillium MUP

Movement	EB	EB	WB	WB
Directions Served	T	T	T	T
Maximum Queue (m)	50.1	52.3	63.0	71.4
Average Queue (m)	20.4	20.6	27.6	34.1
95th Queue (m)	42.4	42.6	51.8	58.5
Link Distance (m)	103.7	103.7	93.8	93.8
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: Preston & Carling

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	42.8	52.4	46.3	58.6	116.6	94.8	93.1	17.2	99.5	88.2	83.9	42.4
Average Queue (m)	18.4	24.5	21.3	27.5	65.7	50.3	60.6	7.3	49.4	37.1	24.5	36.0
95th Queue (m)	36.3	45.6	41.5	49.5	102.4	80.7	87.2	15.4	86.5	72.9	57.2	54.8
Link Distance (m)		93.8	93.8			165.0	165.0		129.7	129.7	129.7	
Upstream Blk Time (%)									0	0	0	
Queuing Penalty (veh)									1	1	1	
Storage Bay Dist (m)	70.0			90.0	120.0			95.0				35.0
Storage Blk Time (%)		0			0		0					28
Queuing Penalty (veh)		0			2		0					99

Intersection: 18: Preston & Carling

Movement	SB	B57
Directions Served	TR	T
Maximum Queue (m)	81.0	383.7
Average Queue (m)	71.5	223.2
95th Queue (m)	79.7	445.0
Link Distance (m)	50.0	416.8
Upstream Blk Time (%)	72	12
Queuing Penalty (veh)	0	0
Storage Bay Dist (m)		
Storage Blk Time (%)	62	
Queuing Penalty (veh)	65	

Intersection: 19: Carling & Rochester

Movement	EB	EB	WB	WB	SB
Directions Served	T	T	T	R	R
Maximum Queue (m)	9.4	11.2	27.1	2.7	67.7
Average Queue (m)	0.5	0.5	2.1	0.1	28.9
95th Queue (m)	4.7	4.8	13.9	1.6	55.0
Link Distance (m)	165.0	165.0	104.1		396.1
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)				30.0	
Storage Blk Time (%)			0		
Queuing Penalty (veh)			0		

Intersection: 20: Carling & Booth

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	R	L	R
Maximum Queue (m)	55.4	70.5	61.3	169.0	37.5	153.5	37.5
Average Queue (m)	23.4	30.0	25.3	90.9	14.6	70.1	31.0
95th Queue (m)	44.5	56.3	50.0	161.4	39.6	128.4	48.1
Link Distance (m)		104.1	104.1	302.7		229.2	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	50.0				30.0		30.0
Storage Blk Time (%)	1	2		30	0	29	8
Queuing Penalty (veh)	3	3		31	1	72	20

Intersection: 21: Bronson & Carling/Glebe

Movement	EB	EB	EB	B1	B1	NB	NB	NB	SB	SB
Directions Served	L	LT	R	T	T	L	L	TR	T	TR
Maximum Queue (m)	47.4	98.0	82.0	172.8	100.8	57.4	399.2	406.6	321.4	327.0
Average Queue (m)	45.1	82.9	34.9	55.7	20.5	57.1	389.7	379.6	247.3	255.4
95th Queue (m)	53.8	110.6	67.2	169.5	122.1	58.1	423.1	468.0	383.2	385.7
Link Distance (m)		71.5	71.5	302.7	302.7		390.8	390.8	332.5	332.5
Upstream Blk Time (%)		40	1	0			50	32	5	7
Queuing Penalty (veh)		202	6	0			322	205	38	53
Storage Bay Dist (m)	40.0					50.0				
Storage Blk Time (%)	28	56				86	4			
Queuing Penalty (veh)	98	140				194	9			

Intersection: 22: Parkdale & 417 WB on/off

Movement	WB	WB	NB	NB	SB
Directions Served	L	TR	L	T	TR
Maximum Queue (m)	74.5	89.6	58.6	58.0	193.0
Average Queue (m)	38.9	44.6	30.2	25.3	136.8
95th Queue (m)	65.0	77.9	52.9	53.1	225.3
Link Distance (m)	152.4	152.4	55.6	55.6	183.6
Upstream Blk Time (%)			1	2	24
Queuing Penalty (veh)			3	4	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 23: Parkdale & 417 EB on/off**

Movement	EB	EB	NB	NB	SB	SB
Directions Served	LT	R	T	TR	L	T
Maximum Queue (m)	104.3	65.6	96.0	37.5	60.6	54.3
Average Queue (m)	54.0	15.9	58.9	34.9	52.4	20.5
95th Queue (m)	89.9	41.6	111.4	43.7	68.6	43.1
Link Distance (m)	121.0		90.9		55.6	55.6
Upstream Blk Time (%)	0		4		12	0
Queuing Penalty (veh)	0		25		43	1
Storage Bay Dist (m)		75.0		30.0		
Storage Blk Time (%)	3	0	0	30		
Queuing Penalty (veh)	4	0	1	37		

**Intersection: 24: Parkdale & Sherwood**

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	30.2	38.2	74.6	77.0
Average Queue (m)	12.8	14.4	29.7	38.2
95th Queue (m)	24.9	29.2	59.5	65.9
Link Distance (m)	236.5	344.4	294.1	90.9
Upstream Blk Time (%)				0
Queuing Penalty (veh)				1
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 25: Parkdale & Ruskin**

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	LTR	LTR
Maximum Queue (m)	28.0	10.3	23.7	53.6	49.2
Average Queue (m)	10.8	1.5	8.4	17.0	20.5
95th Queue (m)	22.8	7.0	18.8	39.3	42.2
Link Distance (m)	236.1		243.9	272.5	294.1
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)		40.0			
Storage Blk Time (%)					
Queuing Penalty (veh)					



**Intersection: 27: Bayswater & Sherwood**

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	17.7	18.5	7.0	24.3
Average Queue (m)	7.2	6.4	1.6	11.0
95th Queue (m)	14.4	13.8	6.5	18.6
Link Distance (m)	602.2	138.3		93.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 28: Driveway & Prince of Wales**

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	26.7	11.8	96.0	229.7
Average Queue (m)	12.5	3.0	20.5	138.2
95th Queue (m)	22.4	10.3	63.7	264.7
Link Distance (m)	203.0	214.2	202.3	278.2
Upstream Blk Time (%)			0	0
Queuing Penalty (veh)			0	4
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 29: Navy/Navy Parking Access & Prince of Wales**

Movement	EB	WB	NB	SB
Directions Served	TR	TR	LTR	R
Maximum Queue (m)	97.0	45.0	12.4	20.0
Average Queue (m)	60.5	2.8	2.4	6.4
95th Queue (m)	125.1	23.1	9.9	15.4
Link Distance (m)	92.6	85.9	39.1	34.1
Upstream Blk Time (%)	10	0		
Queuing Penalty (veh)	84	0		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 30: Prince of Wales & Preston

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	L	TR	L	T	R	LTR	LT	R
Maximum Queue (m)	52.4	93.1	57.8	21.4	188.0	52.5	19.7	105.1	131.6
Average Queue (m)	42.5	85.3	19.5	1.3	148.4	43.3	7.6	40.6	89.2
95th Queue (m)	66.4	106.6	42.9	10.4	228.8	75.8	19.5	76.7	126.6
Link Distance (m)		85.9	85.9		178.4		18.1	129.7	129.7
Upstream Blk Time (%)		28	0		31		24	0	1
Queuing Penalty (veh)		119	0		0		0	0	2
Storage Bay Dist (m)	45.0			30.0		45.0			
Storage Blk Time (%)	5	44		0	61	1			
Queuing Penalty (veh)	15	134		0	223	2			

Intersection: 31: Rochester & 417 WB on/Raymond

Movement	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	T	R
Maximum Queue (m)	39.6	67.4	43.1	59.5	43.8	35.2
Average Queue (m)	17.6	31.2	18.3	25.7	17.5	15.0
95th Queue (m)	31.6	54.0	33.6	47.5	33.6	27.4
Link Distance (m)	102.6	102.6	82.9	82.9	166.0	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						35.0
Storage Blk Time (%)					1	0
Queuing Penalty (veh)					2	0

Intersection: 32: Rochester & 417 EB off/Orangeville

Movement	EB	EB	NB	NB	SB	SB
Directions Served	LT	TR	T	TR	LT	T
Maximum Queue (m)	75.0	50.9	28.6	50.2	46.0	30.3
Average Queue (m)	44.3	21.5	10.8	19.9	22.6	3.4
95th Queue (m)	66.8	44.2	24.1	38.8	40.6	16.7
Link Distance (m)	116.5	116.5	101.7	101.7	82.9	82.9
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 33: Bronson & Catherine 417 WB on

Movement	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	LT	T	TR	L	T	T	T	TR
Maximum Queue (m)	141.2	130.9	113.0	65.6	69.2	58.3	59.6	172.2	170.0
Average Queue (m)	84.9	83.2	58.6	27.1	34.7	32.7	32.5	94.1	90.0
95th Queue (m)	127.7	120.5	101.3	51.0	59.0	54.8	55.1	172.8	166.2
Link Distance (m)	174.4	174.4	174.4	174.4	81.8	81.8	81.8	242.3	242.3
Upstream Blk Time (%)	0	0			0			2	2
Queuing Penalty (veh)	0	0			0			0	0
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 34: Bronson & 417 EB off

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	T	T	T	T
Maximum Queue (m)	101.3	67.5	53.7	63.3	87.4	89.0
Average Queue (m)	42.7	51.9	17.4	38.9	63.7	62.5
95th Queue (m)	97.7	76.9	38.7	65.4	97.7	96.6
Link Distance (m)	91.1		57.4	57.4	81.8	81.8
Upstream Blk Time (%)	6		0	2	3	3
Queuing Penalty (veh)	0		1	10	25	22
Storage Bay Dist (m)		60.0				
Storage Blk Time (%)	0	15				
Queuing Penalty (veh)	1	20				

Intersection: 35: Bronson & Plymouth/Imperial Chamberlain

Movement	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	T	TR
Maximum Queue (m)	342.8	346.3	37.1	63.9	59.5
Average Queue (m)	287.4	307.6	25.5	18.6	17.7
95th Queue (m)	384.2	382.4	40.7	61.7	60.0
Link Distance (m)	332.5	332.5		57.4	57.4
Upstream Blk Time (%)	5	19		2	3
Queuing Penalty (veh)	28	113		19	27
Storage Bay Dist (m)			30.0		
Storage Blk Time (%)			5	5	
Queuing Penalty (veh)			39	14	

**Intersection: 36: Bronson & Madawaska/Fifth**

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (m)	98.3	116.1	247.2	246.5	133.1	133.3
Average Queue (m)	34.1	62.3	204.7	204.8	56.0	59.8
95th Queue (m)	86.2	125.9	321.3	319.9	116.3	122.7
Link Distance (m)	182.2	118.1	232.0	232.0	390.8	390.8
Upstream Blk Time (%)		14	71	72		
Queuing Penalty (veh)		0	0	0		
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

**Intersection: 37: Road L & Road M/Road A**

Movement	NB
Directions Served	R
Maximum Queue (m)	2.5
Average Queue (m)	0.1
95th Queue (m)	1.6
Link Distance (m)	24.1
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

**Intersection: 38: Maple & Winding/Road D**

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	18.0	7.9	21.5	18.4
Average Queue (m)	8.7	2.4	9.6	9.8
95th Queue (m)	14.8	6.7	16.7	15.2
Link Distance (m)	183.3	13.9	131.4	166.9
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 39: Prince of Wales & Road B**

Movement	EB	EB	B86	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (m)	37.7	180.6	16.4	94.2	42.5	24.2	16.7
Average Queue (m)	6.3	69.7	1.5	38.6	19.9	20.2	6.9
95th Queue (m)	20.2	166.1	18.6	83.8	50.6	26.4	14.8
Link Distance (m)		205.7	70.6	92.6		20.9	20.9
Upstream Blk Time (%)		1	0	1		32	0
Queuing Penalty (veh)		10	1	11		33	0
Storage Bay Dist (m)	45.0				35.0		
Storage Blk Time (%)		16		8	2		
Queuing Penalty (veh)		4		33	7		

**Intersection: 40: Prince of Wales & Road E**

Movement	EB	EB	NB	NB	NB	SB	SB	B86	B86
Directions Served	L	R	L	T	T	T	R	T	
Maximum Queue (m)	42.9	27.4	16.0	50.0	23.2	84.2	31.9	47.9	20.8
Average Queue (m)	18.0	7.2	2.4	23.6	1.8	34.5	4.7	10.4	7.4
95th Queue (m)	35.7	21.1	10.2	43.4	12.4	81.7	25.7	79.9	67.5
Link Distance (m)		167.7			278.2	70.6		205.7	205.7
Upstream Blk Time (%)						6		1	0
Queuing Penalty (veh)						49		3	1
Storage Bay Dist (m)	45.0		50.0	50.0			50.0		
Storage Blk Time (%)	1			0		8	0		
Queuing Penalty (veh)	0			1		3	0		

**Intersection: 41: Road B & Road A**

Movement	EB	EB	WB	WB	NB
Directions Served	T	TR	L	T	LR
Maximum Queue (m)	14.0	20.4	13.9	18.3	17.7
Average Queue (m)	6.2	10.3	6.3	9.0	9.6
95th Queue (m)	13.7	16.3	14.1	15.6	14.7
Link Distance (m)	51.4	51.4	39.0	39.0	45.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 42: A Parking Access & Road A**

Movement	EB	EB	WB	NB	SB
Directions Served	LT	TR	LT	LTR	LTR
Maximum Queue (m)	4.1	5.1	12.9	42.6	8.4
Average Queue (m)	0.1	0.2	1.3	22.7	1.2
95th Queue (m)	2.2	2.2	7.3	37.7	6.1
Link Distance (m)	39.0	39.0	58.9	36.7	41.4
Upstream Blk Time (%)				2	
Queuing Penalty (veh)				0	
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 43: Road B & B Parking Access**

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	28.5	7.0
Average Queue (m)	14.5	0.5
95th Queue (m)	24.0	4.1
Link Distance (m)	32.5	45.7
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 44: Road B & Road F**

Movement	EB	NB	SB
Directions Served	LR	LT	T
Maximum Queue (m)	21.2	11.0	40.5
Average Queue (m)	2.8	0.6	13.6
95th Queue (m)	13.2	5.8	35.4
Link Distance (m)	105.3	20.9	42.5
Upstream Blk Time (%)		0	1
Queuing Penalty (veh)		0	1
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 45: Road E & Road D

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	4.5	10.7
Average Queue (m)	0.2	4.2
95th Queue (m)	2.4	10.3
Link Distance (m)	131.9	199.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 3056

**Appendix M:**  
**Original TIA and Mobility Study (July 2021) Conclusions and Recommendations**



The follow discussion outlines key findings and recommendations of the *TIA and Mobility Study* (July 2021) in black text with updated findings or recommendations in blue text where applicable.

### Existing & Future Background Conditions

1. The Ottawa Hospital (TOH) is replacing the aging Civic Campus located at 1053 Carling Avenue with a New Civic Development. The future site is located to the southwest of the intersection of Carling Avenue and Preston Street, west of Prince of Wales Drive, and on lands to the north and east of the Central Experimental Farm. At this location, the new site will have strong ties to transit, served by Light Rail Transit (LRT) via a rapid transit station on the Trillium Line, and bus transit priority lanes with bus stops along Carling Avenue. The site is also located near the heart of the City, and as such is served with strong arterial roads and active transportation infrastructure. **No change.**
2. The estimated mode shares at the existing Civic Campus are: 85% auto-driver and 15% non-auto driver (e.g. transit, walk and cycling), which reflects the lack of high-quality active transportation and transit facilities in the surrounding network. **The existing mode share estimates for the existing Civic Campus in the TIA Mobility Study are now considered conservative, due to changes in travel behaviour caused by the COVID-19 pandemic. A culture shift towards working from home and flexible schedules has already taken hold. TOH is preparing a comprehensive Transportation Demand Management (TDM) Strategy Report which will revisit these assumptions through an employee survey that will help identify implications to future mode share assumptions and parking demand/supply.**
3. The future site is located directly adjacent to the Dow's Lake LRT Station, which is currently being upgraded as part of the City's Stage 2 LRT expansion initiative. The Trillium Line expansion is expected to be completed by 2022. There is an opportunity to provide connectivity between the hospital project and Dow's Lake Station, and in turn connect to the City's overall rapid transit system. **The latest available data suggests that the Trillium LRT Line expansion will be operational by Fall 2023.**
4. Carling Avenue adjacent to both the existing and future hospital sites is anticipated to be upgraded into a transit priority corridor by the Opening Day (2028) horizon year. The modifications include the conversion of two general purpose travel lanes to bus lanes and the addition of bus stops and cycle tracks that will serve the hospital site and the surrounding community. **No change.**
5. The Carling Avenue Transit Priority design includes additional active transportation infrastructure that will further enhance the active transportation experience. The Trillium Pathway, opened in 2016, also provides an important connection to the site. Of note, there was a notable cyclist and pedestrian collision pattern at the Preston/Carling intersection from 2014 to 2018. **No change.**
6. Existing MMLoS analysis for road segments and intersections shows poor pedestrian and cyclist performance, and in the case of the pedestrian scores, this is largely due to the length of the crossings of major roads. **No change.**
7. Overall, the majority of study area intersections in existing conditions operated within City recommended guideline (LOS E or better), with the exception of the following major arterial to arterial intersections:
  - Preston/Carling
  - Bronson/Carling,
  - Preston/Prince of Wales, and
  - Catherine/Bronson.

**No change.** Although time has passed since the *TIA and Mobility Study* (July 2021), the City provided pre-COVID-19 traffic counts are still being used as they reflect a more conservative approach to the analysis (i.e. pre-work from home/hybrid conditions). The same existing volumes and roadway network has been used.

8. Overall, the majority of study area intersections in 2028 and 2048 background conditions operated within City recommended guideline (LOS E or better), with the exception of the following major arterial to arterial intersections:

- Preston/Carling,
- Booth/Carling,
- Bronson/Carling,
- Preston/Prince of Wales, and
- Catherine/Bronson

Negligible change. The background volumes accounted for new other area developments that increased traffic volumes in the study area, but this was balanced by adjustments existing Civic Campus traffic volume and distribution estimates based on new Streetlight data. Therefore, the overall change in background volumes was nominal.

### Proposed Development

9. The assumed phasing of the New Civic Development is:

- Opening Day 2028, which anticipates approximately 2.4M ft<sup>2</sup> of hospital use, 6,600 FTE employees and 765 beds;

The latest site statistics propose approximately 2.7M ft<sup>2</sup> of hospital uses, 5,000 full time employees (FTE) and 640 beds by 2028.

- Full Buildout 2048, which includes the full hospital expansion and all ancillary facilities, including the Carling Village development site and the UOHI building (totaling approximately 5.0M ft<sup>2</sup>), 10,500 FTE employees, and 1,250 beds.

The latest site statistics propose approximately 4.9M ft<sup>2</sup> of hospital and hospital related uses, 9,960 full time employees (FTE) and 1,140 beds by 2048.

10. A total of approximately 3,100 parking spaces (number is subject to change) will be provided on-site. All existing off-site (satellite) parking leases will be discontinued by Opening Day (2028). No change.

11. The target mode shares for the New Civic Development are:

- Opening Day: 50% auto-driver, 15% auto-passenger, 30% transit, 5% active transportation
- Full Buildout: 35% auto-driver, 12% auto-passenger, 45% transit, 8% active transportation

These targets represent all campus users (staff, visitors etc.), but it is recognized there will be variability in the mode shares between each user group (e.g. employees will have a lower auto-driver component, while patients/visitors will have a higher auto-driver component). The aggregated mode share targets for all trips at the NCD have not changed significantly between the TIA Addendum #2 and the TIA and Mobility Study (July 2021), which were developed through research of other institutions in North America, City of Ottawa policies and approaches, and vetted by City staff. However, the TIA Addendum #2 provides further breakdown of the mode share for each type of staff based on anticipated staff schedules, and for visitors based on parking activity data. All information was provided by TOH.

In addition, TOH is preparing a *Transportation Demand Management (TDM) Strategy Report* which will determine the achievability of these mode share targets and develop a comprehensive plan to help ensure TOH reach these goals.

12. At Opening Day (2028), the New Civic Development is estimated to generate approximately:

- 110 to 100 active transportation trips during the commuter peak hours;
- 600 to 700 transit trips during the commuter peak hours; and
- 1,000 to 1,100 personal vehicle trips during the commuter peak hours.

At Full Buildout (2048), the New Civic Development is estimated to generate approximately:

- 250 to 300 active transportation trips during the commuter peak hours;
- 1,600 to 1,800 transit trips during the commuter peak hours; and
- 1,200 to 1,350 personal vehicle trips during the commuter peak hours.

The updated trip generation results by mode for 2028 were:

- 50 to 110 active transportation trips during the peak hours;
- 320 to 650 transit trips during the peak hours; and
- 460 to 850 personal vehicle trips during the peak hours.

The updated trip generation results by mode for 2048 were:

- 280 to 340 active transportation trips during the peak hours;
- 1,220 to 1,790 transit trips during the peak hours; and
- 800 to 1,190 personal vehicle trips during the peak hours.

The notable reduction in vehicle trips from the TIA and Mobility Study reflect the reduction in forecasted number of employees, as well as anticipated staff shift schedules which show a sizeable proportion of staff arriving/departing outside the traditional peak hour period.

### Future Combined Network Conditions

13. TOH is proposing high quality active transportation connections throughout the campus that connect to existing and planned pedestrian, cycling and transit networks. However, future MMLOS for road segments and intersections will have difficulty meeting minimum targets for pedestrian and cyclist performance. Although improvements to active transportation have been proposed since the *TIA and Mobility Study (July 2021)*, no changes to MMLOS have occurred due to governing factors such as number of vehicles on adjacent street or lanes required to cross. For further details on changes to active transportation facilities since the *TIA and Mobility Study (July 2021)*, please refer to **Section 5.1**.
14. The implementation of the Carling Avenue Transit Priority measures will diminish existing vehicular capacity within the Carling Avenue corridor in favour of a more balanced transportation system that includes higher-performing active transportation and transit facilities. **No change**.
15. The evaluation of the road network performance showed that the addition of New Civic Development traffic at Opening Day 2028 and Full Buildout 2048, did not increase the number of poorly performing intersections compared to the future Background conditions with the exception of Parkdale/ WB 417.
  - Preston/Carling,
  - Booth/Carling,
  - Bronson/Carling,
  - Preston/Prince of Wales, and
  - Catherine/Bronson

Parkdale/ WB 417 was on the edge of the acceptable intersection performance threshold in Background conditions, and the addition of New Civic Development traffic reduced performance by only 1%. Overall, the change in overall congestion would be negligible.

This conclusion represented a scenario without demand rationalizations. The TIA Addendum #2 did not revisit this analysis. This decision was made when it was found the updates to the trip generation assumptions with background volumes was generally lower than traffic volumes forecasted in the *TIA and Mobility Study (July 2021)*. Therefore, the results for 2028 and 2048 conditions if demand rationalization reductions were not added are still anticipated to perform similarly or better than previously stated in the *TIA and Mobility Study (July 2021)*.

The New Civic Development [internal] access intersections were all shown to operate well in both future horizons. **No change**.

16. If City-wide sustainable policies and initiatives as outlined in the New Official Plan and supporting transit infrastructure such as the Carling Avenue Transit Priority Corridor are taken into consideration (by applying Background traffic volume reductions), the number of poorly performing intersections would be reduced to:
  - Preston/Carling

The updated trip generation and background volumes along with demand rationalization identified within this TIA Addendum #2 that the only intersection with a critical movement operating poorly is Rochester/Carling, and overall, all signalized intersections are anticipated to operate at LoS 'E' or better.

17. It is acknowledged that the addition of an eastbound right turn-lane at Preston/Carling would resolve the suboptimal intersection performance and enable a time separated phase for cyclists across the south crossride. However, this modification would increase the pedestrian crossing distance at an already excessively long crosswalk (due to the planned median bus lanes), and also would have landscaping and property implications on the south side of Carling Avenue. [This conclusion is still accurate; however, it will be a decision to be made by the City of Ottawa as part of the Carling Avenue Transit Priority Project.](#)
18. The future New Civic Development access intersections have been designed to accommodate projected vehicular queues where possible considering the locational constraints, but some spillback may occur at times during the critical peak hour when the adjacent arterial network is at its most congested state. These intersection design requirements will be confirmed during the Site Plan Control process for subsequent phases. [Please refer to Section 5.4 of this report for the updated intersection design descriptions and Section 5.9 for updated operational and queuing results.](#) Overall, all access intersections are expected to have adequate capacity to accommodate future NCD traffic. It is important to note that discussions are ongoing with NCC and City of Ottawa regarding the intersection designs which may yield further refinements, such as Road B/Prince of Wales Drive intersection.
19. The above results are contingent on TOH achieving ambitious target mode shares for employees and visitors: approximately 50% auto-drivers at Opening Day 2028, and approximately 35% auto-drivers at Full Buildout 2048. [No change.](#)

### Supporting Strategies

20. To help achieve the target mode shares at the Opening Day and Full Buildout horizons, TOH has an opportunity to prioritize the development of a comprehensive Transportation Demand Management (TDM) Strategy/Plan (separate to this document and following the approval of the Master Site Plan) to reduce the project's long-term reliance on the automobile, and in turn reduce parking requirements. TDM Checklists highlight recommended TDM measures for TOH to consider, which will be confirmed incrementally during the development approval process. A preliminary TDM framework is included in this report, and key elements of this framework include:
  - Programming: provide a team and budget for TDM coordination
  - Community and Promotion: inform, engage through campaigns, provide tools and award
  - Partnerships: engage with local associations, OC Transpo, car/bike/van pooling, etc.
  - Policy and Infrastructure: measures to incentivize active transportation such as monthly transit pass discounts, aggressively priced staff parking passes, shower and storage facilities for cyclists, real-time transit information and key locations, emergency ride home program, etc.
  - Monitoring: complete regular surveys and studies to continually upgrade and retrofit TDM strategies

TOH is preparing a comprehensive *Transportation Demand Management (TDM) Strategy Report* that will include a recommended plan to help TOH achieve future mode share targets and manage parking demand in the future.

21. TOH intends to invest heavily in active transportation infrastructure at the New Civic Development, based on the proposed AT Plan, to leverage the proximity of the future site to high-quality facilities in the surrounding network. A list of the prominent elements of the AT Plan include: "The Highline", which is an elevated and sheltered pedestrian connection between Dow's Lake Station and the main Hospital building, Bi-directional cycling facilities around and through the site, ample bicycle parking, secondary pathway connections, and sidewalks that permeate throughout the site. [In addition to the stated improvements to AT facilities in the above comment, new facilities have been proposed since the TIA and](#)

*Mobility Study (July 2021)*. For a detailed description, please refer to **Section 5.1**. Some of the additional proposed active facilities include additional cross-rides at Prince of Wales Drive/Preston Street and Prince of Wales Drive/Road B. New MUP facilities are proposed on the south side of Road A between Road B and the front entrance, along with new bike parking facilities directly in front of the main door. Additional bike parking has been proposed on the northwest entrance to the hospital (backside). There are ongoing discussions with NCC and the City of Ottawa for additional facilities as the intersection designs progress through design approvals.

22. TOH acknowledges the impact the New Civic Development will have on existing AT facilities, such as the pathway across the Queen Juliana Park and the Trillium Pathway.
- To replace the Queen Juliana Park pathway, cycle tracks have been proposed on both sides of Carling Avenue west of Champagne. The internal roads around the parking garage will also have a bi-directional cycling facility connecting Carling to Prince of Wales.
  - The Trillium Pathway will be redirected to a bi-directional cycle facility on the south side of Carling and the west side of Preston back to its current destination in the form of a bi-directional cross-ride at the Preston/Prince of Wales intersection

New details have emerged regarding the types of facilities and timing proposed. The *TIA Addendum #1 (Oct 2021)* for the SPC for the parking garage identified the redirected Trillium Pathway which would follow the southern side of Carling Avenue from the existing Trillium Pathway to Preston Street and follow the west side of Preston Street to Prince of Wales Drive. Within the *TIA Addendum #1*, the pathway was broken down into two distinct segments. The segment on Carling Avenue was identified to be built as an interim MUP until the Carling Avenue Transit Priority Project is built (estimated for 2028 similar to opening day for the NCD). The interim MUP would then be converted into a new bi-directional cycle-track with separate sidewalks. The second segment stretches from Carling Avenue to Prince of Wales Drive following the west side of Preston Street, proposed to be built to full buildout during the construction of the parking garage.

Since the writing of the *TIA Addendum #1*, the interim MUP has been increased in width to a minimum width of 3m with a full buildout of 3.5m sidewalks with more than 2m boulevard separation and 3m bi-directional cycle-track. The full buildout segment bordering Preston Street was also increased in width from 3m bi-directional cycle-tracks to 3.5m and 3m sidewalks with boulevards exceeding 2m.

23. To support these AT infrastructure initiatives, the signal timing plans at signalized intersections along the New Civic Development frontage will be enhanced to improve pedestrian and cycling operations. **No change.**
24. TOH will meet the require bylaw requirements for bicycle parking. The location and distribution of bicycle parking spaces will be confirmed at the Site Plan Control stage for the various development phases. Of note, TOH has made a design decision that cyclists are not to be accommodated at the main hospital front-door entrance in an effort to minimize potential bicycle/vehicle conflicts. Where feasible, opportunities for indoor and/or covered parking can be explored. **The latest site plan proposes a new MUP connection on the south side of Road A from the Road A/Road B intersection to the front door of the hospital. With this new MUP addition, TOH proposes new bike parking facilities directly in front of the main hospital door. Furthermore, new parking facilities are also proposed on the backside of the hospital, near the northwest entrance. The exact number of bike parking has not been finalized and will be confirmed during detailed design.**
25. The hospital site's location within 600-meter walk to high frequency LRT Trillium Line and Dow's Lake Station makes it a prime candidate for a transit-oriented development. The additional proposed Carling BRT lanes functions as a supplementary transit service. It is expected the capacity of both services will accommodate future transit ridership at the New Civic Development. The transit demand and capacity will be reassessed during the Site Plan Control process for subsequent phases. **New data from OC Transpo was used to determine transit demand and capacity. Please refer to Section 5.7.**

26. To leverage transit use, the New Civic Development is proposing an AT Plan that provides direct connections to surrounding transit service. A featured element is the Highline connection to Dow's Lake station. TOH is also pursuing a potential extension of the Dow's Lake Station platform to the south side of Carling Avenue, and discussion are ongoing. Additionally, the transit incentives/strategies within the TDM Plan will be a critical element to leverage the proximity of future infrastructure and service, to maximize its use. [In addition to the above, the City of Ottawa is planning an Environmental Assessment \(EA\) to investigate a future connection between Dow's Lake Station and the NCD across Carling Avenue.](#) TOH is also preparing a [Transportation Demand Management \(TDM\) Strategy](#) which will develop a comprehensive plan to help achieve future mode share targets, including transit incentives and potential measures to encourage ridership. TOH will also investigate future transit shuttle opportunities between Dow's Lake Station, the front door, and other potential destinations, to further encourage transit use and enhance passenger mobility on-campus.
27. TOH understands the importance of identifying the most appropriate locations for the blue 'H' marker along the approaches to the Hospital including Hwy 417. These decisions will be made independent of this study; however, this study has identified the Rochester EB off ramp and the Bronson WB off ramp as possible locations for these markers. If selected, these potential routes would follow the City's arterial and major collector road system, and corresponding decisions would need approval by the Ontario Ministry of Transportation (MTO) on Hwy 417 and the City of Ottawa for the installation of all required trailblazing markers on municipal roads. [The accompanying Neighbourhood Traffic Management Strategy Report has recommended TOH investigate opportunities immediately to relocate 'H' signs away from the Parkdale Avenue interchange to other interchanges such as Carling Avenue and Rochester Street.](#)
28. The access and circulation needs for ambulances and emergency transports have been considered in the Master Site Plan. As a result, the access points for ambulances and emergency transports were segregated from public and staff access points where possible, to minimize potential conflicts and operational impacts of these essential vehicles. [No change.](#)
29. TOH recognizes that the New Civic Development may have traffic implications to nearby communities and neighbourhoods. Therefore, considerable effort was taken to identify vulnerable streets during the design process to help mitigate potential traffic infiltration.
- **Sherwood Drive:** The Sherwood/Carling intersection is ruled out as a primary Carling Avenue access point to the New Civic Development. This will help disincentivize traffic infiltration along Sherwood. Of note, the City of Ottawa is currently updating the Sherwood Traffic Calming Study, and this may lead to other speed management measures along this street. [No change.](#)
  - **Champagne Avenue:** The northbound through movements exiting the future New Civic Development at Carling/Champagne will be prohibited and physical measures such as the inclusion of a channelized turn island departing the site are proposed. Vehicles must turn left or right on to Carling Avenue when exiting the campus. [Champagne Avenue will no longer have a channelized turn island.](#)
  - **Maple Drive:** The New Civic Development intends to regulate access to Maple Drive from the internal site access to discourage/prohibit public and staff movements. This will greatly reduce the traffic volumes on Maple Drive from the New Civic Development and help maximize the travel time and reliability of ambulance movements along the emergency route. [TOH is also preparing a Neighbourhood Traffic Management Strategy with measures to help discourage speeding and traffic infiltration in vicinity of the NCD, including Maple Drive.](#)
  - **Dow's Lake Community:** It is acknowledged that Lakeside Avenue provides direct access for eastbound traffic from Queen Elizabeth Driveway to Bronson and may experience slightly higher traffic volumes at times during peak commuter periods when the adjacent arterial network is most likely to be congested. For the remaining local streets, existing area traffic management measures (such as turn prohibitions and time of day restrictions) will still be

enforced that will help limit traffic infiltration. Additional measures may be explored in consultation with the City Area Traffic Management group if traffic infiltration is observed in the future. *As previously noted, TOH is preparing a [Neighbourhood Traffic Management Strategy](#) that includes a comprehensive plan to address potential traffic implications to surrounding communities when the NCD is operational.*

30. Current parking demand projections suggest the proposed approximately 3,100 parking space supply is appropriate to the context, but parking availability pressures could be experienced if historic travel trends exhibited at the exiting Civic Hospital persist into the future. To address this healthy tension between parking supply and demand, TOH should endeavor through its TDM Plan, to reduce personal vehicle use by staff and visitors as much as possible to avoid this outcome. Leveraging the proximity to the area's existing and proposed rapid transit system, the bus transit infrastructure, and the active transportation networks will be important aspects of this strategy. *TOH is preparing a [Transportation Demand Management \(TDM\) Strategy Report](#) which will develop a comprehensive plan to help achieve future mode share targets to ensure the proposed parking supply is sufficient.*
31. TOH will also develop a comprehensive Parking Management Strategy (separate to this report) prior to implementation of Phases 2 and 3 of the New Civic Development to identify potential parking implications and provide mitigation options, building off the preliminary ideas described in this report. TOH will then be prepared to respond quickly to parking supply shortages and the implications if they arise. *TOH has prepared an [Off-site Parking Strategy Report](#) to accompany this application.*
32. TOH acknowledges the requirement from the National Capital Commission (NCC) to provide approximately 200 public parking spaces within the New Civic Development to offset the loss of parking across from Dow's Lake Pavilion. There is expected to be ample supply within the parking garage to meet this requirement in evenings and weekends. TOH and the NCC are in the process of coming to an agreement as to how these visitor parking requirements and tour bus parking will be provided. *No change. The NCC and TOH negotiations are still ongoing, but the current expectation is that TOH will provide temporary public parking north of the site within an existing parking lot at the corner of Champagne/Carling as the parking garage is under construction. Once the parking garage is completed, the agreed upon spaces will be reserved for public use.*